

Documents of the World Administrative Radio Conference for Space Telecommunications (Geneva, 1971)

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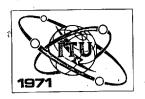
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SPACE CONFERENCE

Document No. 301-E 7 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

REPORT OF THE CHAIRMAN, WORKING GROUP 4B

REGARDING ADDITIONS TO BE MADE TO THE PROPOSED

"OMNIBUS" RECOMMENDATION TO BE ADDRESSED TO THE C.C.I.R.

TO REPLACE RECOMMENDATION No. Spa 3

- During its 11th meeting, on 5 July 1971, the Working Group 4B considered the proposal USA/168/290 on a draft recommendation to the C.C.I.R. relating to the Broadcasting-Satellite Service and a proposal from the U.K. Delegation relating to specifying some numerical values of power flux-densities from space stations in the Broadcasting-Satellite Service which would permit differentiation between individual reception and community reception in the Broadcasting-Satellite Service.
- 2. As regards the proposal USA/168/290, the Working Group was of the opinion that while the U.S.A. proposal was covered in the draft recommendation in Document No. 278, that draft recommendation was limited to the band / 614-790 Mc/s / whereas the proposal USA/168/290 was more general in nature and applied to all frequency bands which may be allocated to the Broadcasting-Satellite Service. It was therefore decided to request Committee 4 to include the ideas in the U.S.A. proposal in the "omnibus" recommendation to the C.C.I.R. which is at present under consideration by Committee 4.
- As regards the proposal of the U.K. Delegation, the Working Group 4B noted that, although some results are available in Table 3.3 VI on page 34 of the S.J.M. Report, it would be useful to study this question further and in view of the fact that limited time is available to the Conference and that it would not be possible to specify any values at present, the Working Group decided to request Committee 4 to include this proposal also in the "omnibus" recommendation referred to above.

G.C. BROOKS Chairman Working Group 4B





SPACE CONFERENCE

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7 July 1971

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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

REPORT OF THE CHAIRMAN OF WORKING GROUP 4B
ON SHARING OF A MARITIME-SATELLITE SERVICE
WITH OTHER SERVICES IN THE
FREQUENCY RANGE 450 TO 614 Mc/s

1. Considerations of sharing in the satellite-to-ship direction

1.1 The proposals contained in United Kingdom Documents Nos. 108 and 133 were examined, taking firstly the band 468-470 Mc/s which is proposed for use in the satellite-to-ship direction.

The sharing considerations here are:

- a) maritime-satellite systems interfering with terrestrial mobile systems;
- b) maritime-satellite systems interfering with terrestrial fixed systems;
- c) maritime-satellite systems interfering with meteorologicalsatellite systems.
- 1.2 In the consideration of 1.1 a), it was concluded that in order to protect the land mobile service, the maximum power flux-density at the surface of the earth should not exceed -145 dbW/m², in a 25 ke/s band, at angles between 0° and 20° to the horizontal, rising linearly to -141 dbW/m² at 60°, and not exceeding that value between 60° and 90°*).
- 1.3 In the consideration of 1.1 b), as a basis of calculation a 24-telephone channel terrestrial link was assumed, operating under the worst possible interference conditions, with the main beam pointing directly at the maritime-satellite.



^{*)} It was considered that these values should only be adopted provisionally, and subject to further study by the C.C.I.R.

Under this condition, the above power flux-densities would cause some degradation in the performance of one or more telephone channels in the terrestrial system. Although this is the worst condition of interference, the probability of its occurring (even where there would be only 3 satellites to provide world-wide coverage) is not insignificant. While the limits of p.f.d. set out in Section 2 might be adopted on a provisional basis, and subject to further study by the C.C.I.R. it was recognized that additional measures might need to be taken to safeguard terrestrial fixed links. Examples of interference calculations are shown in the attached Annex.

1.4 In the consideration of 1.1 c), it was concluded that the proposed secondary maritime-satellite service could not share the same frequencies with the existing secondary meteorological-satellite service in the band 468-470 Mc/s which operates at a power flux-density of -154 dbW/m² in any 4 kc/s band.

2. Considerations of sharing in the ship-to-satellite direction :

2.1 The proposals contained in Documents Nos. 108 and 133 relating to the frequency band between 606 and 614 Mc/s are that 611-613 Mc/s should be used for ship-to-satellite transmissions on the high seas, and 607-607.25 Mc/s for use in coastal waters.

The sharing considerations here are:

- a) maritime-satellite ship transmissions interfering with radio astronomy;
- b) television broadcasting transmitters interfering with a maritimesatellite space station;
- c) maritime-satellite ship transmitters interfering with television broadcast receivers.
- 2.2 In the consideration of 2.1 a), calculations were made of the geographical separations that would be necessary if the ship radiated within a frequency band used for radio astronomy.

Taking as the basis of calculation the need to keep interfering signals below -253 dbW/m²/c/s (S.J.M. Report, Annex 7.1, Table 7.1.1), in order to provide protection for 99% of the time in temperate zones it was calculated that for a radio astronomy station located on the coast, without site shielding, the geographical separation from the ship, (assumed to be radiating horizontally an e.i.r.p. of +14 dbW), would need to be much greater than 1 000 km. The propagation characteristics appropriate to paths of greater length than 1 000 km are not available, but come within the scope of Study Programme 5-1D-1/5 of the C.C.I.R. If the astronomy station were sited such that the path was mainly

over land, again without site shielding, the separation distance would be some 800 to 900 km. With site shielding of 20 db, the separation distances would be greater than 1 000 km over sea, and 650 km over land. Because of these separation distances it is concluded that sharing between the Radio-Astronomy Service and the Maritime-Satellite Service is not feasible on an equal basis.

As regards 2.1 b), it should be noted that if the frequency band 607-607.25 Mc/s were allocated to the Maritime-Satellite Service, television transmissions in Region 2 in the band 602-608 Mc/s will have a sound carrier at 607.75 Mc/s which would be a source of interference to the satellite. The aggregate of e.i.r.p. radiated in the satellite band towards the satellite from all television transmitters should not exceed a value of about +10 dbW/16 kc/s, based on the assumption that the ship's e.i.r.p. is +25 dbW. These considerations also apply to Region 3.

Similar problems of interference apply to the band 611-613Mc/s if the television channel occupying the band 608-614Mc/s is used in Region 3. Similarly in Region 1 there is a sharing problem in the use of the band 606-614Mc/s for television broadcasting and the Maritime-Satellite Service.

Because of the need to limit the e.i.r.p. as above, it is concluded that sharing between the Terrestrial Broadcasting Service and the Maritime-Satellite Service is not feasible on an equal basis.

2.4 As regards 2.1 c), in order to avoid interference to television receivers from ships' transmissions operating on a frequency of 607-607.25 Me/s, the Broadcasting Service area and the areas of shipping operations would need to be separated from one another.

In order to avoid interference to the television channel above the proposed frequency band of 611-613 Mc/s, a frequency separation of about 1 Mc/s is necessary to avoid interference to television receivers near the coast, even when the ship is some distance outside coastal waters.

G.C. BROOKS Chairman Working Group 4B

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A. N. N. E. X

SINGLE FREQUENCY INTERFERENCE LEVELS IN THE TELEPHONE CHANNELS OF A 24-TELEPHONE CHANNEL LINK FROM A MARITIME SATELLITE OPERATING IN THE FREQUENCY RANGE 468 - 470 Mc/s

-		Receiver Input	Thermal noise in top	Interf in cha	erence lev nnel - dk	1
		level - dbm	channel — dbmOp	· CHl	CH14	CH24
		80	. 40	46.3	<i>3</i> 5.5	35
	Case l	70	50	56 . 3	45.5	45
		60	. 60	66 . 3	55•5	55
		80	40	49.3	3 8.5	38
	Case 2	70	50	59•3	48.5	48
	•	60	60	69.3	58.3	58
,		80	40	55.3	44.5	44
	Case ろ	70	50	65.3	54.5	54
		60	-60	75.3	64.5	64

Assumptions

- (i) Baseband range of wanted system = 12-108 ke/s
- (ii) R.m.s. deviation 35 kc/s. Receiver noise factor 8 db
- (iii) Case 1 15 db antenna gain pointing directly at satellite
- (iv) Case 2 12 db antenna gain pointing directly at satellite
 - (v) Case 3 12 db antenna gain average off-beam gain, 2 db

Annex to Document No. 302-E

Page 6

- (vi) 3 db polarization discrimination satellite-terrestrial link
- (vii) Power flux-density, 0 to $20^{\circ} = -145 \text{ dbW/m}^2/25 \text{ kc/s}$ (This applies to Cases 1 and 2)
- (viii) Power flux-density 60° to $90^{\circ} = -141 \text{ dbW/m}^2/25 \text{ kc/s}$ (This applies to Case 3)

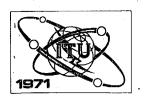
Remarks

In practice, the total system noise will be greater than the values shown in Column 3 of the table due to intermodulation noise.

Factors which will contribute to the reduction of interference may be the dispersal effect of modulation on the interfering carrier, and/or voice switching of the satellite transmission, together with jitter of the wanted and unwanted carriers, which will result in a subjective reduction in noise.

On the other hand, no account has been taken of the consequence of interference being reflected into the terrestrial link antennae from the ground.

In a multi-hop system, owing to the frequency shift between adjacent hops, the average interference per hop will be 3 db below the values shown.



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COMMITTEE 4
WORKING GROUP 4E

REPORT OF THE CHAIRMAN, WORKING GROUP 4B
REGARDING DOCUMENT No. 260 FROM
CHAIRMAN OF WORKING GROUP 4E

During its twelfth meeting on 6 July 1971, Working Group 4B considered Document No. 260 and especially paragraphs 3.1 and 3.2 thereof. After careful examination of:

1.1: Paragraph 3.2 of Document No. 61

1.2: Recommendation No. 432-1 of the C.C.I.R., and

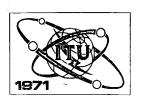
1.3: Article 2 and Appendix 5 of the existing Radio Regulations,

with reference to the activities of Working Group 4B, the Working Group came to the following conclusions:

- As regards paragraph 3.2.1 of Document No. 260, Working Group 4B was of the view that the items of basic characteristics to be notified to the I.F.R.B. should be limited to the minimum necessary ones which would enable the I.F.R.B. to examine the notices with reference to their conformity with the provisions of the Radio Regulations. With this principle in view, Working Group 4E should decide in consultation with Committee 6, the basic characteristics which should be included in Appendices 1, 1A & 1B. Working Group 4B had no specific items to suggest to Working Group 4E.
- As regards paragraph 3.2.2 of Document No. 260, Working Group 4B agreed in principle that it is desirable to update Article 2 and Appendix 5 of the present Radio Regulations, to incorporate therein the provisions of Recommendation 432-1 of the C.C.I.R. However, Working Group 4B had no occasion to use Article 2 and Appendix 5 during the course of its work and therefore had no specific proposals on this subject. Working Group 4B was of the opinion that the Chairman of Working Group 4E may like to decide upon the need or otherwise to revise the provisions of Article 2 and Appendix 5 in consultation with Committee 6.

G.C. BROOKS Chairman Working Group 4B





SPACE CONFERENCE

Document No. 304-E 11 July 1971 Original: French

English Spanish

WORLD ADMINISTRATIVE RADIO CONFERÊNCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SECOND REPORT OF COMMITTEE 5 (ALLOCATIONS)

Article 1 Section IIA ADD 84AQA ADD 84AQB ADD 84ATC

Article 6 MOD 415 MOD 417 ADD 419A

Article 27 MOD 951 MOD 952

Draft Resolution relating to the use of the band 156-174 Mc/s by the Maritime Mobile-Satellite Service

Draft Recommendation relating to a revised presentation of the Sections of Article 1 of the Radio Regulations

Draft Recommendation relating to the future exploitation of bands allocated to the Inter-Satellite Service

Draft Recommendation relating to the future use of the certain frequency bands between 40 and 275 Gc/s by the Radiocommunication Services

Draft Recommendation relating to the future use of the 41-43 Gc/s band by the Fixed and Mobile Services

Draft Recommendation relating to requirements for future frequency allocations for Maritime Mobile Service using space techniques



Document No. 304-E Page 2

Draft Recommendation relating to the protection of radio astronomy observations on the shielded area of the moon

Draft Recommendation relating to the future provision of a band near 10 Mc/s for the Radio Astronomy Service

Committee 5 adopted the above texts which are reproduced in the Annex to the present Report and submitted for first reading by the Plenary.

H.A. KIEFFER Chairman

Annex: 1

ANNEX

ARTICLE 1, SECTION IIA

ADD 84AQA Aeronautical Radionavigation-Satellite Service.

A radionavigation-satellite service in which mobile earth stations are located on board aircraft.

ADD 84AQB Maritime Radionavigation-Satellite Service.

A radionavigation-satellite service in which mobile earth stations are located on board ships.

ADD 84ATC Time Signal-Satellite Service.

A radiocommunication service using space stations on earth satellites for the same purposes as those of time signal service.

ARTICLE 6 MOD 415, MOD 417

MOD 415

- § 2. (1) When special circumstances make it indispensable to do so, an administration may, as an exception to the normal methods of working authorized by these Regulations, have recourse to the special methods of working enumerated below, on the sole condition that the characteristics of the stations still conform to those inserted in the Master International Frequency Register:
 - a) a fixed station in the Terrestrial Service or Fixed Satellite Service may, on a secondary basis transmit to mobile stations on its normal frequencies;
 - b) a land station may communicate, on a secondary basis, with fixed stations in Terrestrial Service or Fixed Satellite Service or other land stations of the same category.

MOD 417

§ 3. Any administration may assign a frequency in a band allocated to the Fixed Service or allocated to the Fixed Satellite Service to a station authorized to transmit, unilaterally, from one specified fixed point to one or more specified fixed points provided that such transmissions are not intended to be received directly by the general public.

ARTICLE 6 ADD 419A

ADD 419A

Aircraft earth stations are authorized to use frequencies in the bands allocated to the Maritime Mobile Satellite Service for the purpose of communicating, via the stations of that service, with the public telegraph and telephone networks.

ARTICLE 27 MOD 951, MOD 952

- MOD 951
- § 3. (1) Aircraft stations may communicate with stations of the Maritime Mobile or Maritime Mobile-Satellite Services. They shall then conform to those provisions of these Regulations which relate to these services.
- MOD 952
- § (2) For this purpose aircraft stations should use the frequencies allocated to the Maritime Mobile or Maritime Mobile-Satellite Services. However, having regard to interference which may be caused by aircraft stations at high altitudes, maritime mobile frequencies in the bands above 30 Mc/s shall not be used by aircraft stations in any specific area in which interference is likely to be caused. In particular, aircraft stations operating in Region 1 should not use frequencies in the bands above 30 Mc/s allocated to the Maritime Mobile Service by virtue of any agreement between administrations in that Region.

DRAFT RESOLUTION

relating to the use of the band 156-174 Mc/s by the Maritime Mobile Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that there is a need to develop the use of Space Radiocommunication techniques to meet the future requirements of the Maritime Mobile Service;
- b) that of the bands used at present by the Maritime Mobile Service, there may be advantages in using for the Maritime Mobile Satellite Service narrow channels between 156-174 Mc/s for safety and distress:

recognizing '

- 1) that the maritime mobile bands between 156-174 Mc/s are also used for other services:
- 2) that the power flux-densities laid down by maritime satellites in this band may cause harmful interference to terrestrial receivers and that the satellite receiver may suffer harmful interference from terrestrial radiocommunication transmissions:
- 5) that the Terrestrial Maritime Mobile Service makes extensive use of the channels given in Appendix 18 of the Radio Regulations:

is of the opinion

that it is important for the Maritime Mobile Satellite Service to be able to use some narrow channels, on an exclusive basis, for safety and distress as soon as practicable:

having provided for

the possible use of narrow channels for safety and distress by the Maritime Mobile Satellite Service in bands 157.3125-157.4125 Mc/s and 161.9125-162.0125 Mc/s not earlier than 1 January 1976 (see Radio Regulation No. 287A):

resolves

that the World Administrative Maritime Radio Conference to be held in 1974 be invited to consider this matter further and to decide if and to what extent the Maritime Mobile Satellite Service should be introduced in the above bands on an exclusive basis and to make any consequential changes in the Radio Regulations and in the use of the channels in Appendix 18;

requests the Secretary-General

to communicate this Resolution to Members and Associate Members and to the Administrative Council for inclusion in the draft agenda for the 1974 Maritime Conference.

relating to a revised presentation of the sections of Article 1 of the Radio Regulations

The World Administrative Radio Conference for Space Telecommunications

considering

- a) that the amendments made to the Article 1 of the Radio Regulations have resulted in a lack of system in the placing of individual terms and the somewhat illogical sequence in which they come;
- b) that it would therefore be desirable to rearrange Article 1 of the Radio Regulations in a more appropriate form;

recognizing

that this Conference was not able to perform this task

recommends

that the next World Administrative Conference which is competent to revise Article 1 of the Radio Regulations should consider the possibility of rearranging Article 1 in a more logical manner, for instance, on the lines of the Annex to this Recommendation, and to consider further consequential amendments to this Article, as necessary.

Annex: 1,

Annex to Recommendation No. ...

Article 1

Section I. General terms

Section II. Radio systems

Section III. Radio Services and stations

Sub-Section IIIA. Terrestrial Radiocommunication

Sub-Section IIIB. Space Radiocommunication

Sub-Section IIIC. Radio astronomy

Section IV. Technical characteristics

relating to the future exploitation of bands allocated to the Inter-Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that the bands 54.25-58.2 GHz, 59-64 GHz, 105-130 GHz, 170-182 GHz and 185-190 GHz have been allocated to the Inter-Satellite Service;
- b) that all the foregoing bands are located in parts of the radiofrequency spectrum close to peaks of atmospheric absorption;

and recognizing

that the Inter-Satellite and Terrestrial Radiocommunication Services are mutually protected by the attenuation due to atmospheric absorption;

recommends

that a future World Administrative Radio Conference should consider allocating these bands also to Terrestrial Radiocommunication (except Aeronautical Mobile) Services.

relating to the future use of certain frequency bands between 40 and 275 Gc/s by the radiocommunication services

The World Administrative Radio Conference for Space Telecommunications, Geneva (1971),

considering

that the 43-48 Gc/s, 66-71 Gc/s, 95-101 Gc/s, 142-150 Gc/s; 190-200 Gc/s and 250-265 Gc/s bands have been allocated to the following services:

- Aeronautical Mobile-Satellite
- Maritime Mobile-Satellite
- Aeronautical Radionavigation-Satellite
- Maritime Radionavigation-Satellite;

recognizing

that it is not desirable for compatibility considerations that at a later date these bands should be shared with Terrestrial Radio-communication Services other than those of interest to the Aeronautical and Maritime Mobile Services and/or the aeronautical and Maritime Radio-navigation Services:

recommends

that a future competent world administrative conference should consider allocating, in addition, the 43-48 Gc/s, 66-71 Gc/s, 95-101 Gc/s, 142-150 Gc/s, 190-200 Gc/s and/250-265 Gc/s bands to the following services:

AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION

in an appropriate manner.

relating to the future use of the 41-43 Gc/s band by the Fixed and Mobile Services

The World Administrative Radio Conference for Space Telecommunications, Geneva (1971),

considering

that the 41-43 Gc/s band has been allocated to the Broadcasting-Satellite Service;

recognizing

that it is possible, by appropriate co-ordination, for a frequency band to be shared by the Broadcasting-Satellite Service, on the one hand, and the Fixed and Mobile Services, on the other;

recommends

that a future competent world administrative conference should consider allocating, in addition, the 41-43 Gc/s band to the Fixed and Mobile Services.

relating to requirements for future frequency allocations for Maritime Mobile Service using space techniques

The World Administrative Radio Conference, Geneva, 1971,

having noted

that the Inter-Governmental Maritime Consultative Organization (I.M.C.O.) has stated a requirement for frequencies on the order of 400 MHz, believing that small vessels in particular may be excluded from satellite communications if such frequencies are not made available;

further noting

that the C.C.I.R. Special Joint Meeting, Geneva, 1971, concluded that the present Conference should be invited to examine the possibility of providing exclusive channels for the Maritime Mobile Service at about 400 MHz and that provision of such channels is desirable:

considering

- a) that ship stations and survival craft stations are completely dependent upon the use of radio for communication;
- b) that the use of space techniques will provide the Maritime Mobile Service with a reliable method of communication, considerably improved over existing methods;
- c) that reliable Maritime Mobile Service communications will greatly assist in the saving of lives and property;

- d) that although the Conference has made certain provisions for the use of space techniques by the Maritime Mobile Service, there is some uncertainty with respect to the adequacy and usefulness of these provisions, particularly insofar as small ships and survival craft are concerned.
- e) that general participation of small ships in a service using space techniques would not only benefit the efficient and safe operation of these ships, but it would also improve the safety service for larger ships and survival craft.
- f) that future conferences might find it necessary to make additional allocation provisions for such uses in more nearly optimum portions of the spectrum;
- g) that some communications functions, such as certain broadcasting and fixed applications, may not be dependent upon the transmission of radio waves, but could in fact use other means, thereby making available portions of the spectrum for services which are so dependent,

recommends

- 1. that administrations and appropriate international organizations should continue to review the requirements for the application of space techniques for the Maritime Mobile Service and the suitability of current frequency allocation provisions in meeting those requirements;
- 2. that the C.C.I.R. should continue its studies to determine the optimum portions of the frequency spectrum and related sharing conditions to accommodate Maritime Mobile Service requirements, taking into consideration technological advances in space techniques for Mobile Services;
- 5. that a future appropriate Administrative Radio Conference should review the requirements of the Maritime Mobile and Safety Services, and if necessary, provide the frequency allocation to satisfy these requirements.

relating to the Protection of Radio Astronomy Observations on the Shielded Area of the Moon

The World Administrative Radio Conference, Geneva, 1971,

considering

- a) that radio astronomy observations at frequencies below the ionospheric critical frequencies and above 100 Gc/s are hampered or prevented by absorption in the earth's atmosphere;
- b) that successful radio astronomy observations require complete freedom from harmful interference:
- c) that observations from the shielded area or of the mean offer unique opportunities for observations which are not affected by such absorption:
- d) that the shielded area of the moon appears to be the most putentially useful area accessible to man which is completely free from interference from terrestrial transmissions:
- e) that the shielded area of the moon refers to the area of the moon which is more than 23.2° beyond the mean limb of the moon as seen from the centre of the earth;
- f) that the transmissions of data from observation stations to collection points by radio-communication will be in the bands allocated for this purpose;

noting

the desirability of maintaining the shielded side of the moon as an area of maximum value for observations by the Radio Astronomy and passive Space Research Services and consequently to be as free as possible from transmissions:

recommends

- 1) that the C.C.I.R. study the problem of the frequency bands most suitable for radio astronomy observations on the shielded side of the moon and work out recommendations concerning these bands as well as criteria for their application and protection;
- 2) that in the meantime administrations, in accordance with the intent of this recommendation, take all practicable steps to ensure that there will be no interference to radio astronomy observations on the shielded side of the moon; and
- 3) that administrations should apply such recommendations as will be provided on this matter by the C.C.I.R. pending the convening of the next World Administrative Radio Conference.

relating to the future provision of a band near 10 Mc/s for the Radio Astronomy Service

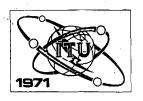
The World Administrative Radio Conference 1971

considering

- a) the requirements of the Radio Astronomy Service, as expressed by the Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science (IUCAF), for a frequency allocation near 10 Me/s;
- b) that the use of the standard frequency guard bands has not satisfied the needs of the Radio Astronomy Service at a frequency near 10 Mc/s;
- c) that propagation conditions at a frequency near 10 Mc/s are such that interference to the Radio Astronomy Service might result from a transmitter operating anywhere on the earth and as a consequence an exclusive world-wide allocation is necessary for long term observations;
 - d) that successful radio astronomical measurements have, at times, been made at frequencies near 10 Mc/s;
 - e) that IUCAF is co-ordinating the needs of radio astronomers for frequency allocations:

recommends

- 1) that administrations keep under review the possibility of releasing a band of frequencies 50 kc/s wide for the use of the Radio Astronomy Service between 10 Mc/s and 15 Mc/s;
- 2) that administrations give close attention to any future recommendation of the IUCAF concerning the specific frequency band between 10 Mc/s and 15 Mc/s required by the Radio Astronomy Service;
- 3) that a future World Administrative Radio Conference consider granting to the Radio Astronomy Service an exclusive allocation in this region of the spectrum.



SPACE CONFERENCE

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9 July 1971

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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SUMMARY RECORD

OF THE

FIFTH MEETING OF COMMITTEE 5

(ALLOCATIONS)

Wednesday, 7 July 1971, at 1500 hrs

Chairman: Mr. H.A. KIEFFER (Switzerland)

Subjects discussed:	Document No.	
1. Proposal by IRAQ (40-275 GHz)	230 and Add. 1	
2. First report from Working Group 5D Second report from Working Group 5D Third report from Working Group 5D Fourth report from Working Group 5D	203 and Corr. 1 239 240 241	
3. First report from Working Group 5E	248	



1. Proposal by Iraq (40-275 CHz) (Document No. 230 and Add. 1)

The <u>Chairman</u> explained that a further vote would be taken on the proposal in application of No. 273 of the Convention.

The <u>Delegate of Iraq</u> said that during discussion the previous day no views had been expressed by those delegations voting against the proposal; as the majority had abstained he had felt the proposal might lack clarity and he had therefore combined the two parts into a single paragraph:

"The bands to be allocated above 40 GHz should be limited to the space services needing them now or which will be needing them within the next ten years."

The <u>Delegates of India</u>. <u>Pakistan and Argentina</u> supported that modification.

The <u>Chairman</u> put the modified proposal to the vote and it was <u>accepted</u> by 29 votes to 5, with 25 abstentions.

The <u>Chairman</u> said that the content of the bands in question would be considered during the discussions on allocations above 40 MHz.

The <u>Delegate of the United States of America</u> said he had abstained from voting on the understanding that the modified proposal was a replacement for paragraphs 1 and 2 on page 2 of Document No. 230.

The <u>Delegates of Italy</u> and the <u>United Kingdom</u> explained that they had abstained for the same reason.

2. First report from Working Group 5D (Document No. 203 + Corrigendum 1)

The <u>Chairman of Working Group 5D</u> indicated that in Appendix E, ADD 274B, "and Mexico" should be inserted after "Cuba". The report had been adopted unanimously by the Working Group, except for the part concerning Radio Astronomy in the HF bands but that had already been dealt with in an earlier meeting of the Committee.

The Chairman took the report paragraph by paragraph.

1.1 and Appendix A : Adopted

1.2 and Appendix B : Adopted

1.3 and Appendix C : Adopted

1.4 and Appendix D : Adopted

1.5 and Appendix E:

The <u>Chairman of Working Group 5D</u> said that the final sentence of 1.5 was no longer necessary and should be deleted.

The <u>Observer from I.C.A.O.</u>, referring to MOD 274, said that the presence of those stations, particularly in the European region, complicated the already difficult task of aeronautical mobile route frequency management and I.C.A.O. hoped that the Administrations concerned would give favourable consideration to the transfer of the stations to another band at the earliest practicable date.

The <u>Delegate of Roumania</u> asked for Roumania to be added to the list of countries mentioned in MOD 274. It was so <u>adopted</u>.

In the Spanish text, first line of ADD 274B, the figure should be corrected to read 132-137 Mc/s.

Adopted, as amended

1.7 and Appendix F:

The <u>Delegate of Italy</u> said that the Table in Appendix F differed from that in the Working Group 5B report and suggested it be left in abeyance until the 5B report had been considered. It was so <u>agreed</u>.

1.8 and Appendix G:

The <u>Delegate of Morocco</u> said that Morocco should be deleted from MOD 281C. The <u>Chairman</u> expressed appreciation to the Delegation of Morocco and asked if any other Administration could follow this good example.

The <u>Delegates of Ceylon</u> and <u>India</u> said their countries should be added to those listed in MOD 281E. It was so <u>adopted</u>.

1.9 and Appendix H : Adopted

1.10 and Appendix I: Adopted

2. Noted.

Second report from Working Group 5D (Document No. 239)

The <u>Chairman of Working Group 5D</u> said that following consideration of Document No. 282, the text of MOD 322 should be altered to read:

"In Denmark, Norway and Sweden, the bands 430-432 Mc/s and 438-440 Mc/s are allocated to the fixed and mobile services."

1.1 and Appendix A : Adopted

1.2 and Appendix B : Adopted

1.3 and Appendix C

The <u>Delegates of Bulgaria</u> and the <u>Syrian Arab Republic</u> asked for their countries to be included in MOD 311A. Those additions were <u>adopted</u>.

1.4 and Appendix D : Adopted

1.5 and Appendix E : Adopted, with the amendments indicated

by the Working Group Chairman.

Third report from Working Group 5D (Document No. 240)

The Chairman of Working Group 5D said that the Drafting Group would adjust the denominations in the Table to bring them into line with terms and definitions adopted by Committee 5, presented by Working Group 5 ad hog in Documents Nos. 218 and Corr. and No. 251. He drew attention to the final sentence on page 6 and to a typing mistake in the English text on page 2, which should read "(see Appendix B)".

Appendix A

The <u>Chairman</u> said that ADD 402A should read "In France and Greece, ..." The <u>Delegate of the United Kingdom</u>, pointing out that the provision was not concerned with Space Services and therefore did not fall within the competence of the Conference, proposed that it be deleted entirely. It was so <u>agreed</u>.

The <u>Delegate of France</u> said he had noted the point but could not agree with the deletion.

Appendix B

There was a lengthy discussion following the suggestion of the <u>Delegate of Syria</u> that allocations could be limited to 150 GHz and the request by the <u>Delegate of Iraq</u> for comments from those delegations which did, in fact, need such allocations in the near future.

The <u>Delegate of the United States of America</u> said that the techniques used in the services concerned (all closely related to the Mobile Service) were developing rapidly and would in many cases become part of operational systems. Provided guidance were given at the present time to designers and equipment manufacturers, a later conference could go into details of how bands could best be divided among the various services. The <u>Delegate of Japan</u> said that there was a possibility of the band being used but the main interest was in setting a target for the development of new systems.

The Observer from I.C.A.O. said that the I.C.A.O. co-ordinated proposals went up to 265 GHz for development purposes. The Delegate of New Zealand said that his Administration had also submitted proposals going up to 265 GHz. Since that part of the spectrum was unused, it should be allocated up to a limit considered reasonable by those delegations which could foresee using it.

The <u>Delegate of the U.S.S.R.</u> thought that U.S.S.R. requirements could be catered for in the band up to 150 GHz.

The <u>Director of the C.C.I.R.</u>, speaking at the request of the Chairman, said that the C.C.I.R. had already been studying propagation characteristics and techniques in the higher GHz ranges and in his view it was essential for the I.T.U. to maintain its guiding role.

The <u>Observer from I.A.T.A.</u> said that in the bands below 40 GHz many allocations were exclusive and I.A.T.A. could see no reason for a change in philosophy in higher bands; he felt that exclusive bands should be made available in the interests of free development.

The <u>Delegates of Denmark</u> and <u>Sweden</u> were not in favour of allocating the band to as many as four services; although they accepted the decision of the Sub-Working Group, they wished to place on record that they did not consider such action to be good frequency management.

The <u>Delegate of Ethiopia</u> referred to the Iraq proposal adopted at the start of the meeting which called for allocations to be limited to more or less immediate requirements. He thought it would be useful to have all the allocations to the various services in those bands shown in the form of a chart. The <u>Delegate of Syria</u> withdrew his own proposal and supported that suggestion.

The <u>Delegate of the United Kingdom</u>, supported by the <u>Delegate of Italy</u>, said that the Working Group report dealt with Mobile Services and he could not see how an overall picture including other services would help. He had been surprised to hear of attempts to discourage Space Services from developing in the higher reaches of the spectrum as that order of frequencies was of no use to Terrestrial Services. He was very much in favour of the Space Services using as high a range of frequencies as possible.

The <u>Delegate of Syria</u> then suggested that the bandwidths might be reduced. Having been reminded by the Chairman that the bands in question were allocated to four services, he withdrew that suggestion, the <u>Chairman</u> giving the assurance that the genuine concern expressed about the manner in which the spectrum would be used in future would be borne in mind.

Appendix B was therefore adopted.

With regard to ADD 412I, the <u>Chairman</u> said that if the Committee agreed a draft recommendation could be produced for discussion at a subsequent meeting, it being understood that the rest of the note would be removed, as he had explained earlier.

The <u>Delegate of New Zealand</u> agreed with that suggestion, noting that the draft recommendation attached to Document No. 254 from Working Group 5A should be taken into consideration.

The <u>Observer from I.C.A.O</u>. said that one of the points made in the I.C.A.O. Council was the importance of the principle of exclusive allocations. That was obviously not possible in the development stage but it might be desirable, in the drafting, to ask future radio conferences to consider that possibility.

Fourth report from Working Group 5D (Document No. 241)

The <u>Chairman of Working Group 5D</u> pointed out a small correction to the French text only: on page 4, 6th line, the final figure should read "157, 4 125 MHz".

The <u>Delegate of Austria</u> said he had not yet been able to make sure whether the arrangement given in Document No. 241 would be compatible with the arrangements for traffic on the lower Danube.

Appendices A and B to Document No. 241 were adopted.

The <u>Chairman of Working Group 5D</u> thanked Working Group 5D-2 and its Chairman, Mr. V.K.Y. Winkleman (Netherlands) for their successful drafting of the texts of these Appendices.

In reply to a point raised by the <u>Delegate of France</u>, the <u>Chairman</u> said that Proposal F/28/280, which had not been examined by Working Group 5D as planned, would be considered at a later meeting of Committee 5.

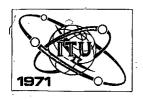
3. First report from Working Group 5E (Document No. 248)

The report was adopted.

The meeting rose at 1800 hrs.

The Chairman:

H.A. KIEFFER



SPACE CONFERENCE

Document No. 306-E 7 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

WORKING GROUP 5E

SECOND REPORT OF SUB-WORKING GROUP 5E-1

TO WORKING GROUP 5E

Broadcasting-Satellite Service (620-960 Mc/s)

1. Frequency band 620-790 Mc/s

The Sub-Working Group agreed in principle that the band 620-790 Mc/s may also be used by stations in the Broadcasting-Satellite Service subject to agreement on the power flux-density limitation values to be inserted in the text of ADD 332A. The Group provisionally agreed on the remainder of the text of foot-note ADD 332A, as shown in the Annex to the present Report.

2. Frequency band 790-960 Mc/s

- 2.1 Sub-Working Group 5E-1 agreed by a large majority not to recommend a world-wide allocation to the Broadcasting-Satellite Service in the band 790-960 Mc/s.
- 2.2 The question of Regional allocations was raised; however, time did not permit of its examination.

Per ÅKERLIND Chairman

Annex : 1



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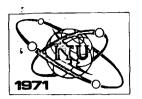
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ANNEX

620-790 Mc/s

ADD 332A

Within the frequency band 620-790 Mc/s, assignments may be made to stations in the Broadcasting-Satellite Service, subject to agreement among the Administrations concerned and affected / (see Articles 9 & 9A or Resolution) / . Such stations shall not produce a power flux-density in excess of the value / / within the territories of other Administrations without the consent of those Administrations.



Document No. 307-E 7 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

SUMMARY RECORD

OF THE

SECOND MEETING OF COMMITTEE 6
Friday, 25 June 1971, at 0940 hrs

Acting Chairman : Mr. M.K. BASU (India)

Subjects discussed:

Document No.

1. Approval of the Summary Record of the First Meeting

142 + Add. No. 1

- 2. Progress of work report by Working Group Chairmen
- 3. Consideration of document by Working Group 6B

195

4. Distribution of new documents among the Working Groups



Document No. 307-E Page 2

1. Approval of the Summary Record of the First Meeting (Document No. 142 + Add. No. 1)

Approved

- 2. Progress of work report by Working Group Chairmen
- (Document No. 195)
- 3. Consideration of document by Working Group 6B

Working Group 6A

The Chairman of Working Group 6A said that the Working Group was making satisfactory progress. It had agreed on six principles to serve as a basis for its revision of Article 9A and its drafting group had almost completed the relevant draft which would be submitted to the next meeting of Committee 6. Another sub-group had agreed on principles and was now drafting proposed texts for Appendices 1 and 1A. Working Group 6A had also reached agreement in principle on the Broadcasting-Satellite Service and had set up a small group to be convened by Mr. JOB (France) to draft the necessary resolutions.

The Chairman stated that the Committee would consider drafts of Articles 9 and 9A at its next meetings.

Working Group 6B

The Chairman of Working Group 6B said that the Working Group had almost completed its work and introduced Document No. 195.

Paragraph 1, Article 8

The proposed modification was approved for the French and English texts.

The <u>Delegate of Mexico</u> said that the Spanish text of RR477 should be maintained as worded in the present Radio Regulations, except for the statement "particularly the portion concerning high frequencies", which was to be deleted. It was very important to say that the Board had to carry out a "continuous and methodic study of the radio spectrum utilization" because, as he understood, that was the intention of the Conference held in 1959 and it was actually what the Board was doing.

The Chairman of the I.F.R.B. said that the present Spanish text would be maintained with the correction mentioned by the Delegate of Mexico.

The Spanish text in Document No. 195 sc modified was also approved.

Paragraph 2, Article 14

The proposed modification was approved.

Paragraph 3, Article 15

The proposed modification was approved.

Paragraph 4, Article 1 (Section III)

The Chairman of Working Group 6B explained that the conclusions of paragraph 4 had not yet been finally approved by the Working Group, but in view of the need to refer them back to Committees 4 and 5 as soon as possible, it was agreed that Committee 6 should consider them immediately.

Sub-paragraph 4.1

Approved.

Sub-paragraph 4.2

The <u>Delegates</u> of <u>Belgium</u>, <u>New Zealand</u>, the <u>Netherlands</u> and <u>Argentina</u> supported the inclusion of the words "the effect of" which they thought rendered the definition more logical. The <u>Chairman of the I.F.R.B.</u>, pointing out that the inclusion of those words might influence the formulation of Articles 9 and 9A, suggested that the question be referred back to Working Group 6A for further study.

The Chairman said that a final decision on the question would be taken at the Committee's next meeting.

Sub-paragraph 4.3

The Chairman of Working Group 6B said he had found that point outside the Group's terms of reference, and it was agreed to delete sub-paragraph 4.3 from Document No. 195.

Document No. 307-E Page 4

Sub-paragraph 4.4

The Chairman said that the Working Group's views on sub-paragraph 4.4.1 would be considered at the Committee's next meeting, before being transmitted to Committee 4.

There was some discussion of sub-paragraph 4.4.2 during which the Delegate of Argentina, strongly supported by the Delegate of France, pointed cut the illogicality of having a definition (No. 89), which was dependent on another definition (No. 85), and suggested that a better formulation of No. 89 should be sought. The Representative of the I.F.R.B. and the Delegates of New Zealand, India, United States of America and the Netherlands said that No. 89 had satisfactorily stood the test of time, and while conceding the validity of the Argentinian Delegate's view, preferred to retain the connection between No. 85 and No. 89 by maintaining No. 89 unchanged.

A decision was postponed, pending the submission by the Delegate of France of a proposed new text for No. 89 to the next meeting of Working Group 6A.

Sub-paragraph 4.5

Decision postponed pending consideration by Working Group 6A.

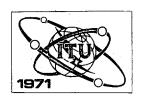
4. Distribution of new documents among the Working Groups

Distribution as in Annex to Document No. C6-2 approved.

The meeting rose at 1105 hours.

The Secretary:
W. GARCIA-RIOS

The Acting-Chairman:
M.K. BASU



Document No. 308-E 7 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

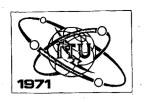
NOTE FROM THE CHAIRMAN OF COMMITTEE 4 TO THE CHAIRMAN OF COMMITTEE 6

- 1. Your attention is drawn to the following documents of Committee 4, which were approved by Committee 4 at its 7th Meeting on 7 July 1971:
 - a) Addendum No. 1(Rev.) to Document No. 198 (ref. paragraph 2 on page 1).
 - b) Document No. 275 (ref. paragraph 3 on page 1).
- 2. You are requested kindly to ensure that in Articles 9 and 9A suitable provisions are incorporated to provide for the co-ordination envisaged in Nos. 470MB and 470NGA in the Annex to Addendum No. 1(Rev.) to Document No. 198 and in No. 470NK in the Annex to Document No. 275.

E. SANDBACH Chairman Committee 4







Document No. 309-E 7 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

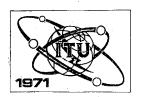
COMMITTEE 5

NOTE FROM THE CHAIRMAN OF COMMITTEE 4 TO THE CHAIRMAN OF COMMITTEE 5

- 1. Your attention is drawn to Documents Nos. 274 and 275 of Committee 4, which were approved by Committee 4 at its 7th Meeting on 7 July 1971, which deal with sharing considerations for the Broadcasting—Satellite Service with terrestrial services in the frequency bands around 2.5 Gc/s and the proposed provisions of Article 7 to incorporate the concerned sharing criteria in the Radio Regulations respectively.
- 2. You are requested kindly to note the contents of these documents.
- 3. Sharing considerations for Broadcasting-Satellite Service with terrestrial services in the band 614-790 Mc/s are contained in Document No. 278 which has not yet been considered by Committee 4.

E. SANDBACH Chairman Committee 4





Document No. 310-E

8 July 1971

Original: English

French

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

REPORT OF WORKING GROUP 6A ON ARTICLE 9A

The Working Group 6A has held several meetings during which the proposals submitted to the Conference by Administrations with respect to Article 9A were examined. The Group has based its work on the six following principles, adopted by it at its 4th meeting.

- 1) The data related to the "Advance Publication Procedure" must be published world-wide by means of the I.F.R.B. weekly circular whether or not geostationary satellites are involved;
- 2) All administrations have the right to make comments;
- 3) The publication of data must contain a specified minimum of data to permit the calculation of Δ T:
- 4) When the co-ordination procedure is commenced, it will be directed to the administrations whose interests may be affected and to those which would have made comments:
- 5) The administration initiating co-ordination will inform the I.F.R.B. who will publish this information in its weekly circular:



6) An administration believing that its notified or co-ordinated system was not taken into account shall have the right to require that it will be brought into the co-ordination procedures provided that this administration will provide the necessary information.

The Working Group was able to reconcile the views expressed in the various proposals and to submit to Committee 6 only one text for Article 9A. Some parts of this text are put within square brackets which, except in a small number of cases, refer to definitions which have to be adopted by other Committees. This result could be obtained only thanks to the spirit of co-operation shown by all delegates.

P.E. WILLEMS
Chairman,
Working Group 6A

Annex: 1

WORKING GROUP 6A

ANNEX

ARTICLE 9A

MOD

Co-ordination, Notification and Recording in the Master International Frequency Register of Frequency

1)
Assignments to Stations in the Space and Radio
Astronomy Services, except the broadcasting satellite services.

ADD Section I

Procedure for the Advance Publication of information on planned /Satellite Systems/.

ADD 639AA

gl. (1) An administration (or one acting on behalf of a group of named administrations) which intends to establish a satellite system shall, prior to the co-ordination procedure in accordance with No. 639AK where applicable, send to the Board not earlier than five years before the date of bringing the planned system into service the information listed in Appendix / IB/.

ADD 639AB

(2) Any amendments to the information sent concerning a planned _satellite system in accordance with No. 639AA shall, as soon as they become available, also be sent to the Board.

ADD 639AC

(3) The Board shall publish the information sent under Nos. 639AA and 639AB in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.

¹⁾ The expression frequency assignment, wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called Master Register).

Annex to Document No. 310-E

ADD 639AD

(4) If, after studying the information published under No. 639AC, any administration is of the epinion that interference, which may be unacceptable, may be caused to its existing or planned space services, it shall within ninety days after the date of the weekly circular publishing the information listed in Appendix /IB/, send its comments to the administration concerned. A copy of these comments shall also be sent to the Board. If no such comments are received from an administration within the period mentioned above, it may be assumed that that administration has no basic objections to the planned /satellite system/

ADD 639AE

(5) An administration receiving comments sent in accordance with No. 639AD shall endeavour to resolve any difficulties that may arise.

ADD 639AF

(6) In case of difficulties arising when the planned satellite system is intended to use the geostationary orbit:

- a) The administration responsible for the planned system shall first explore all possible means of meeting its requirements, taking into account the characteristics of other geostationary /satellite systems/, and without considering the possibility of adjustments to systems of other administrations. If no such means can be found, the administration concerned is then free to apply to other administrations concerned to solve these difficulties;
- b) An administration receiving a request under (a) above shall, in consultation with the requesting administration, explore all possible means of meeting the requirements of the requesting administration, for example, by relocating 1) one or more of its own geostationary space stations involved, or by changing the emissions, frequency usage (including changes in frequency bands) or other technical or operational characteristics;
- c) If after following the procedure outlined in (a) and (b) above there are unresolved difficulties, the administrations concerned shall together make every possible effort to resolve these difficulties by means of mutually acceptable adjustments, for example, to geostationary

¹⁾ See Resolution No. Spa / C /

space station locations and to other characteristics of the systems involved in order to provide for the normal operation of both the planned and existing systems.

ADD 639AG

(7) In their attempts to resolve the difficulties mentioned above administrations may seek the assistance of the Board.

ADD 639AH

ADD 639AI

(9) An administration whose plans for a /satellite system have been published in accordance with Nos. 639AA to 639AC shall periodically inform the Board as to whether or not comments have been received and as to the progress made, with other administrations, in resolving any difficulties. The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so inform all administrations by circular telegram.

Annex to Document No. 310-E

Page 8

ADD Section II Co-ordination Procedures to be Applied in Appropriate Cases

ADD 639AJ

or brings into use any frequency assignment to a space station on a geostationary satellite or to an earth station that is to communicate with a space station on a geostationary satellite, it shall effect co-ordination with any other administration whose assignment in the same band for a space station on a geostationary satellite or an earth station that communicates with a space station on a geostationary satellite or an earth station that communicates with a space station on a geostationary satellite is recorded in the Master Register, or had been co-ordinated or is being co-ordinated under the provisions of this paragraph. For this purpose, the administration requesting co-ordination shall send to any other such administration the information listed in Appendix /IA/.

ADD 639A K

- 2) No co-ordination under No. 639AT is required:
- a) /where the increase in the equivalent noise temperature of an earth station receiver of another administration caused by a new assignment in another / system / (a space station and associated earth stations) is below the permissible increase in noise temperature as determined by the application of the procedure specified in Appendix (297.1) 7

¹⁾ For a broadcasting satellite space station, the technical data used to effect co-ordination should be based upon the latest Recommendations of the C.C.I.R., as accepted by the administrations concerned under Resolution No. Spa J. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used to effect co-ordination shall be agreed between the administrations concerned.

Annex to Document No. 310-E

when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the equivalent noise temperature of an earth station receiver of another administration above the permissible increase in noise temperature as determined by the application of the procedure specified in Appendix 2977.

ADD 639AL

(3) An administration initiating the co-ordination procedure referred to in No. 639AJ shall at the same time send to the Board a copy of the request for co-ordination, with the information listed in Appendix / TA/ and the name(s) of the administration(s) with which co-ordination is sought. The Board shall publish this information in a special section of its weekly circular, together with a reference to the weekly circular in which details of the /system/ were published in accordance with Section I of this Article. When the weekly circular contains such information, the Board shall so inform all administrations by circular telegram.

ADD 639AM

(4) An administration believing that it should have been included in the co-ordination procedure under No. 639AJ shall have the right to request that it be brought into the co-ordination procedure.

MOD 639AN

§ 3. (1) Before an administration notifies to the Board or brings into use any frequency assignment to an earth station, whether for transmitting or receiving, in a particular band allocated with equal rights to the /space service and the fixed or the mobile service in the frequency spectrum above one Gc/s, it shall effect co-ordination of the assignment with any other administration whose territory lies wholly or partly within the co-ordination area) but only in respect of the fixed or the mobile service. For this purpose it shall send to any other such administration a copy of a diagram drawn to an appropriate scale indicating the location of the earth station and showing the co-ordination distance from the earth station for the cases of transmission and reception by the earth station, as a function of azimuth and the data on which it is based, including all pertinent details of the proposed frequency assignment, as listed in Appendix /1A/, and an indication of the approximate date on which it is planned to begin operations.

¹⁾ Calculated in accordance with the procedures described in Appendix \(\sum_{28} \) /.

- ADD 639A0 (2) An administration with which co-ordination is sought under No. 639AJ shall immediately by telegram acknowledge receipt of the co-ordination data. If no acknowledgement is received within thirty days after the date of the weekly circular publishing the information under No. 639AL, the sender shall despatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of thirty days. Upon receipt of the co-ordination data, an administration shall, having regard to the proposed date of bringing into use of the assignment for which co-ordination was requested, promptly examine the matter with regard to interference 1) which would be caused to the service rendered by its stations in respect of which co-ordination is sought under No. 639AJ; and shall, within an overall period of ninety days from the date of the relevant weekly circular, notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree, it shall, within the same period, send to the administration seeking co-ordination the technical details upon which its disagreement is based, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem. A copy of these comments shall also be sent to the Board.
- ADD 639A0.1 1) Criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

Annex to Document No. 310-E

Page 12

MOD 639AP

- (3) An administration with which co-ordination is sought under No. 639AN shall acknowledge receipt immediately by telegram of the co-ordination data. If no acknowledgement is received within fifteen days of despatch of the co-ordination data the sender shall despatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of fifteen days. Upon receipt of the co-ordination data an administration shall, having regard to the proposed date of bringing into use of the assignment for which co-ordination was requested, promptly examine the matter both with regard:
 - interference which would be caused to the service rendered by its stations in the fixed or the mobile service operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer, and
 - b) interference which would be caused to reception at the earth station by the service rendered by its stations in the fixed or the mobile service operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer.

⁶³⁹AP.1 1) Criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

and shall, within an overall period of sixty days from despatch of the co-ordination data notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree it shall, within the same period, send to the administration seeking co-ordination a copy of a diagram drawn to an appropriate scale showing the location of its stations in the fixed or the mobile service which are or will be within the co-ordination area of the earth transmitting or receiving station, as appropriate, together with all other relevant basic characteristics, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

ADD 639AQ

(4) When the administration with which co-ordination is sought sends to the administration seeking co-ordination the information mentioned in No. 639AP, a copy thereof shall also be sent to the Board. The Board shall consider as notifications in accordance with Section I of Article 9 only that information relating to existing stations in the __fixed or the mobile service_/ or to those to be brought into use within the next three years.

Annex to Document No. 310-E Page 14

MOD 639AR

- (5) No co-ordination under No. 639AN is required when an administration proposes:
 - a) to bring into use an earth station, the co-ordination area of which does not include any of the territory of any other country;
 - b) to change the characteristics of an existing assignment in such a way as not to exceed the permissible level of interference to or from the stations in the / fixed or the mobile service / of other administrations;
 - c) $\sqrt{}$ to bring into use an earth station in the band 4 400-4 700 Mc/s or the band 8 100-8 400 Mc/s; $\sqrt{}$ or
 - to operate a / mobile earth station 7. However, if d) the co-ordination area associated with the operation of such a \int mobile earth station \mathcal{I} , in a frequency band referred to in No. 639AN, includes any of the territory of another country, it shall be subject to prior agreement between the administrations concerned in order to avoid harmful interference to existing stations with / fixed and mobile services / of that country. This agreement shall cover the characteristics of the / mobile earth station(s)] or the characteristics of a typical / mobile earth station 7, and shall apply to a specified service area; unless otherwise stipulated in the agreement, it shall apply to any mobile earth stations in the specified service area provided that the probability of harmful interference caused by them shall not be greater than that caused by the typical earth station.

MOD 639AS

- § 4. (1) An administration seeking co-ordination may request the Board to endeavour to effect co-ordination in those cases where:
 - a) an administration with which co-ordination is sought under No. 639AJ fails to acknowledge receipt, under No. 639AO, within sixty days after the date of the weekly circular publishing the information relating to the request for co-ordination;
 - b) an administration with which co-ordination is sought under No. 639AN fails to acknowledge receipt, under No. 639AP within thirty days of despatch of the co-ordination data;
 - c) an administration has acknowledged receipt under
 No. 639AO, but fails to give a decision within a period
 of ninety days from the date of the relevant weekly
 circular;
 - d) an administration has acknowledged receipt under No. 639AP but fails to give a decision within a period of sixty days from despatch of the co-ordination data;
 - e) there is disagreement between the administration seeking co-ordination and an administration with which co-ordination is sought as to the acceptable level of interference;
 - f) co-ordination between administrations is not possible for any other reason.

In so doing it shall furnish the Board with the necessary information to enable it to endeavour to effect such co-ordination.

MOD 639AT

(2) Either the administration seeking co-ordination or an administration with which co-ordination is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.

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MOD 639AU

(3) Where the Board receives a request under 63%S a) or b), it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.

ADD 639AV

(4) Where the Board receives an acknowledgement following its action under No. 639AU, or where the Board receives a request under No. 639AS c) or d), it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.

ADD 639AV

(5) Where the Board receives a request under No. 639AS f), it shall endeavour to effect co-ordination in accordance with the provisions of Nos. 639AJ and 639AN, as appropriate. The Board shall also, where appropriate, act in accordance with No. 639AL. Where the Board receives no acknowledgement to its request for co-ordination within the period specified in No. 639AO or 639AP, as appropriate, it shall act in accordance with No. 639AU.

ADD 639AX

- (6) Where an administration fails to reply within thirty days of the Board's telegram requesting an acknowledgement sent under No. 639AU, or fails to give a decision in the matter within thirty days of the Board's telegram of request sent under No. 639AV, it shall be deemed that the administration with which co-ordination was sought has undertaken:

 - b) that its stations in the space, fixed or mobile service will not cause harmful interference to the use of the assignment for which co-ordination was requested

MOD 639AY

(7) Where necessary, as part of the procedure under No. 639AS, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.

ADD 639AZ

In the event of continuing disagreement between one administration seeking to effect co-ordination and one with which co-ordination has been sought, provided that the assistance of the Board has been requested, the administration seeking co-ordination may, after one hundred and fifty days from the date of the request for co-ordination, taking into consideration the provisions of No. 639BF send its notice concerning the proposed assignment to the Board.

(MOD) Section III Notification of frequency assignments

- (MOD) 639BA
- §6 (1) Any frequency assignment to an earth or space station shall be notified to the International Frequency. Registration Board:
 - a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration; or

- b) if the frequency is to be used for international radiocommunications; or
- c) if it is desired to obtain international recognition of the use of the frequency.

(MOD) 639BB

(2) Similar notice shall be given for any frequency to be used for the reception of transmissions from earth or space stations by a particular space or earth station in each case where one or more of the conditions specified in No. 639BA are applicable.

(MOD) 639BC

(3) Similar notice may be given for any frequency or frequency band to be used for reception by a particular radio astronomy station, if it is desired that such data should be included in the Master Register.

ADD 639BD

(4) A notice submitted in accordance with No. 639BA or 639BB and relating to a frequency assignment to _mobile earth stations in a _satellite system shall include the technical characteristics either of each _mobile earth station or of a typical _mobile earth station and the indication of the service area within which these stations are to be operated.

MOD 639BE

For any notification under No. 639BA, 639BB, 639BC, or 639BD, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix $\sqrt{1}A$, which specifies in Sections \sqrt{B} , C, D, E or F the basic characteristics to be furnished, according to the case. $\sqrt{1}$ t is recommended that the notifying administration should also supply the additional data called for in Section \sqrt{A} of that Appendix, together with such further data as it may consider appropriate.

(MOD) 639BF (ex 639AL)

station, each notice must reach the Board not earlier than three years before the date on which the assignment is to be brought into use. The notice must reach the Board in any case not later than ninety days 1) before this date, except in the case of assignments in the /space research service/ in bands allocated exclusively to this service or in shared bands in which this service is the sole primary service. In the case of such an assignment in the space research service the notice should, whenever practicable, reach the Board before the date on which the assignment is brought into use, but it must in any case reach the Board not later than thirty days after the date it is actually brought into use.

(MOD) 639 B G (ex 639AM) (2) Any frequency assignment to an earth or space station, the notice of which reaches the Board after the applicable period specified in No. 639BF, shall, where it is to be recorded, bear a mark in the Master Register to indicate that it is not in conformity with No. 639BF.

¹⁾ The notifying administration shall take this limit into account when deciding, where appropriate, to initiate the co-ordination procedure(s).

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- (MOD) Section IV Procedure for the examination of notices and the recording of frequency assignments in the Master Register
- (MOD) 639BH § 9. Any notice which does not contain at least those characteristics specified in Appendix /IA/ (Sections /B, C, D, E, or F, // as appropriate) shall be returned by the Board immediately, by airmail, to the notifying administration with the reasons therefor.
- (MOD) 639BI \$10. Upon receipt of a complete notice, the Board shall include the particulars thereof, with the date of receipt, in the weekly circular referred to in No. 497, which shall contain the particulars of all such notices received since the publication of the previous circular.
- (MOD) 639BJ § 11. The circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.
- (MOD) 639BK § 12. Complete notices shall be considered by the Board in the order of their receipt. The Board shall not postpone the formulation of a finding unless it lacks sufficient data to render a decision in connection therewith; moreover, the Board shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Board, until it has reached a finding with respect to such earlier notice.

(MOD), 639BL & 13.

The Board shall examine each notice:

(MOD) 639BM

a) with respect to its conformity with the Convention, the Table of Frequency Allocations and the other provisions of the Radio Regulations (with the exception of those relating to the co-ordination procedure and the probability of harmful interference);

ADD 639BN

b) where appropriate, with respect to its conformity with the provisions of No. 639AJ, relating to the co-ordination of the use of the frequency assignment with the other administrations concerned vis-a-vis /space systems/.

MOD 639B0 (ex 639AT) c) where appropriate, with respect to its conformity with the provisions of No. 639AN relating to the co-ordination of the use of the frequency assignment with the other administrations concerned vis-a-vis stations in the /terrestrial services/.

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ADD 639BP

d) where appropriate, with respect to the probability of harmful interference to the service rendered by a station in the space service for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 639EM if this frequency assignment has not in fact caused harmful interference to any frequency assignment in conformity with No. 639EM previously recorded in the Master Register;

MOD 639BQ

e) where appropriate, with respect to the probability of harmful interference to the service rendered by a station in the /fixed or the mobile service/ for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 501 or /570AB/, as appropriate, if this frequency assignment has not, in fact, caused harmful interference to any frequency assignment in conformity with No. 639BM previously recorded in the Master Register:

ADD 639BR

f) where appropriate, with respect to the probability of harmful interference caused to the receiving earth station by a station in the _fixed or the mobile service_/ for which a frequency assignment already recorded in the Master Register is in conformity with No. 501 or /570AB /as appropriate.

.ADD 639BS

When, following an examination of a notice with respect to No. 639BP, the Board reaches an unfavourable finding based upon the probability of harmful interference to a recorded assignment for a space station which the Board has reason to believe may not be in regular use, the Board shall forthwith consult the administration responsible for the registered assignment. If it is established, after such consultation and on the basis of the information available, that the recorded assignment has not been in use for two years, it shall not be taken into account for the purposes of the examination in progress and any other further examination under No. 639BP conducted before the date on which the assignment is brought back into use. This date shall be entered in the Master Register. Before the assignment is brought back into use, it shall be subject to further co-ordination in accordance with the provisions of No. 659AJ or further examination by the Board with respect to No. 639BP as appropriate.

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MOD 639BT

Depending upon the findings of the Board subsequent to the examination prescribed in Nos. 639BM, 639BN, 639BP, 639BQ, 639BR, as appropriate further action shall be as follows:

MOD 639BU

§15 (1) Finding favourable with respect to No. 639EM in cases where the provisions of Nos. 639EN and 639EO are not applicable.

(MOD) 629BV

(2) The assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

(MOD) 639BW

gl6 (1) Finding favourable with respect to No. 639BM

MOD 639BX

(2) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, and the finding is favourable with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

ADD 639BY

Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 and the finding is unfavourable with respect to No. 639BN, 639BO, 639BP, 639BQ or 639BR, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. Should the administration insist upon reconsideration of the notice, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column.

ADD 639BZ

- (4) The period of one hundred and twenty days mentioned in Nos. 639BY and 639CP shall count from:
 - the date when the assignment to the station in the /space service/ which received an unfavourable finding is brought into use, if the assignment to the station which was the basis for the unfavourable finding is then in use;

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- otherwise, from the date when the assignment to the station which was the basis for the unfavourable finding is brought into use.

But if the assignment to the station which was the basis for the unfavourable finding has not been brought into use by the notified date, the period of one hundred and twenty days shall be counted from this date. Allowance shall, if necessary, be made for the additional period mentioned in No. 639CY.

(MOD) 639CA

(5) Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

MOD 639B

- (6) If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of No. 639CA. If it is resubmitted with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be treated in accordance with the provisions of No. 639EX or 639EY, as appropriate. If it is resubmitted with modifications which, after re-examination, result in a favourable finding by the Board with respect to No. 639EM, it shall be treated as a new notice.
- MOD 639CC \$17 (1) Finding favourable with respect to No. 639BM in cases where the provisions of No. 639BN or 639BO are applicable.
- MOD 639CD
- (2) Where the Board finds that the co-ordination procedures mentioned in Nos. 639BN and 639BO have been successfully completed with all administrations whose fixed or mobile or space services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

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MOD 639CE ·

(3) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has, not been applied, and the notifying administration requests the Board to effect the required co-ordination, the Board shall take the appropriate action necessary and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with No. 639CD. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of Nos. 639BP, 639BQ and 639BR, as appropriate.

MOD 639CF

(4) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has not been applied, and the notifying administration does not request the Board to effect the required co-ordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

MOD 6390G

(5) Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedures mentioned in Nos. 639BN and 639BOhave been successfully completed with all administrations whose fixed or mobile or space services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

MOD 639CH

(6) Where the notifying administration resubmits the notice with a request that the Board effect the required co-ordination under No. 639AJ or 639AN, it shall be treated in accordance with the provisions of No. 639CE. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

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MOD 639CI

(7) Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the co-ordination, the Board shall inform the administrations concerned thereof. The notice shall be examined by the Board with respect to the provisions of Nos. 639BP and 639BQ, as appropriate. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

MOD 639CJ

\$ 18.(1) Finding favourable with respect to Nos. 639BM, 639BP, 639BQ and 639BR, as appropriate.

(MOD) 639CK

(2) The assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

ADD 639CL

(3) However, should the examination show that the level of the interference noise and the percentage of time during which it occurs have values slightly greater than those used for assessing the probability of harmful interference (extreme propagation conditions, abnormal atmospheric humidity, etc.), a remark shall be included in the Master Register to show that there may be a slight risk of harmful interference and hence additional precautions must be taken in the use of the assignment to avoid harmful interference to assignments already recorded in the Master Register.

MOD 639CM

§ 19. (1) Finding favourable with respect to No. 639PM but unfavourable with respect to Nos. 639BP, 639BQ or 639BR, as appropriate.

(MOD) 639CM

(2) The notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

MOD, 63900

(3) Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to Nos. 639BP, 639BQ and 639BR, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.

MOD 639CP

Should the notifying administration resubmit the notice, either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of No. 63900 to be applied, and should that administration insist upon reconsideration of the notice, but should the Board's finding remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered. in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column. The period of one hundred and twenty days shall count from the date indicated in No. 639BZ.

(MOD) 639CQ \$20 (1) Notices relating to radio astronomy stations.

MOD 639CR

- (2) A notice relating to a radio astronomy station shall not be examined by the Board with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR. Whatever the finding, the assignment shall be recorded in the Master Register with a date in Column 2c. The date of receipt by the Board of the notice shall be recorded in the Remarks Column.
- (MOD) 6390S §21 (1) Change in the basic characteristics of assignments already recorded in the Master Register.

MOD 639CT

(2) A notice of a change in the basic characteristics of an assignment already recorded, as specified in Appendix 1A (except the name of the station or the name of the locality in which it is situated) shall be examined by the Board according to No. 639BM, and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, and the provisions of Nos. 639BU to 639CR inclusive applied. Where the change should be recorded, the assignment shall be amended according to the notice.

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MOD 639CU

(3) However, in the case of a change in the characteristics of an assignmend which is in conformity with No. 639BM, should the Board reach a favourable finding with respect to Nos. 639BM, 639BO, 639BP, 639BQ and 639BR, where appropriate, or find that the change does not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. The date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.

(MOD) 639CV

g22 In applying the provisions of the whole of this Section, any resubmitted notice which is received by the Board more than two years after the date of its return by the Board, shall be considered as a new notice.

(MOD) 639CW

§23 (1) Recording of Frequency Assignments notified before being brought into use.

MOD 639CX

(2) If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to No. 639BM and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

(MOD) 639CY

(3) If, within the period of thirty days after the projected date of bringing into use, the Board receives confirmation from the notifying administration of the date of putting into use, the special symbol shall be deleted from the Remarks Column. In the case where the Board, in the light of a request from the notifying administration received before the end of the thirty-day period, finds that exceptional circumstances warrant an extension of this period, the extension shall in no case exceed one hundred and fifty days.

MOD 639CZ

(4). In the circumstances described in Nos. 639BY and 639CP, and as long as an assignment which received an unfavourable finding cannot be resubmitted as a consequence of the provisions of No. 639BZ, the notifying administration may ask the Board to enter the assignment provisionally in the Master Register, in which event a special symbol to denote the provisional nature of the entry shall be entered in the Remarks Column. The Board shall delete this symbol when it receives from the notifying administration, at the end of the period specified in No. 639BY or 639CP, as appropriate, the information relating to the absence of complaint of harmful interference.

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MOD 639DA

(5) If the Board does not receive this confirmation within the period referred to in No. 639CY or at the end of the period referred to in No. 639BY or 639CP as appropriate the entry concerned shall be cancelled. The Board shall advise the administration concerned before taking such action.

(MOD)

Section V. Recording of findings in the Master Register

MOD 639DB

In any case where a frequency assignment is recorded in the Master Register, the finding reached by the Board shall be indicated by a symbol in Column 13a. In addition, a remark indicating the reasons for any unfavourable finding shall be inserted in the Remarks Column.

(MOD)

Section VI. Categories of frequency assignments

(MOD) 639DC

§25 (1) The date in Column 2c shall be the date of putting into use notified by the administration concerned. It is given for information only.

ADD 639DD

(2) If harmful interference is actually caused to the reception of any station in the space service whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to Nos. 639BM, as appropriate, by the use of a frequency assignment in the space service which has been recorded in the Master Register in accordance with the provisions of No. 639CP, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

(MOD) 639DE

(MOD)

Section VII. Review of findings

(MOD) 639DF

- §26 (1) The review of a finding by the Board may be undertaken:
 - at the request of the notifying administration,
 - at the request of any other administration interested in the question, but only on the grounds of actual harmful interference,
 - on the initiative of the Board itself when it considers this is justified.

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MOD 639DG

(2) The Board, in the light of all the data at its disposal shall review the matter, taking into account No. 639BM and Nos.639BN, 639BO, 639BP, 639BQ and 639BR, where appropriate, and shall render an appropriate finding, informing the notifying administration prior either to the premulgation of its finding or to any recording action.

MOD 639DH

period of an assignment which has been entered in the Master Register on the insistence of the notifying administration, following an unfavourable finding with respect to Nos. 639BP, 639BQ or 639BR, this administration may request the Board to review the finding. Thereupon the Board shall review the matter, having first consulted the administrations concerned.

(MOD) 639DI

(2) If the finding of the Board is then favourable it shall enter in the Master Register the changes that are required so that the entry shall appear in the future as if the original finding had been favourable.

(MOD) 639DJ

(3) If the finding with regard to the probability of harmful interference remains unfavourable, no change shall be made in the criginal entry.

ADD 639DK

\$24A.(1) Where the use of a recorded assignment to a space station is suspended for a period of eighteen months, the notifying administration shall, within that eighteen month period, inform the Board of the date on which such use was suspended and of the date on which the assignment is to be brought back into regular use.

ADD 639DL

(2) Whenever it appears to the Board, whether or not as a result of action under No. 639DK, that a recorded assignment to a space station has not been in regular use for more than eighteen months, the Board shall enquire of the notifying administration as to when the assignment is to be brought back into regular use.

ADD 639DM

(3) If no reply is received within six months of action by the Board under No. 639DL, or if the reply does not confirm that the assignment to a space station is to be brought back into regular use within this six month limit, a mark shall be applied against the entry in the Master Register. Thereafter, the assignment shall be treated in accordance with No. 639BS as one which has been established as having been out of regular use for two years.

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- (MOD) Section VIII. Modification, cancellation and review of entries in the Master Register
- (MOD) 639DN § 28. In case of permanent discontinuance of the use of any recorded frequency assignment, the notifying administration shall inform the Board within ninety days of such discontinuance, whereupon the entry shall be removed from the Master Register.
- (MOD) 639DO § 29. Whenever it appears to the Board from the information available that a recorded assignment has not been brought into regular operation in accordance with the notified basic characteristics, or is not being used in accordance with those basic characteristics, the Board shall consult the notifying administration and, subject to its agreement, shall either cancel or suitably modify the entry.

MOD'639DP

\$ 30. If, in connection with an enquiry by the Board under No. 639DL, the notifying administration has failed to supply the Board within forty-five days with the necessary or pertinent information, the Board shall make suitable entries in the Remarks Column of the Master Register to indicate the situation.

(MOD)

Section IX. Studies and Recommendations

(MOD) 650DQ

§ 31.(1) If it is requested by any administration, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall conduct a study of cases of alleged contravention or non-observance of these Regulations, or of harmful interference.

(MOD) 639DR

(2) The Board shall thereupon prepare and forward to the administration concerned a report containing its finding and recommendations for the solution of the problem.

(MOD) 639DS

Board submits to one or more administrations suggestions or recommendations for the solution of a problem, and where no answer has been received from one or more of these administrations within a period of ninety days, the Board shall consider that the suggestions or recommendations concerned are unacceptable to the administrations which did not answer. If it was the requesting administration which failed to answer within this period, the Board shall close the study.

(MOD)

Section X. Miscellaneous Provisions

ADD 639DT

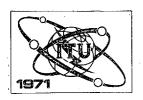
- § 33. (1) If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:
 - a) computation of the increase in the equivalent noise temperature of an earth station receiver as in 639AK;
 - b) preparation of the diagram showing co-ordination area as in 639AN:
 - c) any other assistance of a technical nature for completion of the procedures in this Article:

ADD 639DU

(2) In making a request to the Board under 639DT, the administration shall furnish the Board with the necessary information.

MOD 639DV

- § 34. The technical standards of the Board shall be based upon the relevant provisions of these Regulations and the Appendices thereto, the decisions of Administrative Conferences of the Union as appropriate, the Recommendations of the C.C.I.R., the state of the radio art, and the development of new transmission techniques.
- (MOD) 639DW
- § 35. The Board shall promulgate to administrations its findings and reasons therefor, together with all changes made to the Master Register, through the weekly circular referred to in No. 497.
- (MOD) 639DX
- § 36. In case a Member or Associate Member of the Union avails itself of the provisions of Article 28 of the Convention, the the Board shall, upon request, make its records available for such proceedings as are prescribed in the Convention for the settlement of international disputes.



SPACE CONFERENCE

Document No. 311-E

7 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

SEVENTH REPORT OF WORKING GROUP 4E

TO COMMITTEE 4

Working Group 4E examined the technical content of Document No. DT/77 proposed by Sub-Working Group 6A-4.

After having considered this document from a technical point of view, Working Group 4E agreed on some comments which are given in the Annex to this Document to be sent to Working Group 6A for its deliberation on the Appendix 1B to Article 9A of the Radio Regulations.

Although none of these comments changes the substance of Document No. DT/77, Working Group 4E thought that it may be desirable to incorporate them in the final draft of that Appendix.

N. OHYAMA Chairman Working Group 4E

Annex: 1



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A N N E X

PROPOSED AMENDMENT ON DOCUMENT No. DT/77

1. Page 3

- 1.1 The first line of the first paragraph of sub-paragraph a) should read:
 - "... service area, in all cases indicate the ..."
- 1.2 The second line of the second paragraph of sub-paragraph a) should read:
 - "... indicate, if available, the maximum ..."

Reason: While the first paragraph is mandatory, the second paragraph is optional which is necessary for calculation of interference caused by existing satellite system and may not be available at the early stage of planning.

- The second line of sub-paragraph a) should read:

 "indicate the estimated gain of ..."
- 1.4 The second line of sub-paragraph b) should read:

 "indicate the estimated isotropic gain ..."

Reason: At the planning stage, those data may not be available other than those estimated ones.

2. Page 4

2.1 The first line of the paragraph under Item 6 should read:

"indicate, when no other than single frequency ..."

Reason: The proposed change may clear the meaning.

Annex to Document No. 311-E

Page 4

2.2 The first line of the first sub-paragraph under Item 4 should read:

"indicate, in all cases indicate ..."

2.3 The second line of the second sub-paragraph under Item 4 should read:

"indicate, if available, the maximum ..."

Reason: Same as stated in 1.1 and 1.2 above.

2.4 The third line of the second paragraph under Item 4 should read:

"... category of carrier [supplied under Item 4, Section C] received by ..."

Reason: Additional note may make clear the information referred.

3. Page 5

- 3.1 The second line of sub-paragraph a) should read:
 - "indicate the estimated gain of ..."
- 3.2 The second line of sub-paragraph b) should read:

"indicate the estimated isotropic ..."

Reason: Same as stated in 1.3 and 1.4 above.

- 3.3 The first line of the first paragraph of sub-paragraph a) under Item 6 should read:
 - "... indicate, when no other than simple ..."

Reason: Same as stated in 2.1 above.

Annex to Document No. 311-E Page 5

- 3.4 The third line of second paragraph of sub-paragraph a) should read:
 - "... of carrier [supplied under Item 4, Section C] received by ..."
- 3.5 The fourth line of sub-paragraph b) should read:

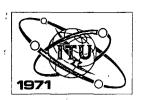
"... of carrier [supplied under Item 4, Section C] "

Reason: Same as stated in 2.4 above.

4. Page 6

- 4.1 Sub-paragraph c) of Section E should read:
 - "c) type class of emission"

Reason: This is the term used in the present Radio Regulations.



SPACE CONFERENCE

Document No. 312-E
7 July 1971

Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

THIRD REPORT OF WORKING GROUP 5 ad hoc TO COMMITTEE 5

- 1. The Working Group considered the proposals by France (Document No. 83) and Mexico (Document No. 77) for the rearrangement of the sections of Article 1.
- 2. The Group considered that, at this stage of the Conference, it was not desirable to make too many amendments to Article 1 and, with reference to Document No. 218, it was agreed:
 - a) that definitions MOD 84AE, space station, MOD 84AD, earth station, MOD 84AC, space radiocommunication, MOD 84AA, terrestrial radiocommunication, MOD 84AB, terrestrial station, and the notes ADD 84AA-1 and ADD 84AB-1, should be placed at the beginning of Section II after the number 21 (station):
 - b) that the other definitions contained in Document No. 218 and to be included in Section IIA should remain in the order in which they appear in the Annex to the said document, the definitions of individual reception and community reception in the broadcasting-satellite service being inserted immediately after the definition of that service:
 - c) that definitions NOC 84AJ, active satellite, and NOC 84AK, passive satellite, should be moved to Section IIB, after the definition of satellite;
 - d) that definition MOD 69, safety service, should stay in Section II.
- Recognizing the merits of the Mexican proposals (Document No. 77) and expressing the hope that a future conference would divide up the subjects of Article 1 in a more logical way, the Group decided to prepare a draft recommendation on the subject. This draft recommendation, which is Annex 1 to the present report, was approved by the Group and submitted for approval to Committee 5.



- 4. In view of certain proposals being studied by Committee 5 Working Groups, the Group decided to supplement the lists of definitions annexed to Documents Nos. 218 and 251 by those given in Annex 2 to this report. These definitions concern the following services:
 - aeronautical radionavigation-satellite service:
 - maritime radionavigation-satellite service;
 - time signal-satellite service.
- 5. The Group considered the terminology to be used in the frequency table for indicating the up and down paths of satellite links.

For the sake of uniformity, the Group decided that in all such cases the expressions "Space-to-Earth" and "Earth-to-Space" should be used, and that the expressions "Satellite-to-Earth" and "Earth-to-Satellite" should no longer be used.

6. Following a request by the Chairman of Committee 4 to the Chairman of Committee 5, the Group examined the terms and definitions given in point 4 and in the Annex of Document No. 146.

The Group considers:

- a) that the terms and definitions given in point 4 were unrelated to the work of Committee 5: and
- b) that the terms and definitions given in the Annex were not useful for the work of committee 5, unless one or more of the Working Groups of the Committee took a contrary view.
- 7. With this Report the Working Group finishes the work assigned to it by Committee 5.

A. PETTI Chairman

Annexes: 2

ANNEX 1

RECOMMENDATION RELATING TO A REVISED PRESENTATION OF THE SECTIONS OF ARTICLE 1 OF THE RADIO REGULATIONS

The World Administrative Radio Conference for Space Telecommunications

considering

- a) that the amendments made to the Article 1 of the Radio Regulations have resulted in a lack of system in the placing of individual terms and the somewhat illogical sequence in which they come;
- b) that it would therefore be desirable to rearrange Article 1 of the Radio Regulations in a more appropriate form;

recognizing

that this Conference was not able to perform this task

recommends

that the next World Administrative Conference which is competent to revise Article 1 of the Radio Regulations should consider the possibility of rearranging Article 1 in a more logical manner, for instance, on the lines of the Annex to this Recommendation.

Annex: 1

Annex to Recommendation No. ...

Article 1

Section I. General terms

Section II. Radio systems

Section III. Radio services and stations

Sub-Section IIIA. Terrestrial Radiocommunication

Sub-Section IIIB. Space Radiocommunication

Sub-Section IIIC. Radio astronomy

Section IV. Technical characteristics

ANNEX 2

ADD AQA Aeronautical Radionavigation-Satellite Service.

A radionavigation—satellite service in which mobile earth stations are located on board aircraft.

ADD AQB Maritime Radionavigation-Satellite Service.

A radionavigation—satellite service in which mobile earth stations are located on board ships.

ADD ATC Time Signal-Satellite Service.

A radiocommunication service using space stations on earth satellites for the same purposes as those of time signal service.

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 313-E 7 July 1971

PLENARY MEETING (FIRST READING)

B. 3

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
5	298	1	Art. 1 — Sections II and IIA	

Francois Job Chairman of the Editorial Committee

Annex: Pages B3/01-06



[ARTICLE 1]

[Sections II and IIA.]

MOD 84AE

Space Station

A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the earth's atmosphere.

MOD 84AD

Earth Station

A station located either on the earth's surface or within the major portion of the earth's atmosphere intended for communication:

- with one or more space stations; or
- with one or more stations of the same kind by means of one or more passive satellites or other objects in space.

MOD 84AC

Space Radiocommunication

Any radiocommunication involving the use of one or more space stations or the use of one or more passive satellites or other objects in space.

MOD 84AA

Terrestrial Radiocommunication 1

Any radiocommunication other than space radiocommunication or radio astronomy.

MOD 84AB

Terrestrial Station 2

A station effecting terrestrial radiocommunication.

ADD 84AA.1 ¹ In these Regulations, unless otherwise stated, any radiocommunication service relates to terrestrial radiocommunication.

ADD 84AB.1 ² In these Regulations, unless otherwise stated, any station is a terrestrial station.

MOD 84AF

Space System

Any group of co-operating earth and/or space stations employing space radiocommunication for specific purposes.

MOD 84AL

Satellite System

A space system using one or more artificial earth satellites.

MOD 84AG

Fixed-Satellite Service

A radiocommunication service:

- between earth stations at specified fixed points when one or more satellites are used; in some cases this service includes satellite to satellite links, which may also be effected in the inter-satellite service;
- for connection between one or more earth stations at specified fixed points and satellites used for a service other than the fixed-satellite service, (for example, the mobile-satellite service, broadcasting-satellite service, etc.).

ADD 84AGA

Mobile-Satellite Service

A radiocommunication service:

- between mobile earth stations and one or more space stations; or between space stations used by this service;
- or between mobile earth stations by means of one or more space stations;
- and if the system so requires, for connection between these space stations and one or more specified fixed points on the earth.

ADD 84AGB Aeronautical Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on board aircraft. Survival craft stations and emergency position indicating radiobeacon stations may also participate in this service.

ADD 84AGC Maritime Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on board ships. Survival craft stations and emergency position indicating radiobeacon stations may also participate in this service.

ADD 84AGD Land Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on land.

MOD 84AP Broadcasting-Satellite Service

A radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception 1 by the general public.

ADD 84APA Individual reception (in the Broadcasting-Satellite Service)

The reception of emissions from a broadcasting-satellite space station by simple domestic installations and in particular those possessing small antennae.

ADD 84APB Community reception (in the Broadcasting-Satellite Service)

The reception of emissions from a broadcasting-satellite space station by receiving equipment, which in some cases may be

ADD 84AP.1 ¹ In the broadcasting-satellite service, the term "direct reception" shall encompass both individual reception and community reception.

complex and have antennae larger than those used for individual reception, and intended for use:

- by a group of the general public at one location, or
- through a distribution system covering a limited area.

ADD 84APC Radiodetermination-Satellite Service

A radiocommunication service involving the use of radiodetermination and the use of one or more space stations.

MOD 84AQ Radionavigation-Satellite Service

A radiodetermination-satellite service applied to navigation; in certain cases this service includes transmission or retransmission of supplementary information necessary for the operation of the Radionavigation Systems.

ADD 84ASA Earth Exploration-Satellite Service

A radiocommunication service between earth stations and one or more space stations in which:

- information relating to the characteristics of the Earth and its natural phenomena is obtained from instruments on earth satellites;
- similar information is collected from air-borne or earthbased platforms;
- such information may be distributed to earth stations within the system concerned;
- platform interrogation may be included.

MOD 84AT Meteorological-Satellite Service

An earth exploration-satellite service for meteorological purposes.

ADD 84ATA Amateur-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur service.

ADD 84ATB Standard Frequency-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the standard frequency service.

MOD 84AM Space Research Service

A radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes.

ADD 84AMA Space Operation Service

A radiocommunication service concerned exclusively with the operation of spacecraft, in particular tracking, telemetry and telecommand.

These functions will normally be provided within the service in which the space station is operating.

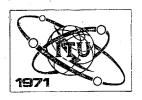
ADD 84AMB Inter-Satellite Service

A radiocommunication service providing links between artificial earth satellites.

MOD 69 Safety Service

A radiocommunication service used permanently or temporarily for the safeguarding of human life and property on the earth's surface, in the air or in space.

NOC	84AJ	Active Satellite	
NOC	84AK	Passive Satellite	
NOC	84AW	Space Telemetering	
NOC	84AX	Maintenance Space Telemetering	
NOC	84AY	Space Telecommand	
NOC	84AZ	Space Tracking	
SUP	84AH	Communication-Satellite Earth Station	
SUP	84AI	Communication-Satellite Space Station	
SUP	84AN	Space Research Earth Station	
SUP	84AO	Space Research Space Station	
SUP	84AR	Radionavigation-Satellite Earth Station	
SUP	84AS	Radionavigation-Satellite Space Station	
SUP	84AU	Meteorological-Satellite Earth Station	
SUP	84AV	Meteorological-Satellite Space Station	



SPACE CONFERENCE

Document No. 314-E 7 July 1971

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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FOURTH REPORT FROM COMMITTEE 4

After consideration of Document No. MEX/78, Committee 4 has approved the proposed modification to Radio Regulation 112. The changes proposed will mean that the English and Spanish versions of the Radio Regulations will then be aligned with the French version. In addition it was recognized by Committee 4 that the term "hertz" has been recommended by the C.C.I.R. and adopted by the International Scientific Unions and other technical bodies as a unit of frequency, and that the I.T.U. should follow suit as soon as practicable.

The texts in question have been forwarded to the Drafting Committee.

E. SANDBACH Chairman Committee 4

Annex: 1 Amended Radio Regulation 112, Nomenclature of the Frequency and Wavelength Bands Used in Radiocommunication.



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ANNEX

MOD Section III. Nomenclature of the Frequency and Wavelength Bands Used in Radiocommunication

MOD 112.

- § 7. The radio spectrum shall be subdivided into nine frequency bands, which shall be designated by progressive whole numbers in accordance with the following Table. Frequencies shall be expressed:
 - in kilohertz (kHz) up to and including 3 000 kHz
 - in megahertz (MHz) thereafter up to and including 5 000 MHz
 - in gigahertz (GHz) thereafter up to and including 5 000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made.

Band Number	Frequency Range (lower limit exclusive, upper limit inclusive)	Corresponding Metric Subdivision
4 5 6 7 8 9 10 11	3 to 50 kHz 30 to 300 kHz 300 to 3 000 kHz 5 to 50 MHz 50 to 500 MHz 500 to 5 000 MHz 5 to 50 GHz 500 to 5 000 GHz 500 to 5 000 GHz 7 THz	Myriametric waves Kilometric waves Hectometric waves Decametric waves Metric waves Decimetric waves Centimetric waves Millimetric waves Decimillimetric waves

Note 1 : "Band Number N" extends from 0.3 x 10^{N} to 3×10^{N} Hz.

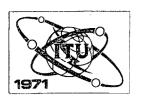
Note 2: Abbreviations:

Hz = hertz

 $k = kilo (10^3), M = mega (10^6), G = giga (10^9), t = tera (1012)$

Note 3: Abbreviations for adjectival band designations:

Band 4 = VLF Band 8 = VHFBand 5 = LF Band 9 = UHFBand 6 = MF Band 10 = SHFBand 7 = HF Band 11 = EHF



SPACE CONFERENCE

Document No. 315-E 7 July 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS -- GENEVA -- 1971

PLENARY MEETING

UNITED KINGDOM

PROPOSED AMENDMENTS TO ARTICLE 5 OF THE RADIO REGULATIONS

The Proposals coming before the Plenary Meeting make provisions for the Amateur Satellite Service in a number of bands allocated exclusively to that Service but do not provide for any use of space techniques in the region of the spectrum lying between 146 MHz and 24 GHz. The United Kingdom considers that the Amateur Satellite Service needs to have access to this part of the spectrum and that this is practicable in the bands the amateurs share with radiolocation, on a secondary basis. This was reflected in the proposals brought to this Conference, in which safeguards were included as a precaution against any interference by the Amateur Satellite Service.

From the very first days of wireless experimentation at the turn of the century, amateurs have contributed to the advancement of the art of radio communication. Initially relegated to the "worthless" bands below 200 metres, in the early 1920s amateurs were responsible for the discovery of the real value of those high frequencies for long-distance communication. Nor is their interest in space phenomena new; in 1936 an amateur built the first radio telescope and received radio noise of extra-terrestrial origin. Inspired by the historic 1957 launch of the first earth satellite, and facilitated by advance technical data published in the Soviet amateur magazine "Radio", amateurs around the world in the very first hours monitored the 20- and 40-MHz transmissions and provided many eager scientists with some of the first orbital data. Five "OSCAR" amateur satellites, the first in 1961, have been placed in orbit as additional packages to basic launch missions, for the purposes of experimentation and self-training in space communications techniques. Amateurs in more than 25 countries have participated in monitoring, tracking and reporting data. The use of voluntary services by thousands of individuals on a world-wide basis provides a service to humanity in the advancement of scientific knowledge that cannot be matched by any single country.

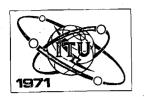


Of particular importance to the Amateur Satellite Service is the band 420-450 MHz. At the Fourth Meeting of Committee 5 on 6 July, when dealing with the First Report of Working Group 5C, a majority voted against approving the use by amateurs of space techniques in the band 420-450 MHz. However, as United Kingdom pointed out at the time, it appeared that no special or separate attention was given to the proposal under the same heading in the Working Group Report for a compromise arrangement whereby amateur space techniques could be permitted in a small section of the band, namely 435-438 MHz. This compromise, first proposed by Switzerland, received considerable support at Working Group level (Third Meeting Working Group 5C of 17 June). The United Kingdom considers this provides the possibility of unanimous agreement and accordingly proposes that amateur space techniques be approved in a narrow portion of the existing band, by means of a foot-note, 320A, reading:

"In the band 435-438 MHz, the Amateur Satellite Service may be authorized, on condition that harmful interference shall not be caused to other services operating in accordance with the Table of Frequency Allocations. Administrations authorizing such use shall ensure that any harmful interference caused by emissions from amateur satellites is immediately eliminated."

The attention of Administrations is also drawn to Document No. 259, the Fourth Report of Working Group ^4E to Committee 4 , covering an Addition to Article ^4I of the Radio Regulations :

"ADD 1567 bis 5bis. Space stations in the Amateur Service shall be fitted with appropriate devices for controlling emissions in the event that harmful interference is reported in accordance with the procedure laid down in Article 15. Administrations authorizing such space stations shall inform the I.F.R.B., and shall insure that sufficient ground command stations are established before launch to guarantee that any harmful interference that might be reported can be terminated by the authorizing Administration. (See No. 470V)."



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COMMITTEE 5

FOURTH AND LAST REPORT OF WORKING GROUP 5E TO COMMITTEE 5 (ALLOCATIONS)

BROADCASTING-SATELLITE SERVICE

- Frequency bands between 670 Mc/s and 960 Mc/s
- Frequency bands between 2 500 Mc/s and 2 690 Mc/s

1. Frequency band 620-790 Mc/s

The Working Group <u>provisionally agreed</u> that the band 620-790 Mc/s may also be used by stations in the Broadcasting-Satellite Service subject to agreement on the power flux-density limitation values to be inserted in the text of ADD 332A. The Group <u>provisionally agreed</u> also on the remainder of the text of foot-note ADD 332A, subject to agreed technical criteria being received from Committee 4.

1bis On a proposition by the Delegate of the U.S.S.R., the Group agreed to forward the text of ADD 332A, which appears in Annex A to the present Report, for the consideration of Committee 5 in the light of the related conclusions of Committees 4 and 6, it being noted that any statements made in Committee 5 could be included, upon request, in the official records of the Conference.

2. Frequency band 790-960 Mc/s

The Group <u>decided</u> to transmit the following conclusion to Committee 5:

- 2.1 "Sub-Working Group 5E-l agreed by a large majority not to recommend a world-wide allocation to the Broadcasting-Satellite Service in the band 790-960 Mc/s.
- 2.2 The question of Regional allocations was raised, however, time did not permit of its examination."



The Delegation of Portugal reserved its right to revert to this subject later should it still so desire. The Delegation of the United Arab Republic was opposed to any allocation to the Broadcasting-Satellite Service in the bands between 620 Mc/s and 960 Mc/s and reserved its right to take up the matter in Committee 5 should it still so desire.

4. Frequency band 2 500-2 690 Mc/s

- 4.1 The Working Group had the Third Report by Sub-Group 5E-1 (Document No. 321) as a basis for its examination of this band. The delegations concerned confirmed their reservations of the right to revert to certain subjects should they still so desire as reproduced hereafter.
- 4.2 The Group had before it Proposals CAN-USA/164/4 in part, CAN-USA/164/5, 6, 7 and 10, IND/39/51 and 32, B/71/81 and 82. These Proposals were thoroughly examined and the Sub-Working Group provisionally agreed the revised provisions appearing in the Annex to the present Report.
- 4.3 The Delegation of India agreed to adjust the lower limit of their Proposal from 2 400 Mc/s to 2 590 Mc/s in the interests of obtaining unanimity.
- 4.4 Proposals AUS/190/1 and 2 were not supported and the Delegation of Australia reserved the right to revert to them in Working Group 5E or in Committee 5, if it still so desired.
- 4.5 The Delegation of Cuba was against the addition of regional with or without a capital "R" in the ADD 361B (No. 125.1 of the Radio Regulations refers), and reserved the right to revert to this question later, if it still so desired.
- 4.6 The Delegations of Bulgaria, Poland, Portugal, Federal Republic of Germany, Czechoslovakia and the U.S.S.R. explained the heavy use of the band by the services to which it is at present allocated and the serious difficulties involved by the proposed additional allocation to the

Broadcasting-Satellite Service for community-type reception. While preferring the status quo for Region 1, they insisted upon receiving sound guarantees from Committee 4 on technical criteria and adequate provisions for co-ordination procedures from Committee 6 before a final agreement could be considered.

- 4.7 The Delegation of Japan also explained the heavy use of this band by Terrestrial Services and the serious difficulties the proposed allocations would cause. The Delegation reserved the right to revert to this question later, if it still so desired.
- 4.8 The Delegations of the U.A.R. and Uganda recalled the unanimously adopted United Nations resolution reproduced by the Secretary-General in Document No. 58.
- 4.9 The Delegation of Denmark explained that it was quite conceivable that Scandinavian countries might wish to develop a system in the future at this order of frequency and consequently urged the adoption of world-wide provisions.
- 4.10 The Delegation of the United Kingdom recalled the unanimous agreement reached in Working Group 5B concerning the band 2 670-2 690 Mc/s ADD 363A (G/54/95) by which administrations should bear in mind the needs of the Radio Astronomy Service in their future planning of this band. In connection with the retention of Radiolocation on a secondary basis in the band 2 500-2 600 Mc/s, the Delegation's request for a foot-note allocation was unanimously agreed as a modification to No. 362 of the Radio Regulations as shown in Annex B to the present Report.
- 4.11 The Group received Document No. 272 containing an alternative Proposal by Canada and New Zealand consequential to the discussion of Document No. 164 from Canada and the United States of America.
- 4.12 In the resumed study of the provisional agreement, the following Delegations declared no support for an allocation to the Broadcasting-Satellite Service at this order of frequency and no support for the foot-note 364C by which new tropospheric scatter systems are prohibited in the band 2 500-2 690 Mc/s as of the entry into force of the Final Acts of the present Conference: Poland, the Ukraine, Roumania, Czechoslovakia, the U.S.S.R., Bulgaria and Bielorussia. However, a show of hards resulted in 19 in favour and 39 against the deletion of foot-note ADD 3: The Delegations of Italy, Portugal, the U.S.S.R., Pakistan, Austra Brazil and Poland reserved the right to revert to this question in Committee 5 should they still so desire.

- 4.13 There was a motion for the exclusion of an allocation of the Broadcasting-Satellite Service in the European Broadcasting Area, which was rejected by 11 for and 34 against the motion.
- 4.14 The provisionally <u>agreed</u> revisions of the Table for these bands were confirmed by the Sub-Group and Working Group 5E as shown in <u>Annex B</u> to the present Report.
- 4.15 In view of these decisions, various suggestions were made in an attempt to give wider satisfaction. Among these was the suggestion of a foot-note based on the provisions of No. 145 of the Radio Regulations to be worded:

"In the U.S.S.R., Iran, Portugal and Switzerland, the band 2 500-2 690 Mc/s is allocated to the Fixed and Mobile Services only."

This foot-note was approved without objection. It was pointed out that the restrictions contained in Article 7 for bands shared between Space Services and the Fixed and Mobile Services would apply to the Fixed and Mobile Services appearing in the foot-note.

- 4.16 The Delegation of the U.S.S.R. proposed a revised text for foot-note ADD 364C which, after thorough examination and slight amendment by the Delegations of the Syrian Arab Republic and Brazil, was agreed by a large majority for world-wide application. The agreed text appears in Annex B to the present Report.
- 4.17 In connection with the show of cards by which the support for the text was evaluated, several delegations including Italy, United Kingdom and Canada reserved the right to revert to this action which they considered to be outside the competence of the Group. According to these delegations, it should have been specified that the motion related to the application of the foot-note insofar as the Broadcasting-Satellite Service only was concerned and not with respect to the Fixed-Satellite Service also.
- 4.18 A motion by the Delegation of Chili, to re-instate the MOBILE Service in the Table for Region 2 for the band 2 655-2 690 Mc/s, gave rise to some difficulties. However, in the final analysis, the Group agreed to the motion.

- 4.19 A motion by the Delegation of Denmark to limit the allocations to the MOBILE Service in the bands between 2 500 Mc/s and 2 690 Mc/s to the Land and Maritime Mobile Services. This also was agreed by the Group.
 - 4.20 The Delegation of U.S.S.R. reserved the right to revert to the question of excluding the European Broadcasting Area from the allocation to the Broadcasting-Satellite Service and declared that, in any event, this allocation would not be used in the U.S.S.R.
 - 4.21 Finally, the Delegation of Cuba objected strongly against various aspects of foot-note No. 361B and reserved the right to revert to this question later should it still so desire.

R. GALIĆ Chairman Working Group 5E

Annexes: 2

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ANNEXA

620-790 Mc/s

ADD 332A

Within the frequency band 620-790 Mc/s, assignments may be made to stations in the Broadcasting-Satellite Service, subject to agreement among the administrations concerned and affected / (see Articles 9 and 9A or Resolution) /. Such stations shall not produce a power flux-density in excess of the value / / within the territories of other administrations without the consent of those administrations.

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ANNEX B

Mc/s

Me/s				
	Region 1	Region 2	Region 3	
	2 450-2 500 FIXED MOBILE Radiolocation	2 450-2 500 FIXED MOBILE RADIOLOCATION	Anna anna ann ann ann ann ann ann ann an	
• • • • • • • • • • • • • • • • • • • •	557 561	357		
	2 500-2 550	2 500-2 555		
MOD	OD BROADCASTING- BROADCASTING-SATELLITE SATELLITE		LLITE	
	361B 361C	361B 361C		
	FIXED 364C MOBILE (except aeronautical mobile)	FIXED-SATELLITE (Space-to-Earth) FIXED 364C MOBILE (except ae	ronautical mobile)	
		361A <u> </u>		
		2 535–2 550		
		BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE (except aeronautical mobile)		
	361A <u> </u>	÷ 362 363		
MOD	2 550-2 655			
, · ;	BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE (except aeronautical mobile)			
		362 363 <u>***</u>		
MOD	2 655-2 690	2 655-2 690	2 655-2 690	
•	BROADCASTING- SATELLITE	BROADCASTING- SATELLITE	BROADCASTING- SATELLITE	
	361B 361C	361B 361C	361B 361C	
	FIXED 364C MOBILE (except aeronautical mobile)	FIXED-SATELLITE (Earth-to-Space) FIXED 364C MOBILE (except aeronautical	FIXED-SATELLITE (Earth-to-Space) FIXED 364C MOBILE (except aeronautical	
	[***]	mobile) /A_/	mobile)	

Annex B to Document No. 316-E(Rev.) Page 10

MOD . 361

In France and the United Kingdom, the band 2 450-2 500 Mc/s is allocated on a primary basis to the Radiolocation Service and, on a secondary basis, to the Fixed and Mobile Services.

ADD 361A

In France the band 2 500-2 550 Mc/s is also allocated on a primary basis to the Radiolocation Service and, on a secondary basis, to the Fixed and Mobile Services. In Canada, the band 2 500-2 550 Mc/s is also allocated on primary basis to the Radiolocation Service.

ADD 561B

The use of the band 2 500-2 590 Mc/s by the Broadcasting-Satellite Service is limited to domestic and regional systems for community reception and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected / (see Articles 9 and 9A or Resolution No. xxx) /. / The power flux-density at the surface of the earth shall not exceed those given in Article 7 Nos. 470NH-470NK. /

MOD 362

In the United Kingdom, the band 2 500-2 600 Mc/s is also allocated, on a secondary basis, to the Radiolocation Service.

ADD 364C

When planning new tropospheric scatter radiorelay links in the band 2 500-2 690 Mc/s, all possible measures shall be taken to avoid directing the antennae of these links towards the geostationary orbit.

ADD / A /

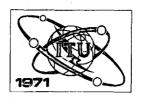
The use of bands 2 500-2 535 Mc/s and 2 655-2 690 Mc/s by the Fixed-Satellite Service is limited to domestic and regional systems and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected. In the direction Space-to-Earth, the power flux-density at the surface of the earth shall not exceed \(\sum_{\cdots\cdots} \)..... see Article 7 \(\sum_{\cdots} \).

ADD /***7

In the U.S.S.R., Iran, Portugal and Switzerland, the band 2 500-2 690 Mc/s is allocated to the Fixed and Mobile Services only.

Note to Committee 7:

Text of foot-note A is to be adjusted according to the results of the work of the present Conference pertinent to this subject.



SPACE CONFERENCE

Corrigendum N° 1 au
Document N° 316-F/E/S
10 juillet 1971
Original : français
anglais

angrais espagnol

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMISSION 5 COMMITTEE 5 COMISION 5

Dans le titre, lire

QUATRIEME ET DERNIER RAPPORT DU GROUPE DE TRAVAIL 5E

Le paragraphe 4 doit être <u>renuméroté</u> 1 bis et <u>être déplacé</u> immédiatement après le paragraphe 1.

A la page 10, après la note ADD /A / ajouter la note suivante :

En U.R.S.S., en Iran, au Portugal et en Suisse, la bande 2 500-2 690 MHz est attribuée seulement au service FIXE et au service MOBILE.

In the title, read

FOURTH AND LAST REPORT OF WORKING GROUP 5E

Renumber paragraph 4 "1 bis" and bring forward to follow paragraph 1.

On page 10, after ADD \angle A/ add the following foot-note :

In the U.R.S.S., Iran, Portugal and Switzerland, the band 2 500-2 690 Mc/s is allocated to the Fixed and Mobile Services only.

En el título, <u>léase</u>

CUARTO Y ULTIMO INFORME DEL GRUPO DE TRABAJO 5E

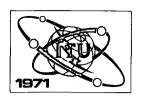
El punto 4 debe ser numerado l bis y <u>desplazado</u> inmediatamente después el punto l.

En la página 9 en el cuadro 2 550-2 655 <u>suprimase</u> la línea vertical.

En la página 10 después de la nota ADD /A aĥadir la siguiente nota:

ADD /*** En la U.R.S.S., Irán, Portugal y Suiza, la banda 2 500-2 690 Mc/s está atribuida a los servicios fijo y móvil únicamente.





SPACE CONFERENCE

Document No. 316-E 9 July 1971 Original : English

Original . English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SECOND REPORT OF WORKING GROUP 5E

TO COMMITTEE 5

(ALLOCATIONS)

BROADCASTING-SATELLITE SERVICE

- Frequency bands between 670 Mc/s and 960 Mc/s
- Frequency bands between 2 500 Mc/s and 2 690 Mc/s

1. Frequency band 620-790 Mc/s

The Working Group provisionally agreed that the band 620-790 Mc/s may also be used by stations in the Broadcasting-Satellite Service subject to agreement on the power flux-density limitation values to be inserted in the text of ADD 552A. The Group provisionally agreed also on the remainder of the text of foot-note ADD 532A, subject to agreed technical criteria being received from Committee 4.

2. Frequency band 790-960 Mc/s

The Group decided to transmit the following conclusion to Committee 5:

- 2.1 "Sub-Working Group 5E-l agreed by a large majority not to recommend a world-wide allocation to the Broadcasting-Satellite Service in the band 790-960 Mc/s.
- 2.2 The question of Regional allocations was raised; however, time did not permit of its examination."



- The Delegation of Portugal reserved its right to revert to this subject later should it still so desire. The Delegation of the United Arab Republic was opposed to any allocation to the Broadcasting-Satellite Service in the bands between 620 Mc/s and 960 Mc/s and reserved its right to take up the matter in Committee 5 should it still so desire.
- 4. On a proposition by the Delegate of the U.S.S.R., the Group agreed to forward the text of ADD 332A, which appears in Annex A to the present Report, for the consideration of Committee 5 in the light of the related conclusions of Committees 4 and 6, it being noted that any statements made in Committee 5 could be included, upon request, in the official records of the Conference.

5. Frequency band 2 500-2 690 Mc/s

- 5.1 The Working Group had the Third Report by Sub-Group 5E-1 (Document No. 321) as a basis for its examination of this band. The delegations concerned confirmed their reservations of the right to revert to certain subjects should they still so desire as reproduced hereafter.
- 5.2 The Group had before it Proposals CAN-USA/164/4 in part, CAN-USA/164/5, 6, 7 and 10, IND/39/31 and 32, B/71/81 and 82. These Proposals were thoroughly examined and the Sub-Working Group provisionally agreed the revised provisions appearing in the Annex to the present Report.
- 5.5 The Delegation of India agreed to adjust the lower limit of their Proposal from 2 400 Me/s to 2 590 $\overline{\text{Me/s}}$ in the interests of obtaining unanimity.
- 5.4 Proposals AUS/190/1 and 2 were not supported and the Delegation of Australia reserved the right to revert to them in Working Group 5E or in Committee 5, if it still so desired.
- 5.5 The Delegation of Cuba was against the addition of regional with or without a capital "R" in the ADD 361B (No. 125.1 of the Radio Regulations refers), and reserved the right to revert to this question later, if it still so desired.
- 5.6 The Delegations of Bulgaria, Poland, Portugal, Federal Republic of Germany, Czechoslovakia and the U.S.S.R. explained the heavy use of the band by the services to which it is at present allocated and the serious difficulties involved by the proposed additional allocation to the

Broadcasting-Satellite Service for community-type reception. While preferring the status quo for Region 1, they insisted upon receiving sound guarantees from Committee 4 on technical criteria and adequate provisions for co-ordination procedures from Committee 6 before a final agreement could be considered.

- 5.7 The Delegation of Japan also explained the heavy use of this band by Terrestrial Services and the serious difficulties the proposed allocations would cause. The Delegation reserved the right to revert to this question later, if it still so desired.
- 5.8 The Delegations of the U.A.R. and Uganda recalled the unanimously adopted United Nations resolution reproduced by the Secretary-General in Document No. 58.
- 5.9 The Delegation of Denmark explained that it was quite conceivable that Scandinavian countries might wish to develop a system in the future at this order of frequency and consequently urged the adoption of world-wide provisions.
- 5.10 The Delegation of the United Kingdom recalled the unanimous agreement reached in Working Group 5B concerning the band 2 670-2 690 Mc/s ADD 363A (G/54/95) by which administrations should bear in mind the needs of the Radio Astronomy Service in their future planning of this band. In connection with the retention of Radiolocation on a secondary basis in the band 2 500-2 500 Mc/s, the Delegation's request for a foot-note allocation was unanimously agreed as a modification to No. 362 of the Radio Regulations as shown in Annex B to the present Report.
- 5.11 The Group received Document No. 272 containing an alternative Proposal by Canada and New Zealand consequential to the discussion of Document No. 164 from Canada and the United States of America.
- In the resumed study of the provisional agreement, the following Delegations declared no support for an allocation to the Broadcasting-Satellite Service at this order of frequency and no support for the foot-note 364C by which new tropospheric scatter systems are prohibited in the band 2 500-2 690 Mc/s as of the entry into force of the Final Acts of the present Conference: Poland, the Ukraine, Roumania, Czechoslovakia, the U.S.S.R., Bulgaria and Bielorussia. However, a show of hands resulted in 19 in favour and 59 against the deletion of foot-note ADD 364C. The Delegations of Italy, Portugal, the U.S.S.R., Pakistan, Australia, Brazil and Poland reserved the right to revert to this question in Committee 5 should they still so desire.

- 5.13 There was a motion for the exclusion of an allocation of the Broadcasting-Satellite Service in the European Broadcasting Area, which was rejected by 11 for and 34 against the motion.
- 5.14 The provisionally agreed revisions of the Table for these bands were confirmed by the Sub-Group and Working Group 5E as shown in Annex B to the present Report.
- 5.15 In view of these decisions, various suggestions were made in an attempt to give wider satisfaction. Among these was the suggestion of a foot-note based on the provisions of No. 145 of the Radio Regulations to be worded:

"In the U.S.S.R., Iran, Portugal and Switzerland, the band 2 500-2 690 Mc/s is allocated to the Fixed and Mobile Services only."

This foot-note was approved without objection. It was pointed out that the restrictions contained in Article 7 for bands shared between Space Services and the Fixed and Mobile Services would apply to the Fixed and Mobile Services appearing in the foot-note.

- 5.16 The Delegation of the U.S.S.R. proposed a revised text for foot-note ADD 364C which, after thorough examination and slight amendment by the Delegations of the Syrian Arab Republic and Brazil, was agreed by a large majority for world-wide application. The agreed text appears in Annex B to the present Report.
- 5.17 In connection with the show of cards by which the support for the text was evaluated, several delegations including Italy, United Kingdom and Canada reserved the right to revert to this action which they considered to be outside the competence of the Group. According to these delegations, it should have been specified that the motion related to the application of the foot-note insofar as the Broadcasting-Satellite Service only was concerned and not with respect to the Fixed-Satellite Service also.
- 5.18 A motion by the Delegation of Chili, to re-instate the MOBILE Service in the Table for Region 2 for the band 2 655-2 690 Mc/s, gave rise to some difficulties. However, in the final analysis, the Group agreed to the motion.

- 5.19 A motion by the Delegation of Denmark to limit the allocations to the MOBILE Service in the bands between 2 500 Mc/s and 2 690 Mc/s to the Land and Maritime Mobile Services. This also was agreed by the Group.
- 5.20 The Delegation of U.S.S.R. reserved the right to revert to the question of excluding the European Broadcasting Area from the allocation to the Broadcasting-Satellite Service and declared that, in any event, this allocation would not be used in the U.S.S.R.
- 5.21 Finally, the Delegation of Cuba objected strongly against various aspects of foot-note No. 361B and reserved the right to revert to this question later should it still so desire.

R. GALIĆ Chairman Working Group 5E

Annexes · 2

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ANNEXA

620-790 Mc/s

ADD 332A

Within the frequency band 620-790 Mc/s, assignments may be made to stations in the Broadcasting-Satellite Service, subject to agreement among the administrations concerned and affected / (see Articles 9 and 9A or Resolution) /. Such stations shall not produce a power flux-density in excess of the value / / within the territories of other administrations without the consent of those administrations.

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ANNEXB

Mc/s

			Mc/s	
		Region 1	Region 2	Region 3
		2 450-2 500 FIXED MOBILE Radiolocation	2 450-2 500 FIXED MOBILE RADIOLOCATION	
	•	357 361	357	
		2 500-2 550	2 500-2 535	
MOD		BROADCASTING- SATELLITE	BROADCASTING-SATELLITE	
		361B 361C	361B 361C	
		FIXED 364C MOBILE (except aeronautical mobile)	FIXED-SATELLITE (Space-to-Earth) FIXED 364C MOBILE (except aeronautical mobile)	
	1.4		361A <u> </u>	
			2 535-2 550	
			BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE (except aeronautical mobile)	
		361A <u></u> ****	362 363	
MOD	· .	2 550-2 655		
	,		BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE (except aeronautical mobile)	
	,		362 363 <u></u>	
MOD		2 655-2 690	2 655-2 690	2 655-2 6 90
	-	BROADCASTING- SATELLITE	BROADCASTING- SATELLITE	BROADCASTING- SATELLITE
• .	į	361B 361C	361B 361C	361B 361C
		FIXED 364C MOBILE (except aeronautical mobile)	FIXED-SATELLITE (Earth-to-Space) FIXED 364C MOBILE (except aeronautical mobile) _A_/	FIXED-SATELLITE (Earth-to-Space) FIXED 364C MOBILE (except aeronautical mobile) _A_7

MOD 361

In France and the United Kingdom, the band 2 450-2 500 Mc/s is allocated on a primary basis to the Radiolocation Service and, on a secondary basis, to the Fixed and Mobile Services.

ADD 361A

In France the band 2 500-2 550 Mc/s is also allocated on a primary basis to the Radiolocation Service and, on a secondary basis, to the Fixed and Mobile Services. In Canada, the band 2 500-2 550 Mc/s is also allocated on primary basis to the Radiolocation Service.

ADD 361B

The use of the band 2 500-2 690 Mc/s by the Broadcasting-Satellite Service is limited to domestic and regional systems for community reception and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected / (see Articles 9 and 9A or Resolution No. xxx) /. / The power flux-density at the surface of the earth shall not exceed those given in Article 7 Nos. 470NH-470NK. /

MOD 362

In the United Kingdom, the band 2 500-2 600 Mc/s is also allocated, on a secondary basis, to the Radiolocation Service.

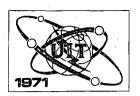
ADD 364C

When planning new tropospheric scatter radiorelay links in the band 2 500-2 690 Mc/s, all possible measures shall be taken to avoid directing the antennae of these links towards the geostationary orbit.

ADD /A /

/Note to Committee 7:

Text of foot-note A is to be adjusted according to the results of the work of the present Conference pertinent to this subject. 7



CONFÉRENCE SPATIALE

Corrigendum au/to/al
Document/Documento 317 - F/E/S

CONFÉRENCE ADMINISTRATIVE MONDIALE DES TÉLÉCOMPUNICATIONS SPATIALES - GENÈVE - 1971

COMMISSION 5 COMMITTEE 5 COMISION 5

CINQUIEME RAPPORT DU GROUPE DE TRAVAIL 5D A LA COMMISSION 5 FIFTH REPORT OF WORKING GROUP 5D TO COMMITTEE 5 QUINTO INFORME DEL GRUPO DE TRABAJO 5D A LA COMISION 5

1. Texte français

Page 3, alinéa 7, 3ème ligne,

<u>lire</u>: "liaisons bilatérales <u>Satellite-Terre</u>"

Page 14, note ADD 383B, 2ème ligne,

supprimer: "aéronautique"

2. English text

Page 3, item 7, 3rd line,

read: "bilateral links Satellite-Earth"

3. Texto español

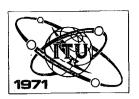
Página 3, párrafo 7, tercera línea,

léase : "los enlaces bilaterales Satélite-Tierra"

Página 14, nota ADD 383B, segunda línea

léase : "servicio fijo por satélite"





SPACE CONFERENCE

Document No. 317-E 7 July 1971 Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

FIFTH REPORT OF WORKING GROUP 5D TO COMMITTEE 5

MOBILE SERVICES AND RADIODETERMINATION

Frequency bands

136 Mc/s (Note 273A) 890 960 Mc/s -1 535 1 525 Mc/s 1 535 -1 660 Mc/s -2 550 Mc/s 2 450 -4 400 4 200 Mc/s Mc/s 5 000 -5 250 -7 300 Mc/s 7 250 7 975 -8 025 Mc/s

1. 117.975-136 Me/s band

The Working Group decided not to amend the text of No. 273A as it now stands in the Radio Regulations.

In order to facilitate the adoption of the First Report (Document No. 203), a corrigendum was drafted to rectify its presentation by adding the symbol NOC. (Document No. 203, as amended was adopted by Committee 5 on 7 July 1971).

2. 890-960 Mc/s band

The Working Group decided to amend the text of No. 340 in order to reduce the limits of the band around the ISM frequency 915 Mc/s (see Appendix A).

3. 1 525-1 535 Mc/s band

The Working Group decided to delete Number 350E and to amend Number 350A in order to protect the 1 535-1 540 Mc/s part now allocated to the Maritime Mobile-Satellite Service (see Appendix A).



4. 1 535-1 660 Mc/s band

- 4.1 As a result of the admirable work carried out by Sub-Working Group 5D-1 under the chairmanship of Mr. Foxcroft (Australia), the Working Group reached agreement on the allocations between 1 535-1 660 Mc/s and the corresponding foot-notes (see Appendix B); however, this agreement was only made possible by numerous concessions on the part of the delegations represented.
- 4.2 A minority of delegations nevertheless stated that they would have preferred the allocations to be made in a narrower band namely, 110 Mc/s instead of 125 Mc/s (1 550-1 660 Mc/s). The Delegation of U.S.S.R. reserved the right to re-open this question in Committee 5 if they still so desire.
- 4.3 With regard to notes 352F and 352I concerning the joint use by the Aeronautical Mobile (R) and Maritime Mobile Services of a shared band (1 542.5-1 543.5 Mc/s and 1 644-1 645 Mc/s), the Working Group was divided on the conditions of use to be specified. It finally adopted the text which appears in Appendix B.
- 4.4 Furthermore, the observers for I.C.A.O. and I.A.T.A. felt that they must make individual statements in order to inform Committee 5 of the views of their organizations on the utilization of the 1 535-1 660 Mc/s band.

These statements are annexed to the present report (see Annexes 1 and 2).

4.5 Finally, Group 5D agreed on the inclusion in Document No. 279 (Radio astronomy between 1 611.5-1 612.5 Mc/s) of Note 352K, drafted and adopted by Group 5B, under the number 352E.

5. 2 400-2 550 Mc/s band

The Group considered that proposals relating to this band were outside its terms of reference (see Document No. DT/59(Rev.)).

6. 4 200-4 400 Mc/s band

After examining the proposals on aeronautical radionavigation, the Group decided to keep note 352A in the Table concerning this frequency band.

7. 5 000-5 250 Mc/s band

The majority was unfavourable to the division of the Table with regard to this frequency band, but agreed to the insertion of a foot-note 383B to permit bilateral links for the Aeronautical Mobile (R) and/or the Radiodetermination Service (see Appendix C).

8. 7 250-7 300 Mc/s and 7 975-8 025 Mc/s bands

The Group decided to delete Number 392C, not to amend Number 392H and to add Israel to the list of countries referred to in 392G (see Appendix D).

Maurice CHEF Chairman

Annexes: 2

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ANNEX 1

I.C.A.O. STATEMENT

- I.C.A.O. is the United Nations Specialized Agency universally recognized as empowered to establish and present international civil aviation requirements in respect of applications of space technology. Over the past two years your own Governments, under the aegis of I.C.A.O., have made a careful and co-ordinated assessment of the future needs of civil aviation for space services. Aided by its ASTRA Panel, I.C.A.O. finally developed a well-founded and conservative statement of the bandwidths needed between 1 535 and 1 660 MHz to assure, in the future, the safety, regularity and efficiency of air transport, which are its primary aims under the terms of its Convention. Whilst manifestly civil aviation does not carry the bulk of world freight, it does carry the great majority of human beings who travel across the broad deserts and oceans of the world, and the safety of human life is its constant concern.
- 2. This Conference has, I believe, made a real effort to satisfy these aeronautical requirements in the face of conflicting and competing demands from another service. In my personal opinion these competing requirements are not of a nature which justifies the comparatively large allocations which have been made to them at the expense of aviation. However, the decision reached shows that, collectively, you do not yet share this opinion.
- The effect of these decisions on the future operational and technical development of international civil aviation will have to be carefully studied in the coming months. It is quite likely that, at a future I.T.U. Conference, civil aviation may be forced to seek an upward revision of the allocations made here, and I trust that, at that time, you will be able to accord a more appropriate priority to the requirements of what is, after all, essentially a safety service.

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ANNEX 2

I.A.T.A. STATEMENT

ON 1 535-1 660 MHz ALLOCATIONS

(1 July 1971)

- 1. I.A.T.A. wishes to express its grave concern with the decisions which have been taken in connection with the allocation to the Aeronautical Mobile Service in the band 1 535-1 660 MHz. Attention has already been drawn to the views expressed by I.C.A.O. Member States justifying the retention of 80 MHz for aeronautical radio navigation and 40 MHz for the Aeronautical Mobile (R) Services to meet the existing and forecast requirement for aviation world-wide.
- 2. Although there appear to be very considerable doubts as to the usefulness of this part of the spectrum for maritime mobile use in the foreseeable future, the conference has seen fit to make incursions into the spectrum allocated by the 1963 Space Conference for the Aeronautical Services.
- It is I.A.T.A.'s view that allocation to meet the demands of a service carrying traffic predominantly of a public correspondence nature at the expense of Aeronautical Services ignores the realities of the situation. The needs of the Aeronautical Services are directed principally to the safety of human life. The spectrum requirements for systems necessary for the safe and expeditious operation and control of large and fast aircraft each carrying hundreds of passengers at just subsonic (and in the near future at greater than mach 2) speeds in three dimensions, should not be sacrificed in favour of claims of other services operating in a far less critical manner. I.A.T.A. also notes that the possibility of reducing the allocations of other services in this part of the spectrum was not examined by the conference.
- 4. Further, the allocation of 2 MHz spectrum to shared aeronautical and maritime use at the expense of aeronautical radio navigation has effectively sterilized this spectrum and is unjustified in I.A.T.A.'s view as the International Aviation Authorities have been unable, after much study, to identify any such use apart from the remote possibility of a few channels for some as yet undefined common Search and Rescue facility excluding Distress/Alerting.

5. In the view of I.A.T.A. the W.A.R.C. has artificially constrained system development and design in the allocation of spectrum by means of unnecessary Definitions and Foot-notes. I.A.T.A. observes that insufficient regard has been paid to the need for the appropriate specialized agencies of the United Nations to have full freedom to develop and apply the technology best suited to their individual and unique needs. I.A.T.A. is convinced that the best course for the W.A.R.C. would have been to allow the specialized United Nations Agencies, and in particular I.C.A.O., in accordance with its defined responsibilities, to specify systems best suited to the requirements of aircraft operation and control.

Appendices: 4

Appendix A

MOD 340

In Region 2, the frequency 915 Mc/s is designated for industrial, scientific and medical purposes. Emissions must be confined within the limits of $^{\pm}$ 13 Mc/s of that frequency. Radiocommunication services operating within these limits must accept any harmful interference that may be experienced from the operation of industrial, scientific and medical equipment.

MOD 350A

Space stations employing frequencies in the band 1 525-1 535 Mc/s for telemetering purposes may also transmit tracking signals in the band.

SUP 350E

Appendix B

Mc/s

		MC/S	
	Region 1	Region 2	Region
	1 535-1 542.5		,
, HCD		MARITIME MOBILE-SATE	LLITE
		352 352D 352E	
	1 542.5-1 543.5		
MOD		AERONAUTICAL MOBILE (R)—SATELLITE MARITIME MOBILE—SATELLITE	
		352 352D 352F	
	1 543.5-1 558.5	. •	
MOD		AERONAUTICAL MOBILE (R)-SATELLITE	
		352 352D 352G	
	1 558.5-1 636.5		
MOD		AERONAUTICAL RADIONAVIGATION	
		352 352A 352B 352D 3	52K
	1 636.5-1 644		
MOD		MARITIME MOBILE-SATE	LLITE
		352 352D 352H	
	1 644-1 645		
MOD		AERONAUTICAL MOBILE MARITIME MOBILE-SATE	
		352 352D 352I	

Mc/s

Region l	Region 2	Region 3
1 645-1 660		
	AERONAUTICAL MOBILE	(R)-SATELLITE
	352 352D 352J	

MOD

SUP 351

NOC 352

MOD 352A

The bands 1 558.5-1 636.5 Mc/s, 4 200-4 400 Mc/s, 5 000-5 250 Mc/s and 15.4-15.7 Gc/s are reserved on a world-wide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities.

MOD 352B

The bands 1 558.5-1 636.5 Mc/s, 5 000-5 250 Mc/s and 15.4-15.7 Gc/s are also allocated to the aeronautical mobile (R) service for the use and development of systems using space communications techniques. Such use and development is subject to agreement and co-ordination among administrations concerned and those having services operating in accordance with the Table, which may be affected.

SUP 3520

MOD NOC 352D

In Austria, Indonesia and] the F.R. of Germany, the band 1 540-1 660 Mc/s is also allocated to the fixed service.

ADD 352E

Limited to transmissions from satellite-borne stations to Stations in the maritime mobile-satellite service for communication and/or radio-determination purposes. Transmissions from coast stations directly to ship stations, or between ship stations, are also authorized when such transmissions are used to extend or supplement the satellite-to-ship links.

Page 12

ADD. 352F

Limited to transmissions from satelliteborne stations to stations in the aeronautical mobile (R) and maritime mobile satellite services for communication and/or radiodetermination purposes. Transmissions from land stations to mobile stations, or between mobile stations, of these services, are also authorized. The utilization of this band is subject to prior operational co-ordination between the two services.

ADD 352G

Limited to transmissions from satelliteborne stations to stations in the aeronautical mobile (R) satellite service for communication and/or radiodetermination purposes. Transmissions from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

ADD 352H

Limited transmissions from stations in the maritime mobile satellite service to satellite-borne stations for communication and/or radiodetermination purposes. Transmissions from ship stations directly to coast stations, or between ship stations, are also authorized when such transmissions are used to extend and supplement the ship-to-satellite links.

ADD 352I

Limited to transmissions from stations in the aeronautical mobile (R) and maritime mobile-satellite services to satellite-borne stations for communication and/or radiodetermination purposes. Transmissions from mobile stations to land stations, or between mobile stations, of these services, are also authorized. The utilization of this band is subject to prior operational co-ordination between the two services.

ADD 352J

Limited to transmissions from stations in the aeronautical mobile (R)-satellite service to satellite-borne stations for communication and/or radiodetermination purposes. Transmissions from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement aircraft-to-satellite links.

*) ADD 352K

Radio astronomy observations on important spectral lines due to the hydroxyl radicle OH at frequencies 1 612.231 Mc/s and 1 720.53 Mc/s are carried out in a number of countries under national arrangements; the bands observed being 1 611.5-1 612.5 Mc/s and 1 720-1 721 Mc/s respectively. Administrations should bear in mind the needs of radio astronomy service in their future planning of these bands.

^{*)} Text shown in proposed ADD 352E in Annex A to Document No. 279 (Third Report of Working Group 5B to Committee 5).

Appendix C

Mc/s

Region 1		Region 2	Region 3	
5 000-5 250				
AERONAUTICAL RADIONAVIGATION				
	352A	352B 383B		

ADD 383B

The band 5 000-5 250 Mc/s is also allocated to the fixed satellite service for connection between one or more earth stations at specified fixed points and satellites used by the aeronautical mobile service (R) and/or the radiodetermination service.

Such use and development shall be subject to agreements and co-ordination between Administrations concerned and those having services operating in accordance with the Table, which may be affected.

Appendix D

Mc/s

	Region 1	Region 2	Region 3	-
	7 250-7 300			
MOD		FIXED-SATELLITE (Space-to-earth)		
		374A 392D 392G		
	7 975-8 025			
MOD		FIXED-SATELLITE (Earth-to-space)		-
		392A 392H		

SUP 3920

MOD 392G

In Algeria, Austria, Bulgaria, Cyprus, Cuba, Ethiopia, Finland, Hungary, Israel, Japan, Kuwait, Lebanon, Liberia, Malaysia, Morocco, the Philippines, Poland, the United Arab Republic, Yugoslavia, Roumania, Sweden, Switzerland, Czechoslovakia and the U.S.S.R., the band 7 250-7 300 Mc/s is also allocated to the fixed and mobile services.

NOC 392H



CONFÉRENCE SPATIALE

Corrigendum au/to/al
Document/Documento Nº 318-F-E-S

CONFÉRENCE ADMINISTRATIVE MONDIALE DES TÉLÉCOMMUNICATIONS SPATIALES — GENÈVE — 1971

COMMISSION 5 COMMITTEE 5 COMISION 5

SIXIEME RAPPORT DU GROUPE DE TRAVAIL 5D A LA COMMISSION 5 SIXTH REPORT OF WORKING GROUP 5D TO COMMITTEE 5 SEXTO INFORME DEL GRUPO DE TRABAJO 5D A LA COMISIÓN 5

Texte français

Remplacer le texte de la page 2 par le texte suivant :

"Une version amendée de cette proposition limitant les contraintes pour le service de radiodiffusion n'a pu, de même, être acceptée (application du numéro 719 de la Convention). Les Délégations du Royaume-Uni et de la Suède se sont réservé le droit de revenir sur cette question si elles le jugent encore souhaitable.

2.3 Le Sous-Groupe de travail a finalement adopté un projet de Recommandation qui figure à l'Appendice B. La Délégation de la Grèce a alors retiré son projet figurant au Document N° 277."

English text

Replace the text of page 2 by the following:

"A revised version of this proposal which tends to restrict the limitations for the Broadcasting Service was also rejected (application of No. 719 of the I.T.U. Convention). The Delegations of the United Kingdom and of Sweden reserved their right to raise the matter again if they still so desire.

2.3 The Working Group finally adopted the attached draft Recommendation which appears at Appendix B. The Delegation of Greece then withdrew its draft Resolution which appears in Document No. 277."

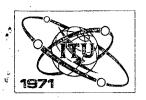
Texto español

Reemplácese el texto de la página 2 por el siguiente:

"Tampoco ha podido ser aceptada una versión enmendada de esta proposición que reducía las limitaciones del servicio de radiodifusión (aplicación del número 719 del Convenio). Las Delegaciones del Reino Unido y de Suecia se reservaron el derecho de insistir sobre esta cuestión si lo consideran conveniente.

2.3 El Subgrupo de trabajo adoptó el adjunto proyecto de Recomendación (Apéndice B), sometido al Subgrupo por la Delegación de Estados Unidos de América. La Delegación de Grecia retiró entonces su proyecto que figuraba en el Documento N.º 277."





SPACE CONFERENCE

Document No. 318-E 7 July 1971 Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SIXTH REPORT OF WORKING GROUP 5D

TO COMMITTEE 5

Bands: 235 -328.6 Mc/s 335.4-339.9 Mc/s 432 -615 Mc/s

1. Bands 235-328.6 Mc/s and 335.4-399.9 Mc/s

- 1.1 The Working Group agreed to add the new foot-note 308A in Table with respect to the above-mentioned frequency bands (see Appendix A).
- 1.2 The Delegation of Poland stated that they accepted this new foot-note as a compromise though their original proposal concerned only the bands 230-300 Mc/s and 344-390 Mc/s.
- 1.3 Proposals B/71/59, J/98/54 and J/98/58 were rejected.
- 1.4 The Delegation of India insisted upon the necessity to protect the Radio Astronomy Service in their country and the Working Group accepted to propose the foot-note 810A (see Appendix A) taking into account the decision taken by Committee 5 at its 4th meeting when considering Document No. 177(Rev.) (1st Report of Working Group 5B).

2. Bands 432-615 Mc/s

- 2.1 After considerable discussion, Proposals G/108/321, 322 and 323 and the Proposal of Sweden contained in Document No. 244 were rejected.
- 2.2 The Working Group then examined a new proposal presented by the Delegations of the United Kindom and of Sweden (Document No. 293) which was not accepted by a majority of the Working Group.



Document No. 318-E Page 2

A revised version of this proposal which tended to restrict the limitations for the Broadcasting Service was also rejected (application of No. 719 of the I.T.U. Convention). The Delegations of the United Kingdom and of Sweden reserved their right to raise the matter again if they still so desire. This statement was supported by the Delegation of Norway.

2.3 The Working Group finally adopted the attached draft Recommendation which appears at Appendix B.

Maurice CHEF Chairman

Appendices: 2

APPENDIX A

Mc/s

			1107.5			
	Region	1	Region 2		Region 3	
	235-267	- Serie description (1984) - Series (1984) - Series (1984)			and general control of the second	
MOD		FIXED MOBILE				
•		305 308	BA 309		/	
	267-272	angalagian ar ak as merupak dari da s	A consequence of the Provider of States III of Originary States and Marketine Provider III and American States III of States III	y de la la cuitar de la cuita de la cuita de la cuita de la cuita	evanean (Palaine) ilikusta kanan ayan ke ana ayan ke (Palaine) ilikusta ke kanan ayan ke (Palaine) ilikusta ke K	
MOD		FIXED MOBILE Space (Telemetering) 309A	309B		
		308A		•		
•	272-273					
MOD		FIXED MOBILE SPACE (Telemetering) 309A			
		308A		•		
	273-328.6			(understätten som et till mit det en stem med kelt kilomen som e	****
MOD	6	FIXED MOBILE				
		308A 31	0 [310A]			

[ADD 310A In India, the band 322-328.6 Mc/s is also allocated to the Radio Astronomy Service.]

Page 4

	Region l	Region 2	Region 3
MOD	335.4-399.9		
•		FIXED MOBILE	
		308A	

ADD 308A

In the bands 240-328.6 Mc/s and 335.4-399.9 Mc/s, the mobile service may be authorized the use and development, for that service, of systems using space techniques. Such use shall be subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

APPENDIX B

DRAFT RECOMMENDATION

relating to requirements for future frequency allocations for Maritime Mobile Service using space techniques

The World Administrative Radio Conference, Geneva, 1971,

having noted

that the Inter-Governmental Maritime Consultative Organization (I.M.C.O.) has stated a requirement for frequencies on the order of 400 MHz, believing that small vessels in particular may be excluded from satellite communications if such frequencies are not made available;

further noting

that the C.C.I.R. Special Joint Meeting, Geneva, 1971, concluded that the present Conference should be invited to examine the possibility of providing exclusive channels for the Maritime Mobile Service at about 400 MHz and that provision of such channels is desirable:

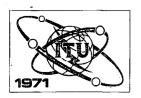
considering

- a) that ship stations and survival craft stations are completely dependent upon the use of radio for communication;
- b) that the use of space techniques will provide the Maritime Mobile Service with a reliable method of communication, considerably improved over existing methods;
- c) that reliable Maritime Mobile Service communications will greatly assist in the saving of lives and property;

- d) that although the Conference has made certain provisions for the use of space techniques by the Maritime Mobile Service, there is some uncertainty with respect to the adequacy and usefulness of these provisions, particularly insofar as small ships and survival craft are concerned.
- e) that general participation of small ships in a service using space techniques would not only benefit the efficient and safe operation of these ships, but it would also improve the safety service for larger ships and survival craft.
- f) that future conferences might find it necessary to make additional allocation provisions for such uses in more nearly optimum portions of the spectrum;
- g) that some communications functions, such as certain broadcasting and fixed applications, may not be dependent upon the transmission of radio waves, but could in fact use other means, thereby making available portions of the spectrum for services which are so dependent,

recommends

- that administrations and appropriate international organizations should continue to review the requirements for the application of space techniques for the Maritime Mobile Service and the suitability of current frequency allocation provisions in meeting those requirements;
- 2. that the C.C.I.R. should continue its studies to determine the optimum portions of the frequency spectrum and related sharing conditions to accommodate Maritime Mobile Service requirements, taking into consideration technological advances in space techniques for Mobile Services;
- 5. that a future appropriate Administrative Radio Conference should review the requirements of the Maritime Mobile and Safety Services, and if necessary, provide the frequency allocation to satisfy these requirements.



SPACE CONFERENCE

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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

FRANCE

ADDITIONAL PROPOSALS

Reason: To confirm the possibility of using satellite transmissions close to 150 and 400 Mc/s for space research (particularly for geodesy) and to provide for this purpose a distinctly higher frequency harmonically related to the two frequencies mentioned above, the French Delegation proposes the insertion of two foot-notes.

These proposals are in agreement with the recommendations made by COSPAR on the subject.

Ref.

Mc/s

Region 1 Region 2 Region 3

F/319/322 149.9-150.05

RADIONAVIGATION-SATELLITE

285B 285C

399.9-400.05

RADIONAVIGATION-SATELLITE

311A 2850

ADD 285C

Emissions of the radionavigation-satellite service in the bands 149.9-150.05 Mc/s and 399.9-400.05 Mc/s may also be used by earth receiving stations of the space research service.



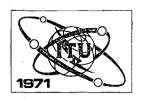
Ref.

Mc/s

		·	
	Region 1	Region 2	Region 3
F/319/323	1 690-1 700	1 690-1 700	
	METEOROLOGICAL AIDS METEOROLOGICAL— SATELLITE (Space to earth) 324A Fixed Mobile except aeronautical mobile	METEOROLOGICAL AI METEOROLOGICAL—SA (Space to earth)	ATELLITE
	353 354A <u>324C</u> 354D	354A 354C <u>324C</u> 354D	
,	1 700-1 710	1 700-1 710	
	FIXED SPACE RESEARCH (Space to earth) Mobile	FIXED MOBILE SPACE RESEARCH (Space to earth)	
ļ	354D	354D	

ADD 354D

The band 1 699.6-1 700.2 Mc/s may be used, on a secondary basis, for the transmission on board satellites of frequencies harmonically related to those emitted in the bands 149.9-150.05 Mc/s and 399.5-400.05 Mc/s for the requirements of precision radionavigation and geodesy.



SPACE CONFERENCE

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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

FOURTH REPORT OF WORKING GROUP 5A

TO COMMITTEE 5 (ALLOCATIONS)

FIXED-SATELLITE SERVICE

Frequency bands: 1 429-1 525 Mc/s

2 150-2 200 Mc/s

5 650-5 925 Mc/s

6 425-7 750 Mc/s

8 025-8 400 Mc/s

14.4-15.25 Gc/s

38-40 **G**c/s

1. Frequency band: 1 429-1 525 Mc/s

The Delegation of Canada stated that it would withdraw its Proposal CAN/14/50 for this band as soon as their alternative Proposal contained in Documents Nos. 164 and 272 was approved in Committee 5.

2. Frequency band: 2 150-2 200 Mc/s

The Delegation of the U.S.A. stated that, taking into consideration the agreement on allocations to the Fixed-Satellite Service which resulted from the Proposals in Documents Nos. 164 and 272, the Administration of U.S.A. would withdraw its Proposal USA/28/78 in this band.

3. Frequency band: 5 650-5 925 Mc/s

The Working Group <u>agreed</u> that it could make no contribution to Committee 5 with respect to the proposals in this band (AUS/60/70, G/54/98, URS/59/22, 23, USA/28/88 and B/71/87) which had already been examined by other Working Groups.



4. Frequency band: 6 425-7 750 Mc/s

- 4.1 The Working Group, after examination of Proposals B/71/90,91, agreed to suggest to Committee 5 the modification of foot-note 392G, as shown in the Annex to the present Report.
- 4.2 The Working Group, having examined the Second Report of Sub-Working Group 5A-2, which concerned a proposal by the U.S.A. (Document No. 217) for the band 6 625-7 125 Mc/s, could not agree to suggest the proposed allocation to Committee 5. The Delegation of the U.S.A. reserved its right to revert to this subject in Committee 5, where it would present a new proposal in the form of a foot-note concerning only Region 2.
- 4.3 The remaining Proposals in frequency range 6 425-7 750 Mc/s (F/41/115-117), G/54/101-103, HOL/49/70,71 and USA/28/93,94) had already been considered in other Working Groups, and the meeting agreed that no new contribution could be made to Committee 5 with respect to these Proposals.

5. Frequency band: 8 025-8 400 Mc/s

Examination of Proposals in this band (CAN/14/79,80, F/41/118,119, G/56/104,105, HOL/49/72,73, USA/28/95) revealed that they had already been discussed in other Working Groups. The group agreed that it could not make any further contribution.

6. Frequency band: 14.4-15.25 Gc/s

The Proposals in this band (AUS/10/40-42,44,48,49, CAN/14/90,91 and J/98/79) were withdrawn by the respective delegations in the light of previous results agreed upon by the Joint Working Group 5A/5E in the band 10.7-14.5 Gc/s.

7. Frequency band: 38-40 Gc/s

The Japanese Administration withdrew its Proposal J/98/80 concerning this band, and would consider this matter in Committee 5 where it had reserved the right to revert to its Proposal J/98/81 (see Document No. 254).

8. Note to Committee 4

The Working Group <u>agreed</u> to send to the Chairman of Committee 4 a note in the following terms:

"Working Group 5A, having difficulties in evaluating the sharing possibilities between Space Services and other Services in the band 14-14.5 Gc/s, requests Committee 4 to consider the possibility of supplying power flux-density limitations at the geostationary orbit which would be applicable to this band."

Luiz BAHTANA Chairman Working Group 5A

Annex: 1

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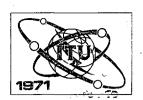
ANNEX

Mc/s

Region 1	Region 2	Region 3
7 250-7 300		
	FIXED-SATELLITE (Space-to-earth)	
	374A 392C 392D 39	2 G

MOD 392G

In Algeria, Austria, Brazil, Bulgaria, Cyprus, Cuba, Ethiopia, Finland, Hungary, Japan, Kuwait, Lebanon, Liberia, Malaysia, Morocco, the Philippines, Poland, the United Arab Republic, Yugoslavia, Roumania, Sweden, Switzerland, Czechoslovakia and the U.S.S.R. the band 7 250-7 300 Mc/s is also allocated to the fixed and mobile services.



SPACE CONFERENCE

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7 July 1971
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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

WORKING GROUP 5E

THIRD REPORT BY SUB-WORKING GROUP 5E-1 TO WORKING GROUP 5E

BROADCASTING-SATELLITE SERVICE

Frequency band: 2 300-2 690 Mc/s

- 1. The Group had before it Proposals CAN-USA/164/4 in part, CAN-USA/164/5, 6, 7 and 10, IND/39/31 and 32, B/71/81 and 82. These Proposals were thoroughly examined and the Sub-Working Group provisionally agreed the revised provisions appearing in the Annex to the present Report.
- 2. The Delegation of India agreed to adjust the lower limit of their Proposal from 2 400 Mc/s to 2 690 Mc/s in the interests of obtaining unanimity.
- Proposals AUS/190/1 and 2 were not supported and the Delegation of Australia reserved the right to revert to them in Working Group 5E or in Committee 5, if it still so desired.
- 4. The Delegation of Cuba was against the addition of regional with or without a capital "R" in the ADD 361B (No. 125.1 of the Radio Regulations refers), and reserved the right to revert to this question later, if it still so desired.
- 5. The Delegations of Bulgaria, Poland, Portugal, Federal Republic of Germany, Czechoslovakia and the U.S.S.R. explained the heavy use of the band by the services to which it is at present allocated and the serious difficulties involved by the proposed additional allocation to the Broadcasting-Satellite Service for community-type reception. While preferring the status quo for Region 1, they insisted upon receiving sound guarantees from Committee 4 on technical criteria and adequate provisions for co-ordination procedures from Committee 6 before a final agreement could be considered.



- 6. The Delegation of Japan also explained the heavy use of this band by Terrestrial Services and the serious difficulties the proposed allocations would cause. The Delegation reserved the right to revert to this question later, if it still so desired.
- 7. The Delegations of the U.A.R. and Uganda recalled the unanimously adopted United Nations resolution reproduced by the Secretary-General in Document No. 58.
- 8. The Delegation of Denmark explained that it was quite conceivable that Scandinavian countries might wish to develop a system in the future at this order of frequency and consequently urged the adoption of world-wide provisions.
- 9. The Delegation of the United Kingdom recalled the unanimous agreement reached in Working Group 5B the day before concerning the band 2 670-2 690 Me/s ADD 363A (G/54/93) by which administrations should bear in mind the needs of the Radio Astronomy Service in their future planning of this band. In connection with the deletion of Radiolocation on a secondary basis from the band 2 500-2 550 Me/s in the Region 1, the Delegation's request for retention of this allocation was not supported. Consequently, it reserved the right to revert to this question later.
- 10. In the resumed study of the provisional agreement, the following Delegations declared no support for an allocation to the Broadcasting-Satellite Service at this order of frequency and no support for the footnote 364C by which new tropospheric scatter systems are prohibited in the band 2 500-2 690 Mc/s as of the entry into force of the Final Acts of the present Conference: Poland, the Ukraine, Roumania, Czechoslovakia, the U.S.S.R., Bulgaria and Bielorussia. However, a show of hands resulted in 19 in favour and 39 against the deletion of foot-note ADD 364C. The Delegations of Italy, Portugal, the U.S.S.R., Pakistan, Australia, Brazil and Poland reserved the right to revert to this question in Committee 5 should they still so desire.
- 11. There was a motion for the exclusion of an allocation of the Broadcasting-Satellite Service in the European Broadcasting Area, which was rejected by 11 for and 34 against the motion.
- 12. Thus the provisionally agreed revisions of the Table for these bands were confirmed by the Sub-Group as shown in the Annex to the present Report.

15. In view of these decisions, various suggestions were made in an attempt to give wider satisfaction. Among these was the suggestion of a foot-note along the lines of No. 145 of the Radio Regulations to be worded:

"In the U.S.S.R., Iran, the band 2 500-2 590 Mc/s is allocated to the Fixed and Mobile Services."

It was pointed out that in view of the decision to retain footnote 364C and in view of the terms of No. 147 of the Radio Regulations, the suggested footnote should include the sense of the restriction contained in ADD 364C.

The Chairman and the Secretary were requested to draw up a text for consideration.

- 14. The Delegation of U.S.S.R. reserved the right to revert to the question of excluding the European Broadcasting Area from the allocation to the Broadcasting-Satellite Service and declared that, in any event, this allocation would not be used in the U.S.S.R.
- 15. Finally, the Delegation of Cuba objected strongly against various aspects of foot-note No. 361B and reserved the right to revert to this question later should it still so desire. The Delegation of India also reserved the right to revert to these questions later should it still so desire.
- 16. The Group agreed that exceptionally the Report may be sent directly to Working Group 5E.

Per AKERLIND Chairman Sub-Working Group 5E-1

Annex

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ANNEX

. Mc/s

		Mc/s	
	. Region 1	Region 2	Region 3
	2 450-2 500	2 450-2 500	
t de la	FIXED MOBILE Radiolocation	FIXED MOBILE RADIOLOCATION	
	357 361	<i>3</i> 57	
	2 500-2 550	2 500-/2 550_7	
MOD	BROADCASTING- SATELLITE	BROADCASTING-SATEI	LITE
	361B 361C	361B 361C	
	FIXED 364C MOBILE	FIXED-SATELLITE (Space-to-Earth) FIXED 364C MOBILE	
	361A	361A <u></u>	
MOD	2 550-2 655		•
		BROADCASTING-SATEI FIXED 364C MOBILE	LITE 361B 361C
		362 363	
MOD	2 655-2 690	2 655-2 690	2 655-2 690
	BROADCASTING- SATELLITE	BROADCASTING- SATELLITE	BROADCASTING- SATELLITE
	361B 361C	361B 361C	361B 361C
	FIXED 364C MOBILE	FIXED-SATELLITE (Earth-to-Space) FIXED 364C	FIXED-SATELLITE (Earth-to-Space) FIXED 364C MOBILE
		A	

Annex to Document No. 321-E Page 6

MOD 361

In France and the United Lingdom, the band 2 450-2 500 Mc/s is allocated on a primary basis to the Radiolocation Service and, on a secondary basis, to the Fixed and Mobile Services.

ADD 361A

In France and the United Kingdom the band 2 500-2 550 Mc/s is also allocated on a primary basis to the Radiolocation Service and, on a secondary basis, to the Fixed and Mobile Services. In Canada, the band 2 500-2 550 Mc/s is also allocated on primary basis to the Radiolocation Service.

ADD 361B

The use of the band 2 500-2 690 Mc/s by the Broadcasting-Satellite Service is limited to domestic and regional systems for community reception and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected / (see Articles 9 and 9A or Resolution No. xxx) /. / The power flux-density at the surface of the earth shall not exceed those given in Article 7 Nos. 470NH-470NK. /

ADD 364C

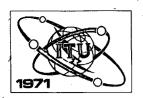
New tropospheric scatter systems are prohibited in the band 2 500-2 690 MHz. Existing tropospheric scatter systems may continue to operate in this band.

ADD /A_/

The use of the bands 2 500-2 535 Mc/s and 2 655-2 690 Mc/s by the Fixed-Satellite Service is limited to domestic and regional systems and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected. In the direction Space-to-Earth, the power flux-density at the surface of the earth shall not exceed / see Article 7 /.

/Note to Committee 7:

Text of foot-note A is to be adjusted with a view to having a single foot-note for application according to the results of the work of the present Conference pertinent to this subject.



SPACE CONFERENCE

Document No. 322-E 8 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

UNITED STATES OF AMERICA

PROPOSED AMENDMENTS TO ARTICLES 6 AND 27 OF THE RADIO REGULATIONS

The Radio Regulations provide for aircraft stations to communicate with stations of the Maritime Mobile Service. For this purpose aircraft should use frequencies allocated to the Maritime Mobile Service. (See Nos. 951 and 952.) One reason for this provision is that frequencies allocated to the Aeronautical Mobile Service cannot be used for public correspondence. (See No. 432.)

The same concept should be applicable to aircraft desiring to communicate with stations in the Maritime Mobile Satellite Service. (See S.J.M. 4.2.1.3) To effect this, consequential amendments to the Regulations are proposed in the attached.

Annex: 1



^{*)} C.C.I.R. S.J.M. 4.2.1.3 "In relation to / public correspondence for ships and aircraft / , provision should be made in the frequency allocation table for world-wide mobile public correspondence, by means of satellite. These allocations should be sufficient to meet the needs of the Maritime Mobile Service with provision for expansion and, should it prove necessary, its extension to aviation."

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ANNEX

Ref.

ARTICLE 6

USA/322/295 MOD 419

§ 5. In certain cases provided for in Articles 32 and 35, aircraft stations are authorized to use frequencies in the bands allocated to the Maritime Mobile Service or Maritime Mobile-Satellite Services for the purpose of communicating with stations of that those Services (see No. 952).

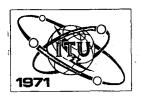
ARTICLE 27

USA/322/296 MOD 951

S 5. (1) Aircraft stations may communicate with stations of the Maritime Mobile or Maritime Mobile—Satellite Services. Service. They shall then conform to those provisions of these Regulations which relate to the Maritime Mebile Service these Services.

USA/322/297 MOD 952

S (2) For this purpose aircraft stations should use the frequencies allocated to the Maritime Mobile or Maritime Mobile-Satellite Services. However, having regard to interference which may be caused by aircraft stations at high altitudes, maritime mobile frequencies in the bands above 30 Mc/s shall not be used by aircraft stations in any specific area in which interference is likely to be caused. In particular, aircraft stations operating in Region 1 should not use frequencies in the bands above 30 Mc/s allocated to the Maritime Mobile Service by virtue of any agreement between administrations in that Region.



SPACE Conference

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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

UNITED STATES OF AMERICA

PROPOSED ALLOCATION FOR THE DEVELOPMENT AND USE OF A WORLD-WIDE EMERGENCY POSITION-INDICATING RADIOBEACON SYSTEM USING SPACE TECHNIQUES

A significant number of lives could be saved each year from ship disasters and downed aircraft if emergency position-indicating radiobeacons (EPIRB's) using space techniques were available to mobile stations. The EPIRB's, when activated, could alert a shore based rescue co-ordination centre by satellite relay, identify the mobile station in distress and provide location information. The combination of these functions provides a means for essentially eliminating the search phase of the search and rescue problem. Thus, lives and valuable property could be saved by minimizing the time interval between the occurrence of a mishap and the initiation of rescue efforts.

Tests conducted by the United States have clearly shown the feasibility of an EPIRB system as described above. These tests are continuing; however the results to this date indicate the following features of such a system:

- a) EPIRB devices can be manufactured with a small physical size and at a low cost to the user;
- b) the system and the user devices would be completely independent of any other communications system or equipment, and would operate entirely within a single, narrow frequency band (100 kHz is the width of the proposed band);
- c) the EPIRB can reliably and immediately access the satellite with a simple antenna and not more than 5 watts of power;
- d) the EPIRB transmission will be a short data burst (no voice capability) with a narrow emission bandwidth,
- e) frequencies in the vicinity of 400 MIz are most suitable for an EPIRB system based upon tests to date.

The experiments referred to above are now being supplemented by conceptual studies for a world-wide EPIRB system.



In view of the importance of distress alerting and survivor location, particularly for ships at sea and aircraft over the sea or in remote parts of the world, the United States is proposing that an allocation be made for this specific purpose. Due to the nature of the system, it is necessary that the allocation be on an exclusive, world-wide basis. In arriving at the proposed band, it was considered that the low power, short duration and narrow bandwidth of the EPIRB emission, together with the low probability of an EPIRB transmission occurring in any particular part of the world, would have negligible effect on radio astronomy observations in this portion of the spectrum.

The proposal is as follows:

Ref.

USA/323/298

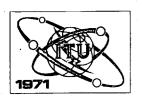
406-406.1 MHz

MOBILE-SATELLITE (Earth-to-Space)

317A

ADD 317A

This band is reserved on a world-wide, exclusive basis solely for the use and development of emergency position-indicating radiobeacon (EPIRB) systems using space techniques.



SPACE CONFERENCE

Document No. 324-E 8 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FIFTH REPORT FROM COMMITTEE 4

The modifications and additions to the provisions of Article 7, Section VIII, relating to limits of power flux-density from space stations, appearing in the Annex hereto have been approved by Committee 4.

The texts in question have been forwarded to the Drafting Committee.

E.F. SANDBACH Chairman Committee 4

Annex: 1



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ANNEX

ARTICLE 7

PROPOSED PARTIAL TEXT OF SECTION VIII

MOD

Limits of power flux-density from space stations

ADD 470MA

\$22.bis(0)Power flux-density limits [below 1 G [c/s]]

ADD 470MB

(a) In the band [614-960 M [c/s]] where the broadcasting-satellite service shares the frequency band with equal rights with the fixed service using tropospheric scatter, and where there is insufficient frequency separation there must be sufficient angular separation between the direction to the broadcasting-satellite space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed -168 dBW in any 4 k [c/s] band.

MOD 470N §23. (1) Power flux-density limits [between 1.67 and 1.7 G[c/s]].

ADD 470NA

(a) The power flux-density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed $-133~\mathrm{dBW/m^2}$ in any 1.5 M[c/s] band. This limit relates to the power flux-density which would be obtained under assumed free-space propagation conditions.

ADD 470NB

(b) The limit given in 470NA applies in frequency band(s) listed in 470NC which is(are) allocated to transmission by space stations in the meteorological-satellite service and [earth exploration-satellite service] where this(these) band(s) is(are) shared with equal rights with the meteorological aids service:

ADD 470NC

(c) - [] - [] etc.

ADD 470ND

g23. (2) Power flux-density limits [between 1.67 G[c/s] and 2.3 G[c/s]].

ADD 470NE

(a) The power flux-density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

-154 dBW/ m^2 in any 4 k[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane;

=154 + $\frac{\delta}{2}$ dBW/m² in any 4 k[c/s] band for angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

 $-144~\mathrm{dBW/m}^2$ in any 4 k[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

ADD 470NF

(b) The limits given in 470NE apply in the frequency bands listed in 470NG which are allocated to transmission by space stations in the following space services:

-	[.]	
-	[:]	4.5
•	Ĺ·]	
-	[]	
]	etc.

where these bands are shared with equal rights with the [fixed or mobile] services:

ADD	470NG	-	[]	
			•[]	
]	
		· ·	[.]	
		_]	etc

ADD 470NGA

(c) The power flux-density values of 470NE are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the bands listed in 470NG and where there is insufficient frequency separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed -168 dBW in any 4 k, [c/s] band.

ADD 470NH

(3) Power flux-density limits [between 2.3 G[c/s] and G[c/s].

ADD 470NI

- (a) The power flux-density at the earth's surface produced by emissions from a space station in the Broadcasting-Satellite Service for all conditions and for all methods of modulation shall not exceed the following values:
 - -152 dBW/m^2 in any 4 k[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane;
 - -152 + $\frac{3(\delta 5)}{4}$ d3W/m² in any 4 k[c/s] band for angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;
 - -137 dBW/m 2 in any 4 k[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

ADD 470NJ

(b) The limits given in 470NI apply in the frequency band:

. [

٦

which is shared by the Broadcasting-Satellite Service with equal rights with the [Fixed or Mobile Service].

ADD 470NK

(c) The power flux-density values of 470NI are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the band mentioned in 470NJ and where there is insufficient frequency separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed -168 dBW in any 4 k[c/s] band.

ADD 470NL

(4) Power flux-density limits [between 3 G[c/s] and 8 G[c/s]]

ADD 470NM

(a) The power flux-density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

-152 dDW/m^2 in any 4 k/c/s/ band for angles of arrival between 0 and 5 degrees above the horizontal plane;

 $-152 + \frac{(\delta - 5)}{2}$ dBW/m² in any 4 k/c/s/ band for angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

-142 dBW/m 2 in any 4 k/c/s/ band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

ADD 470NN

(b) The limits given in 470NM apply in the frequency bands listed in 470NO which are allocated to transmission by space stations in the following space services:

-	·		_7	
-	$ \angle $		Said Said	
_	\angle			etc

where these bands are shared with equal rights with the $\sqrt{\text{fixed or mobile}}$ services :

ADD 470NP

(5) Power flux-density limits $\sqrt{\text{between 8 and ll.7 G/c/s/}}$

ADD 470NQ

(a) The power flux-density at the earth's surface, produced by emissions from a space station, or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

-150 dBW/m² in any 4 k/c/s/ band for angles of arrival between 0 and 5 degrees above the horizontal plane;

 $-150 + \frac{(\delta - 5)}{2}$ dBW/m² in any 4 k/c/s/ band for angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

-140 dBW/m^2 in any 4 k/c/s/ band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

ADD 470NR

(b) The limits given in 470NQ apply in the frequency bands listed in 470NS which are allocated to transmission by space stations in the following space services:

where these bands are shared with equal rights with the fixed or mobile services:

ADD 470NS

ADD 470NT

(6) Power flux-density limits \sqrt{b} etween 11.7 and 15.4 G/c/s//

ADD 470NU

(a) The power flux-density at the earth's surface, produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

-148 dBW/m² in any 4 k/c/s/ band for angles of arrival between 0 and 5 degrees above the horizontal plane;

-148 + $\frac{(\delta - 5)}{2}$ dBW/m² in any 4 k/c/s/ band for angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

-138 dBW/m 2 in any 4 k/c/s/ band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

ADD 470NV

(b) The limits given in 470NU apply in the frequency bands listed in 470NW which are allocated to transmission by space stations in the following space services:

-		J	
-	\angle	J	•
			etc.

where these bands are shared with equal rights with the _fixed or mobile_/ services :

ADD 470NX (7) Power flux-density limits /between 15.4 G/c/s and 23 G/c/s

ADD 470NY

(a) The power flux-density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

-115 dBW/m² in any l M/c/s/ band for angles of arrival between 0 and 5 degrees above the horizontal plane;

-115 + $\frac{\delta - 5}{2}$ dBW/m² in any 1 M/c/s/ band for angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

-105 dBW/m 2 in any 1 M/c/s/ band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

ADD 470NZ

(b) The limits given in 470NY apply in the frequency bands listed in 470NZA which are allocated to transmission by space stations in the following space services:

~]	
	7	
_	7	etc

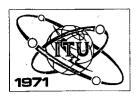
where these bands are shared with equal rights with the /fixed or mobile / services :

ADD 47 ONZA

ADD 470NZB

(8) The limits given in $\sqrt{470\text{NA}}$, 470NE, 470NI, 470NM, 470NQ, 470NU and 470NY may be exceeded subject to the agreement of any administration in whose territory the power flux-density may be higher than the limits indicated above.

SUP 4700 to 470U



SPACE CONFERENCE

Document No. 325-E 8 July 1971 Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

FRANCE

PROPOSED MODIFICATIONS TO THE TEXT OF DOCUMENT NO. \(\overline{D}T/77/\)

In order to avoid certain difficulties which were raised with respect to Document No. $\sqrt{DT/77}$, the French delegation proposes the following modifications :

it is proposed to suppress the second paragraph of item 4, Section C and the second paragraph of item 4, Section D, to account for the case where the translation frequency of the interfering simple frequency changing transponder is different from that of the wanted simple frequency changing transponder,

similarly, a modification is proposed to item 6, Section D, to avoid the difficulties that may be encountered when considering the term "category of carrier".

Annex: 1



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ANNEX

PROPOSED MODIFICATIONS TO THE TEXT OF DOCUMENT NO. /DT/77/

- 1. <u>Suppress</u> the second paragraph of a) of item 4, Section C, and of item 4, Section D. <u>Suppress</u> the words "in all cases" in the first paragraph of a) of item 4, Section C, and also in item 4, Section D.
- 2. Replace the second paragraph of a) of item 6, Section D, and the foot-note by:

"For each /space-to-earth/ service area and for each foreseen usage*), indicate, when simple frequency changing transponders are used on the space station, the smallest equivalent satellite link noise temperature and the highest associated value of link gain evaluated from the output of the receiving antenna of the space station to the output of the receiving antenna of the earth station. For each foreseen usage, indicate also the receiving antenna(e) of the space station to which each simple frequency changing transponder will be connected."

3. Replace the last sentence of b) of item 6, Section D, by:

"When a simple frequency changing transponder is used on the space station, indicate also, if available, the pattern associated with each equivalent satellite link noise temperature indicated above."

A different usage will be considered to take place when different types of carriers are employed (different by virtue of maximum power spectral density), or when different types of receiving earth stations are employed (different by virtue of receiving antenna gain)."

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 326-E 8 July 1971

PLENARY MEETING (FIRST READING)

B. 4

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
4	314	1	No. 112	
4	324	2	Art. 7 — Partial text of Section VIII	
4	271	Annex 2	New Section of Art. 7,	
		Annex 3	Rec. BB	

Francois Job Chairman of the Editorial Committee

Annex: Pages B4/01-12



[ARTICLE 2]

Section III. Nomenclature of the Frequency and Wavelength Bands Used in MOD Radiocommunication

- MOD 112 § 7. The radio spectrum shall be subdivided into nine frequency bands, which shall be designated by progressive whole numbers in accordance with the following Table. Frequencies shall be expressed:
 - in kilohertz (kHz) up to and including 3 000 kHz
 - in megahertz (MHz) thereafter up to and including 3 000 MHz
 - in gigahertz (GHz) thereafter up to and including 3 000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made.

Band Number	Frequency Range (lower limit exclusive, upper limit inclusive)	Corresponding Metric Subdivision
4	3 to 30 kHz	Myriametric waves
5	30 to 300 kHz	Kilometric waves
6	300 to 3 000 kHz	Hectometric waves
7	3 to 30 MHz	Decametric waves
8	30 to 300 MHz	Metric waves
9	300 to 3 000 MHz	Decimetric waves
10	3 to 30 GHz	Centimetric waves
11	30 to 300 GHz	Millimetric waves
12	300 to 3 000 GHz or	Decimillimetric waves
	3 THz	
42		<u> </u>

Note 1: "Band Number N" extends from $0{\cdot}3{\times}10^N$ to $3{\times}10^N$ Hz.

Note 2: Abbreviations:

Hz = hertz

 $k = kilo (10^3), M = mega (10^8), G = giga (10^9), T = tera (10^{12}).$

Note 3: Abbreviations for adjectival band designations:

Band 4 = VLF

Band 8 = VHF

Band 5 = LF

Band 9 = UHF

Band 6 = MF

Band 10 = SHF

Band 7 = HF

Band 11 = EHF

[ARTICLE 7]

[Section VIII]

SUP

Power Flux Density Limits

ADD

Limits of Power Flux Density from Space Stations

ADD 470MA § 22A. Power flux density limits [below 1 G[c/s]].

ADD 470MB

In the portions of the band [614-960 M[c/s]] shared with equal rights by the broadcasting-satellite service and the fixed service using tropospheric scatter, where there is insufficient frequency separation there must be sufficient angular separation between the direction to the broadcasting-satellite space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed—168 dBW in any 4 k[c/s] band.

MOD 470N § 23. (1) Power flux density limits [between 1.67 and 1.7 G[c/s]].

ADD 470NA

a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed —133 dBW/m² in any 1.5 M [c/s] band. This limit relates to the power flux density which would be obtained under assumed freespace propagation conditions.

ADD 470NB

b) The limit given in No. 470NA applies in frequency band[s] listed in No. 470NC which is [are] allocated to transmission by space stations in the earth explora-

tion satellite service and the meteorological-satellite service where this [these] band[s] is [are] shared with equal rights with the meteorological aids service.

ADD	470NC	c) — []
		– []
		-[1

ADD 470ND § 23. (2) Power flux density limits [between 1.67 G[c/s] and 2.3 G[c/s]].

ADD 470NE

- a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - —154 dBW/m² in any 4 k[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane;
 - $-154 + \frac{\delta 5}{2}$ dBW/m² in any 4 k[c/s] band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

—144 dBW/m² in any 4 k[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane. These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NF

b) The limits given in No. 470NE apply in the frequency bands listed in No. 470NG which are allocated to

transmission	bу	space	stations	in	the	following	space
radiocommu	nica	tion se	ervices:				

— [1
1 —	1
- [1
- []
– []

where these bands are shared with equal rights with the [fixed or mobile] services:

ADD	470NG	— [1
		— [1
		- [1
		— []
		[]

ADD 470NGA

The power flux density values given in No. 470NE are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the bands listed in No. 470NG and where there is insufficient frequency separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed —168 dBW in any 4 k[c/s] band.

ADD 470NH

(3) Power flux density limits [between 2.3 G[c/s] and 3 G[c/s]].

ADD 470NI

a) The power flux density at the earth's surface produced by emissions from a space station in the broadcastingsatellite service for all conditions and for all methods of modulation shall not exceed the following values:

-152 dBW/m² in any 4 k[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane;

 $-152 + \frac{3(\delta-5)}{4}$ dBW/m² in any 4 k[c/s] band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

—137 dBW/m² in any 4 k[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NJ

b) The limits given in No. 470NI apply in the frequency band:

— [

which is shared by the broadcasting-satellite service with equal rights with the [fixed or mobile service].

ADD 470NK

c) The power flux density values given in No. 470NI are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the band mentioned in No. 470NJ and where there is insufficient frequency

separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed —168 dBW in any 4 k[c/s] band.

- ADD 470NL (4) Power flux density limits [between 3G[c/s] and 8 G[c/s]].
- ADD 470NM a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - -152 dBW/m² in any 4 k[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane;
 - $-152 + \frac{(8-5)}{2}$ dBW/m² in any 4 k[c/s] band for angles of arrival (8) between 5 and 25 degrees above the horizontal plane;
 - —142 dBW/m² in any 4 k[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane. These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.
- ADD 470NN b) The limits given in No. 470NM apply in the frequency bands listed in No. 470NO which are allocated to transmission by space stations in the following space radiocommunication services:

—	[]
	[]
_]	

where these bands are shared with equal rights with the [fixed or mobile] services:

ADD	470NO	[
		— [
		– [

ADD 470NP

(5) Power flux density limits [between 8 and 11.7 G[c/s]]:

ADD 470NQ

a) The power flux density at the earth's surface, produced by emissions from a space station, or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

—150 dBW/m² in any 4 k[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane:

$$-150 + \frac{(\delta-5)}{2} \text{ dBW/m}^2 \text{ in any 4 k[c/s] band for}$$

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

—140 dBW/m² in any 4 k[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD	470NR
αDD	7/01/11

b) The limits given in No. 470NQ apply in the frequency bands listed in No. 470NS which are allocated to transmission by space stations in the following space radiocommunication services:

— []
— []
— [1

where these bands are shared with equal rights with the [fixed or mobile] services:

ADD 470NS

ADD 470NT

(6) Power flux density limits [between 11.7 and 15.4 G[c/s]]:

ADD 470NU

a) The power flux density at the earth's surface, produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

 -148 dBW/m^2 in any 4 k[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-148 + \frac{(8-5)}{2}$$
 dBW/m² in any 4 k[c/s] band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

 -138 dBW/m^2 in any 4 k[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These	limits	relate	to	the	power	flux	density	which
would	be obt	tained	und	er a	ssumed	free-	space pro	opaga-
tion co	onditio	ns						

Y DD	470NV
ADD	4/UIN V

b) The limits given in No. 470NU apply in the frequency bands listed in No. 470NW which are allocated to transmission by space stations in the following space radiocommunication services:

- [
— [
— [

where these bands are shared with equal rights with the [fixed or mobile] services:

ADD	470NW	— [
		- [
		_ ſ	

ADD 470NX

(7) Power flux density limits [between 15.4 G[c/s]] and 23 G[c/s]].

ADD 470NY

a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

—115 dBW/m² in any 1 M[c/s] band for angles of arrival between 0 and 5 degrees above the horizontal plane;

-115 +
$$\frac{(\delta-5)}{2}$$
 dBW/m² in any 1 M[c/s] band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

 -105 dBW/m^2 in any 1 M[c/s] band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NZ

b) The limits given in No. 470NY apply in the frequency bands listed in No. 470NZA which are allocated to transmission by space stations in the following space radiocommunication services:

— [
— [
[

where these bands are shared with equal rights with the [fixed or mobile] services:

ADD 470NZA

-- [] -- []

ADD 470NZB

(8) The limits given in [470NA, 470NE, 470NI, 470NM, 470NQ, 470NU and 470NY] may be exceeded on the territory of any administration which has so agreed.

SUP 4700 to 470U

[ARTICLE 7]

ADD Section [...]. Power flux density at the geostationary satellite orbit

ADD 470 [...] In the frequency band [8 025 to 8 400 Mc/s] which the Earth Exploration-Satellite Service using non-geostationary satellites shares with the Fixed-Satellite Service (earth-space transmissions), the maximum power flux density produced at the geostationary satellite orbit by any Earth Exploration-Satellite Service space station shall not exceed —174 dBW/m² in any 4 k[c/s] band.

RECOMMENDATION No. Spa BB

Relating to Carrier Energy Dispersal in Systems in the Fixed Satellite Service

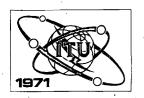
The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that use of carrier energy dispersal techniques in systems in the fixed satellite service can result in a substantial reduction of interference to stations of a terrestrial service operating in the same frequency bands;
- b) that the use of such techniques can result in a substantial reduction in the level of interference between systems in the fixed satellite service operating in the same frequency bands;
- c) that such techniques are being regularly and successfully employed in systems in the fixed satellite service without noticeable deterioration of the quality of operation;

recommends

- 1. that systems in the fixed satellite service employing angle modulation by analogue signals should use carrier energy dispersal techniques as far as is practicable with a view to spreading energy at all times and in a manner consistent with the satisfactory operation of the systems;
- 2. that systems in the fixed satellite service employing digital modulation should use carrier energy dispersal techniques when this becomes technically feasible and is practical.



SPACE CONFERENCE

Corrigendum No. 1 to
Document No. 327-E
13 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

SUMMARY RECORD

OF THE

SEVENTH MEETING OF COMMITTEE 4

(TECHNICAL)

Wednesday, 7 July 1971, at 0940 hrs

Chairman: Mr. E.F. SANDBACH (Australia)

1. Corrigendum to page 4 of Document No. 327, last sentence of second paragraph reads:

"Nevertheless, the Working Group had thought it advisable to insert a definition in Article 1, since equivalent satellite link noise temperature was referred to in Appendices 1A, 1B and 29 and Article 9A of the Regulations."

2. Corrigendum to page 5, first sentence of the first paragraph reads:

"The <u>Delegate of France</u> pointed out that there was the need of alignment of texts in Appendices 1B and 29 where methods of calculating increase of equivalent satellite link noise temperature were concerned."

E.F. SANDBACH Chairman Committee 4





SPACE CONFERENCE

Document No. 327-E 8 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

SUMMARY RECORD

OF THE

SEVENTH MEETING OF COMMITTEE 4

(TECHNICAL)

Wednesday, 7 July 1971, at 0940 hrs

Chairman: Mr. E.F. SANDBACH (Australia)

	Sub	jects discussed	Document No.
	1.	Approval of summary record of sixth meeting	287
(2.	Progress report by Working Group Chairmen	
	3.	Consideration of documents from Working Groups	
· ·		a) Working Group 4A	295
		b) Working Group 4D	194 Addendum No. 2
		c) Working Group 4F	286
		d) Working Group 4B	198 Addendum No. 1(Rev.), 274, 275
1	¥	Document from Committee 4 Drafting Group	285
5	D•	Documents referred to other Committees	288, 289
ϵ	5.	Completion of work of Working Group 4A	



1. Approval of summary record of sixth meeting (Document No. 287)

In response to a suggestion by the <u>Delegate of Syria</u>, the <u>Chairman</u> proposed the following wording for the third sentence in the third paragraph on page 3 of Document No. 287: "Concern was expressed by several delegates as to whether the present Conference was competent to adopt a resolution proposing alteration of the Radio Regulations in contradiction to Nos. 206 and 267 of the Convention".

Document No. 287, as thus amended, was approved.

- (2. Progress report by Working Group Chairmen
- 3. Consideration of documents from Working Groups
 - a) Working Group 4A (Document No. 295)

The Chairman of Working Group 4A, introducing the document, said that Working Group 4A had considered definitions submitted by other Groups and had submitted some definitions, contained in the Annex, to be added to Article 1 and proposed in paragraphs 3 and 5 that the C.C.I.R. should study a clear definition of "system noise temperature" within the framework of the "omnibus" Recommendation and should study the concept of "acceptable" (or unacceptable) interference jointly with that of "harmful interference".

At the proposal of the <u>Delegate of the U.S.S.R.</u>, it was agreed to consider paragraph 3 of the document together with section 3 of the Annex.

The Delegate of the United States of America said he could accept the note at the end of paragraph 5, but suggested that the words "in particular, in Documents Nos. 174, 209, 210 and DT/87," should be inserted after "at the present Conference" in the penultimate sentence.

The <u>Chairman</u> pointed out that Document No. DT/87 was a temporary document, which would be issued in final form later. Since that document was of concern to Committee 6, Committee 4 should for the time being merely draw the attention of that Committee to the proposed change.

It was so agreed.

In response to a criticism of the last paragraph by the <u>Delegate</u> of Chile, the <u>Chairmen of Working Groups 4A and 4E</u> explained that the proposed note was a provisional solution of a problem which had been studied

in greater detail in Working Group 4E than in Working Group 4A. The notion of "harmful interference", which had been introduced into the Radio Regulations a long time previously, was qualitative, rather than quantitative, and it had proved impossible to link that concept with that of "inadmissible interference" or to find a definition of the latter term which would provide the I.F.R.B. with a sound basis for making a favourable or unfavourable finding.

The <u>Director of the C.C.I.R.</u> added that an International Working Party was studying the problem in detail and pointed out that equivalent noise temperature was only one factor in defining acceptable or unacceptable interference. C.C.I.R. Reports 413 and 414 contained useful information on the subject.

Paragraphs 1, 2, 4 and 5 of Document No. 295 were approved.

Definition ADD 84ALA in the Annex was approved.

At the suggestion of the <u>Delegate of the U.S.S.R.</u>, the inverted commas round the words "up path", "down path" and "satellite—to—satellite paths" in definitions ADD 84ALB and ADD 84ALC were deleted.

Definitions ADD 84ALB and ADD 84ALC, as amended, were approved.

The Delegate of Australia pointed out that definition ADD 84BFA should begin with the word "An".

The Chairman of Working Group 4A said that the word "earth" in the English text should begin with a capital letter.

The <u>Director of the C.C.I.R.</u> suggested that the definition of "Geosynchronous satellite" should follow the more detailed one given in the report of the C.C.I.R. Special Joint Meeting.

The Chairman of Working Group 4A, supported by the Delegate of the United States of America and the representative of the I.F.R.B., considered that the definition should be as simple as possible, so as not to confuse the less technically minded readers of the Radio Regulations.

Definition ADD 84BFA, as amended, was approved.

The <u>Delegate of the U.S.S.R.</u> pointed out that ADD 103A was not strictly a definition. Moreover, it was stated in paragraph 3 of the document that the term "system noise temperature" was generally well

understood, whereas that was not the case: indeed, the C.C.I.R. Special Joint Meeting had produced a more detailed and accurate definition in the foot-note to page 127 of its report. Perhaps something along the lines of that text should be used in the relevant parts of the Radio Regulations, pending further study of the subject by the C.C.I.R., and ADD 103A should be deleted.

The Chairman of Working Group 4A said that the definition was in any case provisional and was to be studied further by the C.C.I.R. Nevertheless, the Working Group had thought it advisable to insert a definition in Article 1, since system noise temperature was referred to in Appendices 1A, 1B and 19 and Article 9A of the Regulations.

After a brief discussion, the Committee provisionally approved a text proposed by the <u>Delegate of Spain</u>, based on the S.J.M. proposal on page 3 of Document No. 194, which would be discussed by the Drafting Group.

In response to a comment by the <u>Delegate of the U.S.S.R.</u>, it was agreed to replace the word "omnibus" in paragraph 3 of Document No. 295 by "collective".

After a discussion on the difference between the terms "allowable" and "acceptable" in definition ADD 103B and on the need to refer to "fixed and mobile" stations in the note to ADD 103C, it was decided to leave the definitions in section 4 of the Annex in abeyance until Document No. 294, which contained relevant information, was available.

On that understanding, Document No. 295, as amended, was approved.

b) Working Group 4D (Document No. 194, Addendum No. 2)

At the proposal of the <u>Delegate of France</u>, it was <u>decided</u> to delete the third paragraph on page 3 of the document.

After a brief discussion, it was <u>decided</u> to insert the words "for example" after "using" in the third sentence of the first paragraph of the conclusions on page 7.

At the proposal of the <u>Delegate of France</u>, it was <u>decided</u> to delete the second paragraph of the conclusions.

In response to comments by the <u>Delegate of Syria</u>, it was <u>agreed</u> to replace the word "maximum" in the second sentence of the first paragraph by "predetermined".

The Delegate of France pointed out that there was a discrepancy between Appendices 1B and 29 where methods of calculating increase of noise temperature were concerned. He would therefore submit to the Drafting Group a proposed additional paragraph to Document No. 194. Furthermore, it might be useful to refer to Appendix 1B in that document and to replace the sentence at the bottom of page 6, introducing Table I, by an indication that the essential information concerned should be provided by using Appendix 1B.

The Chairman said that the Drafting Group would deal with the points raised by the Delegate of France.

On that understanding, Document No. 194, Addendum No. 2, as amended, was approved.

c) Working Group 4F (Document No. 286)

The <u>Delegate of the United Kingdom</u> on behalf of <u>Working Group 4F</u> introduced the cover sheet of <u>Document No. 286</u>, which reflected the discussion that had taken place in Committee 4, resulting in the decision to refer the annexed draft resolution to Committee 6.

Document No. 286 was adopted for transmission to Committee 6.

d) Working Group 4B (Documents Nos. 198, 274, 275, 198 Add. No. 1(Rev.), DT/93)

The Chairman of Working Group 4B said that subsequent to the approval of Document No. 198, Working Group 4B had considered the third report of Working Group 5C (Document No. 237), dealing, inter alia, with proposals for the allocation of frequency bands to the Meteorological Satellite Service. He pointed out that in paragraph ADD 470ND (Document No. 198, page 3) ".../ between 1.7 Gc/s and 2.3 Gc/s/" should be changed to ".../ between 1.67 Gc/s and 2.3 Gc/s/," in case Committee 5 decided to allocate that band to a space service shared on an equal basis with fixed and mobile services.

It was so agreed.

The Chairman of Working Group 4B introduced Documents Nos. 274 and 275, which were closely related, and drew attention to paragraph 2 of Document No. 275. He also pointed out an editorial change in Document No. 275: the middle sub-paragraph of paragraph ADD 470NI in the Annex to the Document should read:

Document No. 327-E

"-152 + $\frac{3(\delta-5)}{4}$ dBW/m² in any 4 kc/s band for angles of arrival (δ) between ..."

Document No. 274 was adopted, for transmission to Committee 5.

After questions by the <u>Director of the C.C.I.R.</u> and the <u>Delegate</u> of Pakistan had been answered to their satisfaction by the <u>Chairman of Working</u> Group 4B, Document No. 275 was approved.

The Chairman of Working Group 4B introduced Document No. 198
Add. No. 1(Rev.), which proposed two additions to Article 7 to cover required protection for trans-horizon systems. In answer to a question by the Delegate of Roumania on paragraph ADD 470 MB (Document No. 198 Add.No.1(Rev.), Annex, page 3), he explained that the figures in / / were not final, and might be altered as a result of decisions taken in other Committees.

Document No. 198 Add. No. 1 (Rev.) was approved.

The Chairman of Working Group 4B introduced Document No. DT/93 and announced three editorial changes in it made at the Working Group's most recent meeting.

It was agreed that the Committee 4 Drafting Group be asked to include the material contained in the Document in the proposed "omnibus" recommendation to the C.C.I.R.

4. Document from Committee 4 Drafting Group (Document No. 285)

The Chairman invited consideration of Document No. 285

The Delegate of France pointed out that the terms kc/s and Mc/s appeared in brackets after kHz and MHz in the existing French text of Radio Regulation 112, and the French version of Document No. 285 should indicate that those terms should be deleted.

The Director of the C.C.I.R. proposed that the third sentence on page 1 of Document No. 285 should read "... it was recognized by Committee 4 that the use of the term "hertz" has been recommended by the C.C.I.R. and has been adopted ..."

Document No. 285 was approved with the amendments proposed.

5. Documents referred to other Committees (Documents Nos. 288 and 289)

The Chairman drew attention to Documents Nos. 288 and 289, which had been referred to other Committees.

The documents were noted.

6. Completion of work by Working Group 4A

The Chairman of Working Group 4A stated that in Document No. 146, paragraph 4 and Annex, Document No. 160, paragraph 2, and Document No. 166, paragraph 4, the Working Group had invited other Working Groups and Committees to express their views on the advisability of including definitions of certain terms in the Radio Regulations. The only term the Working Group had been asked to define was "noise temperature". He therefore took it that none of the other terms listed were required to be defined for the Radio Regulations and Working Group 4A had completed its task.

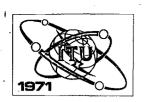
The meeting rose at 1300 hrs.

The Secretary :

The Chairman:

I. DOLEZEL

E.F. SANDBACH



SPACE CONFERENCE

Document No. 328-E 8 July 1971

Original: Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

ARGENTINA ·

ARTICLE 7 - SECTION IX - SPACE SERVICES

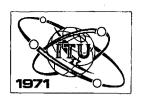
Ref.

ARG/328/73 ADD 470W

Sites and frequencies for stations of the space services operating in frequency bands shared with equal rights with other services, shall be selected having regard to the latest recommendations of the C.C.I.R. /and, where appropriate, with the procedure laid down in Resolution E/ and after co-ordination with stations of the terrestrial service and of the various space services.

Reason: The steady expansion of both space and terrestrial services makes it necessary for the Radio Regulations to stress the need for co-ordination, before sites are chosen and frequencies allocated; not only with terrestrial services but also with the space services.





SPACE CONFERENCE

Document No. 329-E

8 July 1971

Original : French

English Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

REPORT OF WORKING GROUP 6A

On 7 July 1971, Working Group 6A considered draft Appendix 1B prepared by Sub-Working Group 6A-4 and contained in Document No. DT/77. After having examined it, Working Group 6A approved the document as a whole and submits, herewith, to Committee 6 a draft Appendix 1B, in which, in addition to some drafting amendments, it incorporated the amendments proposed by Working Group 4E in Document No. 311.

P.E. WILLEMS
Chairman
Working Group 6A

Annex: 1



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ANNEX

DRAFT

APPENDIX 1B

ADVANCE PUBLICATION INFORMATION TO BE FURNISHED FOR A SATELLITE NETWORK 7

Section A - General instructions

Item 1 - Information shall be provided separately for each $\sqrt{}$ satellite network $\sqrt{}$.

Item 2 - Information to be furnished for each / satellite network / shall include general characteristics (Section B), and, as applicable, characteristics in the earth-to-space direction (Section C), characteristics in the space-to-earth direction (Section D), and characteristics for space-to-space relay (Section E).

Section B - General characteristics to be furnished for a / satellite network 7.

Item 1 - Identity of the / satellite network /

Provide a separate and clear identity of the _satellite network _ and, if applicable, the identity of the _satellite system _ of which it will form a part.

Item 2 - Operational date

Indicate the date by which the $\sqrt{\text{satellite network}}$ is expected to be brought initially into operation.

Item 3 - Administration or group of administrations submitting the advance information

Item 4 - Orbital information relating to the space station(s)

- a) In the case of a space station aboard a geostationary satellite, give the planned nominal geographical longitude on the geostationary satellite orbit and the planned longitudinal and inclination tolerances.

 Indicate also
 - 1) the arc of the geostationary orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
 - 2) the arc of the geostationary orbit within which the space station could, in accordance with Resolution No. Space C, provide the required service to its associated earth stations or service areas; and

- j) in the event that the arc stated in paragraph 2) above is less than the arc stated in paragraph 1) above, provide the reasons therefor;
 - Note: The arcs specified in 1) and 2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.
- b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period and the altitudes in kilometres of the apogee and perigee of the space station(s) / and the number of satellites having the same characteristics used in the satellite network /.

Section C - Characteristics of the / satellite network / in the earth-to-space direction

Item 1 - / Earth-to-space / service area(s)

Indicate the service area(s) on the earth associated with each receiving antenna of the space station.

Item 2 - Class of stations and nature of service

For each / earth-to-space / service area, indicate the class of the stations in the / satellite network / and the nature of the service to be performed, using the symbols shown in appendix 10.

Item 3 - Frequency range

For each / earth-to-space / service area, indicate the frequency range within which the carriers will be located.

Item 4 - Power characteristics of the transmitted wave

a) For each / earth-to-space / service area in all cases indicate the maximum spectral power density (W/Hz) to be delivered to the antenna of the transmitting earth stations (the bandwidth over which this is averaged depends on the nature of the service concerned).

b) If available, indicate, for each / earth-to-space / service area, the actual radiation pattern (relative to isotropic) of the transmitting earth station antenna having the highest offbeam equivalent isotropically radiated spectral power density.

Item 5 - Characteristics of space station receiving antennae For each / earth-to-space / service area,

- a) in the case of a space station aboard a geostationary satellite, indicate the estimated gain of the space station receiving antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6, 10, 20 db and 10 db intervals thereafter as necessary, below the maximum gain, shall be indicated.
- b) in the case of a space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station receiving antenna in the main direction of reception and the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of reception as a reference.

Item 6 - Noise temperature of the receiving space station

For each / earth-to-space / service area, indicate, when other than simple frequency changing transponder is used aboard the space station, the lowest total receiving system noise temperature.

Section D - Characteristics of the / satellite network / in the spaceto-earth direction

Item 1 - / Space-to-earth / service area(s)

Indicate the service area(s) on the earth associated with each transmitting antenna of the space station.

Item 2 - Class of stations and nature of service

For each _space-to-earth _ service area, indicate the class of the stations in the _satellite network _ and the nature of the service to be performed, using the symbols shown in appendix 10.

Item 5 - Frequency range

For each _space-to-earth _ service area, indicate the frequency range within which the carriers will be located.

Item 4 - Power characteristics of the transmission

For each / space-to-earth / service area, indicate in all cases the maximum spectral power density (W/Hz) to be delivered to the transmitting antenna of the space station (the bandwidth over which this is averaged depends on the nature of the service concerned).

When a simple frequency changing transponder is used aboard the space station, indicate, if available, the maximum spectral power density (W/Hz) delivered to the transmitting antenna of the space station for each category of carrier (supplied under item 4, Section C) received by the

space station at the input of this simple frequency changing transponder. When applicable, indicate also the parts of the space-to-earth service area and the frequency range within which the transmissions associated with each category of carrier received by the space station are confined.

Item 5 - Characteristics of space station transmitting antennae

For each space-to-earth service area,

- a) in the case of a space station aboard a geostationary satellite, indicate the estimated gain of the space station transmitting antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6, 10, 20 db and 10 db intervals thereafter as necessary, below the maximum gain, shall be indicated.
- b) in the case of a space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station
 transmitting antenna in the main direction of transmission and
 the antenna radiation pattern in those directions which can
 intersect with the earth's surface, taking the gain in the main
 direction of transmission as a reference.

Item 6 - Characteristics of receiving earth stations

a) For each / space-to-earth / service area, indicate, when other than simple frequency changing transponder is used aboard the space station, the lowest total receiving system noise temperature of the earth stations.

When a simple frequency changing transponder is used aboard the space station, indicate the lowest equivalent satellite link noise temperature associated with each category of carrier (supplied under item 4, Section C) received by the space station*). Indicate also in this case the highest transmission gain measured from the output of the space station receiving antenna to the output of the earth station receiving antenna, associated with each category of carrier received by the space station*).

^{*)} In the event of there being several combinations of values of equivalent satellite link noise temperature and transmission gain for a particular category of carrier received by the space station, the values of each of the combinations will be indicated.

the actual radiation pattern (relative to isotropic) of the receiving earth station antenna having the highest offbeam level.

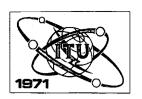
When a simple frequency changing transponder is used aboard the space station, the pattern associated with each category of carrier (supplied under item 4, Section C) received by the space station should be indicated where appropriate.

Section E - Characteristics to be furnished for space-to-space relay

Where the / satellite network / is connected to another / satellite network /

by means of space-to-space relay, indicate the following:

- b) transmit and receive frequency bands
- c) class of emission
- d) nominal e.i.r.p. on the beam axis.



Document No. 330-E 8 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

NOTE FROM THE CHAIRMAN OF COMMITTEE 4
TO THE CHAIRMAN OF COMMITTEE 6

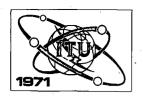
During its Seventh Meeting on 7 July 1971, Committee 4 agreed the following text for a Note relating to the level of unacceptable interference:

"The level of unacceptable interference shall be fixed by agreement between the Administrations concerned, using the relevant C.C.I.R. Recommendations as a guide."

Your attention is drawn to this text, because you may find it applicable also for Note (1) on page 6 of Document No. DT/87.

E.F. SANDBACH Chairman Committee 4





Document No. 331-E 8 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

REPUBLIC OF INDIA

PROPOSALS FOR AMENDMENT OF ARTICLE 5 OF THE RADIO REGULATIONS IN RESPECT OF BROADCASTING SATELLITE SERVICE

Modify proposal IND/39/30 as follows:

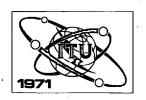
- 1) Add 339B (in the frequency box 845-935, Region 3)
- 2) ADD 339B

In India, the band 845-935 Mc/s is also allocated for experimentation of satellite broadcasting subject to agreement with the administrations having services operating in accordance with the Table which may be affected. The following flux-densities would not be exceeded during the experiments:

Power flux-density	Angle of arrival
-128 dBW/m ²	δ < 20°
$-128 + 0.4(\delta-20^{\circ}) \text{ dBW/m}^2$	20°<δ< 60°
-111 dBW/m ²	

Reason: India had submitted the proposal /IND/39/30/ for allocation of the band 845-935 Mc/s for Broadcasting Satellite Service in Region 3. India would like to conduct live experiment in satellite broadcasting for domestic coverage in this band without causing harmful interference to services of other administrations operating in accordance with the Table. The results of this experiment will be useful to the whole world. Many countries are locking forward to the success and outcome of the experiment.





Document No. 332-E 8 July 1971

Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

The Head of the Delegation of the Czechoslovak Socialist Republic has sent me the letter reproduced in the Annex.

Gunnar PEDERSEN . Chairman of the Conference

Annex : 1



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ANNEX

Geneva, 8 July 1971

Dear Sir,

I am sending you herewith a statement by the Delegation of the Czechoslovak Socialist Republic on the participation in the Conference of the German Democratic Republic, the Democratic Republic of Viet-Nam and the Korean People's Democratic Republic. I request you to publish the text of this statement as an official conference document.

Yours sincerely,

J. MARSICEK
Head of the Delegation of
the Czechoslovak Socialist Republic

Mr. Gunnar PEDERSEN Chairman of the World Administrative Radio Conference for Space Telecommunications

Geneva

Annex : 1

Annex

The Delegation of the Czechoslovak Socialist Republic to the World Administrative Radio Conference for Space Telecommunications expresses its profound regret that delegations from the German Democratic Republic, the Democratic Republic of Viet-Nam and the Korean People's Democratic Republic have not been invited to take part in the Conference.

The absence of delegations from these countries is at variance with the principle of the universality of international organizations and reduces the chances of finding an effective solution to the problems falling within the terms of reference of the Conference.

J. MARSICEK
Head of the Delegation of
the Czechoslovak Socialist Republic



Document No. 333-E

8 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

DRAFT

RECOMMENDATION No. Spa 3

TO THE C.C.I.R. AND TO ADMINISTRATIONS

relating to frequency bands shared between space services and between space and terrestrial services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

recognizing

- a) the value to the Conference of the material contained in Document No. 64 (Results of C.C.I.R. studies relating to space telecommunications concluded at its Special Joint Meeting);
- b) that further studies on a wide range of problems dealing with space communications form the subject of C.C.I.R. Questions and Study Programmes approved by the XIIth Plenary Assembly;

considering however

a) that certain of the C.C.I.R. Recommendations, listed below, are provisional and call for further work and study before they can become definite:

Recommendation 355-1

"FREQUENCY SHARING BETWEEN ACTIVE COMMUNICATION—SATELLITE SYSTEMS AND TERRESTRIAL RADIO SERVICES

IN THE SAME FREQUENCY BANDS"

Recommendation 465

"GENERALIZED EARTH-STATION ANTENNA RADIATION PATTERN FOR USE IN INTERFERENCE CALCULATIONS, INCLUDING COORDINATION PROCEDURES, IN THE

FREQUENCY RANGE 2-10 GHz"



Document No. 333-E Page 2

Recommendation 466

"COMMUNICATION-SATELLITE /SYSTEMS/ FOR TELEPHONY USING FREQUENCY-DIVISION MULTIPLEX - Maximum /allowable/ values of interference in a telephone channel of a geostationary communication-satellite /system/ employing frequency-modulation, cause by other geostationary communication-satellite /systems/"

b) that as a result of the deliberations of this Conference, particularly in relation to the provisions of Article 7 Sections / relevant sections /, and to / other relevant Articles /, further information is required in reply to the following Questions and Study Programmes already set for study by the C.C.I.R.:

Question 1-1/4

"ANTENNAE FOR SPACE SYSTEMS"

under Decides 2

the state of development in antenna design and fabrication;

under Decides 3

the state of development of antennae with improved side- and back-lobe characteristics;

under Decides 4

the polarization characteristics of antennae, particularly in the side-lobe regions and in planes other than the principal planes;

Question 2-1/4

"TECHNICAL CHARACTERISTICS OF COMMUNICATION-SATELLITE SYSTEMS FOR FIXED AND MOBILE, EXCLUDING AERONAUTICAL AND MARTTIME MOBILE, SERVICES"

under Decides 3

under what conditions and to what extent would it be feasible for communication—satellites, operating in the same /system/or operating in different /systems/, to share preferred frequency bands;

under Decides 4

under what conditions and to what extent would it be feasible for communication—satellite systems to share preferred frequency bands with terrestrial services;

Study Programme 2-1A-1/4

"FEASIBILITY OF FREQUENCY SHARING BETWEEN COMMUNICATION-SATELLITE SYSTEMS AND TERRESTRIAL SERVICES"

under Decides 2

the determination of preferred technical characteristics of transmitting and receiving antennae for earth stations at fixed locations, from the standpoint of spectrum sharing with other radio services;

Study Programme 2-1C/4

/"COMMUNICATION-SATELLITE SYSTEMS/ Feasibility of frequency sharing among
/communication-satellite systems"/

under Decides 1

the criteria which affect interference among /communication-satellites/ in a given /system/ and between /communication-satellite systems/, taking into account the two directions of transmission:

under Decides 2

the preferred technical characteristics of transmitting and receiving antennae for earth stations, from the standpoint of frequency sharing within the same /system/ and with other /communication-satellite systems/;

Study Programme 2-1J/4

"/COMMUNICATION-SATEILITE SYSTEMS/ Technical factors influencing the efficiency
of use of the geostationary satellite orbit by
/communication-satellites/ sharing the same
frequency bands"

under Decides 1

the technical characteristics of /communication-satellite systems/ which affect the utilization of the geostationary satellite orbit, and the inter-relationships between them;

under Decides 3

the extent to which it may be feasible and desirable to adopt preferred technical characteristics for different geostationary /communication-satellites/ and earth stations;

under Note 1

particularly, to take account of the following factors in carrying the above studies:

- the /tolerable/ levels of interference noise in different /communicationsatellite systems/;
- the radiation patterns of the earth station and satellite antennae;
- polarization discrimination;
- c) that under the terms of Article 9A of the Radio Regulations frequency assignments to earth stations in certain bands shared with equal rights with / Fixed and Mobile or Terrestrial Services / must be co-ordinated with a view to preventing mutual harmful interference:
- d) that the calculation method described in Appendix 28 applies solely to frequencies in the 1-40 Gc/s range;
- e) that Tables I, Ia and II in Appendix 28 do not show numerical values for the parameters of certain Space Radiocommunication Services and Terrestrial Services, sharing frequency bands with equal rights;
- f) that the method of determining the co-ordination area of an earth station as described in Appendix 28 is probably still open to improvement and simplification:
- g) that frequency bands have been allocated to the broadcasting satellite service and that the use of satellite transmissions for reception by the general public of sound and television broadcasts may be possible in the future:
- h) that the C.C.I.R. is studying the conditions under which sharing between the broadcasting satellite service and other services may be possible;
- i) that it would be useful to have a clear definition of the term "system noise temperature";

- j) that it would be useful to have clear definitions of the terms "acceptable" (or unacceptable) interference" and "harmful interference" for the Space, Radio Astronomy, and Terrestrial Services:
- k) that it would be useful to have specific numerical values of power flux-density from space stations in the Broadcasting Satellite Service which would permit differentiation between "individual reception" and "community reception" in the Broadcasting Satellite Service:
- 1) frequency sharing between the Aeronautical Radionavigation Service and the Communication Satellite Service (satellite-to-earth) has been proposed for the band 4 200 to 4 400 M[Hz];

recommends

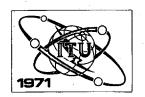
- that all administrations and recognized private operating agencies, through their participation in the work of the C.C.I.R., consider as a matter of priority, the submission of contributions on these subjects, so that definite Recommendations can be prepared at the Interim Meetings of the relevant Study Group for adoption by the XIIIth Plenary Assembly of the C.C.I.R.;
- 2. that the C.C.I.R. should study or, as appropriate, continue to study:
- 2.1 the reference antenna patterns, for earth station antennae, which may be appropriate for setting minimum standards of performance, and to recommend specific patterns for this purpose, in order to improve utilization of the frequency bands shared between communication satellite systems and terrestrial services, and taking into account the effect of such reference patterns on frequency sharing between communication satellite systems;
- 2.2 the reference antenna patterns, for satellite antennae, which may be appropriate for setting minimum standards of performance, particularly outside the main beam, in order to improve the utilization of the geostationary orbit and to foster the possibilities for frequency resus;
- 2.3 the reference cross-polarization antenna patterns which may be appropriate for setting minimum standards of performance and, in this connection, further study:
 - 2.3.1 the portions of the spectrum within which linear-orthogonal or circular-orthogonal polarizations might be most appropriate;

- 2.3.2 the relative desirability, accounting for technical and orbit utilization factors, of using orthogonal polarizations within a single satellite as against between two satellites;
- 2.4 the necessary limitation of spurious emissions and the frequency tolerances to be observed in both the Terrestrial and Space Services insofar as they may affect sharing of frequency bands.
- 2.5 the permissible interference criteria for the various Space and Terrestrial Services sharing the frequency bands allocated by the WARC-ST, Geneva, 1971, in order to permit the determination of:
 - 2.5.1 the co-ordination distance and the probability of interference between stations within that distance:
 - 2.5.2 the necessary limits of power flux-density set up at the earth's surface by space stations.
- 2.6 the maximum /permissible/ amount of interference into a geo-stationary satellite /link/ from any other single interfering geostationary satellite /system/ and from the aggregate of all other geostationary satellite /systems/, particularly in the case of:
 - 2.6.1 frequency-modulated telephony signals;
 - 2.6.2 frequency-modulated television signals;
 - 2.6.3 digitally-modulated signals;

and the most appropriate manner in which permissible interference should be specified in these and other cases;

- 2.7 the interference criteria applicable to frequency sharing between non-geostationary satellite /systems/;
- 2.8 the possibility of establishing a technical criterion for expressing the efficiency of use of the geostationary satellite orbit;
- 2.9 the data which are not included in Tables I, Ia and II of Appendix 28, relating to the Space Radiocommunication Services or Terrestrial Services sharing frequency bands with equal rights;

- 2,10 the possibility of improving and simplifying the method of determining the co-ordination area as described in Appendix 28;
- 2.11 the formulation of a calculation method for determining the co-ordination area of earth stations at frequencies below 1 Gc/s or above 40 Gc/s;
- 2.12 and make early recommendations regarding the conditions for sharing in those bands allocated to the Broadcasting Satellite Service by the W.A.R.C. in order that administrations and the International Frequency Registration Board shall have the necessary technical data required to carry out examination procedures, in particular regarding Articles 9 and 9A of the Radio Regulations;
- 2.13 and formulate the definition of the term "system noise temperature" applicable to space systems;
- 2.14 and formulate definitions of the terms "acceptable (or unacceptable) interference" and "harmful interference" for the various space and terrestrial services:
- 2.15 the power flux-densities required for individual and community reception in the Broadcasting Satellite Service, with the object of specifying the numerical values which will differentiate between these types of reception;
- 2.16 the technical feasibility and sharing criteria of frequency sharing between the Aeronautical Radionavigation Service and the Communication Satellite Service (satellite-to-earth) for frequencies in the vicinity of 4 300 M[Hz].
- 3. that until the next competent Administrative Conference all administrations should use:
 - any C.C.I.R. Recommendation, if applicable, for the values missing from Tables I, Ia and II of Appendix 28,
 - the methods of determining the co-ordination area for frequencies below 1 Gc/s and above 40 Gc/s, which may be the subject of a C.C.I.R. Recommendation.



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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

EIGHTH REPORT OF WORKING GROUP 4E

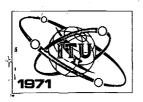
TO COMMITTEE 4

Working Group 4E examined the Appendix 1A jointly with Sub-Working Group 6A-4 and agreed on the proposed text prepared by that Sub-Working Group with appropriate changes. The final draft of that Appendix will be submitted to Committee 6 for its approval.

Working Group $^{h}\!E$ considers that it has discharged all the tasks assigned to this Working Group.

N. OHYAMA Chairman Working Group 4E





Document No. 335-E 8 July 1971

Original : French

English Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SIXTH REPORT FROM COMMITTEE 4

Additions to Article 7 appearing in the Annexes hereto have been approved by Committee 4.

The texts in question have been forwarded to the Drafting Committee.

E.F. SANDBACH Chairman Committee 4

Annexes:

- 1. Station keeping of space stations
- 2. Pointing accuracy of antennae on geostationary satellites
- 3. Control of interference between geostationary-satellite systems and non-synchronous inclined orbit-satellite systems



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ANNEX 1

PROPOSED ADDITION TO ARTICLE 7

(New Section)

ADD 470[...] Station keeping of space stations *)

Space stations on geostationary satellites

- ADD 470[a] shall have the capability of maintaining their positions within \pm 1° of the longitude of their nominal positions, but they shall endeavour to achieve the capability of maintaining their positions within at least \pm 0.5° of the longitude of their nominal positions,
- ADD 470[b] shall maintain their positions within ± 1° of longitude of their nominal positions irrespective of the cause of variation, but
- ADD 470[c] need not comply with [b] as long as the [space system] to which the space station belongs does not produce an unacceptable interference**) into any other [space system] whose space station complies with the limits given in [b].

Notes:

- *) In the case of space stations on [geosynchronous] satellites in orbits having an angle of inclination greater than 5° the positional tolerance shall relate to the nodal point.
- **) The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

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ANNEX 2

PROPOSED ADDITION TO ARTICLE 7

(New Section)

ADD 470/... Pointing accuracy of antennae on geostationary satellites

The pointing direction of maximum radiation of any earthward beam of space station antennae on geostationary satellites shall be capable of being maintained within at least:

- 10% of the half power beamwidth relative to the nominal pointing direction,
- 0.5° relative to the nominal pointing direction,

whichever is greater when these beams are intended only for less than global coverage.

In the event that the beam is not rotationally symmetrical about the axis of maximum radiation the tolerance in any plane containing this axis shall be related to the half power beamwidth in that plane.

This accuracy shall be maintained only if it is required to avoid /unacceptable interference/*) to other /systems/.

Note:

^{*)} The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

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ANNEX 3

PROPOSED ADDITION TO ARTICLE 7

(New Section)

ADD

Control of interference between geostationary satellite /systems/ and non-synchronous inclined orbit satellite /systems/

ADD 470VA

Non-geostationary space stations in the /fixed satellite service/ shall cease or suppress radio emissions, and their associated earth stations shall not transmit to them whenever there is insufficient angular separation between space stations and /unacceptable interference/*) to space /systems/ using geostationary satellite operating in accordance with the Radio Regulations.

Note:

^{*)} The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.



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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

DRAFT

APPENDIX 29

A METHOD OF CALCULATION TO DETERMINE THE

DEGREE OF INTERFERENCE BETWEEN GEOSTATIONARY

SATELLITE / SYSTEMS / SHARING THE SAME FREQUENCY BANDS*)

1. Introduction

The method of calculating interference is based on the concept that the noise temperature of the system suffering interference increases as the level of the interference increases. It can, therefore, be applied irrespective of the modulation characteristics of these / systems /, and of the precise frequencies used.

In this method, the apparent increase in the equivalent / link / noise temperature**) of an earth station receiver resulting from interference caused by a given system is calculated and this value is compared with a predetermined increase in the noise temperature.

2. Calculation of the increase in noise temperature of the link suffering interference

As used in this section, the term $\sqrt{\frac{1}{\ln k}}$ denotes the entire connection consisting of a transmitting earth station, a satellite and a receiving earth station.

Let A and A' be the /links / of the two / systems / considered. Primes indicate the parameters of /link / A'; the notation without primes is used for the parameters of /link / A.



^{*)} Exact title will depend on the outcome of Committee 6 deliberations.

^{**)} The equivalent / link / noise temperature is taken to mean the noise temperature at the input of the earth station receiver corresponding to the RF noise power which produces the total observed noise at the output of the / link / excluding interference coming from / links / using other satellites and terrestrial systems.

The parameters are defined as follows (for $\overline{/}$ link $\overline{/}$ A):

 ΔT_{S} : increase in the receiving noise temperature of the satellite S caused by interference in the receiver of this satellite; (°K)

 $\Delta T_{\rm e}$: increase in the receiving noise temperature of the earth station $e_{\rm R}$ caused by interference in the receiver of this station; (°K)

P_S : maximum power density per Hz delivered to the antenna of satellite S (averaged over the worst 4 kHz band); (W/Hz)

 $g_{\mathfrak{Z}}(\delta_{e}^{\;\;\prime})$: transmitting antenna gain of satellite S in the direction of the receiving earth station e_{R}^{\prime} of $\sqrt{\;\;link_{\perp}^{\;\;\prime}}$ A'; (numerical power ratio)

Note: the product $p_{\rm S}g_{\rm S}(\delta_{\rm e}^{\; \cdot})$ is the maximum equivalent isotropic radiated power per Hz of satellite S in the direction of the receiving earth station $e_{\rm R}^{\; \cdot}$ of / link/A'.

 $P_{\rm e}$: maximum power density per Hz delivered to the antenna of the transmitting earth station ${\rm e_T}$ (averaged over the worst 4 kHz band); (W/Hz)

 $g_2(\delta_e^{'})$: receiving antenna gain of satellite S in the direction of the transmitting earth station $e_T^{'}$ of / link / A'; (numerical power ratio)

 $\mathbf{g_1}(\mathbf{\Theta})$: transmitting antenna gain of the earth station $\mathbf{e_T}$ in the direction of satellite S'; (numerical power ratio)

 $g_{l\downarrow}(\theta)$: receiving antenna gain of the earth station e_R in the direction of satellite S'; (numerical power ratio)

k : Boltzmann's constant; (Joules/K)

 ℓ u*) : free-space transmission loss on the up-path; (numerical power ratio)

^{*)} See Note on page 3

: transmission gain of the _system _ from the satellite receiver input to the earth station receiver input; (numerical power ratio, usually less than 1)

egeocentric angular separation between two satellites / degrees /.

The parameters ΔT_{s} and ΔT_{e} are given by the following equations :

$$\Delta T_{s} = \frac{p' e g' 1 (e) g_{2} (\delta' e)}{k \ell_{u}}$$
 (1)

$$\Delta T_{e} = \frac{p'_{s} g'_{3} (\delta_{e}) g_{4} (\theta)}{k \ell_{d}}$$
 (2).

The symbol ΔT will be used to denote the apparent increase in the equivalent noise temperature for the entire / link / at the receiver input of the receiving station e_R due to interference from / system / / / .

This increase is the result of interference entering at both the satellite and earth station receivers of $\sqrt{\text{system}}$ A and can accordingly be expressed as :

$$\Delta T = \gamma \Delta T_{S} + \Delta T_{S} \tag{3}$$

Hence,
$$\Delta T = \gamma \frac{p' e g' 1 (\theta) g_2 (\delta' e)}{k \ell_u} + \frac{p' s g' 3 (\delta_e) g_4 (\theta)}{k \ell_d}$$
 (4)

Equation (4) combines both the up-path and the down-path interference. If there is a change of modulation in the satellite or if the translation frequencies of the wanted and interfering satellites are different then it may be necessary to treat up and down paths separately using equations (1) and (2).

Note: *) In the interest of simplification it was assumed that:

basic transmission loss on the down-path is the same regardless of the satellite and earth station considered;

⁻ basic transmission loss on the up-path is the same regardless of the earth station and satellite considered:

⁻ the topocentric angular separation between the two satellites as seen from any earth station is identical to the geocentric angular separation between the two satellites.

In the foregoing equations, the gains $g_1' \theta$ and $g_4 \theta$ are those of the earth stations concerned. Unless more precise actual data are available, an appropriate reference radiation pattern may be used to express the gain g_1' (θ) and g_4 (θ) in a direction forming an angle θ with the direction of maximum radiation. In the event that precise numerical data are not available, the reference radiation pattern $52-25\log_{10}$ (θ) shall be used for earth station antennae for which the ratio of effective diameter to wavelength exceeds 100.

In the same way, the increase ΔT^i in the equivalent noise temperature for the entire / link / at receiver input of the receiving earth station e_R^{-1} under the effect of the interference caused by / link / A is given by the following equations:

$$\cdot \mathcal{A}'_{s'} = \frac{p_e g_1(\theta) g'_2(\delta_e)}{k \ell_u} \tag{5}$$

$$\Delta T'_{e'} = \frac{p_{s} g_{3} (\delta_{e'}) g'_{4} (\theta)}{k \ell_{0}}$$
(6)

$$\Delta T' = \gamma' \frac{p_e g_1(\theta) g'_2(\delta_e)}{k \ell_u} + \frac{p_s g_3(\delta'_e) g'_h(\theta)}{k \ell_d} (7)$$

For two multiple-access satellites, this calculation must be made for each of the / links / established via one satellite in relation to each of the / links / established via the other satellite.

3. Comparison between calculated and predetermined percentage increase in equivalent link noise temperature

The calculated values of ΔT and $\Delta T'$ shall be compared with the corresponding predetermined values. These predetermined values are taken as 2% of the appropriate equivalent link noise temperatures.

- If the calculated value of Δ T is less than the predetermined one, the interference level from / link / A is acceptably small irrespective of the modulation characteristics of the two / links / and of the precise frequencies used

 \int - if the calculated value of Δ T is more than the predetermined one, a detailed calculation shall be carried out following the methods and techniques set out in the relevant current C.C.I.R. Reports and Recommendations.

 $\int\!\!\!\!-$ the comparison of Δ T' with the predetermined value shall be carried out in a similar manner.

As an example, it can be seen that in the case of a satellite /system/ operating in accordance with current C.C.I.R. Recommendations using FM telephony and having a total noise in a telephone channel of 10 000 pWOp including 1 000 pWOp interference noise from terrestrial radio-relay systems and 1 000 pWOp interference noise from other satellite /systems/, a 2% increase in equivalent noise temperature would correspond to 160 pWOp of interference noise.

The list of basic characteristics to be furnished for each network is given in Appendix 1B. A detailed illustration of the interference calculation in the case of two geostationary satellite /systems/ is given in the Annex to this Appendix.

4. Determination of the links to be considered in calculating the increase in equivalent link noise temperature from the data furnished for the advance publication of a satellite network

The greatest increase in equivalent link noise temperature caused to any link of another satellite network, existing or planned, by interference produced by the proposed satellite network must be determined.

The most unfavourably sited transmitted earth station of the interfering satellite network should be determined for each satellite receiving antenna of the network suffering interference by superimposing the /earth-to-space service areas/* of the interfering network on the space station transmitting antenna gain contours plotted on a map of the earth's surface. This station is the one for which the satellite receiving antenna gain of the network interfered with, in the direction of the site, is the greatest.

The most unfavourably sited receiving earth station of the network suffering interference should be determined in an analagous manner for each space-to-earth service area/* of that network. This station is the one for which the satellite transmitting antenna gain of the interfering network in the direction of the site is greatest.

^{*} Note: For description of these terms see Appendix IB $\sqrt{ ext{Doc.}}$ DT/7 $\overline{7}$

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Page 6

When the satellite of the network suffering interference is equipped with simple frequency-translating transponders these determinations are made in pairs, one for the satellite receiving antenna associated with the repeater and one for the "space-to-earth" service area connected to the satellite transmitting antenna associated with the repeater.

The calculation procedure described above may be used to determine the greatest increase in equivalent noise temperature caused to any link in a proposed satellite network by interference produced by any other satellite network.

Note : *) For description of these terms see Appendix 1B $\underline{/}$ Document DT/77 $\underline{/}$

ANNEX

TWO GEOSTATIONARY SATELLITE / SYSTEMS / SHARING THE SAME FREQUENCY BAND

A. GENERAL

In this example for simplicity two identical satellite systems are assumed with $\theta=6^\circ$ geocentric angular spacing between the satellites. For this angular separation the reference radiation pattern of the earth station antenna $32-25\log \theta$ gives a gain of 12.5 dB in the direction of the other satellite.

The calculations have been performed in dB, which means that numerical multiplications thus become dB additions and numerical divisions become dB subtractions. In each step the contributing factors have been introduced in a sequence corresponding to the propagation direction. The first three steps define the system parameters for each system. Steps 4, 5 and 6 perform the actual interference calculations.

To determine the equivalent link noise temperature it is necessary to know the ratio between the total internal link noise and the thernal noise of the down-path. The noise budget for this example is assumed as fellows:

Annox to Document No. 336-E Page 8

Noise budget

	(Thermal noise down-path	5 000 pW0p
Internal noise 8 000 pWp	(Thermal noise up-path	1 000 pWOp
	(Intermodulation noise	2 000 pW0p
External noise 2000 pWOp	<pre>(Interference noise from (systems using other (satellites (Interference noise from terrestrial systems</pre>	1 000 pWOp 1 000 pWOp
	Total noise	10 000 pWOp

It may be noted that since both satellites use global beams essentially no antenna discrimination between wanted and unwanted signals is obtained at the satellite and that this constitutes a worst case.

B. SYSTEM PARAMETERS

Step 1) UP-path at 6 175 MHz	Symbol	Link A or A'	Unit	
Maximum earth station transmitter power density per Hz in any 4 KHz band	,	-37	dBw/Hz	
Antenna gain earth station	p _e	62 . 5	dB	
Free space loss 38 500 km at 6 175 MHz	$\boldsymbol{\ell}_{\mathrm{u}}$	200	ďВ	:
Satellite antenna gain (using global beam)	^g 2	15.5	dB	
Receiver input at satellite		-159	dBW/Hz	

	Symbol	Link A or A	<u>Unit</u>
Step 2) DOWN-path at 3 950 MHz			
Maximum power density per Hz delivered to the satellite antenna	p _s	-57	dBW/Hz
Satellite transmit antenna gain Free space loss for 38 500 k	g ₃	15.5	dB
at 3 950 MHz	$\ell_{ m d}$	196	dB
Earth station antenna gain	g ₄	58.5	dB
Receiver input at earth station p _s +g ₃ - ℓ_d +g ₄		-179	dEW/Hz
Step 3) Link calculations			
Transmission gain from satel receiver input to earth sta receiver input 159-179	1	-20	dВ
Earth'station noise temperat (giving G/T=40.7 dB)	ure	60	°K
Thermal noise down-path (see noise budget)		5 000	рWOр
Total internal link noise (see noise budget)		8 000	рШОр
Equivalent link noise temper $\frac{8000}{5000} \times 60^{\circ}$	ature T	96	°K

C. INTERFERENCE CALCULATION

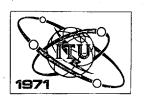
		Symbol	<u>Link</u> A or A'	<u>Unit</u>
Step 4)	UP-path interference			
	Interfering earth station power density (as in Step 1)	p _e '	- 37	dBW/Hz
	Interfering earth station antenna gain towards interfered satellite, (6° off beam)	g'(0)	+12.5	αB
	Free space loss for 38 500 km at 6 175 MHz (see Step 1)	$\ell_{ m u}$	200	ď∃
	Satellite antenna gain in the direction from the interfering earth station	g ₂ (δ [†] e)	15.5	d₿
	Boltzmann's constant 1.38 x 10 ⁻²³ Joule/°K	k	-228.6	dBW∕°K
	Increase in receiver noise temperature at the satellite $p_e^+g_1(s)-k_u^+g_2(s_e^-)-k$		19.6	dB•K
	Absolute value of increase in satellite noise temperature	ΔTs	91	°K
Step 5)	DOWN-path interference			
	Interfering satellite transmitter power density (Step 1)	ps'	- 57	dBW/Hz
	Interfering satellite antenna gain towards interfered earth station	_{සින} ්(_ල ්)	15.5	đB
	Free space loss for 38 500 km at 3 950 MHz	La	196	dB
	Earth station antenna gain in the direction from the interfering satellite (6° off beam)	g ₄ (3)	12.5	đВ
	Boltzmann's constant 1.38 x 10-23 Joule/°K	ls	-228.6	dBW/°K
	Increase in receiver noise temperature at the earth station $p_s'+g'_3(\delta_e)-p_d'+g_4(\vartheta)-k$		+3•5	dB ° K
	Absolute value of increase in earth station noise temperature	Δ.Τ. e	2.24	°K

		Symbol	Link	Unit
Ston 6)	Motel link intenference		A or A'	
Step 6)	Total link interference			
	Increase in satellite noise temperature (Step 4)	ΔTs	91	°K
	Numerical value for γ (from Step 3)	·γ	.01	numerical
	Increase in earth station noise temperature (Step 5)	$\Delta T_{ m e}$	2.24	°K
	Increase in equivalent link noise temperature $\gamma \Delta T + \Delta T_{\alpha} = (.01 \times 91) + 2.24$	ΔΤ	3. 15	°K
		77.1	ノ・エノ	1,
	Percentage increase			
	3.15 96 x 100%	ΔT/Tx100%	. 3.29	%
	Increase in link noise due to interference 3.29/100 x 8 000pWOp		263	рWОр
CONCLUSIO	<u>ns</u>			

In the example shown the increase in equivalent link noise temperature is 3.2%. Since it exceeds the predetermined value of 2%, the amount of noise introduced can no longer be considered negligible and therefore co-ordination between the two systems is required. More precise calculations should now be node using for example the actual antenna patterns of the earth stations, the topocentric angular separation of the satellites, and the precise basic transmission losses. There may be additional factors such as polarization isolation, frequency interleaving, spectral distribution of the interfering noise which all reduce the actual interference experienced.

It can be shown that for this example a larger satellite spacing of 7.5° would have caused only 2% increase in equivalent link noise temperature and thus obviated the need for any co-ordination.

D.



Document No. 337-E 14 July 1971 Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SUMMARY RECORD

OF THE ·

SIXTH MEETING OF COMMITTEE 5
(ALLOCATIONS)

Thursday, 8 July 1971, at 1500 hrs

Chairman: Mr. H.A. KIEFFER (Switzerland)

Sub	jects discussed	Document No.
1.	Adoption of the following Reports:	
	Fifth Report of Working Group 5D	317 & Corr.
	Sixth Report of Working Group 5D	318 & Corr.
	Second Report of Working Group 5D, point 1	236 (Rev.)
	Fourth Report of Working Group 5C, paragraph 1.2	238 (Rev.)
	First Report of Working Group 5A	225



Document No. 337-E Page 2

Fifth Report of Working Group 5D (Document No. 317 & Corr.)

1. 117.975-136 Mc/s band

Approved.

2. 890-960 Mc/s band

Following statements by the <u>Delegates of the United Kingdom</u> and <u>Canada</u> concerning the reasons for the proposed amendment and the competence of the Conference in the matter, point 2 and the relevant part of Appendix A on the band limits were <u>approved</u>, subject to the adoption of foot—note 340 to be submitted by Working Group 5B.

3. 1 525-1 535 Mc/s band

The band limits were <u>approved</u>; the Committee agreed to deal with foot-note 350A (Appendix A) when it was submitted by Working Group 5B.

4. 1 535-1 660 Me/s band

Paragraphs 4.1 and 4.2 and the relevant part of Appendix B gave rise to a long discussion during which the <u>Delegate of Austria</u> explained why his country would be obliged to request the insertion of a foot-note indicating that Austria operated the fixed and mobile services in that band. The <u>Delegate of the U.S.S.R.</u>, supported by the <u>Delegates of the Ukrainian S.S.R.</u> and <u>Czechoslovakia</u>, urged that there should be no change in the situation in that band, the proposal was <u>rejected</u> by 34 votes to 12. with 22 abstentions. In view of that decision, the <u>Delegate of the U.S.S.R.</u> reserved the right to reopen the question in plenary.

The Committee <u>approved</u> paragraph 4.1 and <u>took note</u> of paragraph 4.2 and <u>adopted</u> the relevant part of Appendix B (page 11) without amendment. It maintained foot-note 352D as it stands in the Radio Regulations.

Paragraph 4.3 and Appendix B as a whole were approved.

4.4 I.C.A.O. and I.A.T.A. statements

I.C.A.O. - Annex 1. It was <u>decided</u> to include the I.C.A.O. statement in the summary record of the meeting.

I.A.T.A. - Annex 2. The I.A.T.A. statement gave rise to a discussion in which a large number of delegations took part.

Referring to paragraph 5 of the I.A.T.A. statement, the <u>Delegate of Italy</u>, supported by the <u>Delegates of Chile</u>, <u>India</u> and <u>Israel</u>, said that his Delegation did not recognize the right of I.A.T.A. to judge the conduct of the Conference and the latter's competence to deal with the problems before it.

It was unanimously <u>decided</u> not to include the I.A.T.A. statement in the summary record.

Paragraph 4.5 was approved.

5. 2 400-2 550 Mc/s band

Approved.

6. 4 200-4 400 Mc/s band

The text of the paragraph was <u>approved</u> on the understanding that the name of Brazil would be inserted in foot-note 383, referring to that band.

7. <u>5 000-5 250 Me/s band</u> (Corr. to Document No. 317)

The text of point 7, as amended in the Corrigendum, and Appendix C were <u>approved</u>.

8. 7 250-7 300 Me/s and 7 975-8 025 Me/s bands

Point 8 and the provisions relating to it gave rise to a long discussion during which the <u>Delegates of Cameroon</u>, <u>India</u>, <u>Pakistan</u> and <u>Senegal</u> requested that the names of their countries should be added to those appearing in foot-note 392G.

The <u>Delegate of Italy</u>, supported by the <u>Delegates of the United Kingdom</u>, <u>New Zealand</u> and the <u>United States</u>, opposed any change in Appendix D.

Appendix D was approved on the understanding that foot-note 392G should be maintained as it stood in the Radio Regulations. Administrations which saw fit might raise the question in plenary.

Document No. 317 and its Corrigendum were approved as a whole.

Sixth Report of Working Group 5D (Document No. 318 and Corrigendum)

The <u>Chairman of Working Group 5D</u> said that the reference to the United States Delegation in the Spanish version of paragraph 2.3 in the Corrigendum should be deleted. There had been wide agreement within the Group on the use of space techniques in the 235-400 Mc/s bands. No agreement, however, could be reached on the possibility of allocating any part of the bands between 432 and 615 Mc/s exclusively, or even on a secondary basis, to the maritime mobile-satellite service. It was unanimously decided to continue studying the problem.

1. Bands 235-328.6 Me/s and 335.4-399.9 Me/s

Paragraph 1.2

At the suggestion of the <u>Delegate of Poland</u>, it was <u>decided</u> that the text should be amended to read: "The Delegation of Poland stated that it could accept the bands 240-300 Mc/s and 344-399.9 Mc/s as a compromise, though its original proposal referred to the bands 230-300 Mc/s and 344-390 Mc/s".

Paragraph 1.4

The <u>Chairman</u> pointed out that the number of the foot-note referred to in the third line of the paragraph was "310A" and not "810A" as in the English version.

Appendix A

The <u>Chairman</u> said that, as Working Group 5D had agreed to submit foot-note 310A at the request of the Delegate of India, the square brackets should be removed.

The question gave rise to an exchange of views in which the <u>Delegates of Poland, Venezuela, Pakistan, Syria</u> and <u>Sweden</u> took part.

The <u>Chairman of Working Group 5D</u> said that, after a long discussion and in view of the new amendments to foot-note 310 adopted by Working Group 5B, a majority of the members of Working Group 5D had preferred to apply the provisions of foot-note 308A up to the limit of 328.6 Mc/s.

Appendix A was adopted.

2. Bands 432-615 Mc/s

Paragraph 2.2

In reply to a question from the <u>Delegate of Sweden</u>, the <u>Delegate of the United Kingdom</u> said that, during the vote in Working Group 5D on the joint proposal submitted by Sweden and the United Kingdom (Document No. 293), there had been 15 votes in favour and 15 against. The two Delegations were now preparing a new Proposal in the light of the discussions which had taken place in Working Group 5D and he suggested that Committee 5 should postpone consideration of paragraph 2.2 and Appendix B until it had seen the new solution proposed.

It was so $\underline{\text{decided}}$. Consideration of Document No. 318 was therefore postponed to a later meeting.

Document No. DT/99, Annex

The Chairman said that the document had been prepared on the basis of the results obtained by several working groups and was designed to facilitate the Committee's work. With reference to the bottom of page 2, the band 23.6-24 Gc/s would be allocated to radiolocation and there would be the foot-note MOD 407; in addition, the band 24.25-25.25 Gc/s, which was allocated to radionavigation and in which no change had been made, should be added at the bottom of page 3.

Second Report of Working Group 5C, paragraph 1 (Document No. 236(Rev.))

The <u>Secretary</u> pointed out that the first figure in Appendix A should be "24.0" and not "24.1" as in the French and Spanish versions.

Paragraph 1, as amended, and Appendix A were adopted.

Fourth Report of Working Group 5C, point 1.2 (Document No. 238(Rev.))

At the proposal of the <u>United Kingdom Delegate</u>, supported by the <u>Delegate of the United States</u>, it was <u>decided</u> to delete the square brackets around the words "fixed" and "mobile" in Appendix B.

Point 1.2 and Appendix B, as amended, were adopted.

Replying to the <u>Delegate of Cuba</u>, the <u>Chairman</u> explained that the questions in the various documents which were still outstanding or had been the subject of reservations would be included in the agenda of the Committee's next meeting and would therefore be re-examined in good time.

First Report of Working Group 5A (Document No. 225)

The Chairman of Working Group 5A said that the Group had held 12 meetings and agreement had been reached by a large majority, particularly on point 3; he therefore proposed that the Committee should adopt the allocations in the Annex to Document No. 225.

1. Frequency band : 4 200-4 400 Mc/s

The <u>Delegate of India</u> requested that Proposal IND/37/9 submitted by his Administration but not adopted by the Working Group should be transmitted to the C.C.I.R. for study.

The <u>Delegate of France</u> said that the subject had also been raised in Committee 4, which considered that the question was a very delicate one since it touched on the safety of life. It had therefore included it in the "omnibus" Recommendation so that it should be brought to the notice of the C.C.I.R.

The Delegate of India said he was satisfied with that reply.

2. Frequency band: 6 425-7 250 Mc/s

In view of the fact that a new proposal on that band would be submitted later by the Delegation of the United States, it was decided to postpone consideration of point 2.

3. Frequency band: 17.7-31 Gc/s

The <u>Delegate of Japan</u> requested the insertion of a foot-note reading: "In Japan, the bands 19.7-21.2 and 29.5-31 Gc/s are also allocated to the Fixed and Mobile Services."

In reply to a question by the <u>Chairman</u>, he said that he could not agree to those bands being allocated to the Fixed and Mobile Services on a secondary basis.

The Delegates of the United Kingdom, the United States, the Federal Republic of Germany and Greece insisted on the need to allocate part of the spectrum exclusively to the Communication-Satellite Service.

The <u>Delegate of Japan</u>, explaining his request, said that in 1972 his country intended to set up a high-capacity experimental radio-relay system which would need a higher bandwidth and would use frequencies in the neighbourhood of 20 Gc/s. The network would be used for the improvement of techniques such as videophony, high-speed data transmission, etc. It was planned to put it into commercial operation in 1974. Moreover, frequency sharing between communication-satellite and radio-relay systems in the bands above 15.4 Gc/s seemed possible and the power flux-density fixed by the Special Joint Meeting for the 15.4-23 Gc/s range was apparently enough to ensure that the limits adopted would not have to be exceeded. Japan had adhered to the directives given in the Radio Regulations and it would be unfair to penalize it.

The <u>Delegates of India</u>, <u>Malaysia</u>, <u>Kenya</u> (speaking also on behalf of <u>Tanzania</u> and <u>Uganda</u>), <u>Pakistan</u>, <u>Syria</u>, the <u>Philippines</u> and <u>Indonesia</u> stressed the importance of technical development and the need to avoid adopting any provisions which might hamper it in any way.

The <u>Delegates of the United Kingdom</u> and the <u>United States</u> said that they had no desire to obstruct the progress now being made in Japan.

The <u>Delegate of the United States</u> suggested that the following sentence might be added to the note proposed by the Japanese Delegate: "This additional use shall not involve limitations of power flux-density in space stations in the Fixed-Satellite Service."

The <u>Delegate of Japan</u> asked for time to consider the proposal. It was <u>decided</u> to postpone a decision on the point till the Committee's next meeting.

The meeting rose at 1845 hours.

H.A. KIEFFER Chairman

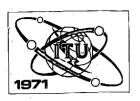
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ANNEX

I.C.A.O. STATEMENT

- 1. I.C.A.O. is the United Nations Specialized Agency universally recognized as empowered to establish and present international civil aviation requirements in respect of applications of space technology. Over the past two years your own Governments, under the aegis of I.C.A.O., have made a careful and co-ordinated assessment of the future needs of civil aviation for space services. Aided by its ASTRA Panel, I.C.A.O. finally developed a well-founded and conservative statement of the bandwidths needed between 1 535 and 1 660 MHz to assure, in the future, the safety, regularity and efficiency of air transport, which are its primary aims under the terms of its Convention. Whilst manifestly civil aviation does not carry the bulk of world freight, it does carry the great majority of human beings who travel across the broad deserts and oceans of the world, and the safety of human life is its constant concern.
- 2. This Conference has, I believe, made a real effort to satisfy these aeronautical requirements in the face of conflicting and competing demands from another service. In my personal opinion these competing requirements are not of a nature which justifies the comparatively large allocations which have been made to them at the expense of aviation. However, the decision reached shows that, collectively, you do not yet share this opinion.
- The effect of these decisions on the future operational and technical development of international civil aviation will have to be carefully studied in the coming months. It is quite likely that, at a future I.T.U. Conference, civil aviation may be forced to seek an upward revision of the allocations made here, and I trust that, at that time you will be able to accord a more appropriate priority to the requirements of what is, after all, essentially a safety service.



SPACE CONFERENCE

Document No. 338-E

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

THIRD REPORT OF COMMITTEE 5 (ALLOCATIONS)

ARTICLE 5 - TABLE OF FREQUENCY ALLOCATIONS

Frequency bands above 40 Gc/s

Committee 5 <u>adopted</u> the allocations reproduced in the Annex to the present Report which are submitted to the Plenary for first reading.

H.A. KIEFFER Chairman

Annex: French

English Spanish



ANNEX

Gc/s

	Allocation to services		
Region 1	Region 2	Region 3	
•	IXED-SATELLITE Earth-to-Space)		
41-43 B	41-43 BROADCASTING-SATELLITE		
A M	43-48 AERONAUTICAL RADIONAVIGATION-SATELLITE AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE MARITIME RADIONAVIGATION-SATELLITE		
48-50 (Not allocated)		
1	IXED-SATELLITE Space-to-Earth)		
	PACE RESEARCH ARTH EXPLORATION-SATELLIT	E	
5 2- 54 . 25	SPACE RESEARCH (Passive only)		
54,25-58.2 I	4,25-58.2 INTER-SATELLITE		

Gc/s

	Allocation to services		
Region 1	Region 2 Region 3		
58.2-59	SPACE RESEARCH (Passive only)		
59 –6 4	INTER-SATELLITE		
64–65	SPACE RESEARCH (Passive only)		
65 - 66	SPACE RESEARCH EARTH EXPLORATION-SATELLITE		
66-71	AERONAUTICAL RADIONAVIGATION-SATELLITE AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE MARITIME RADIONAVIGATION-SATELLITE (Not allocated)		
71-84			
84-86	BROADCASTING-SATELLITE		
86-92	RADIO ASTRONOMY SPACE RESEARCH (Passive only) 4121		

ADD 412I All transmissions in this band are prohibited. The use of passive sensors by other radio services is also authorized.

Allocation to services				
Region 1		Region 2	Region 3	
92 – 95	FIXED_SA' (Earth-te	TELLITE o-Space)		
95–101	AERONAUT:	ICAL RADIONAVIGAT ICAL MOBILE-SATEL MOBILE-SATELLITE RADIONAVIGATION-	LITE	
101-102	SPACE RES	SEARCH (Passive on	nly)	
102-105	FIXED-SAT			
105–130	INTER-SAT 412J	TELLITE		
130-140	RADIO AST SPACE RES 412I	TRONOMY SEARCH (Passive on	nly)	
140-142	FIXED-SAT		 	· ·

Radio Astronomy observations on the carbon monoxide line at 115.271 Gc/s are carried out in a number of countries under national arrangements. In making assignments to other services in the Table, administrations should bear in mind the need to protect Radio Astronomy observations from harmful interference in the band 115.16-115.38 Gc/s.

ADD

Allocation to services			
Region 1		Region .2	Region 3
142–150	AERONAUTICAL RADIONAVIGATION-SATELLITE AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE MARITIME RADIONAVIGATION-SATELLITE		
150–152	FIXED_SATELLITE (Space-to-earth)		
152-170	(Not allocated)		
170–182	INTER-SATELLITE		
182–185	SPACE RESEARCH (Passive only) 412I		
185–190	INTER-SATELLITE		
190–200	AERONAUTICAL RADIONAVIGATION-SATELLITE AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE MARITIME RADIONAVIGATION-SATELLITE		
200-220	(Not allocated)		
220–230	FIXED-SATELLITE		

Gc/s

Allocation to services			
Region 1	· · · · · · · · · · · · · · · · · · ·	Region 2	Region 3
230-240 RADIO ASTRONOMY SPACE RESEARCH (Passive only) 4121			7.)5
.240–250	(Not allocated)		
250–265	AERONAUTICAL RADIONAVIGATION-SATELLITE AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE MARITIME RADIONAVIGATION-SATELLITE		
265–275	FIXE	D-SATELLITE	
Above 275	(Not	allocated)	



SPACE CONFERENCE

Document No. 339-E

9 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SIXTH AND LAST REPORT OF WORKING GROUP 5B
TO COMMITTEE 5 (ALLOCATIONS)

TELEMETERING. TELECOMMAND AND TRACKING

Frequency bands: 136-137 Mc/s 1 535-1 600 Me/s 2 550-2 690 Mc/s 137-138 Mc/s 7 450-7 550 Mc/s 143-144 Mc/s 148-149.9 Mc/s 11.7-12.2 Gc/s 154.2 Mc/s ± 15 kc/s 13.4-14 Gc/s $434 \text{ Mc/s} \pm 0.25 \text{ Mc/s}$ 14 575-15 075 Gc/s 449.75-450.25 Mc/s 17.7-21.2 Gc/s 1 525-1 535 Mc/s 27.5-31 Gc/s 1 535-1 540 Mc/s 29-31 Gc/s

RADIO ASTRONOMY SERVICE

Frequency band: 2 690-2 700 Mc/s

Telemetering, telecommand and tracking

- 1. Frequency band: 136-137 Mc/s
 - 1.1 The Group <u>recalled</u> its discussion of this band when dealing with the Space Research Service and its <u>agreement in principle</u> to the replacement of "(Telemetering and tracking)" by "(Space-to-Earth)", subject to the modification to the definition of the Space Operation Service, Document No. 218, page 6.
 - 1.2 The Group agreed that the detail of the revision of this band would be dealt with when reaching agreement on the revised allocations for the various services and that insofar as telemetering and tracking were concerned, the Group had no objection to their deletion nominally subject to their inclusion in the definition of the Service.



2. Frequency band: 137-138 Mc/s

The Group <u>agreed</u> to the replacement "(Telemetering and tracking)" in relation to the Space Research Service by "(Space-to-Earth)" subject to the same conditions as for the band 136-137 Mc/s (para. 1 above).

3. Frequency band: 145-144 Mc/s

- 3.1 Proposals D/5/56 and 57, insofar as they sought an additional allocation on a secondary basis to the Space Service for Telecommand both in the planned part of the Table and a foot—note ADD 283A with respect to the effective date of change from telemetering and tracking to telecommand were not supported and consequently not considered further.
- 3.2 The <u>Delegation of the F.R. of Germany</u> reserved the right to revert to this subject later should it still so desire.

4. Frequency band: 148-149.9 Mc/s

- 4.1 Discussion polarized on Proposal CAN/14/35 MOD 285A which sought to provide for the use of the band 148-149.9 Mc/s for space telecommand, subject to agreement. The bandwidth of an individual transmission became the main division of opinion. Some delegations were in favour of \pm 20 kc/s, the majority \pm 15 kc/s.
- 4.2 The Group <u>agreed by a majority</u> to recommend the adoption by Committee 5 of the revised provisions appearing in the <u>Annex</u> to the present Report.
- 4.3 The <u>Delegation of India</u> could agree only if this use was put on a secondary basis.
- 4.4 The <u>Delegations of the F.R. of Germany</u>. Finland. <u>India and Israel</u> reserved the right to revert to this subject later should they still so desire.

5. Frequency band: 154.2 Mc/s + 15 kc/s

- 5.1 By a <u>large majority</u>, the Group <u>agreed</u> to recommend the deletion of the band $154.2 \text{ Me/s} \pm 15 \text{ kc/s}$ from No. 285A of the Radio Regulations (see paragraph 4.2 above).
- 5.2 The <u>Delegation of Japan</u> reserved the right to revert to this subject later should it still so desire.

6. Frequency band: 434 + 0.25 Mc/s

Proposal F/41/82 (ADD 318B), seeking to make provision at the above frequency for space telecommand subject to agreement, was not supported and fell. The <u>Delegation of France</u> reserved the right to revert to this question in Committee 5 if it still so desired.

7. Frequency band: 1 525-1 535 Mc/s

- 7.1 Proposals CAN/14/50 in part, F/41/86 and 87 replaced by F/197/322, G/54/71, HOL/49/52 and 53 and USA/28/54 were virtually each conflicting with the others as to the final revision of this band, as may be conveniently seen from pages 14 and 15 cf Document No. DT/11 together with Document No. 197. The Group was informed that Proposal F/197/322 had been considered by Working Group 5C with respect to the Earth Exploration-Satellite Service (ex-Earth Resources Survey by Satellite) and referred to Committee 5 for disposal.
- 7.2 The Group agreed to refer the proposed MOD 350A (F/197/322) with respect to the Earth Exploration Service, to Committee 5 for disposal. However, the amendment of No. 350A to apply to 1 525-1 535 Mc/s was unanimously agreed as shown in the Annex to the present Report.
- 7.3 The <u>Delegation of the F.R. of Germany</u> could agree only to <u>status quo</u>. The <u>Delegation of Canada</u>, with respect to CAN/14/50 by which the band would be allocated exclusively to the Fixed-Satellite Service on a world-wide basis, reserved the right to revert to this question later if it still so desired.
- 8. Frequency band: 1 535-1 540 Mc/s

Several proposals were common in foreseeing the deletion of "SPACE (Telemetering)" from this band, which the Group <u>agreed unanimously</u>. The Group <u>invited</u> the attention of <u>Working Group 5D</u> to this agreement.

9. Frequency band: 1 535-1 600 Mc/s

The Group <u>unanimously agreed</u> to the deletion of No. 351 Spa of the Radio Regulations.

- 10. Frequency band: 2 550-2 690 Mc/s
 - 10.1 Discussion formed around modification to foot-notes 374A and 392A and it was <u>unanimously agreed</u> to send a Note to Working Groups 5A and 5E advising that "it had no objection to the inclusion of foot-notes along the

lines of No. 392A for the upward direction and of No. 374A for the downward direction for the bands allocated by the present Conference for the Communication-Satellite Service and the Broadcasting-Satellite Service.

"374A This band may also be used for the transmission Spa of tracking and telemetering signals associated with communication—satellite space stations operating in the same band.

This band may also be used for the transmission of telecommand signals associated with communication—satellite earth stations operating in the same band."

The above text was communicated by Document No. 226.

10.2 It was noted that the new service definitions may cover the requirements for telemetering, telecommand and tracking and consequently the direction would be indicated against the allocation by using the terms "(Space-to-Earth)" and "(Earth-to-Space)".

11. Frequency band: 7 450-7 550 Mc/s

Proposal F/41/117 (MOD 392F) was examined and the Group unanimously agreed with the last sentence as shown in the Annex to the present Report.

12. The Group <u>decided</u> to expedite its work on the basis of Document No. 226 (see paragraph 10 above) and proceeded with the disposal of Proposals concerning the following bands as shown.

12.1 Frequency band: 11.7-12.2 Gc/s

The Group <u>unanimously agreed</u> ADD 405BB (Proposal CAN/14/89) as shown in the <u>Annex</u> to the present Report.

12.2 <u>Frequency band</u>: 14.575-15.075 Gc/s

The Group <u>unanimously agreed</u> ADD 409G (Proposal AUS/10/43) as shown in the <u>Annex</u> to the present Report.

12.3 Frequency band: 14.575-15.075 Gc/s

The Group unanimously agreed ADD 407A (Proposal CAN/14/91) as shown in the $\underline{\text{Annex}}$ to the present Report.

12.4 Frequency bands: 17.7-21.2 Gc/s and 27.5-31 Gc/s

The Group <u>unanimously agreed</u> that the contents of Document No. 226 applied (paragraph 10 above).

12.5 Frequency band: 29-31 Gc/s

Proposal F/41/135 ADD 408A was examined. The Group was informed that Working Group 5A (Fixed-Satellite Service) had agreed to including directions in the Table. In the light of this information, the Proposal was withdrawn.

13. Service definitions

The Group took note of Document No. 218 page 6 ADD 84ACA Space Operation Service.

- 14. The Group took note of the need to arrange for applying the same solution with respect to telemetering, telecommand and tracking for the Broadcasting-Satellite Service as for the Fixed-Satellite Service.
- 15. Radio Astronomy Service in the frequency band 2 690-2 700 Mc/s

The <u>Delegation of the United Kingdom</u> introduced Document No. 291 which had been distributed that morning and which motivated the proposal of a new foot-note to read:

ADD <u>***</u>

"To protect the Radio Astronomy Service, transmissions in the Broadcasting-Satellite Service in this band shall not result in spurious emissions in the band 2 690-2 700 Mc/s with a power flux-density at the earth's surface exceeding -277 dbW/m²/Hz."

The <u>Delegation of Australia</u> supported the proposal and the Group <u>unanimously agreed</u> to pass the document for examination in Committee 5. In this manner delegations would have time to consider the proposal.

B. DESTA Chairman

Annex: 1

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ANNEX.

MOD 285A

The band 148-149.9 Mc/s may be authorized for space telecommand, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected. The bandwidth of an individual transmission shall not exceed ± 15 kc/s.

MOD 350A

Space stations employing frequencies in the band 1 525-1 535 Mc/s for telemetering purposes may also transmit tracking signals in this band, / and transmit and receive signals for the Earth Exploration-Satellite Service.

Note to Committee 5:

Paragraph 7 of the present Report refers. 7

_MOD 392F

The Meteorological-Satellite Service may use the band 7 450-7 550 Mc/s for space-to-earth transmissions on a primary basis. This band may also be used for the transmission of tracking and telemetering signals associated with meteorological-satellite space stations operating in this band.

ADD 405BB

These bands may also be used for the transmission of tracking and telemetering signals associated with broadcasting-satellite space stations and fixed-satellite space stations operating in the same band.

ADD 409G

The fixed-satellite band 14.575-15.075 Gc/s is also used to provide the earth-to-space link to any broadcasting-satellite space station and also to provide for the transmission of telecommand signals associated with the functions of space stations in the Fixed-Satellite or Broadcasting-Satellite Service.

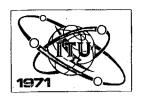
Annex to Document No. 339-E Page 8

ADD 407A

The band 14.575-15.075 Gc/s may also be used to provide for the transmission of telecommand signals associated with earth stations operating in this band.

Note from Working Group 5B to Committee 5:

<u>Note to Committee 5 and Committee 7</u>: ADD 405BB is adopted provisionally pending decisions in Committee 5 on the allocations to the services concerned.



SPACE CONFERENCE

Document No. 340-E 14 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SUMMARY RECORD

OF THE

SEVENTH MEETING OF COMMITTEE 5 (ALLOCATIONS)

Thursday, 8 July 1971, at 2030 hrs

Chairman: Mr. H.A. KIEFFER (Switzerland)

Sul	ojects discussed	Document No.	
1.	Adoption of the following reports:		
	a) First Report W.G. 5A (continued)	225	
	b) Second Report W.G. 5A	254	
.*	c) Joint Report W.G. 5A/5E	273 (Rev.)	
	d) Third Report W.G. 5E	281	



1. Adoption of Reports

a) First Report of Working Group 5A (contd.) (Document No. 225)

The Delegate of Japan said that his Delegation was prepared to accept the compromise proposal put forward by the United States Delegation at the previous meeting of Committee 5. The proposal was adopted.

Page 4

The Chairman pointed out that since the 24.0-24.05 Gc/s band had been allocated exclusively to the amateur and amateur satellite services the figures "23.6-24.25 Gc/s" in MOD 407 Spa, fourth line, should be replaced by "23.6-24.0 Gc/s, 24.05-24.25 Gc/s". It was so agreed.

The Chairman further pointed out that SUP 410 concerned the transfer of frequencies for industrial, scientific and medical purposes from 22.125 Gc/s to 24.125 Gc/s. The Delegate of the U.S.S.R., supported by the Delegate of India, objected to the proposed change on the grounds that such a decision was outside the terms of reference of the Conference. The Delegate of the United States of America, supported by the Delegates of the Federal Republic of Germany, Sweden and France, said that the importance of the 22.125 Gc/s frequency to radio astronomy was such that the Conference was justified in making the transfer. Industrial, scientific and medical activities, which did not belong to any particular service, had made little use of 22.125 Gc/s and would be equally well placed at 24.125 Gc/s in the next highest radiolocation band. It was agreed to maintain SUP 410.

The Delegate of Sweden confirmed that his Delegation wished to maintain MOD 408.

The Secretary drew the Committee's attention to the fact that, as a result of its decisions to include provisions for tracking, telemetering and telecommand in the definitions of the services concerned, foot-notes 374 A and 392 A were obsolete and should be deleted from the present document (and all other documents where they occurred) together with the foot-note in square brackets to Committee 7,

The document, as amended and with the exception of section 2, page 1, which was held for further discussion at a later meeting, was adopted.

b) Second Report of Working Group 5A (Document No. 254)

Page 1, paragraph 1

In view of the fact that proposal J/98/81 had not received majority support in Working Group 5A, the Delegation of Japan put forward a modified proposal to allocate the following bands to the fixed satellite service: 40-41 Gc/s (earth-to-space), and 50-51 Gc/s (space-to-earth). The proposal was adopted.

Annex 1, pages 3 and 4

After a lengthy discussion in which the Delegate of Iraq, supported by the Delegates of Ethiopia and Syria, objected to the allocation of such a wide range of frequencies to the Space Service, which could not make full use of them in the immediate future, and in which the Delegates of the United States of America, Brazil, the United Kingdom and New Zealand upheld the allocation since, outside the atmosphere, the bands concerned could be used only by the Inter-Satellite Service due to atmospheric absorption and the consequent shielding of terrestrial communications, it was decided by 45 votes to 9 with 12 abstentions to adopt Annex 1.

Annex 2, page 5

The following amendments were agreed. Delete the words "the SPACE (Space-to-space)" on the third line, the square brackets in the fourth line and sub-paragraph a), third line, and the words "to the SPACE (Space-to-space) Service" in sub-paragraph a), second line. Replace the words "largely screens ... Terrestrial Services;" in the first and second lines under "recognising" by "may act as a screen between the Inter-Satellite and Terrestrial Services" and the words "the Fixed and ... Services" in the third and fourth lines under "recognising" and the second and third lines under "recommends" by "terrestrial radiocommunications (except the Aeronautical Service)".

The document, as amended, was adopted.

c) Joint Report of Working Groups 5A and 5E (Document No. 273(Rev.))

It was agreed to postpone examination of Section 7 and Annex 2 to the final meeting of Committee 5. The remainder of the document was then considered.

Annex 1, page 4

With regard to foot-notes /A / and /D /, the Chairman of Joint Working Party 5A/5E explained that although the texts were quite different the intention behind them was the same. It had not been possible to reach agreement on a single text in the Joint Working Group, hence the note at the bottom of the page referring the matter to Committee 5. Foot-note /E / was completely different in nature and should remain as a separate foot-note.

After prolonged discussion the Committee was unable to agree on what action to take on foot-notes / A/ and / D/ and it was agreed, by 54 votes to 9 with 4 abstentions, to postpone discussion of all three foot-notes to the appropriate Plenary meeting.

Page 5

A proposal by the Delegate of the U.S.S.R., supported by the Delegate of Spain, to include the Fixed and Mobile Services in the 12.5-12.75Gc/s band for Region 1 and eliminate foot-notes / B / and / C / was rejected by 24 votes to 20 with 2 abstentions.

It was agreed to add the words "(Earth-to-space)" as a third line in the 12.5-12.75 Gc/s band for Region 1, and the words "(except aeronautical mobile)" as a fifth line in the 12.5-12.75 Gc/s band for Region 3.

As their proposal to use the 12.75-13.25 Gc/s band for the Fixed Satellite Service (Earth-to-space) received no support, the <u>Delegation of Japan reserved</u> its right to revert to the matter in the Plenary.

It was agreed to insert the words "(except aeronautical mobile)" after "mobile" on the last lines of foot-notes / B / and / C /.

The following Delegations wished their countries to be included in foot-note / B/: Austria, Cameroon, Congo, Ghana, Israel, Jordan, Libya, Spain and Sweden.

The following delegations wished their countries to be included in foot-note \angle C \angle : Algeria, Belgium, Greece, Luxembourg, Monaco and Nigeria.

The document, as amended and with the exception of Section 7, page 2, and Annex 2, page 7, was adopted.

d) Third Report of Working Group 5E (Document No. 281)

In introducing the document, the Chairman of Working Group 5E drew attention to two corrections to the text: "J/30/81" on page 2, paragraph 2.1, first line, should read "J/30/18", and "J/30/81" in paragraph 3.1, first line: "J/98/81".

The Delegation of the United Kingdom withdrew its reservation on page 2, paragraph 1.4, explaining that it was doing so not on technical grounds but in deference to the majority opinion.

Since proposal J/30/18 had not been supported in the Working Group (page 2, Section 2), the <u>Delegation of Japan</u> proposed instead to add the Broadcasting and Broadcasting Satellite Services to the framed part of the table for 22.5-23 Gc/s for Region 3, together with a new additional foot-note as follows: "The Broadcasting Satellite Service is also authorized in the band 22.5-23 Gc/s, subject to power flux-density limits for the protection of the Terrestrial Services in this band.". The proposal was adopted.

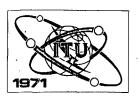
Since a Recommendation had been drafted covering the intent of the foot-note mentioned in paragraph 3.1, page 2, it was agreed to delete the last sentence in that paragraph and the references to the foot-note in the Annex, page 5.

The document as amended was adopted,

The meeting rose at 0040 hours.

The Chairman:

H.A. KIEFFER



SPACE CONFERENCE

Document No. 341-E 9 July 1971 Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

DRAFT RECOMMENDATIONS ON THE USE OF FREQUENCY BANDS ABOVE 40 Gc/s

- Draft Recommendation No. ... on the future use of certain bands between 40 and 275 Gc/s by the Radiocommunication Services.
- Draft Recommendation No. ... on the future use of the 41-43 Gc/s band by the Fixed and Mobile Services.

Annexes: 2



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ANNEX 1

DRAFT RECOMMENDATION ON THE FUTURE USE OF CERTAIN BANDS BETWEEN 40 AND 275 Gc/s BY THE RADIOCOMMUNICATION SERVICES

The World Administrative Radio Conference for Space Telecommunications, Geneva (1971),

considering

that the 43-48 Gc/s, 66-71 Gc/s, 95-101 Gc/s, 142-150 Gc/s; 190-200 Gc/s and 250-265 Gc/s bands have been allocated to the following services:

- Aeronautical Mobile-Satellite
- Maritime Mobile-Satellite
- Aeronautical Radionavigation-Satellite
- Maritime Radionavigation-Satellite;

recognizing

that it is not desirable for compatibility considerations that at a later date these bands should be shared with Terrestrial Radio-communication Services other than those of interest to the Aeronautical and Maritime Mobile Services and/or the aeronautical and Maritime Radio-navigation Services:

recommends

that a future competent world administrative conference should consider allocating, in addition, the 43-48 Gc/s, 66-71 Gc/s, 95-101 Gc/s, 142-150 Gc/s, 190-200 Gc/s and 250-265 Gc/s bands to the following services:

AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION

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ANNEX 2

DRAFT RECOMMENDATION ON THE FUTURE USE OF THE 41-43 Gc/s BAND BY THE FIXED AND MOBILE SERVICES

The World Administrative Radio Conference for Space Telecommunications, Geneva (1971),

considering

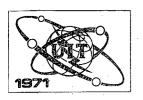
that the 41-43 Gc/s band has been allocated to the Broadcasting-Satellite Service;

recognizing

that it is possible, by appropriate co-ordination, for a frequency band to be shared by the Broadcasting-Satellite Service, on the one hand, and the Fixed and Mobile Services, on the other;

recommends

that a future competent world administrative conference should consider allocating, in addition, the 41-43 Gc/s band to the Fixed and Mobile Services.



CONFÉRENCE SPATIALE

Corrigendum N° 1 au

Document N° 342-F/E/S

10 juillet 1971

Original : français

SEANCE PLENIERE

ITALIE

PROPOSITIONS CONCERNANT L'ATTRIBUTION DE PETITES BANDES DE FREQUENCES AU SERVICE D'AMATEUR PAR SATELLITE ENTRE 1 ET 10,5 GHz

A la première page, premier paragraphe, quatrième ligne, remplacer :

CONFÉRENCE ADMINISTRATIVE MONDIALE DES TÉLÉCOMMUNICATIONS SPATIALES - GENÈVE - 1971

"contre l'attribution à ce service, à titre exclusif, de bandes au voisinage de 144 MHz et de 24 GHz"

par

"contre l'attribution à ce service de bandes comprises entre la bande exclusive à 144 MHz et celle proposée à 24 GHz"

A la première page, trosième alinéa, troisième ligne, remplacer :

"et qu'on choisisse exactement l'emplacement de ces fréquences"

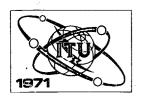
par

"l'exact emplacement de ces portions ayant été choisi".

Does not concern the English text.

No concierne al texto español.





SPACE CONFERENCE

Document No. 342-E

9 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

ITALY

PROPOSALS CONCERNING THE ALLOCATION OF SMALL BANDS TO THE AMATEUR-SATELLITE SERVICE BETWEEN 1 AND 10.5 GHz

At the Fourth Meeting of Committee 5, when proposals for the Amateur Satellite Service came up in the Working Group reports, a majority voted against any provision for this Service between the exclusive amateur bands at 144 MHz and that proposed at 24 GHz. When dealing with the possibility of amateur space operation in the shared bands in this part of the spectrum, it was decided to deal with all bands together and on this basis no provision for amateur space operations was made. Italy pointed out that the study of these bands on a separate, more detailed approach might well yield small bands that would not inconvenience those delegations opposed to general sharing. We consider that this has not been adequately studied at this Conference.

This matter is raised at this stage of the Conference in the belief that to be effective in their operations of experimentation and self-training the amateurs need at least some possibility of operating at representative parts of the spectrum, to give them wider scope.

Accordingly, Italy proposes that small portions of three bands be allocated for amateur space techniques and the exact locations of these small bands are chosen following discussions with some other delegations as ones that are eminently suitable for this purpose.

Proposal A

In the band 5 650-5 925 Mc/s, add a foot-note:

"The band 5 650-5 670 MHz is also allocated to the Amateur Satellite Service on a secondary basis."



Document No. 342-E Page 2

Coming between the provisions for Communications Satellites in the 4 000 and 6 000 MHz parts of the spectrum, this would give amateurs the opportunity of developing simplified and small earth stations and contributing in design techniques.

Proposal B

In the band 1 215-1 300 Mc/s, add a foot-note:

"The band 1 215-1 230 Mc/s is also allocated to the Amateur Satellite Service on a secondary basis."

This is in a part of the spectrum in which attenuation of signals passing through the ionosphere is significantly less than at lower frequencies and is accordingly of special use and interest to amateur propagation studies.

Proposal C

In the band 10 000-10 500 Mc/s, add a foot-note:

"The band 10 350-10 400 Mc/s is also allocated to the Amateur Satellite Service on a secondary basis."

This is regarded as a useful intermediate band for developing millimeter wave techniques and giving experience between the lower frequencies and the proposed provisions at 24 Gc/s.

INTERNATIONAL TELECOMMUNICATION UNION

Ε

SPACE CONFERENCE

Geneva, 1971

Document No. 343-E
9 July 1971

PLENARY MEETING (FIRST READING)

B. 5

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
4	335	Annex 1-3	Additions to Art. 7	

Francois Job Chairman of the Editorial Committee

Annex: Pages B5/01-03



[ARTICLE 7]

ADD	S	Station Keeping of Space Stations 1
ADD	470 [] § [].	Space stations on geostationary satellites:
ADD	470 [a] -	- shall have the capability of maintaining their positions within \pm 1° of the longitude of their nominal positions, but efforts should be made to achieve a capability of maintaining their positions at least within \pm 0.5° of the longitude of their nominal positions,
ADD	470 [b] -	- shall maintain their positions within \pm 1° of longitude of their nominal positions irrespective of the cause of variation, but
ADD	470 [c]	 need not comply with [b] as long as the space system to which the space station belongs does not produce an unacceptable interference ² into any other space system whose space station complies with the limits given in [b].

 $^{^1}$ In the case of space stations on geosynchronous satellites in orbits having an angle of inclination greater than 5° the positional tolerance shall relate to the nodal point.

ADD 476 [c].1 ² The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

[ARTICLE 7]

ADD

Pointing Accuracy of Antennae on Geostationary Satellites

- ADD 470 [...] § [...]. The pointing direction of maximum radiation of any earthward beam of antennae on geostationary satellites shall be capable of being maintained within:
 - 10% of the half power beamwidth relative to the nominal pointing direction; or
 - 0.5° relative to the nominal pointing direction,

whichever is greater, when these beams are intended only for less than global coverage.

In the event that the beam is not rotationally symmetrical about the axis of maximum radiation, the tolerance in any plane containing this axis shall be related to the half power beamwidth in that plane.

This accuracy shall be maintained only if it is required to avoid unacceptable interference 1 to other systems.

ADD 470 [...].1 The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

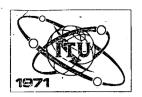
[ARTICLE 7]

ADD

Control of Interference between Geostationary Satellite Systems and Non-Synchronous Inclined Orbit Satellite Systems

ADD 470V [...] § [...]. Non-geostationary space stations in the fixed satellite services shall cease or reduce to a negligible level radio emissions, and their associated earth stations shall not transmit to them whenever there is insufficient angular separation between the non-geostationary satellite and geostationary satellites and unacceptable interference to geostationary satellite space systems operating in accordance with these Regulations.

ADD 470V [...].1 1 The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.



SPACE CONFERENCE

Document No. 344-E

9 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

NOTE FROM THE CHAIRMAN OF COMMITTEE 4

TO THE CHAIRMAN OF COMMITTEE 5

- 1. Your attention is drawn to the following documents of Committee 4, which were approved as amended at its eighth meeting on 9 July 1971 and agreed to be brought to the attention of Committee 5.
- 2. Document No. 278 relating to the criteria to be applied for sharing between Satellite Broadcasting Service and the Terrestrial Broadcasting Service in the band [614-790 Mc/s].
 - 2.1 The document was approved with the following amendments:
 - 2.1.1 In both Report and draft Recommendation to be added definition on δ :

"... where δ is the angle of arrival above the horizontal plane."

2.1.2 Under Item 1 of "recommends" the values of maximum power flux-density read:

"-129 dBW/m²
$$\delta < 20^{\circ}$$

-129 + 0.4 (δ - 20°) dBW/m² $20^{\circ} < \delta < 60^{\circ}$
-113 dBW/m² $60^{\circ} < \delta < 90^{\circ}$ "

2.1.3 Item 3 of "recommends" reads:

"that the transmissions of unmodulated carrier shall be avoided;"

and following items be renumbered correspondingly.



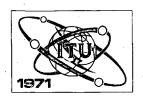
Document No. 344-E

Page 2

- 3. <u>Document No. 302</u> relating to the sharing feasibility of a Maritime-Satellite Service with other Services in the frequency range 450-614 Mc/s
 - 3.1 This document was approved with the following amendment:
 - 3.1.1 On page 2, last sentence of first paragraph
 reads :

"Examples of interference calculations are shown in the attached Annex and show that sharing in some cases would be very difficult."

> E.F. SANDBACH Chairman Committee 4



SPACE CONFERENCE

Document No. 345-E 9 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

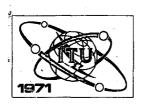
NOTE FROM THE CHAIRMAN OF COMMITTEE 4 TO THE CHAIRMAN OF COMMITTEE 6

During its 8th meeting on 9 July 1971, Committee 4 noted Report of Working Group 4E on examination of the technical content and amendment to Document No. DT/77 prepared by Sub-Group 6A-4 and also Document No. 325 (France).

Committee 4 thought that it may be desirable to draw the attention of Committee 6 to this amendment given in the Annex to Document No. 311 and Document No. 325 when taking deliberation on the Appendix 1B to Article 9A.

E.F. SANDBACH
Chairman
Committee 4





SPACE CONFERENCE

Document No. 346-E

4 July 1971 Original : French

English Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

REPORT OF WORKING GROUP 6A ON ARTICLE 9

Working Group 6A has held a meeting, during which the proposals submitted to the Conference by Administrations with respect to Article 9 were examined, and modifications subsequent to the new draft Article 9A were incorporated.

The Working Group was able to reconcile the views expressed in the various proposals and to submit to Committee 6 one text for Article 9. Some parts of this text are put within square brackets, which refer to definitions which have to be adopted by other Committees.

This result could be obtained only thanks to the spirit of co-operation shown by all delegates.

P.E. WILLEMS
Chairman
Working Group 6A

Annex: 1



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WORKING GROUP 6A

ANNEX

DRAFT

ARTICLE 9

MOD

Motification and recording in the Master International Frequency Register of Frequency Assignments¹⁾ to Terrestrial Radiocommunication Stations°

MOC Section I

Notification of Frequency Assignments and Co-ordination Procedure to be Applied in Appropriate Cases

ADD

1) The expression frequency assignment, wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called Master Register).

(MOD)

° For the notification and recording in the Master International Frequency Register of frequency assignments to stations in the space radiocommunication and the radio astronomy service, see Article 9A.

Annex to Document No. 346-E Page 4

- (MOD) 486
- § 1.(1) Any frequency assignment to a fixed, land, broadcasting, radionavigation land, radiolocation land or standard frequency station, or to a ground-based station in the meteorological aids service, shall be notified to the International Frequency Registration Board.
- (MOD) 486.2
- I In the case where a frequency is used by numerous stations under the jurisdiction of the same administration, see Appendix 1 (Section E, II, Column 5a, paragraphs 2c and 2d).
- (MOD) 486.3
- 2 With respect to assignments to broadcasting stations in the bands allocated exclusively to the broadcasting service between 5 950 kc/s and 26 100 kc/s, see Article 10.

- a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration³; or
- b) if the frequency is to be used for international radiocommunication; or
- c) if it is desired to obtain international recognition of the use of the frequency.

MOD 486.4

The attention of administrations is specifically drawn to the application of the provisions of Nos. 486 a) and 486 c) in those cases where they make a frequency assignment to a station in the /fixed or mobile service/, located within co-ordination area of an earth station (see No. 492A), in a band which these services share with equal rights with the space radiocommunication in the frequency spectrum above 1 Gc/s.

Annex to Document No. 346-E

Page 6

NOC 487

(2) Similar notice shall be given for any frequency to be used for the reception of mobile stations by a particular land station in each case where one or more of the conditions specified in No. 486 are applicable.

NOC 488

(3) Specific frequencies prescribed by these Regulations for common use by stations of a given service (for example, international distress frequencies 500 kc/s and 2 182 kc/s, frequencies of ship radiotelegraph stations operating in their exclusive high frequency bands, etc.), shall not be notified to the Board.

NOC 489

§ 2.(1) For any notification under Nos. 486 or 487 an individual notice for each frequency assignment shall be drawn up as prescribed in Sections A or B of Appendix 1, which specify the basic characteristics to be furnished, according to the case.

It is recommended that the notifying administration should also supply the additional data called for in that Appendix, together with such further data as it may consider appropriate.

MOD 490

(2) When stations of the same service, such as the land mobile service, use a band of frequencies above 28 000 kc/s in a specific area or areas, an individual notice should be drawn up, as prescribed in Section C of Appendix 1, which specifies the basic characteristics to be furnished, for each frequency on which there are assignments within the band; however, the particulars should relate only to a typical station. This does not apply to broadcasting stations or to stations in the /fixed or mobile service/ to which the provisions of Sub-Section IIB of this article apply.

Annex to Document No. 346-E

MOD 491

§ 3.(1) Whenever practicable each notice should reach the Board before the date on which the assignment is brought into use. It must reach the Board not earlier than ninety days before the date on which it is to be brought into use, but in any case not later than thirty days after the date it is actually brought into use. However, for a frequency assignment to a station in the _fixed or mobile_/ service mentioned in Sub-Section IIB of this article and in No. 639AQ, the notice must reach the Board not earlier than three years and not later than ninety days before the date on which the assignment is to be brought into use.

MOD 492

MOD 492A

§ 3A. (1) Before an administration notifies to the Board, or brings into use any frequency assignment to a station in the $\sqrt{ extstyle exts$ transmitting in a band allocated with equal rights to the space radiocommunication (Space-to-Earth) and the fixed or mobile service in the frequency spectrum above 1 Gc/s, it shall initiate co-ordination of the proposed assignment with the administration responsible for the receiving earth station concerned if the assignment is for use within the co-ordination area 1) of an existing receiving earth station or of one for which the co-ordination procedure referred to in No. 639AN has been initiated. For the purpose of effecting co-ordination, it shall send to any other such administration, by the fastest possible means, a copy of a diagram drawn to an appropriate scale indicating the location of the station in the fixed or mobile service and all other pertinent details of the proposed frequency assignment, and the approximate date on which it is planned to begin operations.

MOD 492A.1

¹⁾ Calculated in accordance with the procedures described in appendix \(\sum_{28} \) 7.

Annex to Document No. 346-E Page 10

MOD 492B

(2) An administration with which co-ordination is sought under No. 492A shall immediately by telegram acknowledge receipt of the co-ordination data. If no acknowledgement is received within fifteen days of despatch the sender may despatch a telegram requesting acknowledgement of receipt of the co-ordination data, to which the receiving administration shall respond. Upon receipt of the co-ordination data an administration shall promptly examine the matter with regard to interference 1) which would be caused to the services rendered by its earth stations operating in accordance with the Convention and these Regulations, or to be so operated within the next three years, with the proviso that in this latter case co-ordination specified in No. 639AN has been effected or that the co-ordination procedure has already been initiated; and shall, within an overall period of sixty days from despatch of the co-ordination data, either notify the administration requesting co-ordination of its agreement to the proposals or, if this is not possible,

ADD 492B.1 1) Criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R.

Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

indicate the reasons therefor and make such suggestions as it may be able to offer with a view to a satisfactory solution to the problem.

MOD 4920

- (3) No co-ordination under No. 492A is required when an administration proposes:
 - a) to bring into use a station in the \(\int \) fixed or mobile service \(\int \) which is located, in relation to an earth station, outside co-ordination area; or
 - b) to change characteristics of an existing assignment in such a way as not to exceed the permissible level of interference to the earth stations of other administrations.

Annex to Document No. 346-E Page 12

MOD 492D

- (4) An administration seeking co-ordination may request the Board to endeavour to effect co-ordination, in those cases where:
 - a) an administration with which co-ordination is sought under No. 492A fails to acknowledge receipt under No. 492B within a period of thirty days of despatch of the co-ordination data;
 - b) an administration which has acknowledged receipt under No. 492B fails to give a decision within a period of ninety days of despatch of the co-ordination
 - c) there is a disagreement between the administration seeking co-ordination and an administration with which co-ordination is sought as to the acceptable level of interferenc, or
 - d) co-ordination between administrations is not possible for any other reason.

In so doing, it shall furnish the Board with the necessary information to enable it to endeavour to effect such co-ordination.

MOD 492E

(5) Either the administration seeking co-ordination or an administration with which co-ordination is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.

MOD 492F

(6) Where the Board receives a request under No. 492D a), it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.

ADD 492FA

(7) Where the Board receives an acknowledgement following its action under No. 492F, or where the Board receives a request under No. 492D b), it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.

Annex to Document No. 346-E Page 14

ADD 492FB

(8) Where the Board receives a request under No. 492D d), it shall endeavour to effect co-ordination in accordance with the provisions of No. 492A. Where the Board receives no acknowledgement to its request for co-ordination within the period specified in No. 492B, it shall act in accordance with the provisions of No. 492F.

ADD 492FC

(9) Where an administration fails to reply within thirty days of the Board's telegram requesting an acknowledgement sent under No. 492 F, or fails to give a decision in the matter within sixty days of the Board's telegram of request sent under No. 492FA, it shall be deemed that the administration with which co-ordination was sought has undertaken that no complaint will be made in respect of any harmful interference which may be caused by the stations in the fixed or mobile service to the services rendered by its earth station.

MOD 492G

(10) Where necessary, as part of the procedure under No. 492D, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.

ADD 492GA

(11) In the event of continuing disagreement between one administration seeking to effect co-ordination and one with which co-ordination has been sought, provided that the assistance of the Board has been requested, the administration seeking co-ordination may, after sixty days from the date of the request for the assistance of the Board, taking into consideration the provisions of No. 491, send its notice concerning the proposed assignment to the Board.

ADD 492GB

§ 3 B. Where the Board receives information from an administration in accordance with the provisions of No. 639AQ in reply to a request for co-ordination for an earth station, it shall consider as notifications under the present Section only that information relating to assignments to existing stations in the fixed or mobile service or to stations of these services to be brought into use within the time limits defined in No. 491. Such notifications shall be examined by the Board with respect to the provisions of Nos. 570AB and 570AD, as appropriate, and shall be treated accordingly.

(MOD) 493

§ 3 C.(1) Whatever the means of communication, including telegraph, by which a notice is transmitted to the Board, it shall be considered complete if it contains at least those appropriate basic characteristics specified in Appendix 1.

NOC 494

(2) Complete notices shall be considered by the Board in the order of their receipt.

NOC 495

§ 4. When a service or regional agreement has been concluded, the Board shall be informed of the details of this agreement.

MOD Sub-section IIA Procedure to be followed in cases not covered by Sub-section IIB of this article

MOD Sub-section IIB Procedure to be followed in cases where stations in the fixed or mobile service are in the same frequency band as, and within the co-ordination area of, an established earth station or one for which co-ordination has been effected or initiated.

NOC 570AA § 23A. The Board shall examine each notice.

Annex to Document No. 346-E Page 18

NOC 570AB

a) with respect to its conformity with the Convention, the Table of Frequency Allocations and other provisions of the Radio Regulations (with the exception of those relating to the co-ordination procedure and the probability of harmful interference);

NOC 570AC

b) with respect to its conformity with the provisions of No. 492A relating to co-ordination of the use of the frequency assignment with the other administrations concerned;

NOC 570AD

c) where appropriate, with respect to the probability of harmful interference to the service rendered by an earth receiving station for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 639BM, and if the corresponding frequency assignment

to the space transmitting station has not, in fact, caused harmful interference to any frequency assignment in conformity with No. 501 or 570AB, as appropriate, previously recorded in the Master Register.

NOC 570AE

§ 23 B. Depending upon the findings of the Board subsequent to the examination prescribed in Nos. 570AB, 570AC and 570AD, further action shall be as follows:

NOC 570AF

§ 23 C.(1) Finding unfavourable with respect to No. 570AB.

MOD 570AG

• (2) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be examined immediately with respect to Nos. 570AC and 570AD.

ADD 570AGA

(3) If the finding is favourable with respect to No. 570AC or 570AD, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

ADD 570AGB

If the finding is unfavourable with respect to No. 570AC or 570AD, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. Should the administration insist upon reconsideration of the notice, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column.

ADD 570AGC

- (5) The period of one hundred and twenty days mentioned in Nos. 570AGB and 570AX shall count from:
 - the date when the assignment to the station in the fixed or mobile service which received an unfavourable finding is brought into use, if the assignment to the earth station is then in use;
 - otherwise, from the date when the assignment to the earth station is brought into use.

But if the assignment to the earth station has not been brought into use by the notified date, the period of one hundred and twenty days shall be counted from this date. Allowance may be made for the additional period mentioned in No. 570BF.

Annex to Document No. 346-E

NOC 570AH

(6) Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

NOC 570 AI

(7) If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of No. 570AH.

MOD 570AJ

(8) If the notifying administration resubmits the notice with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be treated in accordance with the provisions of Nos. 570AG and 570AGA or 570AGB, as appropriate.

NOC 570AK

(9) If the notifying administration resubmits the notice with modifications which, after re-examination, result in a favourable finding by the Board with respect to No. 570AB, the notice shall be treated under the provisions of Nos. 570AL to 570AX. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in Column 2d.

NOC 570AL

§ 23D.(1) Finding favourable with respect to No. 570AB.

NOC 570AM

(2) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has been successfully completed with all administrations whose earth stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

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NOC 570AN

(3) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has not been applied, and the notifying administration requests the Board to effect the required co-ordination, the Board shall take the appropriate action necessary and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with No. 570AM. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of No. 570AD.

NOC 570A0

(4) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has not been applied, and the notifying administration does not request the Board to effect the required co-ordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

NOC 570AP

(5) Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedure mentioned in No. 570AC has been successfully completed with all administrations whose earth stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

NOC 570AQ

(6) Where the notifying administration resubmits the notice with a request that the Board effect the required co-ordination, it shall be treated in accordance with the provisions of No. 570AN. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

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NOC 570AR

(7) Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the co-ordination, it shall be examined by the Board with respect to the provisions of No. 570AD. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

NOC 570AS

§ 23E.(1) Finding favourable with respect to Nos. 570AB and 570AD.

NOC 570AT

(2) The assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

NOC 570AU

§ 23F.(1) Finding favourable with respect to No. 570AB but unfavourable with respect to No. 570AD.

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NOC 570AV

(2) The notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

NOC 570AW

(3) Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to No. 570AD, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.

MOD 570AX

(4) Should the notifying administration resubmit the notice, either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of No. 570AW to be applied, and should that administration insist upon reconsideration of the notice, but should

the Board's finding remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column. The period of one hundred and twenty days shall count from the date indicated in No. 570AGC.

SUP 570AY

NOC 570AZ

§ 23 G.(1) Changes in the Basic Characteristics of Assignments already recorded in the Master Register

MOD 570BA

characteristics of an assignment already recorded, as specified in Appendix 1 (except those entered in Columns 3 and 4a of the Master Register), shall be examined by the Board according to Nos. 570AB and 570AC and, where appropriate, No. 570AD, and the provisions of Nos. 570AF to 570AX inclusive applied. Where the change should be recorded, the assignment shall be amended according to the notice.

NOC 570BB

(3) However, in the case of a change in the basic characteristics of an assignment which is in conformity with No. 570AB, should the Board reach a favourable finding with respect to No. 570AC, and, where its provisions are applicable, with respect to No. 570AD, or find that the change does not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. In addition, the date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.

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NOC 570BC

\$ 23 H. In applying the provisions of the whole of this Sub-Section, any resubmitted notice which is received by the Board more than two years after the date of its return by the Board, shall be considered as a new notice.

NOC 570BD

\$ 23 I.(1) Recording of Frequency Assignments notified before being brought into use.

NOC 570BE

(2) If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to Nos. 570AB and 570AC and, where appropriate, with respect to No. 570AD, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

NOC 570BF

(3) If, within the period of thirty days after the projected date of bringing into se, the Board receives confirmation from the notifying administration of the date of putting into use, the special symbol shall be deleted from the Remarks Column. In the case where the Board, in the light of a request from the notifying administration received before the end of the thirty-day period, finds that exceptional circumstances warrant an extension of this period, the extension shall in no case exceed one hundred and fifty days.

MQD 570BG

(4) In the circumstances described in No. 570AX, and as long as an assignment which received an unfavourable finding cannot be resubmitted as a consequence of the provisions of No. 570AGC, the notifying administration may ask the Board to enter the assignment provisionally in the Master Register, in which event a special symbol to denote the provisional nature of the entry shall be entered in the Remarks Column. The Board shall delete this symbol when it receives from the notifying administration, at the end of the period specified in No. 570AX, the information relating to the absence of complaint of harmful interference.

NOC 570BH

(5) If the Board does not receive this confirmation within the period referred to in No. 570BF or at the end of the period referred to in No. 570BG, as appropriate, the entry concerned shall be cancelled.

NOC

Section VIII - Miscellaneous provisions

following assistance:

ADD 635A \$47A. (1) If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the

- a) preparation of the diagram showing co-ordination area referred to in No. 492A;
- b) computation of the interference level, as referred to in No. 492B;
- c) any other assistance of a technical nature for completion of the procedures in this article.

ADD 635B (2) In making a request to the Board under 635A, the administration shall furnish the Board with the necessary information.



SPACE CONFERENCE

Document No. 347-E

Original: French, English,

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SECOND REPORT OF COMMITTEE 6
(REGULATIONS)

Article 9A

The revised text of Article 9A, appearing in the Annex to the present Report was adopted by Committee 6.

M.K. BASU Chairman

Annex: 1



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ANNEX

ARTICLE 9A

MOD

Co-ordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments 1) to Radio Astronomy and Space Radiocommunication Stations / except stations in the Broadcasting-Satellite Service. 7.

ADD Section I Procedure for the Advance Publication of information on planned Satellite Systems.

ADD 639AA

\$1. (1) An administration (or one acting on behalf of a group of named administrations) which intends to establish a satellite system shall, prior to the co-ordination procedure in accordance with No. 639AK where applicable, send to the Board not earlier than five years before the date of bringing into service each satellite network of the planned system, the information listed in Appendix / IB 7.

ADD 639 AB

(2) Any amendments to the information sent concerning a planned satellite system in accordance with No. 639AA shall, as soon as they become available, also be sent to the Board.

ADD 639AC

(3) The Board shall publish the information sent under Nos. 639AA and 639AB in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.

¹⁾ The expression frequency assignment, wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called Master Register)

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ADD 639AD

(4) If, after studying the information published under No. 639AC, any administration is of the opinion that interference, which may be unacceptable, may be caused to its existing or planned space services, it shall within ninety days after the date of the weekly circular publishing the information listed in Appendix [1B_7, send its comments to the administration concerned. A copy of these comments shall also be sent to the Board. If no such comments are received from an administration within the period mentioned above, it may be assumed that that administration has no basic objections to the planned satellite network(s) of that system on which details have been published.

ADD 639AE

(5) An administration receiving comments sent in accordance with No. 639AD shall endeavour to resolve any difficulties that may arise.

ADD 639AF

In case of difficulties arising when any satellite network of a planned system is intended to use the geostationary orbit

- a) The administration responsible for the planned system shall first explore all possible means of meeting its requirements, taking into account the characteristics of the significant geostationary satellite networks of other systems, and without considering the possibility of adjustments to systems of other administrations. If no such means can be found, the administration concerned is then free to apply to other administrations concerned to solve these difficulties;
- b) An administration receiving a request under a) above shall, in consultation with the requesting administration, explore all possible means of meeting the requirements of the requesting administration, for example, by relocating one or more of its own geostationary space stations involved, or by changing the emissions, frequency usage (including changes in frequency bands) or other technical or operational characteristics;
- a) and b) above there are unresolved difficulties, the administrations concerned shall together make every possible effort to resolve these difficulties by means of mutually acceptable adjustments, for example,

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to generationary space station locations and to other characteristics of the systems involved in order to provide for the normal operation of both the planned and existing systems.

ADD 639AG.

(7) In their attempts to resolve the difficulties mentioned above, administrations may seek the assistance of the Board.

ADD 639AH

(8) In complying with the provisions of Nos. 639AE to 639AG, an administration responsible for a planned satellite system shall, if necessary, defer its commencement of the co-ordination procedure, or where this is not applicable, the sending of its notices to the Board, until one hundred and fifty days after the date of the weekly circular containing the information on the relevant satellite network listed in Appendix \(\subseteq \text{1B} \) 7. However, in respect of those administrations with whom difficulties have been resolved or who have responded favourably, the co-ordination procedure, where applicable, may be commenced prior to the expiration of the one hundred and fifty days mentioned above.

ADD 639AI

(9) An administration which has published in accordance with the provisions of Nos. 639AA to 639AC, details of satellite networks in its planned systems shall periodically inform the Board as to whether or not comments have been received and as to the progress made, with other administrations, in resolving any difficulties. The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so inform all administrations by circular telegram.

ADD Section II Co-ordination Procedures to be Applied in Appropriate Cases

ADD 639AJ

Before an administration notifies to the Board \$ 2. (1) or brings into use any frequency assignment to a space station on a geostationary satellite or to an earth station that is to communicate with a space station on a geostationary satellite, it shall effect co-ordination with any other administration whose assignment in the same band for a space station on a geostationary satellite or an earth station that communicates with a space station on a geostationary satellite is recorded in the Master Register, or had been co-ordinated or is being co-ordinated under the provisions of this paragraph. For this purpose, the administration requesting co-ordination shall send to any other such administration the information listed in Appendix $\int l\Lambda$ \int .

ADD 639AK

- (2) No co-ordination under No. 639AJ is required:
- a) / where the increase in the equivalent noise temperature of an earth station large receiver of an administration caused by a frequency assignment to a station of any other administration is below the permissible increase in noise temperature as determined by the application of the method given in Appendix / 29 / . 2) /

¹⁾ If only the up link is involved, the increase in the equivalent noise temperature is determined at the space station receiver.

⁷ For a broadcasting satellite space station, the technical data used to effect co-ordination should be based upon the latest Recommendations of the C.C.I.R., as accepted by the administrations concerned under Resolution No. Spa 7. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used to effect co-ordination shall be agreed between the administrations concerned.

/b) when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the equivalent noise temperature agreed during co-ordination of an earth station receiver of another administration.

ADD 639AL

(3) An administration initiating the co-ordination procedure referred to in No. 639AJ shall at the same time send to the Board a copy of the request for co-ordination, with the information listed in Appendix / IA/ and the name(s) of the administration(s) with which co-ordination is sought. The Board shall publish this information in a special section of its weekly circular, together with a reference to the weekly circular in which details of the satellite system were published in accordance with Section I of this Article. When the weekly circular contains such information, the Board shall so inform all administrations by circular telegram.

ADD 639AM

(4) An administration believing that it should have been included in the co-ordination procedure under No. 639AJ shall have the right to request that it be brought into the co-ordination procedure.

MOD 639AN

§ 3. (1) Before an administration notifies to the Board or brings into use any frequency assignment to an earth station, whether for transmitting or receiving, in a particular band allocated with equal rights to the space radiocommunication and the /fixed or mobile/ service in the frequency spectrum above one Ge/s, it shall effect co-ordination of the assignment with any other administration whose territory lies wholly or partly within the co-ordination area 1) /but only in respect of the fixed or the mobile service. For this purpose it shall send to any other such administration a copy of a diagram drawn to an appropriate scale indicating the location of the earth station and showing the co-ordination areas of the earth station for the cases of transmission and reception by the earth station, and the data on which they based, including all pertinent details of the proposed frequency assignment, as listed in Appendix $\sqrt{1}A$, and an indication of the approximate date on which it is planned to begin operations.

¹⁾ Calculated in accordance with the procedures described in Appendix \(\int 28_{\int} \)

ADD 639A0

(2)An administration with which co-ordination is sought under No. 639AJ shall immediately by telegram acknowledge receipt of the co-ordination data. acknowledgement is received within thirty days after the date of the weekly circular publishing the information under No. 639AL, the sender shall despatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of thirty days. Upon receipt of the co-ordination data, an administration shall, having regard to the proposed date of bringing into use of the assignment for which co-ordination was requested, promptly examine the matter with regard to interference 1) which would be caused to the service rendered by its stations in respect of which co-ordination is sought under No. 639AJ; and shall, within an overall period of ninety days from the date of the relevant weekly circular, notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree, it shall, within the same period, send to the administration seeking co-ordination the technical details upon which its disagreement is based, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem. A copy of these comments shall also be sent to the Board.

ADD 639A0.1

¹⁾ Criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

MOD 639AP

- (3) An administration with which co-ordination is sought under No. 639AN shall acknowledge receipt immediately by telegram of the co-ordination data. If no acknowledgement is received within fifteen days of despatch of the co-ordination data the sender shall despatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of fifteen days. Upon receipt of the co-ordination data an administration shall, having regard to the proposed date of bringing into use of the assignment for which co-ordination was requested, promptly examine the matter both with regard:
 - a) interference which would be caused to the service rendered by its stations in the fixed or mobile service operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer, and
 - b) interference which would be caused to reception at the earth station by the service rendered by its stations in the fixed or mobile service operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer.

⁶³⁹AP.1 1) Criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

and shall, within an overall period of sixty days from despatch of the co-ordination data notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree it shall, within the same period, send to the administration seeking co-ordination a copy of a diagram drawn to an appropriate scale showing the location of its stations in the fixed or mobile / service which are or will be within the co-ordination area of the earth transmitting or receiving station, as appropriate, together with all other relevant basic characteristics, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

ADD 639AQ

(4) When the administration with which co-ordination is sought sends to the administration seeking co-ordination the information mentioned in No. 639AP, a copy thereof shall also be sent to the Board. The Board shall consider as notifications in accordance with Section I of Article 9 only that information relating to existing stations in the __fixed or mobile / service or to those to be brought into use within the next three years.

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MOD 639AR

- (5) No co-ordination under No. 639AN is required when an administration proposes:
 - a) to bring into use an earth station, the co-ordination area of which does not include any of the territory of any other country;
 - b) to change the characteristics of an existing assignment in such a way as not to exceed the permissible level of interference to or from the stations in the / fixed or mobile / service of other administrations;
 - c) _ to bring into use an earth station in the band 4 400-4 700 Mc/s or the band 8 100-8 400 Mc/s (except Region 3)_7; or
 - d) to operate a mobile earth station. However, if the co-ordination area associated with the operation of such a mobile earth station, in a frequency band referred to in No. 639AN, includes any of the territory of another country, it shall be subject to prior agreement between the administrations concerned in order to avoid harmful interference to existing stations with the / fixed or mobile 7 service of that country. This agreement shall cover the characteristics of the mobile earth station(s) or the characteristics of a typical mobile earth station, and shall apply to a specified service area; unless otherwise stipulated in the agreement, it shall apply to any mobile earth stations in the specified service area provided that the probability of harmful interference caused by them shall not be greater than that caused by the typical earth station.

MOD 639AS

- \$4. (1) An administration seeking co-ordination may request the Board to endeavour to effect co-ordination in those cases where:
 - a) an administration with which co-ordination is sought under No. 639AJ fails to acknowledge receipt, under No. 639AO, within sixty days after the date of the weekly circular publishing the information relating to the request for co-ordination;
 - b) an administration with which co-ordination is sought under No. 639AN fails to acknowledge receipt, under No. 639AP within thirty days of despatch of the co-ordination data;
 - c) an administration has acknowledged receipt under
 No. 639AO, but fails to give a decision within a period
 of ninety days from the date of the relevant weekly
 circular;
 - d) an administration has acknowledged receipt under No. 639AP but fails to give a decision within a period of sixty days from despatch of the co-ordination data;
 - e) there is disagreement between the administration seeking co-ordination and an administration with which co-ordination is sought as to the acceptable level of interference;
 - f) co-ordination between administrations is not possible for any other reason.

In so doing it shall furnish the Board with the necessary information to enable it to endeavour to effect such co-ordination.

MOD 639AT

(2) Either the administration seeking co-ordination or an administration with which co-ordination is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.

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MOD 639AU

(3) Where the Board receives a request under 639AS a) or b), it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.

ADD 639AV

(4) Where the Board receives an acknowledgement following its action under No. 639AU, or where the Board receives a request under No. 639AS c) or d), it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.

ADD 639AW

(5) Where the Board receives a request under No. 639AS f), it shall endeavour to effect co-ordination in accordance with the provisions of Nos. 639AJ and 639AN, as appropriate. The Board shall also, where appropriate, act in accordance with No. 639AL. Where the Board receives no acknowledgement to its request for co-ordination within the period specified in No. 639AO or 639AP, as appropriate, it shall act in accordance with No. 639AU.

ADD 639AX

- (6) Where an administration fails to reply within thirty days of the Board's telegram requesting an acknowledgement sent under No. 639AU, or fails to give a decision in the matter within thirty days of the Board's telegram of request sent under No. 639AV, it shall be deemed that the administration with which co-ordination was sought has undertaken:
 - a) that no complaint will be made in respect of any harmful interference which may be caused to the services rendered by its space radiocommunication stations or its stations in the fixed or mobile / service by the use of the assignment for which co-ordination was requested;
 - b) that its space radiocommunication stations or its stations in the / fixed or mobile / service will not cause harmful interference to the use of the assignment for which co-ordination was requested

MOD 639AY

(7) Where necessary, as part of the procedure under No. 639AS, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.

ADD 639AZ

In the event of continuing disagreement between one administration seeking to effect co-ordination and one with which co-ordination has been sought, provided that the assistance of the Board has been requested, the administration seeking co-ordination may, after one hundred and fifty days from the date of the request for co-ordination, taking into consideration the provisions of No. 639BF send its notice concerning the proposed assignment to the Board.

(MOD) Section III Notification of frequency assignments

(MOD) 639BA

- §6 (1) Any frequency assignment to an earth or space station shall be notified to the International Frequency. Registration Board:
 - a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration; or

- if the frequency is to be used for international radiocommunications; or
- c) if it is desired to obtain international recognition of the use of the frequency.

(MOD) -639BB

(2) Similar notice shall be given for any frequency to be used for the reception of transmissions from earth or space stations by a particular space or earth station in each case where one or more of the conditions specified in No. 639BA are applicable.

(MOD) 639BC

(3) Similar notice may be given for any frequency or frequency band to be used for reception by a particular radio astronomy station, if it is desired that such data should be included in the Master Register.

ADD 639BD

(4) A notice submitted in accordance with No. 639BA or 639BB and relating to a frequency assignment to mobile earth stations in a satellite system shall include the technical characteristics either of each mobile earth station or of a typical mobile earth station and an indication of the service area within which these stations are to be operated.

MOD 639BE

For any notification under No. 639BA, 639BB, 639BC, or 639BD, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix $\sqrt{1}\text{A}/$, which specifies in Sections \sqrt{B} , C, D, E or F/ the basic characteristics to be furnished, according to the case. It is recommended that the notifying administration should also supply the additional data called for in Section $\sqrt{A}/$ of that Appendix, together with such further data as it may consider appropriate.

(MOD) 639BF (ex 639AL) \$8. (1) For a frequency assignment to an earth or space station, each notice must reach the Board not earlier than three years before the date on which the assignment is to be brought into use. The notice must reach the Board in any case not later than ninety days 1) before this date, except in the case of assignments in the space research service in bands allocated exclusively to this service or in shared bands in which this service is the sole primary service. In the case of such an assignment in the space research service the notice should, whenever practicable, reach the Board before the date on which the assignment is brought into use, but it must in any case reach the Board not later than thirty days after the date it is actually brought into use.

(MOD) 639 B G (ex 639AM) (2) Any frequency assignment to an earth or space station, the notice of which reaches the Board after the applicable period specified in No. 639BF, shall, where it is to be recorded, bear a mark in the Master Register to indicate that it is not in conformity with No. 639BF.

¹⁾ The notifying administration shall take this limit into account when deciding, where appropriate, to initiate the co-ordination procedure(s).

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- (MOD) Section IV Procedure for the examination of notices and the recording of frequency assignments in the Master Register
- (MOD) 639BH § 9. Any notice which does not contain at least those characteristics specified in Appendix /1A/ (Sections /B, C, D, E, or F,/as appropriate) shall be returned by the Board immediately, by sirmail, to the notifying administration with the reasons therefor.
- (MOD) 639BI \$10. Upon receipt of a complete notice, the Board shall include the particulars thereof, with the date of receipt, in the weekly circular referred to in No. 497, which shall contain the particulars of all such notices received since the publication of the previous circular.
- (MOD) 639BJ § 11. The circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.
- (MOD) 639BK § 12. Complete notices shall be considered by the Board in the order of their receipt. The Board shall not postpone the formulation of a finding unless it lacks sufficient data to render a decision in connection therewith; moreover, the Board shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Board, until it has reached a finding with respect to such earlier notice.

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(MOD) 639BL § 13. The Board shall examine each notice:

(MOD) 639BM

a) with respect to its conformity with the Convention, the Table of Frequency Allocations and the other provisions of the Radio Regulations (with the exception of those relating to the co-ordination procedure and the probability of harmful interference);

ADD 639BN

b) where appropriate, with respect to its conformity with the provisions of No. 639AJ, relating to the co-ordination of the use of the frequency assignment with the other administrations concerned vis-a-vis space radiocommunication stations.

MOD 639B0 (ex 639AT) c) where appropriate, with respect to its conformity with the provisions of No. 639AN relating to the co-ordination of the use of the frequency assignment with the other administrations concerned vis-a-vis stations in the _Fixed or Mobile 7 Service.

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ADD 639BP

d) where appropriate, with respect to the probability of harmful interference to the service rendered by a space radiocommunication station for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 639EM if this frequency assignment has not in fact caused harmful interference to any frequency assignment in conformity with No. 639EM previously recorded in the Master Register;

MOD 639BQ

e) where appropriate, with respect to the probability of harmful interference to the service rendered by a station in the /fixed or mobile / service for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 501 or /570AB/, as appropriate, if this frequency assignment has not, in fact, caused harmful interference to any frequency assignment in conformity with No. 639BM previously recorded in the Master Register;

ADD 639BR

of harmful interference caused to the receiving earth station by a station in the /fixed or mobile / service for which a frequency assignment already recorded in the Master Register is in conformity with No. 501 or /570AB /, as appropriate.

ADD 639BS

When, following an examination of a notice with respect to No. 639BP, the Board reaches an unfavourable finding based upon the probability of harmful interference to a recorded assignment for a space station which the Board has reason to believe may not be in regular use, the Board shall forthwith consult the administration responsible for the registered assignment. If it is established, after such consultation and on the basis of the information available, that the recorded assignment has not been in use for two years, it shall not be taken into account for the purposes of the examination in progress and any other further examination under No. 639BP conducted before the date on which the assignment is brought back into use. This date shall be entered in the Master Register. Before the assignment is brought back into use, it shall be subject to further co-ordination in accordance with the provisions of No. 639AJ or further examination by the Board with respect to No. 639BP as appropriate.

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MOD 639BT

Depending upon the findings of the Board subsequent to the examination prescribed in Nos. 639EM, 639EN, 639EO, 639EP, 639EQ, 639ER, as appropriate further action shall be as follows:

MOD 639BU .

- gl5 (1) Finding favourable with respect to No. 639RM in cases where the provisions of Nos. 639BN and 639BO are not applicable.
- (MOD) 639BV
- (2) The assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.
- (MOD) 639BW
- \$16 (1) Finding unfavourable with respect to No. 639BM

MOD 639BX

(2) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, and the finding is favourable with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

ADD 639BY

(3) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 and the finding is unfavourable with respect to No. 639BN, 639BO, 639BP, 639BQ or 639BR, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. Should the administration insist upon reconsideration of the notice, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column.

ADD 639BZ

- (4) The period of one hundred and twenty days mentioned in Nos. 639BY and 639CP shall count from:
 - the date when the assignment to the space radiocommunication station which received an unfavourable finding is brought into use, if the assignment to the station which was the basis for the unfavourable finding is then in use;

- otherwise, from the date when the assignment to the station which was the basis for the unfavourable finding is brought into use.

But if the assignment to the station which was the basis for the unfavourable finding has not been brought into use by the notified date, the period of one hundred and twenty days shall be counted from this date. Allowance shall, if necessary, be made for the additional period mentioned in No. 639CY.

(MOD) 639CA

(5) Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

MOD 639CB

(6) If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of No. 639CA. If it is resubmitted with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be treated in accordance with the provisions of No. 639BX or 639BY, as appropriate. If it is resubmitted with modifications which, after re-examination, result in a favourable finding by the Board with respect to No. 639BM, it shall be treated as a new notice.

MOD 639CC

\$17 (1) Finding favourable with respect to No. 639BM in cases where the provisions of No. 639BM or 639BO are applicable.

MOD 639CD

Annex to Document No. 347-F

MOD 639CE

(3) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has not been applied, and the notifying administration requests the Board to effect the required co-ordination, the Board shall take the appropriate action necessary and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with No. 639CD. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of Nos. 639BP, 639BQ and 639BR, as appropriate.

MOD 639CF

(4) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has not been applied, and the notifying administration does not request the Board to effect the required co-ordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

MOD 639CG

(5) Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedures mentioned in Nos. 639BN and 639BChave been successfully completed with all administrations whose space radiocommunication stations or stations in the fixed or mobile service may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

MOD 639CH

(6) Where the notifying administration resubmits the notice with a request that the Board effect the required co-ordination under No. 639AJ or 639AN, it shall be treated in accordance with the provisions of No. 639CE. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

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MOD 639CI

(7) Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the co-ordination, the Board shall inform the administrations concerned thereof. The notice shall be examined by the Board with respect to the provisions of Nos. 639BP and 639BQ, as appropriate. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

MOD 639CJ

\$ 18.(1) Finding favourable with respect to Nos. 639BM, 639BP, 639BQ and 639BR, as appropriate.

(MOD) 6390K

(2) The assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

ADD 639CL

(3) However, should the examination show that the level of the interference noise and the percentage of time during which it occurs have values slightly greater than those used for assessing the probability of harmful interference (extreme propagation conditions, abnormal atmospheric humidity, etc.), a remark shall be included in the Master Register to show that there may be a slight risk of harmful interference and hence additional precautions must be taken in the use of the assignment to avoid harmful interference to assignments already recorded in the Master Register.

MOD 639CM

\$ 19. (1) Finding favourable with respect to No. 639EM but unfavourable with respect to Nos. 639EP, 639EQ or 639ER, as appropriate.

(MOD) 639CM

(2) The notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

MOD 63900

(3) Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to Nos. 639BP, 639BQ and 639BR, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.

MOD 639CP

(4) Should the notifying administration resubmit the notice, either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of No. 63900 to be applied, and should that administration insist upon reconsideration of the notice, but should the Board's finding remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column. The period of one hundred and twenty days shall count from the date indicated in No. 639BZ.

(MOD) 639CQ

g20 (1) Notices relating to radio astronomy stations.

MOD 639CR

- (2) A notice relating to a radio astronomy station shall not be examined by the Board with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR. Whatever the finding, the assignment shall be recorded in the Master Register with a date in Column 2c. The date of receipt by the Board of the notice shall be recorded in the Remarks Column.
- (MOD) -639CS
- §21 (1) Change in the basic characteristics of assignments already recorded in the Master Register.

MOD 639CT

(2) A notice of a change in the basic characteristics of an assignment already recorded, as specified in Appendix 147 (except the name of the station or the name of the locality in which it is situated) shall be examined by the Board according to No. 639BM, and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, and the provisions of Nos. 639BU to 639CR inclusive applied. Where the change should be recorded, the assignment shall be amended according to the notice.

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MOD 639CU

- (3) However, in the case of a change in the characteristics of an assignmend which is in conformity with No. 639BM, should the Board reach a favourable finding with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, where appropriate, or find that the change does not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. The date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.
- (MOD) 639CV
- g22 In applying the provisions of the whole of this Section, any resubmitted notice which is received by the Board more than two years after the date of its return by the Board, shall be considered as a new notice.
- (MOD) 639CW
- §23 (1) Recording of Frequency Assignments notified before being brought into use.

MOD 639CX

(2) If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to No. 639BM and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

(MCD) 639CY

(3) If, within the period of thirty days after the projected date of bringing into use, the Board receives confirmation from the notifying administration of the date of putting into use, the special symbol shall be deleted from the Remarks Column. In the case where the Board, in the light of a request from the notifying administration received before the end of the thirty-day period, finds that exceptional circumstances warrant an extension of this period, the extension shall in no case exceed one hundred and fifty days.

MOD 639CZ

(4) In the circumstances described in Nos. 639BY and 639CP, and as long as an assignment which received an unfavourable finding cannot be resubmitted as a consequence of the provisions of No. 639BZ, the notifying administration may ask the Board to enter the assignment provisionally in the Master Register, in which event a special symbol to denote the provisional nature of the entry shall be entered in the Remarks Column. The Board shall delete this symbol when it receives from the notifying administration, at the end of the period specified in No. 639BY or 639CP, as appropriate, the information relating to the absence of complaint of harmful interference.

MOD 639DA

(5) If the Board does not receive this confirmation within the period referred to in No. 639CY or at the end of the period referred to in No. 639BY or 639CP as appropriate the entry concerned shall be cancelled. The Board shall advise the administration concerned before taking such action.

(MOD)

Section V. Recording of findings in the Master Register

MOD 639DB

In any case where a frequency assignment is recorded in the Master Register, the finding reached by the Board shall be indicated by a symbol in Column 13a. In addition, a remark indicating the reasons for any unfavourable finding shall be inserted in the Remarks Column.

(MOD)

Section VI. Categories of frequency assignments

(MOD) 639DC

§25 (1) The date in Column 2c shall be the date of putting into use notified by the administration concerned. It is given for information only.

ADD 639DD

reception of any space radiocommunication station whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to Nos. 639BM, 63

(MOD) 639DE

(MOD)

Section VII. Review of findings

(MOD) 639DF

§26 (1) The review of a finding by the Board may be undertaken:

- at the request of the notifying administration,
- at the request of any other administration interested in the question, but only on the grounds of actual harmful interference,
- on the initiative of the Board itself when it considers this is justified.

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MOD 639DG

(2) The Board, in the light of all the data at its disposal shall review the matter, taking into account No. 639BM and Nos.639BN, 639BO, 639BP, 639BQ and 639BR, where appropriate, and shall render an appropriate finding, informing the notifying administration prior either to the promulgation of its finding or to any recording action.

MOD 639DH

period of an assignment which has been entered in the Master Register on the insistence of the notifying administration, following an unfavourable finding with respect to Nos. 639BP, 639BQ or 639BR, this administration may request the Board to review the finding. Thereupon the Board shall review the matter, having first consulted the administrations concerned.

(MOD) 639DI

(2) If the finding of the Board is then favourable it shall enter in the Master Register the changes that are required so that the entry shall appear in the future as if the original finding had been favourable.

(MOD) 639DJ

(3) If the finding with regard to the probability of harmful interference remains unfavourable, no change shall be made in the original entry.

(MOD)

Section VIII. Modification, cancellation and review of entries in the Master Register.

ADD 639DK

\$28.(1) Where the use of a recorded assignment to a space station is suspended for a period of eighteen months, the notifying administration shall, within that eighteen month period, inform the Board of the date on which such use was suspended and of the date on which the assignment is to be brought back into regular use.

ADD 639DL

(2) Whenever it appears to the Board, whether or not as a result of action under No. 639DK, that a recorded assignment to a space station has not been in regular use for more than eighteen months, the Board shall enquire of the notifying administration as to when the assignment is to be brought back into regular use.

ADD 639DM

(3) If no reply is received within six months of action by the Board under No. 639DL, or if the reply does not confirm that the assignment to a space station is to be brought back into regular use within this six month limit, a mark shall be applied against the entry in the Master Register. Thereafter, the assignment shall be treated in accordance with No. 639BS as one which has been established as having been out of regular use for two years.

Armex to Document No. 347-E Page 40

- (MOD) 639DN § 29. In case of permanent discontinuance of the use of any recorded frequency assignment, the notifying administration shall inform the Board within ninety days of such discontinuance, whereupon the entry shall be removed from the Master Register.
- (MOD) 639DO § 30. Whenever it appears to the Board from the information available that a recorded assignment has not been brought into regular operation in accordance with the notified basic characteristics, or is not being used in accordance with those basic characteristics, the Board shall consult the notifying administration and, subject to its agreement, shall either cancel or suitably modify the entry.

MOP 639DP

§ 31. If, in connection with an enquiry by the Board under No. 639DO, the notifying administration has failed to supply the Board within forty-five days with the necessary or pertinent information, the Board shall make suitable entries in the Remarks Column of the Master Register to indicate the situation.

(MOD)

Section IX. Studies and Recommendations

(MOD) 659DQ

§ 32.(1) If it is requested by any administration, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall conduct a study of cases of alleged contravention or non-observance of these Regulations, or of harmful interference.

(MOD) 639DR

(2) The Board shall thereupon prepare and forward to the administration concerned a report containing its finding and recommendations for the solution of the problem.

(MOD) 639DS

So. In a case where, as a result of a study, the Board submits to one or more administrations suggestions or recommendations for the solution of a problem, and where no answer has been received from one or more of these administrations within a period of ninety days, the Board shall consider that the suggestions or recommendations concerned are unacceptable to the administrations which did not answer. If it was the requesting administration which failed to answer within this period, the Board shall close the study.

(MOD)

Section X. Miscellaneous Provisions

ADD 639DT

- § 34. (1) If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:
 - a) computation of the increase in the equivalent noise temperature of an earth station receiver as in 639AK:
 - b) preparation of the diagram showing co-ordination area as in 639AN:
 - c) any other assistance of a technical nature for completion of the procedures in this Article;

ADD 639DU

(2) In making a request to the Board under 639DT, the administration shall furnish the Board with the necessary information.

MOD 639DV

g 35. The technical standards of the Board shall be based upon the relevant provisions of these Regulations and the Appendices thereto, the decisions of Administrative Conferences of the Union as appropriate, the Recommendations of the G.C.I.R., the state of the radio art, and the development of new transmission techniques.

(MOD) 639DW

§ 35. The Board shall promulgate to administrations its findings and reasons therefor, together with all changes made to the Master Register, through the weekly circular referred to in No. 497.

(MOD) 639DX

§ 37. In case a Member or Associate Member of the Union avails itself of the provisions of Article 28 of the Convention, the the Board shall, upon request, make its records available for such proceedings as are prescribed in the Convention for the settlement of international disputes.



SPACE CONFERENCE

Document No. 548-E

10 July 1971

Original : English

French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SEVENTH REPORT FROM COMMITTEE 4

Additions to Sections IIA, IIB and III of Article 1 appearing in the Annex hereto have been approved by Committee 4.

The texts in question have been forwarded to the Drafting Committee.

E.F. SANDBACH Chairman Committee 4

Annex : 1



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ANNEX

1. Terms and definitions to be added in Section [IIA]:

ADD 84ALA Satellite network

A satellite system consisting of a single satellite and the co-operating earth stations.

ADD 84ALB Satellite link

A radio link between a transmitting earth station and a receiving earth station through one satellite.

A satellite link comprises one up-path and one down-path.

ADD 84ALC Multi-satellite link

A radio link between a transmitting earth station and a receiving earth station through two or more satellites, without any intermediate earth station.

A multi-satellite link comprises one up-path, one or more satellite-to-satellite paths and one down-path.

[2. Term and definition to be added in Section IIB:]

ADD 84BFA Geosynchronous satellite

An earth satellite whose period of revolution is equal to the period of rotation of the Earth about its axis.

[3. Terms and definitions to be added in Section III:]

ADD 103A Equivalent satellite-link noise temperature

The noise temperature at the input of the earth station receiver corresponding to the radio frequency noise power which produces the total observed noise at the output of the satellite link excluding noise due to interference coming from satellite links using other satellites and from terrestrial systems.

Annex to Document No. 348-E

Page 4

ADD 103B Co-ordination distance

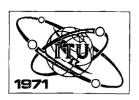
Distance from an earth station in a given azimuth within which a terrestrial station sharing the same frequency band may cause or be subject to more than a permissible level of interference.

ADD 103C Co-ordination contour

The line on a geographical map on which an earth station location is represented joining the points on all azimuths around this earth station which are at a distance equal to the co-ordination distance corresponding to each azimuth.

ADD 103D Co-ordination area

Area around an earth station enclosed by the co-ordination contour.



SPACE CONFERENCE

Document No. 349-E 10 July 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

DRAFT RECOMMENDATION No.

(following the discussion in 3rd Plenary Meeting)

relating to the use of satellite communication systems in the event of natural disasters, epidemics, famines and similar emergency situations

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that in the case of natural disasters, epidemics, famines and similar emergency situations lives can be saved by prompt and effective relief;
- b) that rapid and reliable telecommunications are essential for relief operations;
- c) that, through damage or from other causes, the normal telecommunications facilities in disaster areas are often inadequate for relief operations and cannot be restored or supplemented quickly through local resources;
- d) that use of communication-satellite systems is one of the means by which rapid and reliable telecommunications could be provided for relief operations;

noting

- a) that known planning of communication-satellite systems makes no provision for specific frequencies or channels for emergency communications;
- b) that in the absence of such planning it is not feasible to proceed with specifications for rapidly transportable universally operable earth stations;



recommends

- that administrations, individually or in collaboration, provide for the needs of eventual relief operations in planning their communication-satellite systems, and identify for this purpose preferred radio-frequency channels and facilities which could quickly be made available for relief operations;
- 2. that administrations concerned waive the co-ordination procedures provided for in the Radio Regulations in the case of transportable earth stations used for relief operations;

requests

the C.C.I.R. to study standard specifications and preferred frequencies for transportable earth stations, and compatible mobile and transportable fixed communications for relief operations;

invites

the Secretary General to bring this Recommendation to the attention of the United Nations, the Specialized Agencies and other international organizations concerned, in order to ensure full co-operation in the implementation of this Recommendation.



SPACE CONFERENCE

Document No. 350-E 13 July 1971

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

LIST OF DOCUMENTS

No.	Origin	Title	Destination
1	s.G.	Agenda for the Conference	PL
2	S.G.	Prop., Symbols etc.	PL
3	Denmark	Prop., RR Art. 5	PL
4	F.R. of Germany	Prop., RR Art. 1	PL
5 + Corr.1, 2	F.R. of Germany	Prop., RR Art. 5	PL
6	S.G.	Opinion expressed by the Plan Committee for Europe and the Mediterranean Basin	PL
+ Corr.1,2	S wed en	Prop., RR Art. 5	PL
8	Norway	Prop., RR Art. 5	PL
9	Australia	Prop., RR Art. 1	PL
10 + Corr.1, 2	Australia	Prop., RR Art. 5	PL
11	Australia	Prop., RR Art. 7	PL
12(Rev.)	Canada	Proposals	PL
13(Rev.)	Canada	Prop., RR Art. 1	PL
14(Rev.) + Corr.	Canada	Prop., RR Art. 5	PL
15(Rev.)+Add	Canada	Prop., RR Art. 7	PL
16(Rev.)	Canada	Prop., RR Art. 9	PL
17(Rev.)	Canada	Prop., RR Art. 9A	PL
18(Rev.)	Canada	Prop. RR Art. 14	PL
19(Rev.)	Canada	Prop., RR Art. 15	PL
20(Rev.)	Canada	Prop., RR New App. 1B	PL
21	Argentina	Prop., RR Art. 1	PL
2+Corr.1,2	Argentina	Prop., RR Art. 5	PL ·
23 + Corr.	Argentina	Prop., RR Art. 7	PL
24 + Corr.	Argentina	Prop., RR Art. 14	PL

No.	Origin	Title	Destination
25 + Corr.	Argentina	Prop., RR Art. 41	PL
26+Corr.	Argentina	Prop., RR Res. Spa. 1	PL
27+ Add.	Argentina	Prop., RR Rec. 16	PL
28 + Corr.	U.S.A.	Proposals	PL
1, 2, 3 Corr.1,2 to Corr.1 to 28	U.S.A.	Revised curves for the determination of coordination distance in shared frequency bands between 1 and 40 GHz	PL
29	Japan	Prop., RR Art. 1	PL
30 + Corr.	Japan	Prop., RR Art. 5	PL
1, 2, 3 31 + Corr.	Japan	Prop., RR Art. 7	PL
32	Japan	Prop., RR Art. 8	PL
33	Japan	Prop., RR Arts. 9 & 9A	$_{ m C}$ PL
34	Japan	Prop., RR Rec. Spa. 7	PL
35 ÷	India	Prop., RR Art. 5	PL
Corr.1, 2		110p., 14. A20.	
36	India	Prop., RR Art. 9A	PL
37	India	Prop., Frequency sharing	${ m PL}$
38	India	Prop., RR Art. 1	${ m PL}$
39 + Corr.	India	Prop., RR Art. 5	PL
40	France	Prop., RR Art. 1	${ t PL}$
41	France	Prop., RR Art. 5	PL
42	France	Prop., RR Art. 6	PL
43 + Corr.	France	Prop., RR Art. 7	PL
44	France	Prop., RR Art. 9A	${\tt PL}$
45	France	Prop., RR App. 1A	PL
46 + Corr.	France	Prop., RR App. 1B	PL
47	France	Draft Recommendation	${ m PL}$
48	France	Draft Recommendation	${ t PL}$
49	Neth erla nds	Prop., RR Art. 5	\mathbf{PL}
50	S.G.	List of documents	-

No.	Origin	Title	Destination
51	United Kingdom	Explanatory memorandum covering the Frequency, administrative and technical aspects of the U.K. Proposals for the World Administrative Radio Conference for Space Telecommunications	PL
52	United Kingdom	Control of interference between geo- stationary satellite systems and non- synchronous inclined-orbit satellite systems using the same frequencies in the communication-satellite bands	PL
53	United Kingdom	Prop., RR Art. 1	${ m PL}$
54 + Corr.	United Kingdom	Prop., RR Art. 5	${ t PL}$
55	United Kingdom	Prop. RR Art. 7	${ m PL}$
56	United Kingdom	Prop., RR Arts. 9 & 9A	PL
57	United Kingdom	Draft Resolution C	PL
58	S.G.	International cooperation in the peaceful uses of outer space	PI.
59	U.S.S.R.	Frop., RR Art. 5	${ t PL}$
60	Australia	Prop., RR Art. 5	PL
61 + Corr.	S.G.	Report of the I.F.R.B.	PL
62	New Zealand	Prop., RR Art. 5	PL
63	Sweden	Prop., FR Art. 5	\mathtt{PL}
64 + Corr.1,2	S.G.	Special Joint Meeting of C.C.I.R. Study Groups	${ m PL}$
65	S.G.	Suggestions for the organization of the work of the Conference	PL
66	New Zealand	Additional Prop., RR Art. 5	PI,
67	Australia	Prop., RR Art. 1	PL
68	Sweden	Additional Prop., RR Art. 5	${ m PL}$
	·		·

No.	Origin	Title	Destination
69	Brazil	Prop., RR Arts. 1, 5, 7, 8, 9, 9A & 14	PL
70	Brazil	Prop., RR Art. 1	PL
71 + Corr.	Brazil	Prop., RR Art. 5	PL
72 +Corr.1,2	Brazil	Prop., RR Art. 7	PL
73	Brazil	Prop., RR Art. 8	PL
74	Brazil	Prop., RR Art. 9	PL
75	Brazil	Prop., RR Art. 9A	PL
76	Brazil	Prop., RR Art. 14	PL
77	Mexico	Proposals	PL
78	Mexico	Prop., RR Art. 2	PL
79	United Kingdom	Coordination between geostationary communication satellite system sharing the same frequency bands	PI.
80	United Kingdom	Prop., RR App. 1A	PL
81	United Kingdom	Rev. Prop., RR Art. 7	PL
82	C hina	Prop., RR Art. 1	PL
83	France	Add. Prop., RR Art. 1	PL
84	France	Rev. Prop., RR Art. 5	PL
85	France	Add. Prop., RR Art. 6	PL
. 86	France	Rev. Prop., RR Art. 7	PL
87	France	Add. Prop., RR Art. 9A	PL
8 8	France	Proposals concerning the determination of the coordination area for earth stations	PL
89	France	Draft Recommendation	PL
90	France	Proposals on the establishment of plans for satellite broadcasting	PL
91	s.G.	Convening of the Conference	PL

No.	Origin	Title	Destination
92	s.G.	Invitations to the World Administrative Radio Conference for Space Telecommunications	PL
93 + Corr. + Add.	s.G.	Notification to international organizations	PL
94+Add.1,2,3	s.G.	Situation of certain countries with respect to the International Telecommunication Convention, Montreux (Montreux, 1965)	ΡĻ
95	United Kingdom	Rev. Prop., Art. 9A	PL
96	United Kingdom	Draft Recommendation	PL
97	Japan	Prop., Art. 1	PL
98 + Corr.1,2	Japan	Prop., Art. 5	PL
99	Japan	Prop., Art. 7	PL
100	Secretariat	List of documents	PL
101	U.S.A.	A study of international aeronautical communications/navigation satellite system-channel/spectrum requirements (1 535-1 560 MHz)	PL
102	U.S.A.	Artificial site shielding	${ m PL}$
103	U.S.A.	Signal levels in the rear section of an operational earth station antenna	PL
104	Mexico	Amateur service	PL,
105	Mexico	Survey of earth resources	
106	Mexico	Satellite broadcasting	P,Ľ
107(Rev.)	Secretariat	Programme of work for the Conference as recommended by the meeting of Heads of delegations	PL
108	United Kingdom	Proposals for frequency allocations to the maritime mobile service using space communication techniques at frequencies	
		of the order of 450-600 MHz	PL

No.	Origin	Title	Destination
109(Rev.)	Sceretariat	Assignment of proposals	PL
110	Chile	Proposed amendment concerning the aeronautical mobile service	PI.
lll + Corr.	India	Likelihood of interference to the receivers of tropospheric scatter links operating over the frequency band 845-935 MHz in Regions 1 and 3 from the emissions of an Indian broadcasting sctulite proposed to be located at longitude 79 degrees East in the geostationary orbit	PL
112	In dia	Prop., RR Art. 5 and 7	PL
113	UNESCO	Frequency allocations for space communications	PL
114	Mexico	Proposed amendments to Chapter II (frequencies)	\mathtt{PL}
115	I.P.T.C.	The transmission of news by satellite	PL
116	Secretariat	Committee structure	${ t PL}$
117 (Rev.)	U.S.S.R.	Draft Resolution No. Spa. F	PL
118	Secretariat	Structure of the Working Groups of Com. 4	Com. 4
119	Argentina	Prop., RR Art. 5	PL
120	Com. 5	Structure of the Working Groups of Com. 5	℃m. 5
121	Brazil	Draft Recommendation H	\mathtt{PL}
122(Rev.)	Com. 6	Structure of the Working Groups of Com. 6	Com. 6.
123	Rep. of India	Satellite instructional television experiment (site)	PL

No.	Origin	Title	Destination
124		Preliminary comments on the proposals for the maritime mobile service	PL
125	Greece	Prop., RR Art. 5	Com. 5
126	Com. 5	Note by the Chairman - Categories of services and allocations	Com. 5
127	Com. 4	Summary Record of the first meeting of Com. 4	Com. 4
128	Com. 2	Summary Record of the first meeting of Com. 2	Com. 2
129	PL	Minutes of the first Plenary Meeting	PL
130 + Corr.	Malaysia	General comments concerning RR Art. 5 - broadcasting satellite service	Com. 5
131	Japan	Allowable power flux-density produced at the surface of the Earth by a satellite if radio-relay systems were to share the frequency with space services in the band 2.3-3 GHz	Com. 4
132	Japan	Information document relating to allocation of frequencies above 40 Gc/s	PL
133 + Corr.	United Kingdom	Proposals for frequency allocations to the maritime mobile service using space communication techniques at frequencies of the order of 450-600 Mc/s	PL
134	I.A.T.A.	I.A.T.A. views on Article 5 of the RR	PL
135	I.M.C.O.	Recommendations concerning maritime requirements for the use of space techniques	WG 5D

136	Norway	Supplementary information to Document No.8 on spectrum/channel requirements for the	
137		international maritime communications satellite system	`PL
137	Norway	Modification to No. 322 of Article 5 to the RR	Com. 5
138	Mexico	Draft Resolution No. G	\mathtt{PL}
139	Japan	Frequency sharing between communication- satellite systems and radio-relay systems at frequencies above 15.4 GHz	Com. 5
140	Japan	Project of 20 GHz large-capacity digital radio-relay system in Japan	Com. 5
141	Japan	Draft Resolution H	PL
142 + Add.	Com. 6	Summary Record of the first meeting of Com. 6	Com. 6
143	India	Techno-economic considerations in the use of the 12 GHz band for satellite broad-casting in the tropical countries	Com. 4 & 5
144	Cuba	Amateur service	PL
145	Com. 5	Provisional Summary Record of the first meeting of Com. 5	Com. 5
146	WG ⁴A	First report from WG 4A, revision of Article 1, Section III	Com. 4
147	Secretariat	Note by the Secretariat - Communication from the Czechoslovak Delegation	PL
148	Rep. of India	Prop., RR Art. 5	Com. 5
149 + Corr.	Kenya Tanzania Uganda	General observations concerning proposals - Article 5 of the RR	Com. 5
150	Secretariat	List of documents	PL

No.	Origin	Title	Destination
151	WG 5D	Note from Working Group 5D to Working Groups 5B and 5C	WG 5B and WG 5C
152	WG 50	Note from Working Group 5D to Working Group 5B	WG 5B
153	WG 5D	Note from Working Group 5D to Working Group 5E	WG 5E
154	Com. 2	First report by the Working Party of Committee 2 (Credentials)	Com. 2
155	WC 4B	Note by the Chairman of Working Group 4B	WG 4B
156	s.c.	Budget of the Conference	Budget control Committee
157	s.c.	Contributions of recognized private operating agencies and international organizations not enjoying exemption	Budget control Committee
158	S.G.	Cost of printing the Final Acts	Com. 3
159	S.G.	Situation concerning expenditure for the Space Conference at 1 June 1971	Budget control Committee
160	WG 4A	Second report - Revision of Section I of Article 1	Com. 4
161	Com. 5	Summary Record of the Second Meeting of Committee 5	Com. 5
162	Rep. of Indonesia	Proposal for amendment of foot-note 311A of the Radio Regulations	Com. 5
163	WG 4B	Article 7 Proposed partial text of Section VIII	WG 4B
164	U.S.A. & Canada	Prop., RR Art. 5	Com. 5
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No.	Origin	Title	Destination
155(Rev.)	Rep. of Indonesia	Reservation regarding 470BA	Com. 4
166	WG 4A	Third Report - Revision of Article 1, Section IIB	Com. 4
167(Rev.) + Corr.	Com. 2	Summary Record of the Second Meeting of Committee 2 (Credentials)	Com. 2
168	U.S.A.	Recommendation No. I	Com. 4
169	Com. 4	Summary Record of the Second Meeting of Committee 4 (Technical)	Com. 4
170(Rev.)	United Kingdom	Draft Resolution No. I	WG 6A
171	United Kingdom	Protection ratio measurements and interference calculations for FM television signals affecting V.S.B. AM television reception in the same channel (625 lines PAL colour system)	Com. 4
172+Corr.	United Kingdom	Aeronautical and Maritime Satellite Services in the band 1 535-1 660 MHz	Com. 5
173	Chairman of the Conference	Memorandum relating to proposals presented by Poland	PL
174(Rev.)	WG 4D	First report of Working Group 4D to Committee 4	Com. 4
175	PL	Minutes of the second Plenary Meeting	PL
176	WG 5D	Note from Working Group 5D to Chairman of Committee 5	Com. 5
177 (Rev.)	WG 5B	First report of Working Group 5B to Committee 5 (Allocations)	Com. 5
178	U.S.A.	Proposals in the band 2 500-2 690 MHz	Com. 5
179 + Corr.	Argentina	Survey of earth resources	PL
	•	4	

No.	Origin	Title	Destination
180(Rev.)	Com. 4	Proposals concerning Broadcasting Satellite Service	Com. 6
181 (Rev.2)	WG 5C	First Report of Working Group 5C to Committee 5	Com. 5
182	I.A.R.U.	Space techniques in the Amateur Service	PL
183	Argentina	Prop. RR App. 10	Com. 6
. 184	Com. 2	Second report by the Working Party of Committee 2 (Credentials)	Com. 2
185 (Rev.)	WG 5C	Note from Working Group 5C to Working Group 5D	WG 5D
186	Sub-WG 5 ad hoc-1	Terms and Definitions, section IIa, RR Art. 1	WG 5 ad hoc
187(Rev.	WG 5B	Second Report to Com. 5	Com. 5
188 (Rev.)	France	Draft Resolution No. J	Com. 4
189	I.A.F.	Position paper for the World Administrative Radio Conference for Space Telecommunications	PL
190	Australia	Prop. RR Art. 5	WG 5E
191	WG 4B	Partial Revision of Recommendation No. Spa 3	Com. 4
192	Com. 4	Summary Record of the third Meeting of Com. 4	Com. 4
193	WG 4D	Third Report of WG 4D to Committee 4	Com. 4
194 + Corr. + Add.1,2 (Rev.)	WG 4D	Fourth Report of Working Group 4D to Committee 4. Proposed new Appendix 29	Com. 4

No.	Origin	Title	Destination
195	WG 6B	First Report - Revision of Articles 8, 14, 15 and Article 1 (Section III)	Com. 6
196	WG 4B	Note from the Chairman to WG 4A and Com. 4	Com. 4
197	France	Amendment to French proposals F/41/86, F/41/87 and F/41/87A	Com. 5
198+Add.1 (Rev.)	WG 4B	Art. 7 - Proposed partial text of Section VIII	Com. 4
199	Sub-WG 5D-1	Terms of reference	Sub-WG 5D-1
200	Secretariat	List of documents	PL
201	I.P.T.C.	News distribution by satellite service	PL
202	Sub-WG 5E-1	First Report of Sub-Working Group 5E-1 to Working Group 5E	WG 5E
203+Corr.	WG 5D	First Report to Committee 5	Com. 5
204	Sub-WG 5E-2	Report of Sub-Working Group 5E-2 to Working Group 5E	WG 5E
205	Canada	Draft Recommendation No. J	Com. 5
206	W G 4 B	Note from the Chairman of Working Group 4B Report on techno-economic comparison among the candidate bands of 800, 2 500, 12 000 Mc/s for broadcasting satellite service in new and developing countries situated in the tropical zone	WG 5E
207	United States	Technical aspects of sharing between transhorizon radio relay systems and broadcasting satellite systems in the vicinity of 800 MHz	Com. 4

No.	Or i gin	Title	Destination
208	U nited States	Geographical sharing between the space and terrestrial broadcasting services below 1 GHz	Com. 4
209	WG 4D	Second report to Committee 4	Com. 4
210	WG 4D	Fifth report to Committee 4	Com. 4
211	WG 4D	Sixth report to Committee 4	Com. 4
212	Com. 3	Report of the first meeting of Committee 3	Com. 3
213	Sub-WG 5D-2	Mandate of Sub-Working Group 5D-2	Sub-WG 5D-2
214	WG 5C	Note from Working Group 5C to Chairman of Committee 5	Com. 5
215	WG 5C	Note from Working Group 5C to Working Groups 5A and 5D	WG 5A and 5D
216	WG 518	Note from the Chairman of Working Group 5B to the Chairmen, Committee 5 and Working Group 5A	Com. 5 and WG 5A
217	United States	Amendment to Proposal USA/28/90	WG 5A
218 + Corr.	WG 5 Ad hoc	First report of Working Group 5 Ad hoc to Committee 5	Com. 5
219	Com. 6	Letter from the Chairman of Committee 6 to the Chairman of the Conference	PL
220	WG 4D	Seventh report of Working Group 4D to Committee 4	Com. 4
221	WG 4D	Eighth report of Working Group 4D to Committee 4	Com. 4
222	United States	Frequency band: 115.16-115.38 GHz - radio astronomy	Com. 5 and WG 5B
223	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 6	Com. 6

NO	Origine	Titre	Destination
224	Rép. des Philippines	Projet de Recommandation N ^O K	PL
225	GT 5A	Premier Rapport du Groupe de travail 5A à la Commission 5	Com. 5
226	GT 5B	Note du Président du Groupe de travail 5B aux Présidents des Groupes de travail 5A et 5E	Com. 5 et GT 5A, 5B et 5E
227	Com. 4	Compte rendu de la quatrième séance de la Commission 4	Com. 4
228	Com. de contrô- le budgétaire	Premier Rapport de la Commission de contrôle budgétaire	PL
229	Etats-Unis	Distances de coordination pour les sta- tions terriennes du service d'études des sciences de la Terre par satellites	PL
230+A dd .	Iraq	Observations générales concernant les différentes propositions d'attribution des bandes comprises entre 40 et 275 GHz à différents services	Com. 5
231 (Rev.2)	GT 5C	Note du Groupe de travail 5C à la Commission 5	Com. 5
232 (Rev.)	Etats-Unis	Prop., RR Art.5	Com. 5
233	Sous-GT 5B-1	Rapport du Sous-Groupe de travail 5B-l au Groupe de travail 5B	GT 5B
234	GT 4E	Premier Rapport-Projet de nouvelle réso- lution relative à l'utilisation expéri- mentale des ondes radioélectriques par	
		les satellites servant à la recherche ionosphérique	Com. 4
235	GT 4E	Deuxième Rapport - texte proposé pour la Section IX de l'Article 7	Com. 4
236(Rev.)	GT 5C	Deuxième Rapport du Groupe de travail 5C à la Commission 5	Com. 5
237(Rev.)	GT 5C	Troisième Rapport du Groupe de travail 50 à la Commission 5	Com. 5

No.	Origin	Title	Destination
140.0	OTTENT	11016	2000111111111111
238 (Rev.)	WG 5C	Fourth report of Working Group 5C to Committee 5	Com. 5
239	WG 5D	Second report of Working Group 5D to Committee 5	Com. 5
240	WG 5D	Third report of Working Group 5D to Committee 5	Com. 5
241	W G 5D	Fourth report of Working Group 5D to Committee 5	Com. 5
242	Sub-WG 5D-3	Terms of reference of Sub-Working Group 5D-3	Sub-WG 5D-3
243	Com. 4	Summary Record of the fifth meeting of Committee 4	Com. 4
244	Sweden	Proposals for allocation of bands for introduction of space techniques for the maritime mobile service in the higher VHF-lower UHF range	Com. 5
245	Rep. of India	Prop., RR Art. 6	Com. 5
246	Com. 2	Summary Record of the third meeting of Committee 2	Com. 2
247	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 6	Com. 6
248	WG 5E	First report of Working Group 5E to Committee 5	Com. 5
249	Com. 6	First report from Committee 6	PL
250	Sec retariat	List of documents	PL
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No.	Origin	Title	Destination
251	WG 5 Ad hoc	Second report of Working Group 5 Ad hoc to Committee 5	Com. 5
252	Com. 2	Report by Committee 2	PL.
253	WG 4E	Third report of Working Group 4E - Proposed new draft resolution relating to the technical criteria recommended by the C.C.I.R. for sharing between the space and terrestrial services and within the space service	Com. 4
254 + Corr.	WG 5A	Second report of Working Group 5A to Committee 5 - Frequency bands above 40 Gc/s	Com. 5
255	Com. 5	Note from the Chairman of Committee 5 relating to the newly adopted service names and the equivalent terms	Com. 5
256	Com. 5	Summary record of the third meeting of Committee 5	Com. 5
257 + Corr.	WG 5A and 5E	Note by the Chairmen of Working Groups 5A and 5E - Communication- satellite and broadcasting- satellite services	Com. 5 WG 5A and WG 5E
258 + Add.	WG 4C	Draft New Appendix 28 - Procedure for calculating co-ordination distance between earth stations and terrestrial stations sharing the same frequency band in the range 1-40 GHz	WG 4C
2 59	WG 4E	Fourth report of Working Group 4E - Proposed draft text for addition to Article 41 of the RR	Com. 4
260	WG 4E	Fifth report of Working Group 4E	Com. 4
261	Com. 3	Summary record of the second meeting of Committee 3	Com. 3
262	PL	Minutes of the Extraordinary Plenary Meeting held on 30 June 1971	PL

No.	Origin	Title	Destination
263	WG 4C	Question from the Chairman of Working Group 4C to the Chairman of Working Group 4E	WG 4E
264	WG 5A	Third report from Working Group 5A to Committee 5 - Frequency bands: 1 435-2 690 Mc/s and 3 500-3 700 Mc/s	Com. 5
265	WG 4C	Report of the Chairman of Working Group 4C concerning the draft recommendation on the co-ordination of earth stations and a proposed addition to draft Recommendation No. Spa 3	Com∙ 4
266	WG 4C	Report of the Chairman of Working Group 4C concerning the notes to be considered by Committee 6	Com. 6
267	Com. 4	First report from Committee 4	P I.
268	Com. 5	Note from the Chairman of Committee 5 relating to the presentation of reports containing revisions to Article 5 of the RR	Com. 5
269	WG 4C	Report from the Chairman of Working Group 4C to Committee 4	Com. 4
270	Com. 7	Summary record of the first meeting of Committee 7	Com. 7
271	Com. 4	Second report from Committee 4	PL
272	Canada and New Zealand	Joint alternative proposal to Proposal CAN-USA/164/4	Com. 5
273 (Rev.)	WG 5A and 5E	Joint report by Working Groups 5A and 5E to Committee 5	Com. 5
274	W G 4B	Report of the Chairman of Working Group 4B on space services sharing frequency bands with terrestrial services around 2.5 Gc/s	Com. 4

No.	Or i gin	Title	Destination
2 7 5	WG 4B	Report from the Chairman of Working Group 4B relating to proposed partial text of Section VIII, Art. 7, relating to limits of power flux-density from space stations in the bands between 2.3 to 3 Gc/s	Com. 4
276	Chairman	Memorandum by the Chairman concerning the letter sent by the Heads of the Delegations of the Union of Soviet Socialist Republics, the Ukrainian Soviet Socialist Republic and the Bielorussian Soviet Socialist Republic	PL
277	Greece	Draft Resolution No. K	Com. 5
278	₩ G . 4B	Report from the Chairman of Working Group 4B relating to the power flux- density limits in the frequency band 614-790 Mc/s for broadcasting- satellite service	Com. 4
2 7 9	WG 5B	Third report of Working Group 5B to Committee 5	Com. 5
280	WG 5B	Fourth report of Working Group 5B to Committee 5	Com. 5
281	WG 5E	Third report of Working Group 5E to Committee 5	Com. 5
282	Sweden	New foot-note to Art. 5 of RR, 430-440 MHz	Com. 5
283	Com. 7	B.1	P L
284	Com. 4	Third report of Committee 4	${ m PL}$
285	Com. 4	Draft fourth report from Committee 4	Com. 4
286	Com. 4	Report from the Chairman of Committee 4 to the Chairman of Committee 6 - draft resolution relating to the technical criteria recommended by the C.C.I.R. for sharing between the space and terrestrial services and within the space service	Com. 6

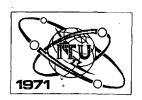
No.	Origin	Title	Destination
287 + Corr.	Com. 4	Summary record of the sixth meeting of Committee 4	Com. 4
288	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 5	Com. 5
289	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 6	Com. 6
290	Chairman	Memorandum from the Chairman concerning a letter from the Head of the Delegation of Cuba	PL
291	United Kingdom	Proposed new foot-note relating to the protection of radio astronomy observations in the band 2 690-2 700 Mc/s	Com _• 5
292	Com. 2	Summary record of the fourth meeting of Committee 2	Com. 2
293 (Rev.)	United Kingdom, Sweden and Norway	Prop. Art. 5 RR	Com. 5
294 + Corr. 1 and 2	WG 4C	Report by the Chairman of Working Group 4C - Draft new Appendix 28 concerning the procedure for cal-culating co-ordination distance between earth and terrestrial stations sharing the same frequency band in the range 1-40 GHz	Com. 4
295	WG 4A	Fourth report of Working Group 4A	Com. 4
296	Com. 7	B•2	PL.
297	Com. 5	Summary record of the fourth meeting of Committee 5	Com. 5
298	Com. 5	First report of Committee 5	PL
299	WG 5B	Fifth report of Working Group 5B to Committee 5	Com. 5
300	Secretariat	List of documents	PL

No.	Origin	Title	Destination.
301	WG 4B	Report of the Chairman, Working Group 4B regarding additions to be made to the proposed "Omnibus" Recommendation to be addressed to the C.C.I.R. to replace Recommendation No. Spa 3	Com. 4
302	WG 4B	Report of the Chairman of Working Group 4B on sharing of a Maritime-Satellite Service with other services in the frequency range 450 to 614 Mc/s	Com. 4
303	GT 4B	Report of the Chairman, Working Group 4B regarding Document No. 260 from Chairman of Working Group 4E	Com. 4 and WG 4E
304	Com. 5	Second Report of Committee 5	${ m PL}$
305	Com. 5	Summary Record of the Fifth Meeting of Committee 5 (Allocations)	Com. 5
306	Sub-WG 5E-1	Second Report of Sub-Working Group 5E-1 to Working Group 5E	WG 5E
307	Com. 6	Summary Record of the Second Meeting of Committee 6	Com. 6
308	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 6	Com. 6
309	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 5	Com. 5
310	GT 6A	Report of Working Group 6A on Art. 9A	Com. 6
311	WG 4E	Seventh Report of Working Group 4E to Committee 4	Com. 4
312	WG 5 ad hoc	Third Report of Working Group 5 Ad hoc to Committee 5	Com. 5

No.	Origin	Title	Destination
313	Com. 7	B.3	PL_{\cdot}
314	Com. 4	Fourth Report from Committee 4	${ t PL}$
<i>3</i> 15	United Kingdom	Prop., Art. 5 RR	PL
316(Rev.) + Corr. 1	WG 5E	Second Report of Working Group 5E to Committee 5 (Allocations) - Broadcasting-Satellite Service	Com. 5
317 + Corr.	WG 5D	Fifth Report of Working Group 5D to Committee 5	Com. 5
318 + Corr.	WG 5D	Sixth Report of Working Group 5D to Committee 5	Com. 5
319	France	Additional proposals	Com. 5
320	WG 5A	Fourth Report of Working Group 5A to Committee 5 (Allocations)	Com. 5
321	Sub-WG 5E-1	Third Report by Sub-Working Group 5E-1 to Working Group 5E	WG 5E
322	USA	Prop., Art. 6 and 27 RR	Com. 5
323	USA	Proposed allocation for the development and use of a world-wide emergency position-indicating radiobeacon system using space techniques	Com. 5
324	Com. 4	Fifth Report from Committee 4	${ m PL}$
325	France	Proposed modifications to the text of Document No. / DT/77_7	Com. 4
326	Com. 7	B.4	${ m PL}$
327 + Corr.	Com. 4	Summary Record of the Seventh Meeting of Committee 4 (technical)	Com. 4
32 8	Argentina	Art. 7 - Section IX - Space Services	Com. 4
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No.	Origin	Title	Destination
329	. WG 6A	Report of Working Group 6A	, Com 6
330	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 6	Com. 6
331	India	Prop., Art. 5 RR	Com. 5
332	Chairman	Memorandum by the Chairman concerning a letter received from the Head of the Delegation of the Czechoslovak Socialist Republic	PL
· 333	Com. 4	Draft Recommendation No. Spa 3 to the C.C.I.R. and to Administrations relating to frequency bands shared between Space Services and between Space and Terrestrial Services	Com. 4
33 4	WG 4E	Eighth Report of Working Group 4E to Committee 4	Com. 4
. 33 5	Com. 4	Sixth Report from Committee 4	PL
336	Com. 4	Draft Appendix 29 - A method of calculation to determine the degree of interference between geostationary satellite / systems / sharing the same frequency bands	Com. 4
337	Com. 5	Summary Record of the Sixth Meeting of Committee 5	Com. 5
338	Com. 5	Third Report of Committee 5	PL
339	WG 5B	Sixth and last Report of Working Group 5B to Committee 5 (Allocations)	Com. 5
340	Com. 5	Summary Record of the Seventh Meeting of Committee 5	Com. 5

No.	Origin	Title	Destination
341	Com. 5	Draft Recommendations on the use of frequency bands above 40 Gc/s	Com. 5
342 + Corr.	Italy	Proposals concerning the allocation of small bands to the Amateur—Satellite Service between 1 and 10.5 GHz	${ m PL}$
343	Com. 7	B.5	PL
344	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 5	Com. 5
<i>3</i> 45	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 6	Com. 6
346	WG 6A	Report of Working Group 6A on Art. 9	Com. 6
347	Com. 6	Second Report of Committee 6 (Regulations) Art. 9A	PL _.
3 48	Com. 4	Seventh Report from Committee 4 - Art. 1	PL
349	PL	Draft Recommendation No. relating to the use of satellite communication systems in the event of natural disasters, epidemics, famines and similar emergency situations	PL
<i>3</i> 50	Secretariat	List of documents	PL



SPACE CONFERENCE

Document No. 351-E 10 July 1971

Original : English

French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

EIGHTH REPORT FROM COMMITTEE 4

Additions and modifications to the Radio Regulations appearing in the Annexes hereto have been approved by Committee 4.

The texts in question have been forwarded to the Drafting Committee.

E.F. SANDBACH Chairman Committee 4

Annex 1: Partial text of Section VIII of Article 7.

2: New Recommendation No. / / relating to the criteria to be applied for sharing between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the band / 614-790 Mc/s /.



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ANNEX 1

/ARTICLE 7 /

/ PARTIAL TEXT OF SECTION VIII /

MOD

Section VIII. Space services sharing frequency bands with terrestrial services above 1 G/c/s/

Choice of sites and frequencies

NOC 470E

§ 20. Sites and frequencies for earth stations, operating in frequency bands shared with equal rights between terrestrial and space services, shall be selected having regard to the relevant recommendations of the C.C.I.R. with respect to geographical separation from terrestrial stations.

Power limits

MOD 470F

§ 21.(1) Earth stations

MOD 470G

(2) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands between 1 and 15 Gc/s, shall not exceed the following limits except for the provisions of Nos. 470H or 470HA:

- + 40 dBW in any 4 k/c/s/ band for $9 \le 0^{\circ}$
- + $40 + 3 \vartheta$ dBW in any 4 k/c/s band for $0 < \vartheta \le 5^{\circ}$

where ϑ is the angle of elevation of the horizon viewed from the centre of radiation of the antenna of the earth station and measured as positive above the horizontal plane and negative below it.

ADD 470GA

(2bis) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands above 15 G/c/s/shall not exceed the following limits except for the provisions of Nos. 470H or 470HB:

+ 64 dBW in any 1 M/c/s/ band for $9 \le 0^{\circ}$

+ 64 + 3 ϑ dBW in any 1 M/c/s/band for $0 < \vartheta \le 5^{\circ}$

where 9 is as defined in 470G.

ADD 470GB

(2ter) For angles of elevation of the horizon greater than 5° there shall be no restriction as to the equivalent isotropically radiated power transmitted by an earth station towards the horizon.

MOD 470H

(3) The limits of 470C or 470GA, as applicable, may be exceeded by up to a maximum of 10 dB. However, when the resulting / co-ordination zone / extends into the territory of another administration, such increase shall be subject to agreement by that administration.

ADD 470HA

(3bis) As an exception to the limits of 470G, the equivalent isotropically radiated power towards the horizon for a space research earth station (deep-space) shall not exceed + 55 dBW in any 4 k/c/s/b band.

ADD 470HB

(3ter) As an exception to the limits of 470GA, the equivalent isotropically radiated power towards the horizon for space research earth station (deep-space) shall not exceed + 79 dBW in any 1 M/c/s/band.

SUP 470I

MOD 470J

(3quater) The limits given in No. 470G apply in the following frequency bands allocated to transmission by earth stations in the Fixed-Satellite Service, where these are shared with equal rights with the / Fixed or Mobile Service /.

Minimum angle of elevation

MOD 470K

§ 22.(1) Earth stations

MOD 470L

(2) Earth station antennae shall not be employed for transmission at elevation angles of less than 3° measured from the horizontal plane to the direction of maximum radiation, except when agreed to by administrations concerned or affected. In case of reception by earth station, the above value shall be used for co-ordination purposes if the operating angle of elevation is less than the above value.

ADD 470LA

(2bis) As an exception to 470L, earth station antennae in the space research service (near-earth) shall not be employed for transmission at elevation angles of less than 5°, and earth station antennae in the space research service (deep-space) shall not be employed for transmission at elevation angles of less than 10°, both angles being those measured from the horizontal plane to the direction of maximum radiation. In case of reception by an earth station the above values shall be used for co-ordination purposes if the operating angle of elevation is less than the above values.

Annex 1 to Document No. 351-E Page 6

MOD 470M

(2ter) The limit given in No. 470L applies in the following frequency bands allocated to transmission by earth stations in the fixed-satellite service, where these are shared with equal rights with the / fixed or mobile services /:

[] [] []

A'NNEX-2

ADD

RECOMMENDATION NO.

relating to the criteria to be applied for sharing between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the band / 614-790 Mc/s 7

The World Administrative Radio Conference, Geneva, 1971

considering

- a) that this frequency band has been allocated to the Broadcasting-Satellite Service;
- b) that it is necessary to have a power flux-density limit which will provide adequate protection to the Terrestrial Broadcasting Service;

taking into account

a) the fact that the conclusions of the Special Joint Meeting of the C.C.I.R., Geneva, 1971, indicated a power flux-density limit of

-121 dBW/m²
$$\delta < 20^{\circ}$$

-121 + 0.4 (δ -20°) dBW/m² 20° $< \delta < 60^{\circ}$
-105 dBW/m² 60° $< \delta < 90^{\circ}$

where δ is the angle of arrival above the horizontal plane;

b) that additional tests carried out by one administration after the Special Joint Meeting of the C.C.I.R., indicated that the following more conservative power flux-density limits may be necessary to protect the Terrestrial Broadcasting Service

-130 dBW/m²
$$\delta < 20^{\circ}$$

-150 + 0.4 (δ -20°) dBW/m² 20° $< \delta < 60^{\circ}$
-114 dBW/m² $60^{\circ} < \delta \le 90^{\circ}$

where & is the angle of arrival above the horizontal plane;

- c) that additional information is required on the protection ratio for interference from a FM television signal into a VSB television signal for both the 625 and 525 line systems;
- d) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in C.C.I.R. Recommendation 417-2;
- e) that account may have to be taken of ground reflections;
- f) that the use of energy dispersal may reduce the required protection ratio and should be used if shown to be effective;

recommends

that in view of the absence of sufficient information on tests under operational conditions and in order to provide for a preliminary / co-ordination procedure /, on a provisional basis, the maximum power flux-density produced at the surface of the earth within the service area of a terrestrial broadcasting service (vide C.C.I.R. Recommendation 417-2), by a broadcasting-satellite space station in the band 614-790 MHz shall not exceed:

$$-129 \text{ dBW/m}^2$$
 $\delta < 20^\circ$
 $-129 + 0.4 (\delta - 20^\circ) \text{ dBW/m}^2$ $20^\circ < \delta < 60^\circ$
 -113 dBW/m^2 $60^\circ < \delta < 90^\circ$

where & is the angle of arrival above the horizontal plane.

- 2. that this limit may be exceeded subject to the agreement of administrations in whose territory the above limit is exceeded;
- 3. that the transmission of unmodulated carriers shall be avoided;
- 4. that the C.C.I.R. urgently study the sharing criteria to be applied to frequency sharing between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the band __614-790 MHz __ and prepare a Recommendation on power flux-densities to be used in lieu of the above provisional limits;

- 5. that in its studies the C.C.I.R. consider in particular the following aspects:
 - a) the required protection ratio for both 525 and 625 line systems for interference from FM television signals into VSB television signals;
 - b) the minimum field strength to be protected for the Terrestrial Television Service taking into account current progress in technology:
 - c) the effect of ground reflections;
 - d) the number of broadcasting satellites that may be visible from a terrestrial broadcasting receiver;
 - e) the effect of polarization discrimination;
 - f) the effect of antenna directivity.
- 6. that in its studies the C.C.I.R. should consider the benefits of energy dispersal in the Broadcasting-Satellite Service for television.

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 352-E 10 July 1971

PLENARY MEETING (FIRST READING)

B. 6

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
6	347		Art. 9A	

Francois Job Chairman of the Editorial Committee

Annex: Pages B6/01-28



ANNEX 💂

Revision of Article 9A of the Radio Regulations

The entire Article 9A is replaced by the following new text:

MOD

ARTICLE 9A

Co-ordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments ¹ to Radio Astronomy and Space Radiocommunication Stations [except Stations in the Broadcasting Satellite Service]

Section I. Procedure for the Advance Publication of Information on Planned Satellite Systems

- 639AA §1. (1) An administration (or one acting on behalf of a group of named administrations) which intends to establish a satellite system shall, prior to the co-ordination procedure in accordance with No. 639AK where applicable, send to the Board not earlier than five years before the date of bringing into service each satellite network of the planned system, the information listed in Appendix [1B].
- 639AB (2) Any amendments to the information sent concerning a planned satellite system in accordance with No. 639AA shall also be sent to the Board as soon as they become available.

¹ The expression *frequency assignment*, wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called *Master Register*).

- 639AC (3) The Board shall publish the information sent under Nos. 639AA and 639AB in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.
- No. 639AC, any administration is of the opinion that interference, which may be unacceptable, may be caused to its existing or planned space radiocommunication services, it shall within ninety days after the date of the weekly circular publishing the information listed in Appendix [1B], send its comments to the administration concerned. A copy of these comments shall also be sent to the Board. If no such comments are received from an administration within the period mentioned above, it may be assumed that that administration has no basic objections to the planned satellite network(s) of that system [satellite networks of that planned system], on which details have been published.
- 639AE (5) An administration receiving comments sent in accordance with No. 639AD shall endeavour to resolve any difficulties that may arise.
- 639AF (6) In case of difficulties arising when any satellite network of a planned system is intended to use the geostationary orbit:
 - a) The administration responsible for the planned system shall first explore all possible means of meeting its requirements, taking into account the characteristics of the [significant] [potentially affected] geostationary satellite networks of other systems, and without considering the possibility of adjustments to systems of other administrations. If no such means can be found, the administration concerned is then free to

apply to other administrations concerned to solve these difficulties;

- b) An administration receiving a request under a) above shall, in consultation with the requesting administration, explore all possible means of meeting the requirements of the requesting administration, for example, by relocating one or more of its own geostationary space stations involved, or by changing the emissions, frequency usage (including changes in frequency bands) or other technical or operational characteristics;
- c) If after following the procedure outlined in a) and b) above there are unresolved difficulties, the administrations concerned shall together make every possible effort to resolve these difficulties by means of mutually acceptable adjustments, for example, to geostationary space station locations and to other characteristics of the systems involved in order to provide for the normal operation of both the planned and existing systems.
- 639AG (7) In their attempts to resolve the difficulties mentioned above administrations may seek the assistance of the Board.
- 639AH (8) In complying with the provisions of Nos. 639AE to 639AG, an administration responsible for a planned satellite system shall if necessary defer its commencement of the co-ordination procedure, or where this is not applicable, the sending of its notices to the Board, until one hundred and fifty days after the date of the weekly circular containing the information listed in Appendix [1B] on the relevant satellite network. However, in respect of those administrations with whom difficulties have been resolved or who have responded favourably, the co-ordination procedure, where applicable, may be commenced prior to the expiration of the one hundred and fifty days mentioned above.

639AI (9) An administration on behalf of which details of satellite networks in its planned system have been published, in accordance with the provisions of Nos. 639AA to 639AC, shall periodically inform the Board whether or not comments have been received and of the progress made, with other administrations, in resolving any difficulties. The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so inform all administrations by circular telegram.

Section II. Co-ordination Procedures to be Applied in Appropriate Cases

639AJ § 2. (1) Before an administration notifies to the Board or brings into use any frequency assignment to a space station on a geostationary satellite or to an earth station that is to communicate with a space station on a geostationary satellite, it shall effect co-ordination with any other administration whose assignment in the same band for a space station on a geostationary satellite or an earth station that communicates with a space station on a geostationary satellite is recorded in the Master Register, or has been co-ordinated or is being co-ordinated under the provisions of this paragraph. For this purpose, the administration requesting co-ordination shall send to any other such administration the information listed in Appendix [1A].

639AK (2) No co-ordination under No. 639AJ is required:

[a] if the increase in the equivalent noise temperature of an earth station ¹ receiver of an administration caused by a frequency assignment to a station of any other

⁶³⁹AK.1 If only the up path is involved, the increase in the equivalent noise temperature is determined at the space station receiver.

administration is below the permissible increase in noise temperature as determined by the application of the method given in Appendix [29].¹]

- [b) when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase equivalent noise temperature of an earth station receiver of another administration above the level agreed during co-ordination of the existing assignment.]
- 639AL (3) An administration initiating the co-ordination procedure referred to in No. 639AJ shall at the same time send to the Board a copy of the request for co-ordination, with the information listed in Appendix [1A] and the name(s) of the administration(s) with which co-ordination is sought. The Board shall publish this information in a special section of its weekly circular, together with a reference to the weekly circular in which details of the satellite system were published in accordance with Section I of this Article. When the weekly circular contains such information, the Board shall so inform all administrations by circular telegram.
- 639AM (4) An administration believing that it should have been included in the co-ordination procedure under No. 639AJ shall have the right to request that it be brought into the co-ordination procedure.

⁶³⁹AK.2 [¹ For a broadcasting satellite space station, the technical data used to effect co-ordination should be [based upon the most recent, Recommendations of the C.C.I.R., as accepted by the administrations concerned under Resolution No. Spa...]. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used to effect co-ordination shall be agreed between the administrations concerned.]

639AN§ 3. (1) Before an administration notifies to the Board or brings into use any frequency assignment to an earth station, whether for transmitting or receiving, in a particular band allocated with equal rights to the space radiocommunication service and the [fixed or mobile] service in the frequency spectrum above 1 Gc/s, it shall effect co-ordination of the assignment with any other administration whose territory lies wholly or partly within the co-ordination area 1 of the planned earth station [but only with respect to the fixed or the mobile service]. For this purpose it shall send to any other such administration a copy of a diagram drawn to an appropriate scale indicating the location of the earth station and showing the coordination areas of the earth station for the cases of transmission and reception by the earth station and the data on which they are based, including all pertinent details of the proposed frequency assignment, as listed in Appendix [IA], and an indication of the approximate date on which it is planned to begin operations.

639AO (2) An administration with which co-ordination is sought under No. 639AJ shall acknowledge receipt of the co-ordination data immediately by telegram. If no acknowledgement is received within thirty days after the date of the weekly circular publishing the information under No. 639AL, the administration seeking co-ordination shall dispatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of thirty days. Upon receipt of the co-ordination data, an administration shall, having regard to the proposed date of bringing into use of the assignment for which co-ordination was requested,

639AN.1 ¹ Calculated in accordance with the procedures described in Appendix [28].

promptly examine the matter with regard to interference ¹ which would be caused to the service rendered by its stations in respect of which co-ordination is sought under No. 639AJ; and shall, within ninety days from the date of the relevant weekly circular, notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree, it shall, within the same period, send to the administration seeking co-ordination the technical details upon which its disagreement is based, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem. A copy of these comments shall also be sent to the Board.

- 639AP (3) An administration with which co-ordination is sought under No. 639AN shall acknowledge receipt of the co-ordination data immediately by telegram. If no acknowledgement is received within fifteen days of dispatch of the co-ordination data the administration seeking co-ordination shall dispatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of fifteen days. Upon receipt of the co-ordination data an administration shall, having regard to the proposed date of bringing into use of the assignment for which co-ordination was requested, promptly examine the matter both with regard to:
 - a) interference ² which would be caused to the service rendered by its stations in the [fixed or mobile] service operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer, and

⁶³⁹AO.1 ¹ The criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

⁶³⁹AP.1 ² The criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

b) interference 1 which would be caused to reception at the earth station by the service rendered by its stations in the [fixed or mobile] service operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer.

Then, within sixty days from despatch of the co-ordination data shall notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree it shall, within the same period, send to the administration seeking co-ordination a copy of a diagram drawn to an appropriate scale showing the location of its stations in the [fixed or mobile] service which are or will be within the co-ordination area of the earth transmitting or receiving station, as appropriate, together with all other relevant basic characteristics, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

- 639AQ (4) When the administration with which co-ordination is sought sends to the administration seeking co-ordination the information mentioned in No. 639AP, a copy thereof shall also be sent to the board. The Board shall consider as notifications in accordance with Section I of Article 9 only that information relating to existing stations in the [fixed or mobile] service or to those to be brought into use within the next three years.
- 639AR (5) No co-ordination under No. 639AN is required when an administration proposes:

⁶³⁹AP.1 ¹ The criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

- a) to bring into use an earth station, the co-ordination area of which does not include any of the territory of any other country;
- to change the characteristics of an existing assignment in such a way as not to exceed the permissible level of interference to or from the stations in the [fixed or mobile] service of other administrations;
- c) ¹ to bring into use an earth station in the band 4 400-4 700 Mc/s or the band 8 100-8 400 Mc/s; or
- d) to operate a mobile earth station. However, if the co-ordination area associated with the operation of such a mobile earth station, in a frequency band referred to in No. 639AN, includes any of the territory of another country, it shall be subject to prior agreement between the administrations concerned in order to avoid harmful interference to existing stations in the [fixed or mobile] service of that country. This agreement shall cover the characteristics of the mobile earth station(s), of the characteristics of a typical mobile earth station, and shall apply to a specified service area; unless otherwise stipulated in the agreement, it shall apply to any mobile earth stations in the specified service area provided that the probability of harmful interference caused by them shall not be greater than that caused by the typical earth station.

639AS § 4. (1) An administration seeking co-ordination may request the Board to endeavour to effect co-ordination in those cases where:

⁶³⁹AR.1 The provisions of c) do not apply to Region 3.

- a) an administration with which co-ordination is sought under No. 639AJ fails to acknowledge receipt, under No. 639AO, within sixty days after the date of the weekly circular publishing the information relating to the request for co-ordination;
- an administration with which co-ordination is sought under No. 639AN fails to acknowledge receipt, under No. 639AP within thirty days of dispatch of the coordination data;
- an administration has acknowledged receipt under No. 639AO, but fails to give a decision within ninety days from the date of the relevant weekly circular;
- an administration has acknowledged receipt under No. 639AP but fails to give a decision sixty days from dispatch of the co-ordination data;
- e) there is disagreement between the administration seeking co-ordination and an administration with which coordination is sought as to the acceptable level of interference;
- f) co-ordination between administrations is not possible for any other reason.

In so doing, it shall furnish the Board with the necessary information to enable it to endeavour to effect such co-ordination.

639AT (2) Either the administration seeking co-ordination or an administration with which co-ordination is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.

- 639AU (3) Where the Board receives a request under 639AS a) or b), it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.
- 639AV (4) Where the Board receives an acknowledgement following its action under No. 639AU, or where the Board receives a request under No. 639AS c) or d), it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.
- 639AW (5) Where the Board receives a request under No. 639AS f), it shall endeavour to effect co-ordination in accordance with the provisions of Nos. 639AJ and 639AN, as appropriate. The Board shall also, where appropriate, act in accordance with No. 639AL. Where the Board receives no acknowledgement to its request for co-ordination within the period specified in No. 639AO or 639AP, as appropriate, it shall act in accordance with No. 639AU.
- 639AX (6) Where an administration fails to reply within thirty days of dispatch of the Board's telegram requesting an acknowledgement sent under No. 639AU, or fails to give a decision in the matter within thirty days of dispatch of the Board's telegram of request under No. 639AV, it shall be deemed that the administration with which coordination was sought has undertaken:
 - a) that no complaint will be made in respect of any harmful interference which may be caused to the services rendered by its space radiocommunication stations or its stations in the [fixed or mobile] service by the use of the assignment for which co-ordination was requested;
 - b) that its space radiocommunication stations or its stations in the [fixed or mobile] service will not cause

harmful interference to the use of the assignment for which co-ordination was requested.

- 639AY (7) Where necessary, as part of the procedure under No. 639AS, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.
- 639AZ § 5. In the event of continuing disagreement between one administration seeking to effect co-ordination and one with which co-ordination has been sought, provided that the assistance of the Board has been requested, the administration seeking co-ordination may, after one hundred and fifty days from the date of the request for co-ordination, taking into consideration the provisions of No. 639BF, send its notice concerning the proposed assignment to the Board.

Notification of Frequency Assignments

- 639BA § 6. (1) Any frequency assignment to an earth or space station shall be notified to the International Frequency Registration Board:
 - a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration; or
 - b) if the frequency is to be used for international radiocommunications; or
 - c) if it is desired to obtain international recognition of the use of the frequency.
- 639BB (2) Similar notice shall be given for any frequency to be used for the reception of transmissions from earth or space stations by a particular space or earth station in each case where one or more of the conditions specified in No. 639BA are applicable.

- 639BC (3) Similar notice may be given for any frequency or frequency band to be used for reception by a particular radio astronomy station, if it is desired that such data should be included in the Master Register.
- 639BD (4) A notice submitted in accordance with No. 639BA or 639BB and relating to a frequency assignment to mobile earth stations in a satellite system shall include the technical characteristics either of each mobile earth station, or of a typical mobile earth station, and an indication of the service area within which these stations are to be operated.
- 639BE § 7. For any notification under No. 639BA, 639BB, 639BC, or 639BD, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix [1A], which specifies in Sections [B, C, D, E or F] the basic characteristics to be furnished, according to the case. It is recommended that the notifying administration should also supply the additional data called for in Section [A] of that Appendix, together with such further data as it may consider appropriate.
- 639BF § 8. (1) For a frequency assignment to an earth or space station, each notice must reach the Board not earlier than three years before the date on which the assignment is to be brought into use. The notice must reach the Board in any case not later than ninety days before this date, except in the case of assignments in the space research service in bands allocated exclusively to this service or in shared bands in which this service is the sole primary service. In the case of such an assignment in the space research service the notice should, whenever practicable, reach the Board before the date on which the assignment is brought into use, but it must in any case reach the Board not later than thirty days after the date it is actually brought into use.

⁶³⁹BF.1 The notifying administration shall take this limit into account when deciding, where appropriate, to initiate the co-ordination procedure(s).

639BG (2) Any frequency assignment to an earth or space station, the notice of which reaches the Board after the applicable period specified in No. 639BF, shall, where it is to be recorded, bear a mark in the Master Register to indicate that it is not in conformity with No. 639BF.

Section IV. Procedure for the Examination of Notices and the Recording of Frequency Assignments in the Master Register

- 639BH § 9. Any notice which does not contain at least those characteristics specified in Appendix [1A] (Sections [B, C, D, E, or F,] as appropriate) shall be returned by the Board immediately, by airmail, to the notifying administration with the reasons therefor.
- 639BI § 10. Upon receipt of a complete notice, the Board shall include the particulars thereof, with the date of receipt, in the weekly circular referred to in No. 497, which shall contain the particulars of all such notices received since the publication of the previous circular.
- 639BJ §11. The circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.
- 639BK § 12. Complete notices shall be considered by the Board in the order of their receipt. The Board shall not postpone the formulation of a finding unless it lacks sufficient data to render a decision in connection therewith; moreover, the Board shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Board, until it has reached a finding with respect to such earlier notice.
- 639BL § 13. The Board shall examine each notice:
- 639BM a) with respect to its conformity with the Convention, the Table of Frequency Allocations and the other pro-

visions of the Radio Regulations (with the exception of those relating to the co-ordination procedure and the probability of harmful interference);

639BN

b) where appropriate, with respect to its conformity with the provisions of No. 639AJ, relating to the coordination of the use of the frequency assignment with the other administrations concerned vis-a-vis space radiocommunication stations;

639BO

c) where appropriate, with respect to its conformity with the provisions of No. 639AN relating to the co-ordination of the use of the frequency assignment with the other administrations concerned vis-a-vis stations in the [fixed or mobile] service;

639BP

d) where appropriate, with respect to the probability of harmful interference to the service rendered by a space radiocommunication station for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 639BM if this frequency assignment has not in fact caused harmful interference to any frequency assignment in conformity with No. 639BM previously recorded in the Master Register;

639BQ

e) where appropriate, with respect to the probability of harmful interference to the service rendered by a station in the [fixed or mobile] service for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 501 or [570AB], as appropriate, if this frequency assignment has not, in fact, caused harmful interference to any frequency assignment in conformity with No. 639BM previously recorded in the Master Register; 639BR

f) where appropriate, with respect to the probability of harmful interference caused to the receiving earth station by a station in the [fixed or mobile] service for which a frequency assignment already recorded in the Master Register is in conformity with No. 501 or [570AB], as appropriate.

639BS When, following an examination of a notice with respect to No. 639BP, the Board reaches an unfavourable finding based upon the probability of harmful interference to a recorded assignment for a space station which the Board has reason to believe may not be in regular use, the Board shall forthwith consult the administration responsible for the registered assignment. If it is established, after such consultation and on the basis of the information available, that the recorded assignment has not been in use for two years, it shall not be taken into account for the purposes of the examination in progress and any other further examination under No. 639BP conducted before the date on which the assignment is brought back into use. Before the assignment is brought back into use, it shall be subject to further co-ordination in accordance with the provisions of No. 639AJ or further examination by the Board with respect to No. 639BP as appropriate. The date on which the assignment is brought back into use shall then be entered in the Master Register.

- 639BT § 14. Depending upon the findings of the Board subsequent to the examination prescribed in Nos. 639BM, 639BN, 639BO, 639BP, 639BQ and 639BR, as appropriate, further action shall be as follows:
- 639BU § 15. (1) Finding favourable with respect to No. 639BM in cases where the provisions of Nos. 639BN and 639BO are not applicable.
- 639BV (2) The assignment shall be recorded in the Master Register.

 The date of receipt by the Board of the notice shall be entered in Column 2d.

639BW § 16. (1) Finding unfavourable with respect to No. 639BM;

- 639BX (2) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, and the finding is favourable with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.
- 639BY (3) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 and the finding is unfavourable with respect to Nos. 639BN, 639BO, 639BP, 639BQ or 639BR, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. Should the administration insist upon reconsideration of the notice, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column.
- 639BZ (4) The period of one hundred and twenty days mentioned in Nos. 639BY and 639CP shall count:
 - from the date when the assignment to the space radiocommunication station which received an unfavourable finding is brought into use, if the assignment to the station which was the basis for the unfavourable finding is then in use;
 - otherwise, from the date when the assignment to the station which was the basis for the unfavourable finding is brought into use.

But if the assignment to the station which was the basis for the unfavourable finding has not been brought into use by the notified date, the period of one hundred and twenty days shall be counted from this date. Allowance shall, if necessary, be made for the additional period mentioned in No. 639CY.

- 639CA (5) Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.
- 639CB (6) If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of No. 639CA. If it is resubmitted with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be treated in accordance with the provisions of No. 639BX or 639BY, as appropriate. If it is resubmitted with modifications which, after re-examination, result in a favourable finding by the Board with respect to No. 639BM, it shall be treated as a new notice.
- **639CC** § 17. (1) Finding favourable with respect to No. **639BM** in cases where the provisions of No. **639BN** or **639BO** are applicable.
- 639CD (2) Where the Board finds that the co-ordination procedures mentioned in Nos. 639BN and 639BO have been successfully completed with all administrations whose space radiocommunication stations or stations in the [fixed or mobile] service may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

- 639CE (3) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has not been applied, and the notifying administration requests the Board to effect the required co-ordination, the Board shall take appropriate action and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with No. 639CD. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of Nos. 639BP, 639BQ and 639BR, as appropriate.
- 639CF (4) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has not been applied, and the notifying administration does not request the Board to effect the required co-ordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.
- 639CG (5) Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedures mentioned in Nos. 639BN and 639BO have been successfully completed with all administrations whose space radiocommunication stations or stations in the [fixed or mobile] service may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.
- 639CH (6) Where the notifying administration resubmits the notice with a request that the Board effect the required co-ordination under No. 639AJ or 639AN, it shall be treated in accordance with the provisions of No. 639CE. However, in any subsequent recording

of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

- 639CI (7) Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the co-ordination, the Board shall inform the administrations concerned thereof. The notice shall be examined by the Board with respect to the provisions of Nos. 639BP and 639BQ, as appropriate. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.
- 639CJ § 18. (1) Finding favourable with respect to Nos. 639BM, 639BP, 639BG and 639BR, as appropriate.
- 639CK (2) The assignment shall be recorded in the Master Register.

 The date of receipt by the Board of the notice shall be entered in Column 2d.
- 639CL (3) However, should the examination show that the level of the interference noise and the percentage of time during which it occurs have values slightly greater than those used for assessing the probability of harmful interference (extreme propagation conditions, abnormal atmospheric humidity, etc.), a remark shall be included in the Master Register to show that there may be a slight risk of harmful interference and hence additional precautions must be taken in the use of the assignment to avoid harmful interference to assignments already recorded in the Master Register.
- 639CM § 19. (1) Finding favourable with respect to No. 639BM but unfavourable with respect to Nos. 639BP, 639BQ or 639BR, as appropriate
- 639CN (2) The notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this

finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

- 639CO (3) Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to Nos. 639BP, 639BQ and 639BR, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.
- 639CP (4) Should the notifying administration resubmit the notice, either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of No. 639CO to be applied, and should that administration insist upon reconsideration of the notice, but should the Board's finding remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignmen thas been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column. The period of one hundred and twenty days shall count from the date indicated in No. 639BZ.

639CQ § 20. (1) Notices relating to radio astronomy stations.

639CR (2) A notice relating to a radio astronomy station shall not be examined by the Board with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR. Whatever the finding, the assignment

shall be recorded in the Master Register with a date in Column 2c. The date of receipt by the Board of the notice shall be recorded in the Remarks Column.

- 639CS § 21. (1) Change in the basic characteristics of assignments already recorded in the Master Register.
- 639CT (2) A notice of a change in the basic characteristics of an assignment already recorded, as specified in Appendix [1A] (except the name of the station or the name of the locality in which it is situated) shall be examined by the Board according to No. 639BM, and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, and the provisions of Nos. 639BU to 639CR inclusive applied. Where the change should be recorded, the assignment shall be amended according to the notice.
- 639CU (3) However, in the case of a change in the characteristics of an assignment which is in conformity with No. 639BM, should the Board reach a favourable finding with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, where appropriate, or find that the changes does not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. The date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.
- 639CV § 22. In applying the provisions of the whole of this Section, any resubmitted notice which is received by the Board more than two years after the date of its return by the Board, shall be considered as a new notice.
- 639CW § 23. (1) Recording of Frequency Assignments notified before being brought into use.

- 639CX (2) If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to No. 639BM and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.
- 639CY (3) If, within thirty days after the projected date of bringing into use, the Board receives confirmation from the notifying administration of the date of putting unto use, the special symbol shall be deleted from the Remarks Column. In the case where the Board, in the light of a request from the notifying administration received before the end of the thirty-day period, finds that exceptional circumstances warrant an extension of this period, the extension shall in no case exceed one hundred and fifty days.
- 639CZ (4) In the circumstances described in Nos. 639BY and 639CP, and as long as an assignment which received an unfavourable finding cannot be resubmitted as a consequence of the provisions of No. 639BZ, the notifying administration may ask the Board to enter the assignment provisionally in the Master Register, in which event a special symbol to denote the provisional nature of the entry shall be entered in the Remarks Column. The Board shall delete this symbol when it receives from the notifying administration, at the end of the period specified in No. 639BY or 639CP, as appropriate, the information relating to the absence of complaint of harmful interference.
- 639DA (5) If the Board does not receive this confirmation within the period referred to in No. 639CY or at the end of the period referred to No. 639BY or 639CP, as appropriate, the entry concerned shall be cancelled. The Board shall advise the administration concerned before taking such action.

Section V. Recording of Findings in the Master Register

639DB § 24. In any case where a frequency assignment is recorded in the Master Register, the finding reached by the Board shall be indicated

by a symbol in Column 13a. In addition, a remark indicating the reasons for any unfavourable finding shall be inserted in the Remarks Column.

Section VI. Categories of Frequency Assignments

- 639DC § 25. (1) The date in Column 2c shall be the date of putting into use notified by the administration concerned. It is given for information only.
- 639DD (2) If harmful interference is actually caused to the reception of any space radiocommunication station whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to Nos. 639BM, 639BN, 639BO, 639BP, 639BQ and 639BR, as appropriate, by the use of a frequency assignment to a space radiocommunication station which has been recorded in the Master Register in accordance with the provisions of No. 639CP, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.
- 639DE (3) If harmful interference to the reception of any station whose assignment is in accordance with No. 501, [570AB] or 639BM, as appropriate, is actually caused by the use of a frequency assignment which is not in conformity with No. 639BM, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

Section VII. Review of Findings

639DF § 26. (1) The review of a finding by the Board may be undertaken:

— at the request of the notifying administration,

- at the request of any other administration interested in the question, but only on the grounds of actual harmful interference,
- on the initiative of the Board itself when it considers this is justified.
- 639DG (2) The Board, in the light of all the data at its disposal shall review the matter, taking into account No. 639BM and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR and shall render an appropriate finding, informing the notifying administration prior either to the promulgation of its finding or to any recording action.
- 639DH § 27. (1) After actual use for a reasonable period of an assignment which has been entered in the Master Register on the insistence of the notifying administration, following an unfavourable finding with respect to Nos. 639BP, 639BQ or 639BR, this administration may request the Board to review the finding. Thereupon the Board shall review the matter, having first consulted the administrations concerned.
- 639DI (2) If the finding of the Board is then favourable it shall enter in the Master Register the changes that are required so that the entry shall appear in the future as if the original finding had been favourable
- **639DJ** (3) If the finding with regard to the probability of harmful interference remains unfavourable, no change shall be made in the original entry.

Section VIII. Modification, Cancellation and Review of Entries in the Master Register

639DK § 28. (1) Where the use of a recorded assignment to a space station is suspended for a period of eighteen months, the notifying administration shall, within that eighteen month period, inform the Board

of the date on which such use was suspended and of the date on which the assignment is to be brought back into regular use.

- 639DL (2) Whenever it appears to the Board, whether or not as a result of action under No. 639DK, that a recorded assignment to a space station has not been in regular use for more than eighteen months, the Board shall inquire of the notifying administration as to when the assignment is to be brought back into regular use.
- 639DM (3) If no reply is received within six months of action by the Board under No. 639DL, or if the reply does not confirm that the assignment to a space station is to be brought back regular use within this six month limit, a mark shall be applied against the entry in the Master Register. Thereafter, the assignment shall be treated in accordance with No. 639BS as one which has been established as having been out of regular use for two years.
- 639DN § 29. In case of permanent discontinuance of the use of any recorded frequency assignment, the notifying administration shall inform the Board within ninety days of such discontinuance, whereupon the entry shall be removed from the Master Register.
- 639DO § 30. Whenever it appears to the Board from the information available that a recorded assignment has not been brought into regular operation in accordance with the notified basic characteristics, or is not being used in accordance with those basic characteristics the Board shall consult the notifying administration and, subject to its agreement, shall either cancel or suitably modify the entry.
- 639DP § 31. If, in connection with an enquiry by the Board under No. 639DO, the notifying administration has failed to supply the

Board within forty-five days with the necessary or pertinent information, the Board shall make suitable entries in the Remarks Column of the Master Register to indicate the situation.

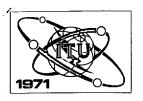
Section IX. Studies and Recommendations

- 639DQ § 32. (1) If it is requested by any administration, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall conduct a study of cases of alleged contravention or non-observance of these Regulations, or of harmful interference.
- 639DR (2) The Board shall thereupon prepare and forward to the administration concerned a report containing its finding and recommendations for the solution of the problem.
- 639DS § 33. In a case where, as a result of a study, the Board submits to one or more administrations suggestions or recommendations for the solution of a problem, and where no answer has been received from one or more of these administrations within a period of ninety days, the Board shall consider that the suggestions or recommendations concerned are unacceptable to the administrations which did not answer. If it was the requesting administration which failed to answer within this period, the Board shall close the study.

Section X. Miscellaneous Provisions

- 639DT § 34. (1) If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board, using such means at its .disposal as are appropriate in the circumstances, shall render the following assistance:
 - a) computation of the increase in the equivalent noise temperature of an earth station receiver as in No. 639AK;

- b) preparation of the diagram showing the co-ordination area as in No. 639AN;
- c) any other assistance of a technical nature for completion of the procedures in this Article.
- 639DU (2) In making a request to the Board under No. 639DT, the administration shall furnish the Board with the necessary information.
- 639DV § 35. The technical standards of the Board shall be based upon the relevant provisions of these Regulations and the Appendices thereto, the decisions of Administrative Conferences of the Union as appropriate, the Recommendations of the C.C.I.R., the state of the radio art, and the development of new transmission techniques.
- 639DW § 36. The Board shall promulgate to administrations its findings and reasons therefor, together with all changes made to the Master Register, through the weekly circular referred to in No. 497.
- 639DX § 37. In case a Member or Associate Member of the Union avails itself of the provisions of Article 28 of the Convention, the Board shall, upon request, make its records available for such proceedings as are prescribed in the Convention for the settlement of international disputes.



SPACE CONFERENCE

Document No. 353-E

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

SUMMARY RECORD

OF THE

THIRD MEETING OF COMMITTEE 6

Thursday, 8 July 1971, at 2035 hrs

Acting Chairman: Mr. M.K. BASU (India)

Subjects discussed	Document No.
1. Summary Record of the Second Meeting	307
2. Article 14	195, 284
3. Article 9A	310, 48(Rev), 33



1. Summary Record of the second meeting (Document No. 307)

Approved.

2. Article 14 (Document No. 195, 284)

The Chairman stated that paragraph 2 of Document No. 195 showed the modification proposed to Article 14 by Working Group 68. Committee 4 had now finalized the new text of No. 470 V, as shown in Document No. 284, page 3.

There being no comments, it was agreed that MOD RR 695 Spa (Document No. 195, paragraph 2) should be transmitted to the Drafting Group for submission to the Plenary.

3. Article 9A (Document No. 310, 48(Rev.))

The Chairman of Working Group 6A introduced Document No. 310 which represented the result of several weeks of hard work by experts from a number of delegations, who had attempted to draft a new Article 9A on the basis of the six principles set out on pages 1 - 2 of Document No. 310. The square brackets in Document No. 310 were mostly around the names of services and the Working Group had considered that they should be retained until the new names of the services had been adopted by Committees 4 and 5. To save time, he proposed that the Committee should appoint a small drafting group to bring the names of services into conformity with the terms and definitions now agreed by Committees 4 and 5.

The Chairman invited the Committee to consider Document No. 310 page by page. Any typographical errors pointed out in the course of discussion would be corrected before the document was submitted to the Plenary. As suggested by the Chairman of Working Group 6A, he appointed a small drafting group consisting of Mr. Davis (United Kingdom), Mr. Chaspoul (France) and Mr. Hernandez (Mexico) to remove the square brackets in Document No. 310, after consideration of Document No. 255 and "blue" Document B3.

Page 3

The Chairman of Working Group 6A explained that there had been a difference of opinion regarding the words "except the broadcasting satellite service" in square brackets in the title. Some delegates thought that pending

the convening at some future date of a broadcasting satellite planning conference, the broadcasting satellite service as a whole should be excluded from Article 9A, and should be covered by a resolution dealing with co-ordination procedure for broadcasting satellites vis-à-vis other space systems. Sub-Working Group 6A-2 was considering the point, and had almost reached agreement on it.

On the proposal of the <u>delegate of the United States</u>, supported by the <u>delegates of Japan and the United Kingdom</u>, it was <u>agreed</u> that square brackets should be retained round the words "except the broadcasting satellite service" until Sub-Working Group 6A-2 had finished its work.

In reply to a question by the <u>delegate of Pakistan</u> on ADD Section I, the <u>representative of the I.F.R.B.</u> said that existing satellite systems were notified and registered in accordance with existing regulations, and that would continue until the new regulations to be approved by the present Conference were brought into force.

Page 3 was approved.

Pages 4, 5, 6 and 7 were approved.

Pages 8 - 9

The Chairman of Working Group 6A pointed out that footmotel) on page 8 was closely related to the words "except the broadcasting satellite service" on page 3, and proposed that in view of the treatment of page 3, footmotel) should also be kept in square brackets till a further decision was taken. It might be necessary to re-word ADD 639AK in the light of Committee 4's decision.

The delegate of Denmark said that the words "in another / system /" in the third line of ADD 639AK, para. 2(a) should be "to another / system /", and that was accepted."

The <u>delegate of Denmark</u> further suggested that if the line in question read: "caused by a new frequency assignment to another / system/", it would be possible to delete sub-para. 2(b) of ADD 639AK. The <u>representative</u> of the I.F.R.B. pointed out that if sub-para. 2(b) was deleted, it would mean that administrations would have to effect co-ordination even in cases where it was not absolutely necessary, e.g. if noise temperature had been reduced.

It was agreed that the delegates of the United Kingdom and France should re-draft sub-para. 2(a) of ADD 639AK for submission to the Plenary without square brackets, and that the delegates of the United Kingdom, France and Denmark with the assistance of the representative of the I.F.R.B. should consider whether or not to retain sub-para. 2(b).

Page 10

The Chairman of Working Group 6A drew attention to the square brackets in the fifth, sixth, ninth and tenth lines of MOD 639AN, which had been retained pending a decision by Committee 5 on the terrestrial services which would share bands with space services.

The delegate of the Netherlands suggested that the fifth line should be altered to read "rights to space radiocommunication and terrestrial services" and that the phrase in square brackets in the ninth and tenth lines should be deleted.

The <u>delegate of the United States of America</u> said he was not sure that Appendix 28, setting out the co-ordination procedure, in fact dealt with all the terrestrial services sharing bands with space services. It would therefore be best to keep the square brackets until the new version of Appendix 28 was available. It was so agreed.

The <u>delegate of Canada</u> proposed that the words "distance from" in the fourteenth line should be replaced by "area around".

The <u>delegate of the United Kingdom</u> supported that proposal, but pointed out that two co-ordination areas were involved. The words should therefore be "areas around", and the phrase "as a function of azimuth" could then be deleted.

Page 10, as amended by the Canadian and United Kingdom delegates, was approved.

Pages 11, 12 and 13

To state .

At the invitation of the Chairman, the <u>delegate of India</u> who had participated in a small sub-group of Working Group 6A to reconcile divergent views on the use of the terms "acceptable", "admissible" and "permissible" interference levels, said that the sub-group had decided that the terms in Document No. DT/87(Rev.) could be improved upon and had consequently submitted Nos. ADD 639AO and MOD 639AP for insertion in the Radio Regulations.

Pages 11, 12 and 13 were approved.

The <u>delegate of Japan</u> drew attention to his delegation's proposal on page 4 of Document No. 33, to the effect that the words "(except Region 3)" should be added after "the band 4 400-4 700 Mc/s" and "the band 8 100-8 400 Mc/s" in sub-paragraph c). In view of the microwave radio relay system being planned in Region 3, it was becoming increasingly desirable to effect co-ordination on the bands in question.

The delegates of India, Pakistan and Korea supported that proposal.

The <u>delegate of Australia</u> said he could not support the Japanese proposal and suggested that the square brackets round sub-paragraph c) be deleted.

The delegate of New Zealand said that he too could not support the Japanese proposal with regard to the whole of Region 3, although he would not object to the application of the co-ordination procedure north of the Equator.

In reply to a query by the <u>delegate of the U.S.S.R.</u>, the <u>Chairman of the I.F.R.B.</u> said that, whereas Committee 5 had made no change in the provision, the question of effecting co-ordination fell within the terms of reference of Committee 6.

After a brief procedural discussion, it was <u>decided</u> to accept the Japanese proposal, on the understanding that the Australian delegation was entitled to raise the matter again in the Plenary Meeting.

Page 14, as amended, and pages 15 to 22 were approved.

Page 23

The <u>delegate of France</u> pointed out that his <u>Delegation</u> had submitted some relevant proposals in <u>Document No. 48</u> and, on finding that other delegations held different views on the subject, had sought a compromise solution by submitting the <u>Draft Recommendation</u> in <u>Document No. 48(Rev.)</u>. That document would be considered in detail in Working Group 6A, but the French <u>Delegation</u> would like to know whether the Committee agreed on the principles of the <u>Recommendation</u>. If that were the case, it could give its unreserved support to ADD 639BS.

The <u>delegate of Canada</u> said he could support the principle and wording of the French Draft Recommendation, as well as Nos. ADD 639DK, ADD 639DL and ADD 639DM, which also constituted elements of a compromise solution for the problem of removing "deadwood" from the Master Register.

Document No. 353-E Page 6

The delegates of the U.S.S.R., Mexico and Brazil also supported the idea contained in the French Draft Recommendation.

Pages 23 to 42 were approved.

Page 43

The Chairman of Working Group 6A said that the Group had left it to the Committee itself to decide whether MOD 639DV should be aligned with No. 636 or No. 639CP of the existing Radio Regulations.

In reply to questions by the delegate of India, the Chairman of the I.F.R.B. explained that if MOD 639DV were aligned with No. 639CP, the Board would find itself in a dilemma in a case where technical information required for the examination of a notice received could not be found in the Recommendations of the C.C.I.R., and might be obliged to send back the notice. One case had already arisen where the necessary information could not be provided by the C.C.I.R., but the Board had been able to solve the problem by its own resources. With the development of space techniques, however, more and more such cases could be expected to arise, and the work of the I.F.R.B. would be facilitated and the interests of administrations would be best served by aligning MOD 639DV with No. 636.

At the proposal of the <u>delegate of India</u>, supported by the <u>delegates of the United States of America</u>, the <u>United Kingdom</u> and the <u>Natherlands</u>, it was decided to remove the square brackets from MOD 639DV.

Page 43 was approved.

The <u>Chairman</u> observed that the only passages remaining in square brackets were those in the title and on pages 8 and 9. Working Group 6A would try to solve the problems concerned and would communicate the results to the Editorial Committee. The brackets would, however, be retained if the Working Group failed to reach agreement.

On that understanding, Document No. 310, as amended, was approved.

The meeting rose at 2240 hrs.

The Secretary:

The Chairman:

W. GARCIA-RIOS

M.K. BASU



Document No. 354-E

Original : English

· French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

THIRD REPORT FROM COMMITTEE 6

(REGULATIONS)

Article 14

The revised text of the provisions of No. 695 of the Radio Regulations appearing in the Annex to the present Report were adopted by Committee 6.

M. K. BASU Chairman

Annex: 1



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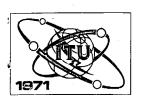
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ANNEX.

Article 14

MOD RR695 Replace the text of the last sub-paragraph Spa by the following:

- the conditions specified under No. 470V shall be fulfilled.



SPACE CONFERENCE

Document No. 355-E

10 July 1971

Original : French English

Spanish

COMMITTEE 6

REPORT OF WORKING GROUP 6A

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

On 10 July 1971, Working Group 6A considered draft Appendices 1 and 1A prepared by Sub-Working Group 6A-4/4E and contained in Documents Nos. DT/103 and DT/102 respectively. After having examined them, Working Group 6A approved these documents provisionally as a whole and submits herewith to Committee 6 in Annexes I and II draft Appendices 1 and 1A.

P.E. WILLEMS Chairman Working Group 6A

Annexes: I and II



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ANNEXI

DRAFT MODIFICATIONS TO APPENDIX 1

In view of the addition of an item in Sections B, C, D and E of Appendix 1A related to "Agreements", it is necessary to introduce the same item in Sections A, B and C of Appendix 1, as follows:

- 1) At the end of Section A of Appendix 1, to read:
 - "Supplementary information:
 - a) Reference frequency, if any, and any co-ordination required by No. 492A.
 - b) Indicate any administration with which an agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement."
- 2) At the end of Sections B and C of Appendix 1, to read: "Supplementary information:
 - a) Any co-ordination required by 492A.
 - b) Indicate any administration with which an agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement."

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ANNEX II

DRAFT APPENDIX 1A

Spa

MOD

NOTICES RELATING TO STATIONS / IN THE SPACE
AND RADIO ASTRONOMY SERVICES /
(see Article 9A)

Section A. General instructions

- 1. A separate notice shall be sent to the International Frequency Registration Board for notifying:
 - each new frequency assignment,
 - any change in the characteristics of a frequency assignment recorded in the Master International Frequency Register (hereinafter called the Master Register),
 - any total deletion of a frequency assignment recorded in the Master Register.
- 2. When submitting notices under No. / 639BA / for earth and space transmitting assignments and under No. / 639BB / for space and earth receiving assignments, separate notice shall be submitted to the Board for each assignment to an earth or space station. In the case of a passive / satellite system /, only earth transmitting and receiving assignments shall be notified.
- 3. In the case of a \angle satellite system $\overline{/}$ employing multiple space stations with the same general characteristics, a separate notice shall be submitted for each space station:
 - when it is aboard a geostationary satellite, or

- when it is aboard a non-geostationary satellite except when a number of satellites have the same radio frequency characteristics and orbital characteristics (excluding the ascending node position). In this case one notice covering all such space stations may be submitted.
- 4. The following basic information shall be shown on the notice:
 - (a) the serial number of the notice and the date on which the notice is sent to the Board:
 - (b) the name of the notifying administration;
 - (c) sufficient data to identify the particular / satellite network / in which the earth or space station will operate:
 - (d) whether the notice reflects:
 - (1) the first use of a frequency by a station,
 - (2) a change in the characteristics of a frequency assignment recorded in the Master Register (indicate whether the change is areplacement, addition or deletion of existing characteristics), or
 - (3) a deletion of an assignment in all of its notified characteristics;
 - (e) reference to the weekly circular providing the advance publication information required in accordance with No. / 639AA /:
 - (f) basic characteristics as outlined in section B, C, D, E or F as appropriate;
 - (g) any other information which the administration considers to be relevant, e.g. any factors taken into account when applying Appendix 28 for the determination of co-ordination area and also an indication that the assignment concerned would be operating in accordance with No. 115, information concerning the use of the notified frequency if such use is restricted, or, in the case of notices pertaining to space stations, if the transmissions of the station are to be permanently switched off after a certain period.

Section B. Basic characteristics to be furnished in notices relating to frequencies used by earth stations for transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in k[c/s] up to 30 000 k[c/s] inclusive, and in M[c/s] above 30 000 k[c/s] (see number 85)

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in k[c/s] (see number 89)

Item 3 Date of putting into use

- (a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of putting the frequency assignment into use.
- (b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4(a)), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).
- Item 4 Identity and location of the transmitting earth station.
 - (a) Indicate the name by which the station is known or the name of the locality in which it is situated.
 - (b) Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.
 - (c) Indicate the geographical co-ordinates (in degrees and minutes) of the transmitter site.
- Item 5 Station(s) with which communication is to be established

Identify the associated receiving space station(s) by reference to the notification thereof or in any other appropriate manner, or, in the case of a passive satellite, the identity of the satellite and the location of the receiving earth station(s).

Item 6 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 7 Class of emission, necessary bandwidth and description of transmission
 - (a) Indicate the class of emission of the assignment
 - (b)* Indicate the carrier frequency or frequencies
 of the emission(s)
 - (c)* Indicate for each carrier the class of emission, necessary bandwidth and description of transmission, in accordance with Article 2 and Appendix 5.
- Item 8 Power characteristics of the transmission
 - (a)* Indicate for each carrier the peak power supplied to the input of the antenna;
 - (b) Indicate the total peak power and the maximum power density per c/s supplied to the input of the antenna averaged over the worst $\frac{1}{2}$ k/c/s/ band, for carriers below 15 G/c/s/ or averaged over the worst 1 M/c/s/ band, for carriers above 15 G/c/s/.
- Item 9° Transmitting antenna characteristics
 - (a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see number 100).
 - (b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).
 - (c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for co-ordination.
 - (d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.
 - (e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation;

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

- (f) Indicate in degrees clockwise from true North the planned range of operating azimuthal angles for the direction of maximum radiation
- (g)* Indicate the type of polarization of the transmitted wave in the direction of maximum radiation; also indicate the sense in the case of circular polarization and the plane in the case of linear polarization
- (h) Indicate the altitude (metres) of the antenna above mean sea level

Item 10* Modulation characteristics

For each carrier, according to the nature of the signal modulating the carrier and the type of modulation, indicate the following characteristics:

- (a) Carrier frequency-modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband; indicate the lowest and highest frequencies of the baseband and the r.m.s. frequency deviation of the test tone as a function of baseband frequency.
- (b) Carrier frequency-modulated by a television signal; indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristic and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals.
- (c) Carrier phase-shift-modulated by a pulse code modulation signal (PCM/PSK); indicate the bit rate and the number of phases.
- (d) Amplitude-modulated carrier (including single sideband); indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used.
- (e) For all other types of modulation, provide such particulars as may be useful for an interference study.
- (f) For any type of modulation as applicable indicate the characteristics of energy dispersal.

This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

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Item 11 Maximum hours of operation

Indicate in GMT the maximum hours of operation on the frequency of each carrier.

Item 12 Co-ordination

Give the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance with Nos. / 639AJ / and / 639AN / and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 13 Agreements

Give also, if appropriate, the name of any Administration with which agreement has been effected to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 14 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic address of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section C. Basic characteristics to be furnished in notices relating to frequencies to be received by earth stations

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in kc/s up to 30 000 k/c/s/ inclusive, and in Mc/s above 30 000 k/c/s/. (See number 35)

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band (see number 89).

Item 3 Date of putting into use

(a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.

- (b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4 (a)), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).
- Item 4 Identity and location of the receiving earth station
 - (a) Indicate the name by which the receiving earth station is known or the name of the locality in which it is situated.
 - (b) Indicate the country in which the receiving earth station is located. Symbols from the Preface to the International Frequency List should be used.
 - (c) Indicate the geographical co-ordinates (in degrees and minutes) of the receiver site.
- Item 5 Station(s) with which communication is to be established

Identify the associated transmitting space station(s) by reference to the notification thereof or in any other appropriate manner, or, in the case of a passive satellite, the identity of the satellite(s) and the associated transmitting earth station(s).

Item 6 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 7 Class of emission, necessary bandwidth and description of the transmission to be received
 - (a) Indicate the class of emission of the assignment to be received.
 - (b)* Indicate the carrier frequency or frequencies to be received.
 - (c)* Indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission, in accordance with Article 2 and Appendix 5.
- Item 8 Earth station receiving antenna characteristics
 - (a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see number 100).

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

- (b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).
- (c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for co-ordination.
- (d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.
- (e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation.
- (f) Indicate in degrees, clockwise from true North, the planned range of operating azimuthal angles for the direction of maximum radiation.
- (g) Indicate the altitude (metres) of the antenna above mean sea level.

Item 9 Noise temperature

Indicate the lowest equivalent satellite link noise temperature in degrees Kelvin (see number ..) under "quiet sky conditions". This value shall be indicated for the nominal value of the angle of elevation when the associated transmitting station is aboard a geostationary satellite and, in other cases, for the minimum value of angle of elevation.

Item 10 Maximum hours of reception

Indicate in GMT the maximum hours of reception of the frequency of each carrier.

Item 11 Co-ordination

Give the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance with Nos. / 639AJ / and / 639AN / and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 12 Agreements

Give also, if appropriate, the name of any Administration with which agreement has been effected to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 13 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

Section D. Basic characteristics to be furnished in notices relating to frequencies used by space stations for transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in k[c/s] up to 30 000 k[c/s] inclusive, and in M[c/s] above 30 000 k[c/s.] (see number 85). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in k[c/s] (see number 89).

Item 3 Date of putting into use

- (a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of putting the frequency assignment into use.
- (b) Whenever the assignment is changed in any of its basic characteristics as shown in this Section (except in the case of a change in Item 4), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity of the space station(s)

Indicate the identity of the space station(s).

Item 5 Orbital information

(a) In the case of a space station aboard a geostationary satellite indicate the nominal geographical longitude on the geostationary satellite orbit and the longitudinal and inclination tolerances. Indicate also:

- (1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
- (2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and
- (3) in the event that the arc stated in paragraph (2) above is less than the arc stated in paragraph (1) above, provide the reasons therefor.
 - Note: The arcs specified in (1) and (2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.
- (b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period and the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Service area

Indicate the service area or areas on the earth or the name of the locality and country in which the associated receiving station(s) is (are) located.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 8 Class of emission, necessary bandwidth and description of transmission
 - (a) Indicate the class of emission of the assignment.
 - (b)* Indicate the carrier frequency or frequencies.

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

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- (c)* Indicate, for each carrier, the class of emission, necessary bandwidth and description of transmission, in accordance with Article 2 and Appendix 5.
- Item 9 Power characteristics of the transmission
 - (a)* Indicate for each carrier the peak power supplied to the input of the antenna,
 - (b) Indicate the total peak power and the maximum power density per cycle per second input of the antenna averaged over the worst 4 k/c/s/ band for carriers below 15 G/c/s/ or averaged over the worst 1 M/c/s/ band for carriers above 15 G/c/s/
- Item 10 Space station transmitting antenna characteristics

For each service area:

- (a) In the case of a space station aboard geostationary satellite, indicate the gain of the space station transmitting antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6, 10, 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated.
- (b) In the case of a space station aboard non-geostationary satellite, indicate the isotropic gain of the space station transmitting antenna in the main direction of radiation and the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of radiation as a reference.
- (c)* Indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization; also indicate the worst case axial ratio in the half power beamwidth.
- (d) Indicate for geostationary satellite, the pointing accuracy of the antenna.

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect do-ordination with another administration.

Item 11 * Modulation characteristics

For each carrier, according to the nature of the signal modulating carrier and the type of modulation, indicate the following characteristics:

- (a) Carrier frequency-modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband; indicate the lowest and highest frequencies of the baseband and the r.m.s.frequency deviation of the test tone as a function of baseband frequency.
- (b) Carrier frequency-modulated by a television signal; indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristic and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals.
- (c) Carrier phase-shift-modulated by a pulse code modulation signal (PCM/PSK); indicate the bit rate and the number of phases.
- (d) Amplitude-modulated carrier (including single sideband); indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used.
- (e) For all other types of modulation, provide such particulars as may be useful for an interference study.
- (f) For any type of modulation as applicable indicate the characteristics of energy dispersal.

Item 12 Maximum hours of operation

Indicate in GMT the maximum hours of operation on the frequency of each carrier.

Item: 13 Co-ordination

Give the name of any administration or group of administrations with which the use of the space system to which the space station belongs has been successfully co-ordinated in accordance with No. $\sqrt{639}$ AJ $\sqrt{}$

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

Item 14 Agreements

Give also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 15 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section E. Basic characteristics to be furnished in notices relating to frequencies to be received by space stations.

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in k[c/s] up to 30 000 k[c/s] inclusive, and in M[c/s] above 30 000 k[c/s.] (see number 85). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in k[c/s] (see number 89).

Item 3 Date of putting into use

- (a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.
- (b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity of the receiving space station(s)

Indicate the identity of the receiving space station(s).

Item 5 Orbital information

- (a) In the case of a space station aboard a geostationary satellite, indicate the planned naminal geographical longitude on the geostationary satellite orbit and the planned longitudinal and inclination tolerances. Indicate also:
 - (1) the arc of the geostationary orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
 - (2) the arc of the geostationary orbit within which the space station could provide the required service to its associated earth stations or service areas; and
 - (3) in the event that the arc stated in paragraph (2) above is less than the arc stated in paragraph (1) above, provide the reasons therefor.
 - Note: The arcs specified in (1) and (2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.
- (b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period and the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Associated transmitting earth station(s)

Identify the associated transmitting earth station(s) by reference to the notification thereof or in any other appropriate manner.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 8 Class of emission, necessary bandwidth and description of the transmission(s) to be received
 - (a) Indicate the class of emission of the assignment to be received.
 - (b)* Indicate the carrier frequency or frequencies of the transmissions(s) to be received.
 - (c)* Indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission(s) to be received, in accordance with Article 2 and Appendix 5.
- Item 9 Space station receiving antenna characteristics

For each receiving beam:

- (a) In the case of a space station aboard geostationary satellite, indicate the gain of the space station receiving antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6, 10, 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated.
- (b) In the case of a space station aboard non-geostationary satellite, indicate the isotropic gain of the space station receiving antenna in the main direction of radiation and the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of radiation as a reference.
- (c)* Indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization, also indicate the worst case axial ratio in the half power beamwidth.

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

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(d) Indicate, for geostationary satellite, the pointing accuracy capability of the antenna.

Item 10 Noise temperature

Indicate the total receiving system noise temperature (°K) at the input of the space station receiver.

Item 11 Maximum hours of reception

Indicate in GMT the maximum hours of reception of the frequency of each carrier.

Item 12 Co-ordination

Give the name of any administration or group of administrations with which the use of the space system to which the space station belongs has been successfully co-ordinated in accordance with No. / 639AJ_7.

Item 13 Agreements

Indicate also if appropriate the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 14 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

NOC Section F.

FORM OF NOTICE *) FOR USE WHEN NOTIFYING TO THE INTERNATIONAL FREQUENCY REGISTRATION BOARD A FREQUENCY ASSIGNMENT OR A CHANGE TO AN ASSIGNMENT RECORDED IN THE MASTER INTERNATIONAL FREQUENCY REGISTER (SEE ARTICLE 9A)

Earth station (transmitting (Section B of Appendix 1A) (T) (receiving (Section C of Appendix 1A) (R)

(b)	(d1) New assignment (d2) Change	(d3) Deletion of	(a) Notice No	
	(dl) New destignment (dl.) Orange	an assignment	(c) Identity of [satellite (e) Reference of Weekly Circulating to No. [659AA]	cular
1 Assigned frequency	Name of earth station	-		for I.F.R.B. use
2 Assigned frequency band in kc/s	4b Country	_		
Date of putting into use	Longitude and latitude of earth sta	ation site		

	of station and e of service rmed	emission nment	Carrier frequency	Class of emission, neccssary bandwidth		ower ceristics		Antenn	a characte	ristics		Altitude	Modulation	Iowest Equivalent	Haximun		SPECTION (G)
Station(s) with which communication is established	Class of st nature of s performed	of sife	(frequencies) **		Peak power	Total peak power aximum power	1	!	Minimur Minimur (M) of ole- vation	(R) muchal	Pola- * riza- tion		characteris- tics **	satellite link noise temperature	hours of operation on each carrier (G.H.T.)	Supplementary information (g)) : FORM C
5	6	7a	7ъ	7c	8a(T)	8b(T)8b(T	il	8ь (R) 9ь(T)	9e (T)	9f (T)	9g (T)	8g(R) 9h.(T)	10(T)	9(R)	10(K) 11(T)		NOT SK
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(R) ز 1	14 (T)	Operating administration or company		11(R), 12(T)	COORD/
		operating administration of company		12(R), 13(T)	Agreement
			Other information (a)		

Name and address of administration

15(R) 14(T)

NOTE: For radiation diagram [9c(T), 8c(R)] and horizon profile [9d(T), 8d(R)] attach the relevant information to this form.

^{*} The actual size of the notice is a matter for individual administrations.

^{**} See No. [*]

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NOTE : For antenna characteristics [10a(T) or 10b(T) and 9a(R) or 9b(R)] attach the relevant information to this form.

FORM OF NOTICE*) FOR USE WHEN NOTIFYING TO THE INTERNATIONAL FREQUENCY REGISTRATION BOARD A FREQUENCY ASSIGNMENT OR A CHANGE TO AN ASSIGNMENT RECORDED IN THE MASTER INTERNATIONAL FREQUENCY REGISTER

(b) Notifying administration ke/s ke/s Assigned frequency Assigned frequency band in ke/s Date of putting into use	5 Or	(d1) N	e Station (rec	nsmitting (Section eiving (Section (d2) Ch	E of Appendix 1A)	(R)	Deleti an ass	on of ignment			(a) Da (c) Na	te	network	lating to 639AA For I.F.R.B. use	
			's nominal long tolerance 5 (a) +	itude and		inclination ination toler 5b)		t	Perio in sp	od of object Ace 5b)		titudes of apog	1	Number of space stations 5b)	
Service area or station(s) with which communication is established	Class of station and nature of service performed	Class of emission of assignment	Carrier frequency (frequencies) **	Class of em necessary be and descript transmiss **	amwidth ion of ion	Peak power **	Total peak power	رن Maximum power در المدينة ا	Geo- stationary satellite pointing accuracy 9d(R) 10d(T)	Polarization ** 9c(R) 10c(T)	Modulation charac- toristics **	Receiving system noise Temperature	Maximum hours of operation to each service area or station (G.M.T.)	Supplementary	information (g)
			-			ya(1)			10d(T)				22(1)		

14(R), 15(T) Name and address of administration

^{*} The actual size of the notice is a matter for individual administrations.

^{**} Sce No. [*]



SPACE CONFERENCE

Document No. 356-E

ll July 1971 Original : French

English Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

APPENDIX 10

Following a discussion on Document No. 183, which took place in-Working-Group-6A on 10 July 1971, the attached list of draft amendments to be made to Appendix 10 of the Radio Regulations is submitted to Committee 6 for consideration.

P.E. WILLEMS Chairman Working Group бА

Annex: 1



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A N N E X

DRAFT

APPENDIX 10

1. New symbols

EA: Space station in the Amateur Satellite Service

TA: Space operation earth station in the Amateur Satellite Service

'EB: Space station in the Broadcasting-Satellite Service (sound broadcasting)

EV: Space station in the Broadcasting-Satellite Service (television)

TF: Fixed earth station in the Radiodetermination Satellite Service

TL: Mobile earth station in the Radiodetermination Satellite Service

TT: Earth station in the Space Operation Service

TP: Receiving earth station

2. Amendments to existing symbols

Replace:

FE : Earth station (Earth-Space Service)

bу

TE: Transmitting earth station

3. The Drafting Committee will have to amend the fallowing symbols to adapt them to the new definitions for the services:

Replace:

EC: Communication-satellite space station

by

Space station in the Fixed Satellite Service

TC : Communication-satellite earth station

by

Earth station in the Fixed Satellite Service

TH: Space research earth station

bv

Earth station in the Space Research Service

TM : Meteorological-satellite earth station

by

Earth station in the Meteorological-Satellite Service

TN: Radionavigation-satellite earth station

by

Earth station in the Radionavigation-Satellite Service



SPACE CONFERENCE

Document No. 357-E 10 July 1971

Original : English

French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

NINTH REPORT OF COMMITTEE 4

New Appendix 29 to the Radio Regulations appearing in the Annex hereto has been approved by Committee 4.

The text in question has been forwarded to the Drafting Committee.

E.F. SANDBACH Chairman Committee 4

Annex: 1



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ANNEX

ADD

APPENDIX 29

A METHOD OF CALCULATION TO DETERMINE THE DEGREE OF INTERFERENCE BETWEEN GEOSTATIONARY SATELLITE \[\subseteq \text{SYSTEMS} \] SHARING THE SAME FREQUENCY BANDS \[\subseteq \subseteq \]

1. Introduction

The method of calculating interference is based on the concept that the noise temperature of the system suffering interference increases as the level of the interference increases. It can, therefore, be applied irrespective of the modulation characteristics of these \(\subseteq \) systems \(\subseteq \), and of the precise frequencies used.

In this method, the apparent increase in the equivalent Z satellite link / noise temperature**) of an earth station receiver resulting from interference caused by a given system is calculated and this value is compared with a predetermined increase in the noise temperature. (See paragraph 3.)

2. Calculation of the increase in noise temperature of the link suffering interference

As used in this section, the term \(\int \) satellite link \(7 \) denotes the entire connection consisting of a transmitting earth station, a satellite and a receiving earth station.

Let A and A' be the / satellite links / of the two / systems / considered. Primes indicate the parameters of / satellite link / A'; the notation without primes is used for the parameters of / satellite link / A.

- ${ ilde I}^*$) Exact title will depend on the outcome of Committee 6 deliberations. ${ ilde I}$
 - **) The equivalent / satellite link / noise temperature is taken to mean the noise temperature at the input of the earth station receiver corresponding to the RF noise power which produces the total observed noise at the output of the / satellite link / excluding noise due to interference coming from / satellite links / using other satellites and terrestrial systems.

The parameters are defined as follows (for \sqrt{s} satellite link \sqrt{A}):

- ΔT_S : increase in the receiving noise temperature of the satellite S caused by interference in the receiver of this satellite; (°K)
- $\Delta T_{\rm e}$: increase in the receiving noise temperature of the earth station $e_{\rm R}$ caused by interference in the receiver of this station; (°K)
- Ps : maximum power density per Hz delivered to the antenna of satellite S (averaged over the worst 4 kHz band); (W/Hz)

Note: the product $p_Sg_{\mathfrak{Z}}(\delta_e^{\; !})$ is the maximum equivalent isotropic radiated power per Hz of satellite S in the direction of the receiving earth station $e_R^{\; !}$ of / satellite link / A'.

- $P_{\rm e}$: maximum power density per Hz delivered to the antenna of the transmitting earth station $e_{\rm T}$ (averaged over the worst 4 kHz band); (W/Hz)
- $g_2(\delta_e^{'})$: receiving antenna gain of satellite S in the direction of the transmitting earth station $e_T^{'}$ of $\sqrt{$ satellite link / A'; (numerical power ratio)
- $\mathbf{g_1}(\mathbf{0})$: transmitting antenna gain of the earth station $\mathbf{e_T}$ in the direction of satellite S'; (numerical power ratio)
- $g_{l\mu}(\theta)$: receiving antenna gain of the earth station e_R in the direction of satellite S'; (numerical power ratio)
- k : Boltzmann's constant; (Joules/oK)
- ℓ u*) : free-space transmission loss on the up-path; (numerical power ratio)

^{*)} See Note on page 3

: transmission gain of the /system / from the satellite receiver input to the earth station receiver input; (numerical power ratio, usually less than 1)

egeocentric angular separation between two satellites (degrees).

The parameters $\Delta T_{_{\mathbf{S}}}$ and $\Delta T_{_{\mathbf{C}}}$ are given by the following equations :

$$\Delta T_{s} = \frac{p'_{e} g'_{1} (\theta) g_{2} (\delta'_{e})}{k \ell_{ij}}$$
 (1)

$$\Delta T_{e} = \frac{p' s g' 3 (\delta_{e}) g_{4} (\theta)}{k \ell_{d}}$$
 (2)

The symbol ΔT will be used to denote the apparent increase in the equivalent noise temperature for the entire / satellite link / at the receiver input of the receiving station e_p due to interference from / system / A^{\dagger} .

This increase is the result of interference entering at both the satellite and earth station receivers of $\sqrt{\text{system}}$ A and can accordingly be expressed as :

$$\Delta T = \gamma \Delta T_{s} + \Delta T_{e}$$
 (3)

Hence,
$$\Delta T = \gamma \frac{p' e g' 1}{k \ell_u} (\theta) g_2 (\delta' e) + \frac{p' s g' 3}{k \ell_d} (\delta_e) g_4 (\theta)$$
 (4)

Equation (4) combines both the up-path and the down-path interference. If there is a change of modulation in the satellite or if the translation frequencies of the wanted and interfering satellites are different then it may be necessary to treat up and down paths separately using equations (1) and (2).

Note: *) In the interest of simplification it was assumed that:

- basic transmission loss on the down-path is the same regardless of the satellite and earth station considered:
- basic transmission loss on the up-path is the same regardless of the earth station and satellite considered:
- the topocentric angular separation between the two satellites as seen from any earth station is identical to the geocentric angular separation between the two satellites.

In the foregoing equations, the gains $g'_1 \theta$ and $g_4 \theta$ are those of the earth stations concerned. Unless more precise actual data are available, an appropriate reference radiation pattern may be used to express the gain g'_1 (0) and g_h (0) in a direction forming an angle 0 with the direction of maximum radiation. In the event that precise numerical data are not available, the reference radiation pattern $52-25 \log_{10}$ (0) shall be used for earth station antennae for which the ratio of effective diameter to wavelength exceeds 100.

In the same way, the increase ΔT^i in the equivalent noise temperature for the entire \angle satellite link \angle at receiver input of the receiving earth station e_R^{-i} under the effect of the interference caused by \angle satellite link \angle A is given by the following equations:

$$\Delta \Gamma'_{s'} = \frac{p_e g_1(\theta) g'_2(\delta_e)}{k \ell_u}$$
 (5)

$$\Delta T'_{e}' = \frac{p_{s} g_{3} (\delta_{e'}) g'_{\mu} (\theta)}{k \ell_{g'}}$$
 (6)

$$\Delta T' = \gamma \frac{p_e g_1(\theta) g'_2(\delta_e)}{k \ell_d} + \frac{p_s g_3(\delta_e) g'_{1}(\theta)}{k \ell_d} (7)$$

For two multiple-access satellites, this calculation must be made for each of the \angle satellite links \angle established via one satellite in relation to each of the \angle satellite links \angle established via the other satellite.

3. Comparison between calculated and predetermined percentage increase in equivalent link noise temperature

The calculated values of ΔT and $\Delta T'$ shall be compared with the corresponding predetermined values. These predetermined values are taken as 2% of the appropriate equivalent link noise temperatures.

If the calculated value of ΔT is less than the predetermined one, the interference level from \angle satellite link \angle A to \angle satellite link \angle A is acceptably small irrespective of the modulation characteristics of the two \angle satellite links \angle and of the precise frequencies used,

if the calculated value of Δ T is more than the predetermined one, a detailed calculation shall be carried out following the methods and techniques set out in the relevant current C.C.I.R. Reports and Recommendations:

the comparison of Δ T' with the predetermined value shall be carried out in a similar manner.

As an example, it can be seen that in the case of a satellite /system/ operating in accordance with current 0.0.T.R. Recommendations using FM telephony and having a total noise in a telephone channel of 10 000 pWOp including 1 000 pWOp interference noise from terrestrial radio-relay systems and 1 000 pWOp interference noise from other satellite /systems/, a 2% increase in equivalent noise temperature would correspond to 160 pWOp of interference noise.

The list of basic characteristics to be furnished for each network is given in Appendix 1B. A detailed illustration of the interference calculation in the case of two geostationary satellite systems is given in the Annex to this Appendix.

4. Determination of the links to be considered in calculating the increase in equivalent link noise temperature from the data furnished for the advance publication of a satellite network

The greatest increase in equivalent link noise temperature caused to any link of another satellite network, existing or planned, by interference produced by the proposed satellite network must be determined.

The most unfavourably sited transmitted earth station of the interfering satellite network should be determined for each satellite receiving antenna of the network suffering interference by superimposing the earth—to-space service areas*) of the interfering network on the space station transmitting antenna gain contours plotted on a map of the earth's surface. This station is the one for which the satellite receiving antenna gain of the network interfered with, in the direction of the site, is the greatest.

The most unfavourably sited receiving earth station of the network suffering interference should be determined in an analagous manner for each space-to-earth service area *) of that network. This station is the one for which the satellite transmitting antenna gain of the interfering network in the direction of the site is greatest.

When the satellite of the network suffering interference is equipped with simple frequency-translating transponders these determinations are made in pairs, one for the satellite receiving antenna associated with the repeater and one for the space-to-earth service area connected to the satellite transmitting antenna associated with the repeater.

The calculation procedure described above may be used to determine the greatest increase in equivalent noise temperature caused to any link in a proposed satellite network by interference produced by any other satellite network.

Annex : 1

Annex

Example of an interference calculation between two geostationary satellite / systems 7 sharing the same frequency band

A. GENERAL

In this example for simplicity two identical satellite systems are assumed with $\vartheta=6^\circ$ geocentric angular spacing between the satellites. For this angular separation the reference radiation pattern of the earth station antenna $32-25\log_{10}\vartheta$ gives a gain of 12.5 dB in the direction of the other satellite.

The calculations have been performed in dB, which means that numerical multiplications thus become dB additions and numerical divisions become dB subtractions. In each step the contributing factors have been introduced in a sequence corresponding to the propagation direction. The first three steps define the system parameters for each system. Steps 4, 5 and 6 perform the actual interference calculations.

To determine the equivalent link noise temperature it is necessary to know the ratio between the total internal link noise and the thermal noise of the down-path. The noise budget for this example is assumed as follows:

Noise budget

	(Thermal noise down-path	5 000 pWOp
Internal noise 8 000 pW0p	Thermal noise up-path	1 000 pWOp
External noise 2000 pWOp	(Intermodulation noise	9 900 gWq
	(Interference noise from (systems using other (satellites	1 000 pWCp
	Interference noise from terrestrial systems	1 000 pWOp
	Total noise	10 000 pWop

It may be noted that since both satellites use global beams essentially no antenna discrimination between wanted and unwanted signals is obtained at the satellite and that this constitutes a worst case.

B. SYSTEM PARAMETERS

Step 1)	UP-path at 6 175 MHz	Symbol	A or A'	<u>Unit</u>
	Maximum earth station transmitter power density per Hz in any 4 KHz band	p _e	-37	dBw/Hz
	Antenna gain earth station	g 1	62.5	d₿
	Free space loss 38 500 km at 6 175 MHz	$\boldsymbol{\ell}_{\mathrm{u}}$	200	đB
	Satellite antenna gain (using global peam)	g ₂	15.5	dB.
	Receiver input at satellite $p_e + g_1 - \ell_u + g_2$		-159	dBW/Hz

		Symbol	Link A or A'	<u>Unit</u>
Step 2)	DOWN-path at 3 950 MHz		1	ŀ
	Maximum power density per Hz delivered to the satellite			
,	antenna		- 57	dBW/Hz
	Satellite transmit antenna gain	⁴ 3	15.5	₫B
	Free space loss for 38 500 km at 3 950 MHz	$\ell_{ m d}$	196	dB
	Earth station antenna gain	. g _{lį}	58.5	dB
	Receiver input at earth station $p_s+g_3-\ell_d+g_4$.		-179	dBW/Hz
Step 3)	Link calculations			
	Transmission gain from satellite receiver input to earth station			
	receiver input 159-179	Υ	-20	dB
	Earth station noise temperature (giving G/T=40.7 dB)		60	°K
	Thermal noise down-path (see noise budget)		5 000	qOWq
	Total internal link noise (see noise budget)		8 000	p₩Ōp
· .	Equivalent link noise temperature $\frac{8000}{5000} \times 60^{\circ}$	T	96	c K

C. INTERFERENCE CALCULATION

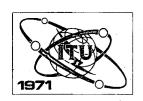
," .				:	
		Symbol	Link A or A'	Unit	
Step 4)	UP-path interference				
	Interfering earth station power density (as in Step 1)	pe	-37	dBW/Hz	
	Interfering earth station antenna gain towards interfered satellite (6° off beam)	g ₁ '(&)	+12.5	dB	
	Free space loss for 38 500 km at 6 175 MHz (see Step 1)	l_{u}	200 ;	dΒ	
	Satellite antenna gain in the direction from the interfering earth station	g ₂ (δ'e)	15.5	đB .	
	Boltzmann's constant 1.38 x 10 ⁻²³ Joule/°K	2.5	-228.6	dBW/°K	
	Increase in receiver noise temperature at the satellite $p_e+g_1(s)-\ell_u+g_2(\delta'_e)-k$		19.6	dBoK	
	Absolute value of increase in satellite noise temperature	ΔTs	91	°K	
Step 5)	DOWN-path interference				
	Interfering satellite transmitter power density (Step 1)	p _s ¹	- 57	dBW/Hz	
	Interfering satellite antenna gain towards interfered earth station	క్రె'(్మ్)	15.5	dB	
	Free space loss for 38 500 km at 3 950 MHz	\mathcal{L}_{d}	196	đВ	
	Earth station antenna gain in the direction from the interfering satellite (6° off beam)	g ₄ (%)	12.5	dВ	
	Boltzmann's constant 1.38 x 10-23 Joule/°K	k	-228.6	dBW∕°K	
	Increase in receiver noise temperature at the earth station				
	$p_{s}'+g'_{3}(\delta_{e})-l_{d}+g_{l_{1}}(\vartheta)-k$		+3.5	dB ∘ K	
	Absolute value of increase in earth station noise temperature	ΔTe	2.24	°K	
	± •	f -			

		Symbol	Link A or A	Unit
Step 6)	Total link interference		A OF A	
	Increase in satellite noise temperature (Step 4)	ΔTs	91	°K
	Numerical value for γ (from Step 3)	γ	.01	numerical
	Increase in earth station noise temperature (Step 5)	$\Delta ext{T}_{e}$	2.24	°K
	Increase in equivalent link noise temperature $\gamma \Delta T + \Delta T_e = (.01 \times 91) + 2.24$	ΔΤ	3 . 15	°K
	Percentage increase 3.15 96 x 100%	ΔT/Tx100%	3. 29	%
	Increase in link noise due to interference 3.29/100 x 8 000p\v0p	: ' !	263	g₩Op
CONCLUSIO	<u>ns</u>			

In the example shown the increase in equivalent link noise temperature is 3.2%. Since it exceeds the predetermined value of 2%, the amount of noise introduced can no longer be considered negligible and therefore co-ordination between the two systems is required. More precise calculations should now be made using for example the actual antenna patterns of the earth stations, the topocentric angular separation of the satellites, and the precise basic transmission losses. There may be additional factors such as polarization isolation, frequency interleaving, spectral distribution of the interfering noise which all reduce the actual interference experienced.

It can be shown that for this example a larger satellite spacing of 7.5° would have caused only 2% increase in equivalent link noise temperature and thus obviated the need for any co-ordination.

D.



SPACE CONFERENCE

Document No. 358-E

11 July 1971

Original : English,

French,

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971 COMMITTEE 6

REPORT OF SUB-WORKING GROUP 6A-2

TO COMMITTEE 6

Sub-Working Group 6A-2 has held six meetings, in the course of which it has examined the proposal concerning satellite broadcasting and which fall under the competence of Committee 6.

Due to time limitations, it was not possible to submit to Working Group 6A the outcome of the work of the Sub-Working Group. Following a proposal by the Chairman of Working Group 6A, these results are submitted to Committee 6 directly.

The following documents are submitted as a result of the Sub-Working Group's work :

- the draft of a provision to be added to Article 7 (Annex 1)
- a draft Resolution (Annex 2)
- a draft Resolution (Annex 3)
- a draft Recommendation (Annex 4).

The Sub-Working Group was not able to come to one solution with regard to paragraph 2 of Annex 2 and the whole of Annex 4, these two elements being connected.

F. JOB Convenor, Sub-Working Group 6A-2

Annexes: 4



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ANNEX 1

DRAFT

ARTICLE 7

Satellite Broadcasting

Ref.

428A

§ 2A. In devising the characteristics of a broadcasting space station, all technical means available shall be used to reduce as much as possible the radiation over the territory of neighbouring countries unless an agreement has been previously reached with such countries.

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ANNEXZ

DRAFT RESOLUTION / D /

on the establishment of agreements and associated plans for satellite broadcasting

The World Administrative Radio Conference for Space Telecommunications, Geneva 1971,

considering

- a) that it is important to make the best possible use of the geostationary satellite orbit and of the frequency bands allocated to the Broadcasting-Satellite Service:
- b) that the great number of receiving installations using such directional antennae as could be set up for a Broadcasting-Satellite Service may be an obstacle to changing the location of broadcasting space stations on the geostationary satellite orbit, from the date of their bringing into use;
- c) that satellite broadcasts may create harmful interference over a large area of the earth's surface;
- d) that the other services with allocations in the same band need to use the band before the Broadcasting-Satellite Service is set up:

resolves

- that satellite broadcasting stations shall be established and operated in accordance with agreements and associated plans adopted by World or Regional Administrative Conferences, as the case may be, in which all the administrations concerned and the administrations whose services are liable to be affected may participate;
- 3. that during the period before the entry into force of such agreements and associated plans the administrations and the I.F.R.B. shall apply the procedure contained in Resolution \sqrt{E} .

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ANNEX 3

DRAFT RESOLUTION No. E

on the bringing into service of broadcasting space stations, prior to the entry into force of agreements and associated plans for satellite broadcasting

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that while Resolution No. D has been adopted by this Conference, envisaging plans for satellite broadcasting, some administrations might nevertheless feel the need to bring such stations into service prior to such plans being established;
- b) that administrations should, as far as possible, avoid proliferation of broadcasting space stations before such plans have been established;
- c) that a broadcasting space station may cause harmful interference to stations in the / Terrestrial Service / operating in the same frequency band, even if the latter are outside the service area of the space station;
- d) that the procedure specified in Article 9A of the Radio Regulations contains no provisions for the co-ordination between broadcasting space stations and terrestrial stations and between broadcasting space stations and space systems of other administrations.

resolves

- 1. that the following procedure shall be applied until agreements and associated plans pursuant to Resolution No. D enter into force:
 - <u>Section A</u>: Co-ordination procedure between broadcasting space stations and terrestrial stations
- 2.1 Before an administration notifies to the Board or brings into service any frequency assignment to a broadcasting space station in a frequency band where this frequency band is allocated, with equal rights,

to the Broadcasting-Satellite Service and to a / Terrestrial Service /, either in the same Region or sub-Region or in different Regions or sub-Regions, it shall co-ordinate the use of this assignment with any other administration whose / Terrestrial Service / may be affected. For this purpose, it shall inform the Board of all the technical characteristics of the station, as listed in Appendix 1A, Sections / A and D /, which are necessary to assess the risk of interference to a / Terrestrial Service 1)/.

- 2.2 The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.
- 2.3 Any administration which considers that its / Terrestrial Service / may be affected shall forward its comments to the administration seeking co-ordination and, in any case, to the Board. These comments must be received within / ninety / days from the date of the relevant I.F.R.B. weekly circular. It shall be deemed that any administration which has not forwarded comments within that period does not consider that its / Terrestrial Service / is likely to be affected.
- 2.4 Any administration which has forwarded comments on the projected station shall either give its agreement to the co-ordination, or, if this is not possible, send to the administration seeking co-ordination all the data on which its comments are based as well as any such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.
- 2.5 The administration which plans to bring into use a space station as well as any other administration which believes that its / Terrestrial Service / is likely to be affected by the station in question may request the assistance of the Board at any time during the co-ordination procedure.
- 2.6 If the assistance of the Board has been sought and there is a continuing disagreement between the administration seeking co-ordination and the administration which has forwarded its comments, the administration seeking co-ordination may, after a total period of /one hundred and fifty / days, send to the Board its notice concerning the frequency assignment in question.

The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations \(\subseteq \) as accepted by the administrations concerned under the terms of Resolution No. ... \(\subseteq \).

In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

- Section B: Co-ordination procedure between broadcasting space stations and space systems of other administrations.
- 3. An administration intending to establish a service of broadcasting by satellite shall, for the purpose of co-ordination with space systems of other administrations, apply the following provisions of Article 9A of the Radio Regulations:
- 3.1 Numbers 639AA to 639AI inclusive.
 - 3.2.1 Number 639AJ 1).
 - 3.2.2 No co-ordination under paragraph 2.1 is required when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the probability of harmful interference to stations in the / Space Service / of other administrations.
 - 3.2.3 Numbers 639AL, 639AM, 639AO, 639AS(a), (c), (e), (f), 639AT, 639AU, 639AV, 639AW, 639AX, 639AY, 639AZ.
 - Section C: Notification, examination and recording in the Master Register of assignments to broadcasting space stations, treated under this Resolution.
- 4.1 When notifying frequency assignments to broadcasting space stations, the notifying administration shall apply the provisions of the first paragraph of Number / 639BA / and those of Numbers 639BE, 639BF and 639BG of the Radio Regulations.
- 4.2 Notices made under paragraph 4.1 shall initially be treated in accordance with Number 639BH.

The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations / as accepted by the administrations concerned under the terms of Resolution No. .../.

In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

²⁾ See Number 639AA.1 of the Radio Regulations.

- 5.1 The Board shall examine each notice with respect to:
- 5.2 a) its conformity with the Convention, the Table of Frequency Allocations and the other provisions of the Radio Regulations (with the exception of those relating to the co-ordination procedure and to the probability of harmful interference);
- 5.3 b) its conformity, where applicable, with the provisions of paragraph 2.1 and Section B below relating to co-ordination of the use of the frequency assignment with the other administrations concerned;
- 5.4 c) where appropriate, the probability of harmful interference to the service rendered by a station in a / Space or Terrestrial Service / for which a frequency assignment has already been recorded in the Master Register in conformity with the provisions of Number 50l or 639EM as appropriate, if that assignment has not, in fact, caused harmful interference to the service rendered by a station for which an assignment has been previously recorded in the Master Register and which itself is in conformity with Number 50l or Number 639EM as appropriate.
- 5.5 Depending upon the findings of the Board subsequent to the examination prescribed in paragraphs 5.2, 5.3 and 5.4, further action shall be as follows:
- 5.6 Where the Board reaches an unfavourable finding with respect to paragraph 5.2 the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.7 Where the Board reaches a favourable finding with respect to paragraph 5.2, or where it reaches the same finding after resubmission of the notice, it shall examine the notice with respect to the provisions of paragraph 5.3 above.
- 5.8 Where the Board finds that the co-ordination procedures mentioned in paragraph 5.3 have been successfully completed with all administrations whose services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in the column 2d of the Master Register with entry in the Remarks Column indicating that such recording does not prejudge in any way the decisions to be included in the agreements and associated plans referred to in Resolution No. $\langle D \rangle$.

- 5.9 Where the Board finds that the co-ordination procedures mentioned in paragraph 5.3 have not, as appropriate, been applied or have been unsuccessfully applied, the notice shall be returned immediately by airmail to the notifying administration with the reason for its return and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.10 Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedures, as appropriate, have been successfully completed with all administrations whose services may be affected, the assignment shall be treated as indicated in paragraph 5.8.
- 5.11 Where the notifying administration resubmits the notice and states that it has been unsuccessful in endeavouring to effect the co-ordination, the notice shall be examined by the Board with respect to paragraph 5.4.
- 5.12 Where the Board reaches a favourable finding with respect to paragraph 5.4, the assignment shall be recorded in the Master Register. The appropriate symbol indicating the finding by the Board shall indicate that the co-ordination procedures, as appropriate, referred to in paragraph 2.1 were not successfully completed. The date of receipt by the Board of the notice shall be entered in the column 2d of the Master Register, with the remark mentioned in paragraph 5.8.
- 5.13 Where the Board reaches an unfavourable finding with respect to paragraph 5.4, the notice shall be returned immediately by airmail to the notifying administration with the reasons for the Board's finding and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.14 If the administration resubmits the notice unchanged with the insistence that it be reconsidered, but should the Board's unfavourable finding under paragraph 5.4 remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in column 2d of the Master Register, with the remark mentioned in paragraph 5.8. appropriate remark shall be placed in column 13 to indicate that the assignment is not in conformity with the provisions of paragraphs 5.2, 5.3 or 5.4, as appropriate. In the event that the administration concerned receives no complaint of harmful interference concerning the operation of the station in question for a period of / one year / from the commencement of operation, the Board shall review its finding.

- 5.15 If harmful interference is actually caused to the reception of any station in the / Space Service / whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to paragraphs 5.2, 5.3 and 5.4 of this Resolution, as appropriate, by the use of a frequency assignment in the / Space Service / which has been recorded in the Master Register in accordance with the provisions of paragraph 5.14 of this Resolution or of No. 639CP of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.
 - 5.16 If harmful interference to the reception of any station whose assignment is in accordance with paragraph 5.2 of this Resolution, is actually caused by the use of a frequency assignment which is not in conformity with paragraph 5.2 of this Resolution, or with Numbers 501, 570AB or 639BM of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

ANNEX 4

_ DRAFT RECOMMENDATION No. _ 1_7

The World Administrative Radio Conference for Space Telecommunications, Geneva (1971),

considering

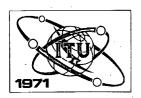
- a) that ultimately the Broadcasting-Satellite Service may be one of the prime users of the band / 11.95-12.75 Gc/s/ in the European Broadcasting Area;
- b) that the Broadcasting-Satellite Service will not be fully developed for many years;
- c) that other services in the European Broadcasting Area having allocations in this band need to use the band in advance of the development of the Broadcasting-Satellite Service;
- d) that the disposition of these services, including the planning of the terrestrial broadcasting stations, is dependent upon assignments made in the Broadcasting-Satellite Service, as the existence of plans for fixed and mobile services must in no way inhibit the planning of the Broadcasting-Satellite Services;
- e) that Resolution No. / D / specifies that the broadcasting-satellite stations are to be established and operated in accordance with agreements and associated plans adopted by appropriate Administrative Conferences;

recommends

- that an Administrative Conference, in which all the Administrations concerned and the Administrations whose services are liable to be affected may participate, be convened to establish an agreement and an associated assignment plan for stations of the Broadcasting-Satellite Service for the European Broadcasting Area with the following objectives:
 - a) to agree the technical characteristics of channels to be assigned within the band / 11.95-12.75 Gc/s/ and the number of channels available for assignment;

Annex 4 to Document No. 358-E Page 14

- b) to assign channels to individual Administrations without taking into account existing or planned Fixed, Mobile and Broadcasting Services;
- c) to frame any necessary procedures to replace those in the Radio Regulations and to ensure the successful implementation of assignments in this band;
- 2. that such a conference be held not later than 1975;
- that this conference be immediately followed by a further conference to establish an agreement and an associated plan for stations of the Broadcasting Service;
- 4. that the Administrative Council determine the exact date and place of such a conference or conferences, in accordance with No. 69 of the International Telecommunication Convention, Montreux, (1965).



SPACE CONFERENCE

Document No. 359-E

11 Ju**ly** 1971

Original: English

French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

FINAL REPORT BY THE CHAIRMAN OF WORKING GROUP 6A

TO THE CHAIRMAN OF COMMITTEE 6

In its last two meetings, Working Group 6A:

I agreed on the texts of Annexes 1, 2 and 3 to this Document;

With reference to the terms and definitions mentioned in Documents Nos. 146, 160, 166 and 195, considered that it was not necessary to include the following terms in the Radio Regulations, as they are not used in Appendices 1, 1A and 1B:

IIA Frequency band Allocated frequency band Shared (allocated) (frequency) band Geographically allocated frequency band Shared assigned (frequency band) Frequency allotment plan Pre-assigned frequency Demand-assigned frequency Figure of merit of a system Noise temperature Energy-dispersal frequency Multiplex operation Multi-destination transmission Multiple access operation Phase-shift telegraphy Data transmission . Primary body Unperturbated orbit Orbital elements Orbital plane .Direct orbit Circular orbit Elliptical orbit Equatorial orbit Polar orbit

Inclined orbit



Apoastron
Periastron
Period (anomalistic)
Nodal period
Sidereal period of revolution
Sidereal period of rotation
Station-keeping satellite
Synchronized satellite
Attitude-stabilized satellite
Synchronous satellite
Sub-synchronous satellite
Object in space
Principal plane of reference

agreed that the definition of "noise temperature" is needed and the Working Group took note that Committee 4 had referred the matter to the C.C.I.R.;

IIC noted that the following terms are used in Appendices 1A or 1B:

- ascending node
- apogee
- perigee

but that they are defined in the technical literature and, at this time, it was not considered necessary to have their definitions included in the Radio Regulations;

with reference to the definition of "harmful interference" the Working Group considered that the addition of the words "the effect of" at the beginning of the existing definition was not needed, because the text has to be the same as it is in the I.T.U. Convention;

ITE with regard to the definition of "assigned frequency band": the Working Group agreed on the following text:

MOD 89 assigned Frequency Band: The frequency band (the centre of which coincides with the frequency assigned to the station) the width of which equals the necessary bandwidth plus twice the absolute value of the frequency tolerance;

the Working Group also examined Document No. 188(Rev.) from the French Administration dealing with Resolution No. J. The Working Group decided to transmit this Document No. 188(Rev.) to Committee 6 for further examination because it was not able to reach an agreement.

·P.E. WILLEMS Chairman

Annexes: 3

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ANNEX 1

DRAFT -

RESOLUTION No. Spa / F /

on the use by all countries with equal rights of frequency bands for / space services.

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

that all countries have equal rights in the use of both the radio frequencies, allocated to various / space services /, and the geostationary satellite orbit for these services;

taking into account

that radio frequency spectrum and the geostationary satellite orbit are limited natural resources and should be most effectively and economically used;

having in mind

that the use of the allocated frequency bands and definite fixed satellite positions in the geostationary orbit by individual countries or groups of countries can start at various dates depending on requirements and readiness of technical facilities of countries.

decides

that the registration in the I.T.U. of frequency assignments for \(\subseteq \space \) space services \(/ \) and their use should not provide any permanent priority for any individual country or groups of countries and should not create an obstacle to the establishment of \(/ \space \) space systems \(/ \) by other countries,

Annex 1 to Document No. 359-E Page 6

2) that, in this connection, a country or a group of countries, having registered in the I.T.U. frequencies for their / space services_/, should take all practicable measures in order to realize the possibility of the use of new / space systems_/ by other countries or groups of countries so desiring

and

3) that the provisions contained in items 1 and 2 of this Resolution should be taken into account by the Administrations and the permanent organs of the Union.

ANNEX 2

DRAFT

RECOMMENDATION No. /B /

concerning the examination by the Administrative Radio Conferences of the situation with regard to occupation of the frequency spectrum in space communications

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that the frequency bands available for space applications are limited in number and size;
- b) that the possible positions for satellites whose main purpose is to establish telecommunication links are limited in number and that certain positions are more favourable than others for certain links;
- c) that all administrations should be enabled to establish the space links which they deem necessary;
- d) that the scale and cost of space networks or systems are such that their operation and development must be hindered as little as possible;
- e) that technology is steadily and rapidly evolving and that the best possible use should be made of resources in / space telecommunications /;
- f) that administrations should ensure that frequency assignments for space applications are utilized in the most efficient practicable manner consistent with developing technology and that such assignments are relinquished when no longer in use:
- g) that despite the provisions of Article 9A and the principles adopted by this Conference, which provide for full consultation and co-ordination between administrations with a view to the maximum accommodation of all _ space systems _/, it is possible that as the use of frequencies and orbital

locations increases administrations may encounter undue difficulties in one or more frequency bands in meeting their requirements for space radiocommunication:

recommends

that, if this situation arises, it will need to be examined by the next appropriate Administrative Radio Conference which should be empowered to deal with the situation:

invites

the Administrative Council, in the event of such a situation arising, to include in the agenda for the next appropriate Administrative Radio Conference specific provisions enabling it to examine all aspects of the use of the frequency band(s) concerned including, for example, the relevant frequency assignments recorded in the Master International Frequency Register and to find a solution to the problem.

ANNEX 3

DRAFT

RECOMMENDATION [No. H]

relating to technical standards for the assessment of harmful interference in the frequency bands above 28 Me/s

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

considering

- a) that the definition of harmful interference (RR No. 93), of a qualitative nature, leads to a purely subjective estimation of the nuisance:
- b) that, for the accomplishment of its regulatory tasks, the I.F.R.B. has adopted in its technical standards, for the frequency bands below 28 Mc/s, values for the ratio between the wanted signal and the interfering signal, below which harmful interference may be expected;
- c) that "harmful interference" implies a degree of interference or a probability of interference which is considerable;
- d)—that, as a consequence, it is desirable to determine the level of interference by which any emission, radiation or induction affects a Radio-communication Service beyond specific limits established for its performance with regard to the quality and reliability required by the nature of the service;
- e) that the assessment of interference values is related to various factors such as: nature of the services concerned, number of interference sources, percentages of time during which the interfering signal affects the wanted signal, etc.

and noting

- a) that the I.F.R.B. has been considering the maximum allowable values of interference given in the pertinent C.C.I.R. Recommendations, as values which ensure a satisfactory service;
- b) that, however, the I.F.R.B. does not possess data on the increases of these recommended values and on the associated percentages of time affecting a service beyond the specific limits established for its performance with regard to the quality and reliability required by the nature of the service:

invites the C.C.I.R.

to study this subject and to recommend the technical performance criteria for the frequency bands above 28 Mc/s, allocated to Space, Radio Astronomy, and / the concerned / Terrestrial Services, in order to enable the I.F.R.B. and administrations to apply such criteria for these bands;

and invites the I.F.R.B.

to publish its technical standards, for the information of administrations, based upon the relevant provisions of the Radio Regulations and Appendices thereto, decisions of Administrative Conferences of the Union as appropriate and the Recommendations of the C.C.I.R., the state of the radio art and the development of transmission techniques.

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 360-E 11 July 1971

PLENARY MEETING (FIRST READING)

B. 7

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
4	348		Art. 1 — Sections IIA, IIB and III	
	349		Rec. CC	
4	351		Art. 7—Partial text of Section VIII Rec. DD	
6	354		No. 695	

Francois Job Chairman of the Editorial Committee

Annex: Pages B7/01—12



[ARTICLE 1]

[1. Terms and definitions to be added in Section [IIA]]

ADD 84ALA Satellite network

A satellite system consisting of a single satellite and the co-operating earth stations.

ADD 84ALB Satellite link

A radio link between a transmitting earth station and a receiving earth station through one satellite.

A satellite link comprises one up path and one down path.

ADD 84ALC Multi-satellite link

A radio link between a transmitting earth station and a receiving earth station through two or more satellites, without any intermediate earth station.

A multi-satellite link comprises one up path, one or more satellite-to-satellite paths and one down path.

[2. Term and definition to be added in Section IIB]

ADD 84BFA Geosynchronous satellite

An earth satellite whose period of revolution is equal to the period of rotation of the Earth about its axis.

[3. Terms and definitions to be added in Section III]

ADD 103A Equivalent satellite-link noise temperature

The noise temperature at the input of the earth station receiver corresponding to the radio frequency noise power which

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produces the total observed noise at the output of the satellite link excluding noise due to interference coming from satellite links using other satellites and from terrestrial systems.

ADD 103B

Co-ordination distance

Distance from an earth station in a given azimuth within which a terrestrial station sharing the same frequency band may cause or be subject to more than a permissible level of interference.

ADD 103C

Co-ordination contour

The line, on a geographical map on which an earth station location is represented, joining the points on all azimuths around this earth station which are at a distance equal to the co-ordination distance corresponding to each azimuth.

ADD 103D

Co-ordination area

Area around an earth station enclosed by the co-ordination contour.

RECOMMENDATION No. Spa CC

Relating to the Use of Space Radiocommunication Systems in the Event of Natural Disasters, Epidemics, Famines and Similar Emergencies

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that in the case of natural disasters, epidemics, famines and similar emergencies lives can be saved by prompt and effective relief;
- b) that rapid and reliable telecommunications are essential for relief operations;
- c) that, through damage or from other causes, the normal telecommunications facilities in disaster areas are often inadequate for relief operations and cannot be restored or supplemented quickly through local resources;
- d) that use of space radiocommunication systems is one of the means by which rapid and reliable telecommunications could be provided for relief operations;

noting

- a) that known planning of space radiocommunication systems makes no provision for specific frequencies or channels for emergency communications;
- b) that in the absence of such planning it is not feasible to proceed with specifications for rapidly transportable, universally operable earth stations;

recommends

1. that administrations, individually or in collaboration, provide for the needs of eventual relief operations in planning their [international] space radiocommunication systems and identify for this purpose preferred radio-frequency channels and facilities which could quickly be made available for relief operations;

2. that administrations concerned waive the coordination procedures provided for in the Radio Regulations in the case of transportable earth stations used for relief operations;

requests

the C.C.I.R. to study standard specifications and preferred frequencies for transportable earth stations and for compatible mobile and transportable fixed radiocommunications equipment for relief operations;

invites

the Secretary General to bring this Recommendation to the attention of the United Nations, the specialized agencies, and other international organizations concerned, in order to ensure full cooperation in the implementation of this Recommendation.

[ARTICLE 7]

[Partial text of Section VIII]

MOD Section VIII. Space Radiocommunication Services sharing Frequency Band with terrestrial radiocommunication Services above 1 G [c/s]

Choice of Sites and Frequencies

(MOD) 470E § 20. Sites and frequencies for earth stations, operating in frequency bands shared with equal rights between terrestrial and space radiocommunication services, shall be selected having regard to the relevant recommendations of the C.C.I.R. with respect to geographical separation from terrestrial stations.

Power Limits

MOD 470F § 21. (1) Earth stations

MOD 470G (2) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands between 1 and 15 G[c/s], shall not exceed the following limits except as provided in Nos. 470H or 470HA:

+40 dBW in any 4 k[c/s] band for $\theta \leqslant 0^\circ$ +40 + 3 θ dBW in any 4 k[c/s] band for $0^\circ < \theta \leqslant 5^\circ$

where θ is the angle of elevation of the horizon viewed from the centre of radiation of the antenna of the earth station and measured as positive above the horizontal plane and negative below it.

ADD 470GA (2A) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands above 15/G[c/s] shall not exceed the following limits except as provided in Nos. 470H or 470HB:

+64 dBW in any 1 M[c/s] band for $\theta \le 0^{\circ}$ +64+3 θ dBW in any 1 M[c/s] band for $0^{\circ} < \theta \le 5^{\circ}$

where θ is as defined in No. 470G.

- ADD 470GB (2B) For angles of elevation of the horizon greater than 5° there shall be no restriction as to the equivalent isotropically radiated power transmitted by an earth station towards the horizon.
- MOD 470H (3) The limits given in No. 470G or No. 470GA, as applicable, may be exceeded by not more than 10 dB. However, when the resulting coordination area extends into the territory of another administration, such increase shall be subject to agreement by that administration.
- ADD 470HA (3A) As an exception to the limits given in No. 470G, the equivalent isotropically radiated power towards the horizon for an earth station in the space research (deep-space) shall not exceed +55 dBW in any 4 k[c/s] band.
- ADD 470HB (3B) As an exception to the limits given in No. 470GA, the equivalent isotropically radiated power towards the horizon for space research earth station (deep-space) shall not exceed +79 dBW in any 1 M[c/s] band.

SUP 470I

MOD 470J (3C) The limits given in No. 470G apply in the following frequency bands allocated to the fixed-satellite service for transmission by earth stations where these bands are shared with equal rights with the [fixed or mobile service]:

[] []

Minimum Angle of Elevation

MOD 470K § 22. (1) Earth stations.

MOD 470L (2) Earth station antennae shall not be employed for transmission at elevation angles of less than 3° measured from the horizontal plane to the direction of maximum radiation, except when agreed to by administrations concerned or affected. In case of reception by an earth station, the above value shall be used for coordination purposes if the operating angle of elevation is less than that value.

ADD 470LA (2A) As an exception to No. 470L, earth station antennae in the space research service (near-earth) shall not be employed for transmission at elevation angles of less than 5°, and earth station antennae in the space research service (deep-space) shall not be employed for transmission at elevation angles of less than 10°, both angles being those measured from the horizontal plane to the direction of maximum radiation. In case of reception by an earth station, the above values shall be used for coordination purposes if the operating angle of elevation is less than those values.

MOD 470M (2B) The limit given in No. 470L applies in the following frequency bands allocated to the fixed-satellite service for transmission

by	earth	stations	where	these	bands	are	shared	with	equal	rights
wit	h the	[fixed or	mobile	e servi	ces]:					

RECOMMENDATION No. Spa DD

Relating to the Criteria to be Applied for Sharing between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the Band [614-790 Mc/s]

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that the band [614-790 Mc/s] has been allocated to the broadcasting-satellite service;
- b) that it is necessary to have a power flux-density limit which will provide adequate protection to the terrestrial broadcasting service;

taking into account

a) that the conclusions of the Special Joint Meeting of the C.C.I.R. Geneva, 1971, indicated that the following power flux-density limits are necessary to protect the terrestrial broadcasting service:

-121 dBW/m^2	$\delta < 20^{\circ}$
$-121 + 0.4 (\delta - 20^{\circ}) \mathrm{dBW/m^2}$	$20^{\circ} < \delta < 60^{\circ}$
-105 dBW/m^2	$60^{\circ} < \delta < 90^{\circ}$

where δ is the angle of arrival above the horizontal plane;

b) that additional tests carried out by one administration after the Special Joint Meeting of the C.C.I.R., indicated that the following more conservative power flux-density limits may be necessary:

$$\begin{array}{lll} -130 \ dBW/m^2 & \delta < 20^\circ \\ -130 + 0.4 \ (\delta - 20^\circ) \ dBW/m^2 & 20^\circ < \delta < 60^\circ \\ -114 \ dBW/m^2 & 60^\circ < \delta \leqslant 90^\circ \end{array}$$

where δ is the angle of arrival above the horizontal plane;

- c) that additional information is required on the protection ratio for interference from an FM television signal into a VSB television signal for both the 625 and 525 line systems;
- d) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in C.C.I.R. Recommendation 417-2;
- e) that account may have to be taken of ground reflections;
- f) that energy dispersal techniques may reduce the required protection ratio and should be used if shown to be effective;

recommends

1. that in view of the absence of sufficient information on tests under operational conditions and in order to provide for a preliminary [co-ordination procedure], on a provisional basis, the maximum power flux-density produced at the surface of the earth within the service area of a terrestrial broadcasting station (see C.C.I.R. Recommendation 417-2), by a space station in the broadcasting-satellite service in the band [614-790 Mc/s] should not exceed:

-129 dBW/m^2	$\delta < 20^\circ$
$-129+0.4~(\delta-20^\circ)~{ m dBW/m^2}$	$20^{\circ} < \delta < 60^{\circ}$
-113 dBW/m^2	$60^{\circ} < \delta < 90^{\circ}$

where δ is the angle of arrival above the horizontal plane;

- 2. that these limits be not exceeded on the territory of an administration except with the latter's agreement;
- 3. that the transmission of unmodulated carriers should be avoided.
- 4. that the C.C.I.R. urgently study the sharing criteria to be applied to frequency sharing between the broadcasting-satellite service and the terrestrial broadcasting service in the band [614-790 Mc/s] and prepare a Recommendation on power flux densities to be used in lieu of the above provisional limits;

- 5. that in its studies the C.C.I.R. consider in particular the following aspects:
 - 5.1 the required protection ratio for both 525 and 625 line systems for interference from an FM television signal into a VSB television signal;
 - 5.2 the minimum field strength to be protected for the terrestrial television service taking into account the current state of the art;
 - 5.3 the effect of ground reflections;
 - 5.4 the number of broadcasting satellites that may be visible from a terrestrial broadcasting receiver;
 - 5.5 the effect of polarization discrimination;
 - 5.6 the effect of antenna directivity;
- 6. that in its studies the C.C.I.R. should consider the advantages of energy dispersal in the broadcasting-satellite service (television).

[ARTICLE 14]

MOD 695 § 3. In order to avoid interference:

- locations of transmitting stations and, where the nature of the service permits, locations of receiving stations shall be selected with particular care;
- radiation in and reception from unnecessary directions shall be minimized, where the nature of the service permits, by taking the maximum practical advantage of the properties of directional antennae;
- the choice and use of transmitters and receivers shall be in accordance with the provisions of Article 12;
- the conditions specified under No. 470V shall be fulfilled.

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 361-E

11 July 1971

PLENARY MEETING (FIRST READING)

B. 8

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Commenst
4	357	3	Appendix 29	

Francois Job Chairman of the Editorial Committee

Annex: Pages B8/01



ADD

APPENDIX 29

[Method of calculation to determine the degree of interference between geostationary satellite [systems] sharing the same frequency bands]

1. Introduction

The method of calculating interference is based on the concept that the noise temperature of the system receiving interference increases as the level of the interference increases. It can, therefore, be applied irrespective of the modulation characteristics of these [systems], and of the precise frequencies used.

In this method, the apparent increase in the equivalent satellitelink noise temperature ¹ [of an earth station receiver] resulting from interference caused by a given system is calculated and this value is compared with a predetermined increase in the noise temperature (see section 3 below).

2. Calculation of the Increase in Noise Temperature of the Satellite Link[2] receiving Interference.

[As used in this section, the term satellite link denotes the entire connection consisting of a transmitting earth station, a satellite and a receiving earth station.]

Let A and A' be the satellite links of the two [systems] considered. Primes indicate the parameters of satellite link A'; the notation without primes is used for the parameters of satellite link A.

The parameters are defined as follows (for satellite link A):

ΔT_s: increase in the receiving noise temperature of the satellite S caused by interference in the receiver of this satellite (°K);

¹ See No. 103A.

^{[2} See No. 84ALB].

- ΔT_e: increase in the receiving noise temperature of the earth station e_R caused by interference in the receiver of this station (°K);
- ps: maximum power density per Hz delivered to the antenna of satellite S (averaged over the worst 4 k[c/s] band) (W/[c/s]);
- g₃(δ_{e'}): transmitting antenna gain of satellite S in the direction of the receiving earth station e'_R of satellite link A' (numerical power ratio);
 Note: the product p_sg₃(δ_{e'}) is the maximum equivalent isotropic radiated power per [c/s] of satellite S in the direction of the receiv-
- p_e: maximum power density per [c/s] delivered to the antenna of the transmitting earth station e_T (averaged over the worst 4 k[c/s] band) (W/[c/s]);

ing earth station e'_R of satellite link A'.

- $g_2(\delta_{e'})$: receiving antenna gain of satellite S in the direction of the transmitting earth station e_T of satellite link A' (numerical power ratio);
- $g_1(\theta)$: transmitting antenna gain of the earth station e_T in the direction of satellite S' (numerical power ratio);
- $g_4(\theta)$: receiving antenna gain of the earth station e_R in the direction of satellite S' (numerical power ratio);
- k : Boltzmann's constant (Joules/°K);
- l_d*) : free-space transmission loss on the down-path (numerical power ratio);
- l_u*) : free-space transmission loss on the up-path (numerical power ratio);

^{*)} To simplify the calculation it was assumed that:

basic transmission loss on the down-path is the same regardless of the satellite and earth station considered;

basic transmission loss on the up-path is the same regardless of the earth station and satellite considered;

[—] the topocentric angular separation between the two satellites as seen from any earth station is identical to the geocentric angular separation between the two satellites.

- : transmission gain of the [system] from the satellite receiver input to the earth station receiver input (numerical power ratio, usually less than 1);
- θ^*) : geocentric angular separation between two satellites (degrees). The parameter ΔT_s and ΔT_e are given by the following equations:

$$\Delta T_{s} = \frac{p'_{e} g'_{1} (\theta) g_{2}(\delta_{e}')}{k l_{v}}$$
 (1)

$$\Delta T_{e} = \frac{p'_{s} g'_{3} (\delta_{e}) g_{4} (\theta)}{k l_{d}}$$
 (2)

The symbol ΔT will be used to denote the apparent increase in the equivalent noise temperature for the entire satellite link at the receiver input of the receiving station e_R due to interference from [system] A'.

This increase is the result of interference entering at both the satellite and earth station receivers of [system] A and can accordingly be expressed as:

$$\Delta T = \gamma \Delta T_s + \Delta T_e \tag{3}$$

Hence,
$$\Delta T = \frac{\gamma p'_{e} g'_{1}(\theta) g_{2}(\delta_{e}')}{k l_{u}} + \frac{p'_{s} g'_{3}(\delta_{e}) g_{4}(\theta)}{k l_{d}}$$
 (4)

Equation (4) combines both the up-path and the down-path interference. If there is a change of modulation in the satellite or if the translation frequencies of the wanted and interfering satellites are different then it may be necessary to treat up and down paths separately using equations (1) and (2).

In the foregoing equations, the gains $g'_1(\theta)$ and $g_4(\theta)$ are those of the earth stations concerned. Unless more precise actual data are available, an appropriate reference radiation pattern may be used to express the gain $g'_1(\theta)$ and $g_1(\theta)$ in a direction forming an angle θ with the direction of maximum radiation. In the event that precise numerical data are not avail-

able, the reference radiation pattern $32 - 25 \log_{10}$ (w) shall be used for earth station antennae for which the ratio of effective diameter to wavelength exceeds 100.

In the same way, the increase $\Delta T'$ in the equivalent noise temperature for the entire satellite link at the receiver input of the receiving earth station e_R ' under the effect of the interference caused by satellite link A is given by the following equations:

$$\Delta T'_{s'} = \frac{p_e g_1(\theta) g'_2(\delta_e)}{kl_n}$$
 (5)

$$\Delta T'_{e'} = \frac{p_s g_3(\delta_{e'}) g'_4(\theta)}{k l_d}$$
 (6)

$$\Delta T' = \gamma \frac{p_{e} g_{1} (\theta) g'_{2} (\delta_{e})}{k I_{u}} + \frac{p_{s} g_{3} (\delta_{e'}) g'_{4} (\theta)}{k I_{d}}$$
(7)

For two multiple-access satellites, this calculation must be made for each of the satellite links established via one satellite in relation to each of the satellite links established via the other satellite.

3. Comparison between Calculated and Predetermined Percentage Increase in Equivalent Satellite Link Noise Temperature

The calculated values of ΔT and ΔT shall be compared with the corresponding predetermined values. These predetermined values are taken as 2% of the appropriate equivalent satellite link noise temperatures:

- if the calculated value of ΔT is less than the predetermined one, the interference level from satellite link A' to satellite link A is acceptably small irrespective of the modulation characteristics of the two satellite links and of the precise frequencies used;
- if the calculated value of ΔT is more than the predetermined one, a detailed calculation shall be carried out following the methods and techniques set out in the relevant C.C.I.R. Reports and Recommendations.

The comparison of $\Delta T'$ with the predetermined value shall be carried out in a similar manner.

As an example, it can be seen that in the case of a satellite [system] operating in accordance with current C.C.I.R. Recommendations, using FM telephony and having a total noise in a telephone channel of 10 000 pWOp including 1 000 pWOp interference noise from terrestrial radio-relay systems and 1 000 pWOp interference noise from other satellite [systems], a 2% increase in equivalent noise temperature would correspond to 160 pWOp of interference noise.

The list of basic characteristics to be furnished for each [network] is given in Appendix 1B. A detailed illustration of the interference calculation in the case of two geostationary satellite [systems] is given in the Annex to this Appendix.

4. Determination of the Satellite Links to be Considered in Calculating the Increase in Equivalent Satellite Link Noise Temperature from the Data Furnished for the Advance Publication of a Satellite Network

The greatest increase in equivalent satellite link noise temperature caused to any link of another satellite network, existing or planned, by interference produced by the proposed satellite network must be determined.

The most unfavourably sited transmitting earth station of the interfering satellite network should be determined for each satellite receiving antenna of the network suffering interference by superimposing the earth-to-space service areas of the interfering network on the space station receiving antenna gain contours plotted on a map of the earth's surface. This station is the one for which the satellite receiving antenna gain of the network interfered with, in the direction of the site, is the greatest.

The most unfavourably sited receiving earth station of the network suffering interference should be determined in an analogous manner for each space-to-earth service area of that network. This station is the one for which the satellite transmitting antenna gain of the interfering network in the direction of the site is greatest.

When the satellite of the network suffering interference is equipped with simple frequency-translating transponders the above determinations are made in pairs, one for the receiving antenna of the transponder and one for the space-to-earth service area associated with the transmitting antenna of the transponder.

The calculation procedure described above may be used to determine the greatest increase in equivalent noise temperature caused to any satellite link in a proposed satellite network by interference produced by any other satellite network.

ANNEX

Example of an Interference Calculation Between Two Geostationary Satellite [Systems] Sharing the Same Frequency Band

A. General

In this example, for simplicity, two identical satellite networks are assumed with $\theta = 6^{\circ}$ geocentric angular spacing between the satellites. For this angular separation the reference radiation pattern of the earth station antenna $(32-25\log_{10}\theta)$ gives a gain of 12.5 dB in the direction of the satellite of the other network.

The calculations have been performed in dB, which means that numerical multiplications thus become dB additions and numerical divisions become dB subtractions. In each step, the contributing factors have been introduced in a sequence corresponding to the propagation direction. The first three steps define the system parameters for each [system]. Steps 4, 5 and 6 perform the actual interference calculations.

To determine the equivalent link noise temperature it is necessary to know the ratio between the total internal link noise and the thermal noise of the down-path. The noise budget for this example is assumed as follows:

Noise budget

Internal noise 8 000 pWOp	Thermal noise (down-path) Thermal noise (up-path) Intermodulation noise	5 000 pWOp 1 000 pWOp 2 000 pWOp
External noise 2 000 pWOp	Interference noise from systems using other satellites Interference noise from	1 000 pWOp
	terrestrial systems	1 000 pWOp
	Total noise	10 000 pWOp
External noise 2 000 pWOp	systems using other satellites Interference noise from terrestrial systems	1 000 pWOp

It may be noted that since both satellites use global beams, essentially no antenna discrimination between wanted and unwanted signals is obtained at the satellite and that this constitutes a worst case.

B. System parameters

		Symbol	Link A or A'	Unit
Step 1)	Up-path at 6 175 M[c/s] Maximum power density per [c/s] delivered to the antenna of the transmitting earth station in any 4 K[c/s] band Earth station antenna gain Free space loss 38 500 km at 6 175 [c/s] Satellite antenna gain (using global beam) Receiver input at satellite (pe + g1 - eu + g2)	$egin{array}{c} \mathbf{p_e} & & & & & & & & & & & & & & & & & & &$	-37 62.5 200 15.5 -159	dBW/[c/s] dB dB dB dB
Step 2)	Down-path at 3 950 $M[c/s]$ Maximum power density per $[c/s]$ delivered to the satellite antenna Satellite transmitting antenna gain Free space loss for 38 500 km at 3 950 $M[c/s]$ Earth station antenna gain Receiver input at earth station $(p_s + g_3 - l_d + g_4)$	Ps g ₃ l _d g ₄	-57 15·5 196 58·5 179	dBW/[c/s] dB dB dB dBW/[c/s]
Step 3)	Link calculations Transmission gain from satellite receiver input to earth station receiver input 159 dB-179 dB Earth station noise temperature (giving G/T = 40.7 dB) Thermal noise down-path	Υ	-20 60	dB °K
	(see noise budget)	100	5 000	pWOp

	Symbol	Link A or A'	Unit
Total internal link noise (see noise budget) Equivalent link noise temperature		8 000	pWOp
$\frac{8000}{5000} \times 60^{\circ}$	Т	96	°K

C. Interference calculation

Step 4)	Up-path interference			
	Interfering earth station power density (as in Step 1)	p _e '	-37	dBW/[c/s]
	Interfering earth station antenna	Fe		, [-,-]
	gain towards interfered satellite (6° off beam)	$g_1(\theta)$	+12.5	dB
	Free space loss for 38 500 km at			
	6 175 M[c/s] (see Step 1)	$I_{ m u}$	200	dB
	Satellite antenna gain in the direction of the interfering earth sta-			
	tion	$g_2 \delta_e$	15.5	d B
1	Boltzmann's constant		222 -	10227/077
	1.38×10^{-23} Joule/°K	k	-228.6	dBW/°K
	Increase in receiver noise temper- ature of the satellite	1		Δ
	$p_e + g_1(\theta) - l_0 + g_2(\delta_e') - k$	ľ	19.6	dB°K
	(in logarithmic units)		ļ i	
1	Increase in receiver noise temper-			017
	ature of the satellite	$\Delta T_{\rm s}$	91	°K
Step 5)				
	Interfering satellite transmitter	۱ .	-57	dBW/Hz
1	power density (As in Step 2) Interfering satellite antenna gain	p _s ′	-31	UDW/FIZ
	towards interfered earth station	g ₃ '(δ _e)	15.5	dB
	Free space loss for 38 500 km at		100	150
]	3 950 M[c/s] (see Step 2) Earth station antenna gain in the	$I_{\bar{\mathbf{d}}}$	196	dB
	direction of the interfering sa-			10.0
	tellite (6° off beam)	g ₄ (θ)	12.5	dB
i	!	i i	1	1 1

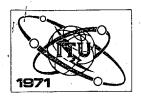
		Symbol	Link A or A'	Unit
	Boltzmann's constant			
	$1.38 \times 10^{-23} \text{ Joule/}^{\circ} \text{K}$	k	-228.6	dBW/°K
	Increase in receiver noise temper-			
	ature of the earth station			1-0
	$p_{s}' + g'_{3} g'_{3} (\delta_{e}) - l_{d} + g_{4} (0)$		+3.5	dB°K
	(in logarithmic units) Increase in receiver noise temper-			
	ature of the earth station	ΔΤα	2.24	°K
	active of the earth station	Δie	2 24	
Step 6)	Total link interference			
	Increase in satellite noise tempera-			
	ture (from Step 4)	ΔT_s	91	°K.
	Numerical value for γ			l
	(from Step 3)	Υ	∙01	numerical
,	Increase in earth station noise	A.T.	2.24	°ĸ
	temperature (from Step 5) Increase in equivalent link noise	$\Delta T_{ m e}$	2.24	K
	temperature			
	$\gamma \Delta T_{s} + \Delta T_{e} = (0.01 \times 91) + 2.24$	ΔT	3-15	°K
	Percentage increase			
	3-15	$(\Delta T/T) \times$	3.29	1 %
	$\frac{313}{96} \times 100\%$	100%		
	Increase in link noise due to inter-			
	ference		262	-71/0-
	$(3.29/100 \times 8\ 000\ pWOp)$		263	pWOp

D. Conclusions

In the example shown, the increase in equivalent satellite link noise temperature is 3.29%. Since it exceeds the predetermined value of 2%, the amount of noise introduced can no longer be considered negligible and therefore co-ordination between the two [systems] is required. More precise calculations should now be made using, in particular, the actual antenna patterns of the earth stations, the topocentric angular separation of the satellites, and the precise basic transmission losses. There may be addi-

tional factors such as polarization discrimination, frequency interleaving, spectral distribution of the interference which all reduce the calculated interference.

It can be shown that for this example a larger satellite spacing of 7.5° would have caused only 2% increase in equivalent link noise temperature and thus obviated the need for any co-ordination.



SPACE CONFERENCE

Corrigendum to
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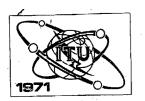
PLENARY MEETING

FOURTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

On page 8 in the framed part of the Table for the frequency band 37.75 - 38.25 MHz replace foot-note "233A" by "233AA" and renumber "ADD 233A" by "ADD 233AA"

Note: ADD 233A on page 7 applies to the bands mentioned therein.





SPACE CONFERENCE

Document No. 362-E 13 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FOURTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

ARTICLE 5 - TABLE OF FREQUENCY ALLOCATIONS

Frequency bands between 1 800 kc/s and 174 Mc/s

Committee 5 <u>adopted</u> the revised provisions reproduced in the Annex to the present Report which are submitted to the Plenary for first reading.

H.A. KIEFFER Chairman

Annex: French English Spanish



ANNEX

ARTICLE 5

kc/s

Allocation to services						
Region 1	Region 2	Region 3				
1	1 800-2 000					
NOC		cal mobile				
	RADIONAVIG 198	ATION				

SUP 199 SUP 199.1

Region 1	Region 2	Region 3
2 170-2 194		
	MOBILE (distress	and calling)
	201 201A	

MOD

MOD

ADD 201A

Frequencies 2 182 kc/s, 3 023.5 kc/s, 5 680 kc/s, 8 364 kc/s, 121.5 Mc/s, 156.8 Mc/s and 243 Mc/s may also be used, in accordance with the procedures in force, for search and rescue operations concerning manned space Vehicles.

The same ruling applies to frequencies 10 003 kc/s 14 993 kc/s and 19 993 kc/s, but in these cases emissions must be confined in a band of + 3 kc/s about the frequency.

kc/s

	Allocation to services				
	Region 1		Region 2		Region 3
	2 300–2 498	:	2 300–2 495		
NOC	FIXED	!		FIXE	ED .
	MOBILE except aeronautical mobile (R)			MOBI	LE
	BROADCASTING 202			BROA	DCASTING 202
	193				
	2 498-2 502		2 495- 2 505		
MOD	STANDARD FREQUENCY 203 203A			STAN	DARD FREQUENCY
				203	203A
	2 502–2 625	Ì			
NOC	FIXED MOBILE except aeronautical mobile	(R)		FIXE MOBI	

ADD 203A

The bands 2 501-2 502 kc/s, 5 003-5 005 kc/s, 10 003-10 005 kc/s, 15 005-15 010 kc/s, 19 990-19 995 kc/s, 20 005-20 010 kc/s and 25 005-25 010 kc/s are also allocated, on a secondary basis, to the space research service.

SUP 204

	2 850-3 025
MOD	AERONAUTICAL MOBILE (R)
	201A
	4 995-5 005
MOD	STANDARD FREQUENCY
	203A 210

kc/s

	Allocation to services		
	Region 1	Region 2	Region 3
,	5 480-5 680		
MOD		AERONAUTICAL MOBILE (R)	
		201A	
	5 680-5 730		
MOD		AERONAUTICAL MOBILE (OR)	
	Í !	201A	
MOD	7 000-7 100	AMATEUR AMATEUR —SATE LLITE	
MOD	8 195–8 815	MARITIME MOBILE 201A 213	
MOD	9 995-10 005	STANDARD FREQUENCY 201A 203A 214	
SUP 215			
MOD	14 000-14 350	AMATEUR 211A 218	

ADD 211A

The band 14 000-14 250 kc/s, is also allocated to the amateur-satellite service.

kc/s

	Allocation to services			
	Region 1	Region 2	Region 3	
	14 990-15 010	STANDARD FREQUENCY		
MOD		201A 203A 219	·	
MOD	15 762-15 768	FIXED		
	18 030-18 036		-	
MOD	<u> </u>	FIXED		
SUP 215A				
	18 036–19 990			
	; ·	FIXED		
MOD		221B		
ADD 221B	The a secondary b	band 18 052-18 068 kc/s is asis, to the space research	also allocated on service.	
	19 990-20 010			
MOD		STANDARD FREQUENCY		
		201A 203A 220		
SUP 221				

SUP 221A

kc/s

	Allocation to services		
	Region 1	Region 2	Region 3
	21 000-21 450		
MOD	AMATEUR AMATEUR—SATELLITE		
-	21 850-21 870		
MOD	:	RADIO ASTRONOMY 221C	
	21 870-22 000		
MOD	, : : !	AERONAUTICAL FIXED AERONAUTICAL MOBILE	E (R)
ADD 2210	In Bulgaria, Hungary, Poland, Roumania, Czechoslavakia and the U.S.S.R. the band 21 850-21 870 kc/s is also allocated to the aeronautical fixed and the aeronautical mobile (R) services. The administrations concerned will take all practicable steps to protect radio astronomy observations from harmful interference.		
	23 350-24 990		
		FIXED LAND MOBILE	

ADD 222A

MOD

In Argentina the band 24 528-24 538 kc/s may be used by the space research service, subject to agreement between the administrations concerned and those having services operating in accordance with the Table, which may be affected.

222 222A

kc/s

	Allocation to services			
	Region 1	Region 2	Region 3	
	24 990–25 010			
MOD		STANDARD FREQUENCY	:	
		203A 223		
		Mc/s		
	Region l	Region 2	Region 3	
į	28-29.7			
MOD		AMATEUR AMATEUR-SATELLITE		
	30.005-30.010			
		FIXED 228 229 231 MOBILE	•	
MOD		SPACE RESEARCH		
		SPACE OPERATION /(Sa	tellite identifi-	
		233 ca	tion)_/	
	30.010-37.750	•		
MOD		FIXED 228 229 239 MOBILE	0 231	
; ; ;		233 233A		

ADD 233A

In Argentina the bands 36.650 to 36.850 Mc/s, 41.150 to 41.350 Mc/s and 45.65 to 45.85 Mc/s and in Argentina and Brazil, the band 170.55 to 170.95 Mc/s are allocated to the radio astronomy service and no assignments shall be made to the fixed and mobile services in this band.

Mc/s

	Allocation to services		
	Region 1	Region 2	Region 3
MOD	37.75-38.25	FIXED 228 229 231 MOBILE Radio Astronomy	
		233A	

SUP 233

ADD 233A

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

38.25-41

MOD FIXED 228 229 230 231

MOBILE

235 236 236A

MOD 235

The band 39.986-40.02 Mc/s is also allocated, on a secondary basis, to the space research service.

ADD 236A

The band 40.980-41.015 is also allocated, on a secondary basis, to the space research service in particular for measurements of the differential Faraday effect.

Mc/s

Allocation to services				
Region 1	Region 2	Region 3		
41-47	41-50	41-44		
BROADCASTING Fixed 228 237	FIXED 228 231 237 MOBILE	FIXED 228 237 MOBILE 236A		
Mobile		44–50		
236A	233A 236A	FIXED 228 231 237		
238 239 240 241		MOBILE		
47–68		BROADCASTING		
	50-54 AMATEUR			
	244 245 246 247			
BROADCASTING	54–68	5 4–6 8		
	FIXED 228 237	FIXED 228 231 237		
	MOBILE			
	BROADCASTING	BROADCASTING		
238 239 241 242 243		246		
75.2-87.5	75.4-88	80–87		

MOD

75.2-87.5	75.4-88	80 – 87
(NOC)	(NOC)	FIXED MOBILE
	Ì	254 255 256 257 261 266

MOD 267

In New Zealand, the bands 87-88 Mc/s and 94-108 Mc/s are allocated to the fixed and mobile services.

Mc/s

	Allocation to services		
	Region 1	Region 2	Region 3
	117.975-132		
	AERONAUTICAL MOBILE (R)		
MOD		201A 273 273A	
	132-136		
		AERONAUTICAL MOBILE (R)	
		273A 274 274A 274B	275

NOC 273

NOC 273A

MOD 274

In Bulgaria, Japan, Poland, Portugal, Portuguese Overseas Provinces in Region 1 south of the equator, Roumania, Sweden, Czechoslovakia and the U.S.S.R., existing stations in the aeronautical mobile service (OR) will continue to operate for an unspecified period, on a primary basis.

ADD 274A

In Regions 2 and 3, stations of the fixed and mobile services may continue to use this band until 1 January 1976.

Until that date, frequency assignments to the aeronautical mobile (R) service shall be co-ordinated between the administrations concerned and shall be protected from harmful interference.

ADD 274B

In Cuba and Mexico, the band 132-136 Mc/s is also allocated to the fixed and mobile services.

MOD 275

In Burundi, Ethiopia, Nigeria, Sierra Leone, Gambia, Portuguese Overseas Provinces in Region 1 south of the equator, Rhodesia, Rwanda, and the Rep. of South Africa, the band 138-144 Mc/s is allocated to the fixed and mobile services. In these countries, existing stations in the fixed and mobile services may continue to operate in the band 132-136 Mc/s until 1.1.1976.

Mc/s

Allocation to services				
Region 1 Region 2 Region 3				
136–137				
SPACE RESEARCH (Space-to-Earth)				
281A 281AA				

MOD

MOD 278

In New Zealand the band 138-144 Mc/s is allocated to the aeronautical mobile (OR) service.

SUP 279

NOC 279A

NOC 281A

ADD 281AA

In Bulgaria, China, Cyprus, Korea, Cuba, Spain, Ethiopia, Ghana, Hungary, India, Indonesia, Iran, Iraq, Kuwait, Pakistan, Philippines, Poland, Portugal, the United Arab Republic, Roumania, Senegal, Syria, Czechoslovakia and the U.S.S.R., the band 136-137 Mc/s is also allocated to the fixed and mobile services.

SUP 281B

Mc/s

	Allocation to services		
	Region 1	Region 2	Region 3
MOD	137-138		
		METEOROLOGICAL-SATELLITE SPACE RESEARCH (Space-to-Earth) SPACE OPERATION (Telemetering and track	
·	275A 279A 281C 281E		

NOC 275A

SUP 276

SUP 277

MOD 281C

In Algeria, Bulgaria, Hungary, Kuwait, Lebanon, Poland, the United Arab Republic, Roumania, Czechoslavakia, the U.S.S.R. and in Yugoslavia, the band 137-138 Mc/s is also allocated to the aeronautical mobile (OR) service.

SUP 281D

MOD 281E

In Malaysia, Pakistan and the Philippines, the band 137-138 Mc/s is also allocated to the fixed and mobile services.

SUP 281F

Mc/s

Allocation to services			
Region 1 Region 2 Region 3			
138-143.6 AERONAUTICAL MOBILE (OR)	FIXED MOBILE Radiolocation*) Space Research (Space-to- Earth)	138-143.6 FIXED MOBILE Space Research (Space-to- Earth)	
275 281G 282 282A 283	283A	278 279A 284	

MOD

Note to Committee 7: Radiolocation in Region 2 is a permitted service - RR 137b)

ADD 281G

In the F.R. of Germany, the band 138-140 Mc/s is also allocated, on a secondary basis, to the space research service (Space-to-Earth).

ADD 283A

In Argentina, the frequency 138.540 Mc/s ± 7.5 kc/s and the band 143.6-143.65 Mc/s may be used by the space research service for telecommand operations, subject to agreement between administrations concerned and those having services operating in accordance with the Table, which may be affected.

Mc/s

Allocation to services			
Region 1	Region 2	Region 3	
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (Space-to-Earth) 275 282 283	FIXED MOBILE SPACE RESEARCH (Space-to-Earth) Radiolocation*)	FIXED MOBILE SPACE RESEARCH (Space-to-Earth) 278 279A 284	
143.65-144 AERONAUTICAL MOBILE (OR) 275 282 282A 283	143.65-144 FIXED MOBILE Radiolocation*) Space Research (Space-to-Earth)	FIXED MOBILE Space Research (Space-to-Earth) 278 2794 284	

Mote to Committee 7 : Radiolocation in Region 2 is a
permitted service - RR 137b)_/

ADD 282A

MOD

In Belgium, France, Israel, Italy, the Netherlands and the United Kingdom the bands 138-143.6 Mc/s and 143.65-144 Mc/s are also allocated, on a secondary basis, to the space research service (Space-to-Earth).

SUP 282

MOD 283

In Austria, Denmark, Greece, Norway, Netherlands, Portugal, F.R. of Germany, United Kingdom, Sweden, Switzerland and Turkey, the band 138-144 Mc/s is also allocated to the fixed and mobile, except aeronautical mobile (R), services.

Mc/s

Allocation to Service		
Region 1	Region 2	Region 3
144-146		
	AMATEUR AMATEUR-SATELLITE	

SUP 284A

MOD

146-149.9	146-148
FIXED	AMATEUR
MOBILE except aeronautical mobile (R)	289
	148-149.9
	FIXED MOBILE
285 285≜	285 A 290

MOD 285A

MOD

The band 148-149.9 Mc/s may be authorized for space telecommand, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected. The bandwidth of an individual transmission shall not exceed \pm 15 kc/s.

Mc/s

Allocation to services					
Region 1 Region 2 Region 3					
149.9–150.05					
RADIONAVIGATION—SATELLITE 285B 285C					

MOD

MOD 285B

In Austria, Bulgaria, Cuba, Hungary, Iran Kuwait, Pakistan, Poland, the United Arab Republic, Roumania, and Yugoslavia, the band 149.9-150.05 Mc/s is also allocated to fixed and mobile services (see Recommendation No. Spa 8).

ADD 2850

Emissions of the radionavigation-satellite service in the bands 149.9-150.05 Mc/s and 399.9-400.05 Mc/s may also be used by earth receiving stations of the space research service.

Mc/s

	Allocation to Services			
	Region 1	Region 2	Region 3	
	150.05-151	150.05-174	150.05_170	
	FIXED MOBILE except aeronautical mobile (R) RADIO ASTRONOMY	FIXED MOBILE	FIXED MOBILE	
MOD	285 286 286A			
MOD	151-153			
	FIXED MOBILE except aeronautical mobile (R) RADIO ASTRONOMY Meteorological Aids / Permitted Service /	·		
MOD				
MQD	FIXED MOBILE except aeronautical mobile (R) Meteorological Aids / Permitted Service /			
	285 286A		·	
	FIXED MOBILE except aeronautical mobile (R)			
MOD	285		201A 287 287A 290	
	156–174	-	170-174	
	FIXED MOBILE except aeronautical mobile		FIXED MOBILE BROADCASTING	
MOD	201A 285 287 287A 288	201A 233A 287 287A		

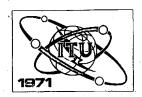
MOD 286

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

Note to Committee 7: MOD 286 contains the same text as ADD 233A at 37.75-38.25 Mc/s and MOD 317 at 406-410 Mc/s.

ADD 287A

In the frequency bands designated for the maritime mobile service in accordance with Appendix 18 of the Radio Regulations, the use of satellite systems for safety and distress may be authorized on certain channels on an exclusive basis in the band 157.3125-157.4125 Mc/s for transmissions from ships to satellites and in the band 161.9125-162.0125 Mc/s for transmissions from satellites to ships. The date on which satellite systems may be brought into use shall not be earlier than 1 January 1976 (see Resolution No. ...).



SPACE CONFERENCE

Document No. 363-E 12 July 1971 Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FINAL REPORT BY THE BUDGET CONTROL COMMITTEE

The Budget Control Committee held three meetings at which it considered the various points arising out of its terms of reference.

Its first report (Document No. 228) was prepared in accordance with No. 675 of the General Regulations which provides that, before a conference budget is exhausted, the Budget Control Committee should present an interim statement of expenditure to the Plenary Meeting.

The General Regulations also provide that, at the end of each conference, the Budget Control Committee shall present a report to the Plenary Meeting showing as accurately as possible the estimated total expenditure of the conference. After consideration and approval by the Plenary Meeting, this report must be transmitted to the Secretary-General for submission to the Administrative Council at its next annual session.

To facilitate consideration of these reports by the Plenary Meeting and the Administrative Council, the information contained in the first report has been brought up to date and included in the final report.

1. Budget of the Conference (Document No. 156)

The Budget Control Committee took note of the budget of the Conference adopted by the Administrative Council of the Union at its 25th Session, 1970. This budget constitutes Annex 1 to the present Report.

2. Cost of printing the Final Acts (Document No. 158)

The Space Conference is printing, for its own use, documents of which the type set-up can subsequently be used, in whole or in part, for the printing of the Final Acts. Administrative Council Resolution No. 83 (amended) specifies that in such case the budget of the Conference must bear a percentage of the composition costs and the whole of the printing costs of such documents and that this percentage of the composition costs shall be decided by the Plenary Assembly.



The Budget Control Committee proposes that the Plenary Meeting adhere to the practice followed by all the conferences held in the past few years and adopt the principle of charging one—third of the cost of typographical composition to the Budget of the Conference and two—thirds to the I.T.U. Supplementary publications budget. The accounts situation described in point 3 below takes account of this proposal.

3. Situation concerning expenditure for the Space Conference

The Budget Control Committee was informed that it would probably be impossible to meet the entire expenditure for the Space Conference from the budget approved in 1970 by the Administrative Council and adjusted in 1971 to take account of intervening salary increases. In this connection, the Secretariat pointed out that, in order to keep Members' contributions as low as possible, the Union budgets provide virtually no margin, so that substantial unforeseen expenditure meant that the credits estimated more than a year before their use were exceeded.

A position of the Conference accounts as at 7 July 1971, compiled by the General Secretariat (Annex 2 attached), shows that an excess of expenditure over credits of about 158,000 Swiss francs may now be expected. This excess relates to the following items:

- a) Printing of Report of C.C.I.R. Special Joint Meeting: 92,000 Swiss francs;
- b) share of cost of typographical composition of documents used for printing of Final Acts: 75,000 Swiss francs;
- c) overtime worked by Conference staff: 115,000 Swiss francs;
- d) postage for despatch of Conference preparatory documents: 40,000 Swiss francs.

The Budget Control Committee studied point a) with particular attention in the light of the explanations contained in Document No. 159 in order to determine whether the sum of 92,000 Swiss francs should be debited to the budget of the Conference or to the budget of C.C.I.R. meetings, on the grounds that it was spent on printing the Report drawn up in February 1971 by the C.C.I.R. Joint Meeting for the Space Conference. However, the Budget Control Committee failed to reach any conclusion, since it was informed by the General Secretariat that the budget for C.C.I.R. meetings was completely exhausted. Consequently, the sum of 92,000 Swiss francs will remain in excess of the allocated credits and, as such, must be brought to the notice of the Administrative Council at its next Session.

In connection with point b), the Budget Control Committee has taken note of the considerable increases in printing costs since the budget of the Space Conference was established; these increases have resulted in an expenditure of 75,000 Swiss francs beyond the credits provided for the share of typographical composition costs chargeable to the Conference. On the basis of information given by the Secretariat, the Committee felt itself unable to recommend a reduction in printing work to the Plenary Meeting.

The Secretariat informed the Budget Control Committee that the pace of work at the Conference had caused an unusual amount of staff overtime. Under this head, the budget provides for 58,000 Swiss francs, whereas overtime expenditure amounted to 90,000 Swiss francs for the first three weeks alone, so that overtime costs can be expected to total about 173,000 Swiss francs.

The attention of the Budget Control Committee was also drawn to the excess expenditure of 40,000 Swiss francs for postage of documents before the start of the Conference. The Secretariat informed the Committee that, since a number of proposals arrived too late to reach all participants by ordinary mail in time, they had had to be despatched by airmail to destinations outside Europe, which meant a very substantial increase in postage.

The total excess expenditure under these four heads amounts to 322,000 Swiss francs, part of which could be offset by economies, so that the budget of 1,545,000 Swiss francs is now expected to be exceeded by some 158,000 Swiss francs.

* *

After a lengthy study of this situation, the Budget Control Committee concluded that Conference expenditure should be kept within the limits of the budget approved by the Administrative Council.

Under No. 675 of the Convention, the Budget Control Committee therefore drew the Plenary Meeting's attention to the situation.

Document No. 363-E

Page 4

The Budget Control Committee nevertheless recognizes that the excess expenditure mentioned above could not be cut without jeopardizing the smooth running of the Conference and was therefore justified.

Under these conditions, the Committee recommends the approval of this report for transmission to the Secretary-General for submission to the Administrative Council at its next annual session, in accordance with No. 677 of the Convention.

4. Contributions of recognized private operating agencies and international organizations not enjoying exemption (Document No. 157)

Under No. 231 of the International Telecommunication Convention, Montreux, 1965, the amount of the contributory unit for recognized private operating agencies and international organizations not enjoying exemption was fixed at 3.226 Swiss francs.

A list of agencies and organizations in question, together with an indication of the number of contributory units chosen to date, constitutes Annex 3 to the present document.

L. CONSTANTINESCU
Chairman
Budget Control Committee

Annexes: 3

ANNEX 1

Section 7. Conference of the Union (No. 208 of the Convention)

7.1 WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS, GENEVA, 1971

	For comparison : Space Conference 1963	Budget 1971	Revised Budget 1971
	Swis	ss francs	
Chapter 1 - Staff			
Salaries and related expenditure		1,005,000	1,050,000
Travel expenses Insurance		40,000 15,000	40,000 13,000
	701,000	1,058,000	1,103,000
Chapter 2 - Premises and equipment			
Premises, furniture, machines Document reproduction —Supplies and overheads— Technical installations Sundry and unforeseen	92,000 48,000 -32,000 14,000 6,000	140,000 50,000 33,000 14,000 20,000	140,000 50,000 33,000 14,000 20,000
	192,000	257,000	257,000
Chapter 3 - Exceptional expenditure Preparatory work Publication of proposals Final Acts	17,000 75,000 73,000	40,000 65,000 80,000	40,000 65,000 80,000
	165,000	185,000	185,000
Total Section 7	1,058,000	1,500,000	1,545,000

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SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE

(at 7 July 1971)

		<u></u>						
	BUDGET	Credit	transfers	Total	Actual	Commitments	Estimated	Total
Chapters and items	including add.cred.	item to item	chapter to chapter	credits available	expenditure	to expenditure	expenditure	estimated expenditure
. Staff		!						
.101 - Salaries and related exp	enses	,						
- Salaries - Cvertime - Sundry expenses					496,841,65	335,226.— 85,553.50	11,900 82,000 122	843,967.65 172,910.35 122.—
	1,050,000			1,050,000	502,198.50	420,779.50	94,022	1,017,000
1.102 - Travel expenses		İ						
Travel expenses and subsistence allowances					21,082.50	2,392.15	1,525.35	25,000
	40,000	,		40,000	21,082.50	2,392.15	1,525.35	25,000
7.103 - Insurance								
- Accident insurance - Sickness insurance - Other insurances					1,030.60 2,011.50		5,200 5,800 957.90	5,200 6,830.6 2,969.4
	13,000	•••	-	13,000	3,042.10		11,957.90	15,000
POTAL, CHAPTER I	1.103,000	en.		1,103,000	526,323.10	423,171.65	107,505.25	1,057,000

SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE AT 7 JULY 1971

		Credit	transfers					
Chapters and items	BUDGET including add.cred.	item to item	chapter to chapter	Total credits available	Actual expenditure	Commitments to expenditure	Estimated expenditure	Total estimated expenditure
II. Premises and equipment								
7.201 - Premises, furniture, mac	hines							
- Renting of Palais des Exposition - Upkeep of Palais des Exposition - Electricity - Installation - Renting and upkeep of furnitus - Renting of vehicles - Sundry expenses	ons premise				52,500 - - 1,639 1,986.15	52,500 1,419.10 5,000 3,900 797.70	1,000	105,000.— 10,500.— 6,000.— 3,419.10 5,000.— 6,539.— 3,541,90
	140,000		_	140,000	56,125.15	63,616.80	20,258.05	140,000
7.202 - Document production								
- Cost of producing Conference of Printing of C.C.I.R. Study Grown Other expenses					50,709.80 91,891.25 34,322.40	20,400,	13,290.20 108.75 277.60	92.000
	50,000	_	+ 65,000	115,000	176,923.45	20,400	13,676,55	211,000
7.203 - Office supplies and overheads Office supplies and equipment Postage, telephones, telegram Guide, badges, etc.	5				9,251.50 34,927.25 5,395.— 5,909.10	1,000 640	1,748.50 15,072.75 105.—	50,000 6,500
- Sundry expenses	33,000	_		33,000	55,482.85	1,640		

Annex 2 to Document No. 363-E Page 9

SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE AT 7 July 1971

	BUDGET	Credit	transfers	Total		Commitments		Total
Chapters and items	including add.cred.	item to item	chapter to chapter	credits available	Actual	to expenditure	Estimated expenditure	estimated expenditure
Article II. (contd.)								
7.204 - Simultaneous interpreta and other technical ins								
- Rental of equipment, Palais des Expositions - Cost of installing I.T.U.						4,600	5,400	10,000
equipment					-	_	1,000	1,000
	14,000			14,000	_	4,600	6,400	11,000,
7.205 - Sundry and unforeseen					2,674.05	1,618.25	10,707.70	15,000
	20,000	-	-	20,000	2,674.05	1,618.25	10,707.70	15,000
TOTAL, CHAPTER II	257,000		+ 65,000	322,000	291,205.50	91,875.05	68,919.45	452,000
					<u> </u>			

Annex 2 to Document No. 363-E
Page 10
SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE AT 7 July 1971

	. BUDGET	Credit	transfers	Total	Actual	Commitments	Estimated	Total
Chapters and items	including add.ored.	item to item	chapter to chapter	credits available	expenditure	to expenditure	expenditure	estimated expenditure
Article III. Exceptional exper	diture							
7.301 - Preparatory work								
- Supernumerary staff for the	I.F.R.B.		;		17,511.75	1,261.70	_	18,773.45
- Electronic computer - Other expenses	TANK TANK TANK TANK TANK TANK TANK TANK				20,226.55	-	energy (20,226.55
	40,000		_	40,000	37,738.30	1,261.70		39,000.—
7.302 - Publication of proposals					_	-		
	65,000	· <u></u>	- 65,000	_		_	_	_
7.303 - Final Acts								
- Printing of Final Acts - Translation into Russian - Translation into Chinese					-		140,000 7,500 7,500	140,000 7,500 7,500
	80,000		_	80,000			155,000	155,000
TOTAL, CHAPTER III	185,000	. –	- 65,000	120,000	37,738,30	1,261.70	155,000	194,000,
TOTAL, SECTION 7 SPACE CONFERENCE	.1,545,000			1,545,000	855,266.90	516,308.40	331,424.79	1,703,000.—

ANNEX 3

LIST OF RECOGNIZED PRIVATE OPERATING AGENCIES AND INTERNATIONAL ORGANIZATIONS TAKING PART IN THE CONFERENCE

Number of contributory units Recognized private operating agencies I. Marconi International Marine Co. Itd. 글) <u>구</u>) Radio-Austria AG International organizations II. **) International Air Transport Association (I.A.T.A.) **) Inter-American Association of Broadcasters (I.A.A.B.) 불 International Association of Lighthouse Authorities (I.A.L.A.) International Chamber of Shipping (I.C.S.) 를) International Committee of the Red Cross (C.I.C.R.) **) -눌**)**-International Press Telecommunication Committee (I.P.T.C.) International Marine Radio Association (C.I.R.M.) **) Inter-Union Commission on Allocation of Frequencies for Radio Astronomy and Base Science (I.U.C.A.F.) **) World Confederation of Organizations of the Teaching Profession (W.C.O.T.P.) *) Council of Europe *) International Council of Scientific Unions (I.C.S.U.) ** **)** 븡 International Telecommunications Satellite Consortium (INTELSAT) Ecumenical Satellite Commission * } International Astronautical Federation (I.A.F.) **) International Transport Workers Federation (I.T.F.) 출) International Broadcast Institute (I.B.I.) *) European Space Research Organization (E.S.R.O.) *) European Space Vehicle Launcher Development Organization (E.L.D.O.)

Annex 3 to Document No. 363-E

Page 12

	COI	ary	
International Radio and Television Organization (O.I.R.T.)	*	**)	
African and Malagasy Postal and Telecommunications Union (U.A.M.P.T.)		**)	
Asian Broadcasting Union	·	**)	
Arab States Broadcasting Union (A.S.B.U.)		**)	
Union of National Radio and Television Organizations of Africa (U.N.T.R.A.)		**)	
European Broadcasting Union (E.B.U.)	7.1	**)	
International Amateur Radio Union (I.A.R.U.)		**)	

^{*)} The Secretariat has not yet been informed of the class of contribution chosen

^{**)} Exempted from all contributions under the provisions of Administrative Council Resolution No. 574

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 364-E
12 July 1971

PLENARY MEETING (FIRST READING)

B. 9

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
5	304	1 2 3 4, 6 8, 9, 10, 11 13, 15	Art. 1—Section IIA Art. 6—Nos. 415, 417, 419A Art. 27—Nos. 951, 952 Res. B, Rec. EE, FF, GG, HH, II, JJ, KK	

Francois Job Chairman of the Editorial Committee

Annex: Pages B9/01-15



[ARTICLE 1, Section IIA]

ADD 84AQA Aeronautical Radionavigation-Satellite Service.

A radionavigation-satellite service in which mobile earth stations are located on board aircraft.

ADD 84AQB Maritime Radionavigation-Satellite Service.

A radionavigation-satellite service in which mobile earth stations are located on board ships.

ADD 84ATC Time Signal Satellite Service.

A radiocommunication service using space stations on earth satellites for the same purposes as those of the time signal service.

[ARTICLE 6]

- MOD 415 § 2. (1) When special circumstances make it indispensable to do so, an administration may, as an exception to the normal methods of working authorized by these Regulations, have recourse to the special methods of working enumerated below, on the sole condition that the characteristics of the stations still conform to those inserted in the Master International Frequency Register:
 - a) a fixed station in the terrestrial radiocommunication service or fixed satellite service may, [on a secondary basis], transmit to mobile stations on its normal frequencies;
 - b) a land station may communicate, [on a secondary basis], with fixed stations in the terrestrial radiocommunication service or fixed satellite service or other land stations of the same category.
- MOD 417 § 3. Any administration may assign a frequency in a band allocated to the fixed service or allocated to the fixed satellite service to a station authorized to transmit, unilaterally, from one specified fixed point to one or more specified fixed points provided that such transmissions are not intended to be received directly by the general public.
- ADD 419A § 5A. Aircraft earth stations are authorized to use frequencies in the bands allocated to the maritime mobile satellite service for the purpose of communicating, via the stations of that service, with the public telegraph and telephone networks.

[ARTICLE 27]

- MOD 951 § 3. (1) Aircraft stations may communicate with stations of the maritime mobile or maritime mobile satellite services. They shall then conform to those provisions of these Regulations which relate to these services.
- MOD 952 (2) For this purpose aircraft stations should use the frequencies allocated to the maritime mobile or maritime mobile satellite services. However, having regard to interference which may be caused by aircraft stations at high altitudes, maritime mobile frequencies in the bands above 30 M[c/s] shall not be used by aircraft stations in any specific area [without the prior agreement of all the administrations of the area] in which interference is likely to be caused. In particular, aircraft stations operating in Region 1 should not use frequencies in the bands above 30 M[c/s] allocated to the maritime mobile service by virtue of any agreement between administrations in that Region.

RESOLUTION No. Spa B

Relating to the Use of the Band 156-174 M[c/s] by the Maritime Mobile Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that there is a need to develop the use of space radiocommunication techniques to meet the future requirements of the maritime mobile service;
- b) that, of the bands used at present by the maritime mobile service, there may be advantages in using for the maritime mobile satellite service narrow channels between 156-174 M[c/s] for safety and distress;

recognizing

- a) that the maritime mobile bands between 156-174 M[c/s] are also used for other services;
- b) that the power flux densities laid down by maritime satellites in this band may cause harmful interference to terrestrial receivers and that the satellite receiver may suffer harmful interference from terrestrial radio-communication transmissions;
- c) that the terrestrial maritime mobile service makes extensive use of the channels given in Appendix 18 of the Radio Regulations;

is of the opinion

that it is important for the maritime mobile satellite service to be able to use some narrow channels, on an exclusive basis, for safety and distress as soon as practicable;

having provided for

the possible use of narrow channels for safety and distress by the maritime mobile satellite service in bands 157.3125-157.4125 M[c/s] and 161.9125-162.0125 M[c/s] not earlier than 1 January 1976 (see No. 287A of the Radio Regulations);

resolves

that the World Administrative Maritime Radio Conference to be held in 1974 be invited to consider this matter further and to decide if and to what extent the maritime mobile satellite service should be introduced in the above bands on an exclusive basis and to make any consequential changes in the Radio Regulations and in the provisions governing the use of the channels in Appendix 18;

request the Secretary-General

to transmit this Resolution to Members and Associate Members and to the Administrative Council for inclusion in the draft agenda for the 1974 Maritime Conference.

RECOMMENDATION No. Spa. EE

Relating to a Revised Presentation of the Sections of Article 1 of the Radio Regulations

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that, as a result of the amendments made to the Article 1 of the Radio Regulations, the terms specified in that Article are no longer arranged in logical order;
- b) that it would therefore be desirable to rearrange Article 1 of the Radio Regulations in a more appropriate form;

recognizing

that this Conference was unable to perform this task;

recommends

that the next world administrative conference which is competent to revise Article 1 of the Radio Regulations should consider the rearrangement of Article 1 in a more logical manner, for example, on the lines of the Annex to this Recommendation, and further amendments to this Article, as necessary.

ANNEX TO RECOMMENDATION No. Spa EE

ARTICLE 1

Section I. General Terms

Section II. Radio Systems

Section III. Radio Services and Stations

Sub-Section IIIA. Terrestrial Radiocommunication

Sub-Section IIIB. Space Radiocommunication

Sub-Section IIIC. Radio Astronomy

Section IV. Technical Characteristics

RECOMMENDATION No. Spa FF

Relating to the Future Use of Bands Allocated to the Inter-Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that the bands 54.25-58.2 G[c/s], 59-64 G[c/s], 105-130 G[c/s], 170-182 G[c/s] and 185-190 G[c/s] have been allocated to the inter-satellite service;
- b) that all the foregoing bands are located in parts of the radiofrequency spectrum close to peaks of atmospheric absorption;

and recognizing

that the inter-satellite and terrestrial radiocommunication services are protected from mutual interference by the attenuation due to atmospheric absorption;

recommends

that a future world administrative radio conference should consider allocating these bands also to terrestrial radiocommunication (except the aeronautical mobile) services.

RECOMMENDATION No. Spa GG

Relating to the Future Use of Certain Frequency Bands between 40 and 275 G[c/s]

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

that the 43-48 G[c/s], 66-71 G[c/s], 95-101 G[c/s], 142-150 G[c/s], 190-200 G[c/s] and 250-265 G[c/s] bands have been allocated to the following services:

- Aeronautical mobile satellite
- Maritime mobile satellite
- Aeronautical radionavigation-satellite
- Maritime radionavigation-satellite;

recognizing

that it is not desirable for compatibility considerations that at a later date these bands should be shared with terrestrial radiocommunication services other than those of interest to the aeronautical and maritime mobile services and/or the aeronautical and maritime radionavigation services;

recommends

that a future competent world administrative conference should consider allocating, in addition, the 43-48 G[c/s], 66-71 G[c/s], 95-101 G[c/s], 142-150 G[c/s], 190-200 G[c/s] and 250-265 G[c/s] bands to the following services:

- Aeronautical mobile
- Maritime mobile
- Aeronautical radionavigation
- Maritime radionavigation

in an appropriate manner.

RECOMMENDATION No. Spa HH

Relating to the Future Use of the 41-43 G[c/s] Band by the Fixed and Mobile Services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

that the 41-43 G[c/s] band has been allocated to the broad-casting-satellite service;

recognizing

that it is possible, by appropriate co-ordination, for a frequency band to be shared by the broadcasting-satellite service, on the one hand, and the fixed and mobile services, on the other;

recommends

that a future competent world administrative conference should consider allocating, in addition, the 41-43 G[c/s] band to the fixed and mobile services.

[RECOMMENDATION No. Spa II

Relating to Future Frequency Allocation Requirements for the Maritime Mobile Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

having noted

that the Inter-Governmental Maritime Consultative Organization (I.M.C.O.) has stated a requirement for frequencies of the order of 400 M[c/s], believing that small vessels in particular may be unable to use satellite radiocommunications if such frequencies are not made available;

further noting

that the C.C.I.R. Special Joint Meeting, Geneva, 1971, concluded that the present Conference should be invited to examine the possibility of providing exclusive channels for the maritime mobile satellite service at about 400 M[c/s] and that provision of such channels is desirable;

considering

- a) that ship stations and survival craft stations are completely dependent upon the use of radio for communication;
- b) that the use of space techniques will provide the maritime mobile satellite service with a reliable and more efficient method of communication;
- c) that reliable maritime mobile satellite service communications will greatly assist in the saving of lives and property;
- d) that although the Conference has made certain provisions for the maritime mobile satellite service, there is some uncertainty with respect to the adequacy and usefulness of these provisions, particularly insofar as small ships and survival craft are concerned;

- e) that general participation of small ships in a service using space techniques would not only benefit the efficient and safe operation of these ships but would also improve the safety service for larger ships and survival craft;
- f) that future conferences might find it necessary to make additional allocations for such uses nearer to the optimum portions of the spectrum;
- g) that for some communications functions, such as certain broadcasting and fixed applications, other means than radio could be used, thereby making portions of the spectrum available for services which are dependent on radio:

recommends

- 1. that administrations and appropriate international organizations continue to review the requirements for the maritime mobile satellite service and the suitability of current frequency allocations in meeting those requirements;
- 2. that the C.C.I.R. should continue its studies to determine the optimum portions of the frequency spectrum and related sharing conditions to accommodate maritime mobile satellite service requirements, taking into consideration advances in space radiocommunication technology;
- 3. that a competent administrative radio conference should review the requirements of the maritime mobile satellite and safety services, and if necessary, provide the frequency allocation to satisfy these requirements.]

RECOMMENDATION No. Spa JJ

Relating to the Protection of Radio Astronomy Observations on the Shielded Area of the Moon

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that radio astronomy observations at frequencies below the ionospheric critical frequencies and above 100 G[c/s] are hampered or prevented by absorption in the Earth's atmosphere;
- b) that successful radio astronomy observations require complete freedom from harmful interference;
- c) that the shielded area of the Moon offers unique opportunities for observations which are not affected by such absorption;
- d) that the shielded area of the Moon appears to be the potentially most useful area accessible to man which is completely free from interference from terrestrial transmissions;
- e) that the shielded area of the Moon refers to the area of the Moon which is more than $23 \cdot 2^{\circ}$ beyond the mean limb of the Moon as seen from the centre of the Earth;
- f) that the transmissions by radio of data from observation stations to collection points will be in the bands allocated for this purpose;

noting

the desirability of maintaining the shielded area of the Moon as an area of maximum value for observations by the radio astronomy service and by passive space research and consequently as free as possible from transmissions;

recommends

- 1. that the C.C.I.R. study the frequency bands most suitable for radio astronomy observations on the shielded area of the Moon and work out recommendations concerning these bands as well as criteria for their application and protection;
- 2. that in the meantime, administrations, in accordance with the intent of this Recommendation, take all practicable steps to ensure that there will be no interference to radio astronomy observations on the shielded area of the Moon; and
- 3. that administrations apply such Recommendations as may be provided on this matter by the C.C.I.R. pending the convening of the next World Administrative Radio Conference.

RECOMMENDATION No. Spa KK

Relating to the Future Provision of a Band near 10 [Mc/s] for the Radio Astronomy Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) the requirements of the radio astronomy service, as expressed by the Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science (IUCAF), for a frequency allocation near 10 M[c/s];
- b) that the use of the standard frequency guard bands has not satisfied the needs of the radio astronomy service at a frequency near 10 M[c/s];
- c) that propagation conditions at a frequency near 10 M[c/s] are such that a transmitter operating anywhere on the Earth might cause interference to the radio astronomy service and as a consequence an exclusive world-wide allocation is necessary for long term observations;
- d) that successful radio astronomical measurements have, at times, been made at frequencies near 10 M[c/s];
- e) that IUCAF is co-ordinating the needs of radio astronomers for frequency allocations;

recommends

- 1. that administrations keep under review the possibility of releasing a band of frequencies 50 k[c/s] wide for the use of the radio astronomy service between 10 M[c/s] and 15 M[c/s];
- 2. that administrations give close attention to any future recommendation of the IUCAF concerning the specific frequency band between 10 M[c/s] and 15 M[c/s] required by the radio astronomy service;
- 3. that a future world administrative radio conference consider granting to the radio astronomy service an exclusive allocation in this region of the spectrum.



SPACE CONFERENCE

Document No. 365-E
12 July 1971
Original: English
French
Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

TENTH REPORT OF COMMITTEE 4

Modified Recommendation No. Spa 3 appearing in the Annex hereto has been approved by Committee 4.

The text in question has been forwarded to the Drafting Committee.

E.F. SANDBACH Chairman Committee 4

Annex: 1



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ANNEX

MOD

RECOMMENDATION No. Spa 3

TO THE C.C.I.R. AND TO ADMINISTRATIONS

relating to frequency bands shared between space services and between space and terrestrial services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

recognizing

- a) the value to the Conference of the material contained in Document No. 64 (Results of C.C.I.R. studies relating to space telecommunications concluded at its Special Joint Meeting);
- b) that further studies on a wide range of problems dealing with space communications form the subject of C.C.I.R. Questions and Study Programmes approved by the XIIth Plenary Assembly:

considering-however-

a) that certain C.C.I.R. Recommendations, listed below, call for further work and study:

Recommendation 355-1

"FREQUENCY SHARING BETWEEN ACTIVE COMMUNICATION—SATELLITE SYSTEMS AND TERRESTRIAL RADIO SERVICES IN THE SAME FREQUENCY BANDS"

Recommendation 465

"GENERALIZED EARTH-STATION ANTENNA RADIATION PATTERN FOR USE IN INTERFERENCE CALCULATIONS, INCLUDING COORDINATION PROCEDURES, IN THE FREQUENCY RANGE 2-10 GHz"

Annex to Document No. 365-E Page 4

Recommendation 466

"COMMUNICATION-SATELLITE SYSTEMS FOR TELEPHONY USING FREQUENCY-DIVISION
MULTIPLEX - Maximum allowable values of interference in a telephone channel of a geostationary communication-satellite system employing frequency-modulation, caused by other geostationary communication-satellite systems"

b) that as a result of the deliberations of this Conference, particularly in relation to the provisions of Article 7 Sections / relevant sections /, and to / other relevant Articles /, further information is required in reply to the following current Questions and Study Programmes of the C.C.I.R.:

Question 1-1/4

"ANTENNAE FOR SPACE SYSTEMS"

under Decides 2

the state of development in antenna design

and fabrication:

under Decides 3

the state of development of antennae with improved side- and back-lobe characteristics;

under Decides 4

the polarization characteristics of antennae, particularly in the side-lobe regions and in planes other than the principal planes;

Question 2-1/4

"TECHNICAL CHARACTERISTICS OF COMMUNICATION—SATEILITE SYSTEMS FOR FIXED AND MOBILE, EXCLUDING AERONAUTICAL AND MARITIME MOBILE, SERVICES"

under Decides 3

under what conditions and to what extent would it be feasible for communication—satellites, operating in the same system or operating in different systems, to share preferred frequency bands;

under Decides 4

under what conditions and to what extent would it be feasible for communication satellite systems to share preferred frequency bands with terrestrial services;

Study Programme 2-1A-1/4

"FEASIBILITY OF FREQUENCY SHARING BETWEEN COMMUNICATION-SATELLITE SYSTEMS AND TERRESTRIAL SERVICES"

under Decides 2

the determination of preferred technical characteristics of transmitting and receiving antennae for earth stations at fixed locations, from the standpoint of spectrum sharing with other radio services;

Study Programme 2-1C/4

"COMMUNICATION-SATEILLITE SYSTEMS -Feasibility of frequency sharing among communication-satellite systems"

under Decides 1

the criteria which affect interference among communication—satellites in a given system and between communication—satellite systems, taking into account the two directions of transmission;

under Decides 2

the preferred technical characteristics of transmitting and receiving antennae for earth stations, from the standpoint of frequency sharing within the same system and with other communication—satellite systems;

Study Programme 2-1J/4

"COMMUNICATION—SATELLITE SYSTEMS_-Technical factors influencing the efficiency of use of the geostationary satellite orbit by Communication—satellites sharing the same frequency bands"

under Decides 1

the technical characteristics of communicationsatellite systems which affect the utilization of the geostationary satellite orbit, and the inter-relationships between them:

under Decides 3

the extent to which it may be feasible and desirable to adopt preferred technical characteristics for different geostationary communication—satellites and earth stations;

under Note 1

some of the factors which should be taken into account in carrying out these studies:

- the tolerable levels of interference noise in different communicationsatellite systems;
- the radiation patterns of the earth station and satellite antennae;
- factors affecting the multiple use of the same frequencies within a single communication-satellite;
- polarization discrimination;
- c) that under the terms of Article 9A of the Radio Regulations frequency assignments to earth stations in certain bands shared with equal rights with / Fixed and Mobile or Terrestrial Services / must be co-ordinated with a view to preventing mutual harmful interference;
- d) that the calculation method described in Appendix 28 applies solely to frequencies in the 1-40 G / c/s / range;
- e) that Tables I, Ia and II in Appendix 28 do not show numerical values for the parameters of certain Space Radiocommunication Services and Terrestrial Services, sharing frequency bands with equal rights;
- f) that the method of determining the co-ordination area of an earth station as described in Appendix 28 is probably still open to improvement and simplification;
- g) that frequency bands have been allocated to the broadcasting satellite service and that the use of satellite transmissions for reception by the general public of sound and television broadcasts may be possible in the future;
- h) that the C.C.I.R. is studying the conditions under which sharing between the broadcasting satellite service and other services may be possible;
- i) that it would be useful to have a clear definition of the term "system noise temperature";

- j) that it would be useful to have clear definitions of the terms "acceptable (or unacceptable) interference" and "harmful interference" for the Space, Radio Astronomy and Terrestrial Services;
- k) that it would be useful to have specific numerical values of power flux-density from space stations in the Broadcasting-Satellite Service which would permit differentiation between "individual reception" and "community reception" in the Broadcasting-Satellite Service;
- 1) that frequency sharing between the Aeronautical Radionavigation Service and the Communication-Satellite Service (satellite-to-earth) has been proposed for the band 4 200 to 4 400 M/Hz/;
- m) that frequency sharing between the Radionavigation Service and the Fixed-Satellite Service (Earth-to-space) has been proposed for the frequency band / 14.0 to 14.3 G/Hz//, and between the Radionavigation-Satellite Service and the Fixed-Satellite Service (Earth-to-space) for the frequency band / 14.3 to 14.4 G/Hz//;

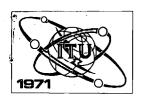
recommends

- that administrations, recognized private operating agencies, and other participants in the work of the C.C.I.R., consider as a matter of priority, the submission of contributions on these subjects, so that corresponding draft Recommendations can be prepared at the meetings of the relevant Study Groups for consideration by the XIII th Plenary Assembly of the C.C.I.R.;
- 2. that the C.C.I.R. should study or, as appropriate, continue to study:
- the-reference antenna patterns, for earth station antennae, which may be appropriate for setting minimum standards of performance, and to recommend specific patterns for this purpose, in order to improve utilization of the frequency bands shared between communication-satellite systems and terrestrial services and bands shared by space services, and to improve the utilization of the geostationary orbit;
- 2.2 the reference antenna patterns, for satellite antennae, which may be appropriate for setting minimum standards of performance, particularly outside the main beam, in order to improve the utilization of the geostationary orbit and to foster the possibilities for frequency re-use;
- 2.3 the reference cross-polarization antenna patterns which may be appropriate for setting minimum standards of performance and, in this connection, further study:

- 2.3.1 the portions of the spectrum within which linear-orthogonal or circular-orthogonal polarizations might be most appropriate;
- 2.3.2 the relative desirability, accounting for technical and orbit utilization factors, of using orthogonal polarizations within a single satellite as against between two satellites;
- 2.4 the necessary limitation of spurious emissions and the frequency tolerances to be observed in both the Terrestrial and Space Services insofar as they may affect sharing of frequency bands;
- 2.5 the permissible interference criteria for the various space and terrestrial services sharing the frequency bands allocated by the WARC-ST, Geneva, 1971, in order to permit the determination of:
 - 2.5.1 the co-ordination distance and the probability of interference between stations within that distance;
 - 2.5.2 the necessary limits of power flux-density set up at the earth's surface by space stations;
- 2.6 the maximum / permissible / level of interference into a geo-stationary satellite / link / from any other single interfering geostationary satellite / system / and from the aggregate of all other geostationary satellite / systems /, particularly in the case of:
 - 2.6.1 frequency-modulated telephony signals;
 - 2.6.2 frequency-modulated television signals;
 - 2.6.3 digitally-modulated signals;

- 2.7 the interference criteria applicable to frequency sharing between non-geostationary satellite / systems / and geostationary satellite /systems/;
- 2.8 the possibility of establishing a technical criterion for expressing the efficiency of use of the geostationary satellite orbit;
- 2.9 the data which are not included in Tables I, Ia and II of Appendix 28, relating to the Space Radiocommunication Services or Terrestrial Services sharing frequency bands with equal rights;

- 2.10 the possibility of improving and simplifying the method of determining the co-ordination area as described in Appendix 28;
- 2.11 the formulation of a calculation method for determining the co-ordination area of earth stations at frequencies below 1 G/c/s and above 40 G/c/s;
- 2.12 the conditions for frequency sharing in those bands allocated to the Broadcasting-Satellite Service by the W.A.R.C. and make appropriate recommendations as soon as possible in order that Administrations and the International Frequency Registration Board shall have the necessary technical data required to carry out examination procedures, in particular regarding Articles 9 and 9A of the Radio Regulations;
- 2.13 the term "system noise temperature" and formulate a clear definition of this term applicable to space systems;
- 2.14 the terms "acceptable (or unacceptable) interference" and "harmful interference" and formulate clear definitions appropriate to the Radio Astronomy Service and to the various space and terrestrial services;
- 2.15 the power flux-densities required for individual and community reception in the Broadcasting-Satellite Service, with the object of specifying numerical values which will differentiate between these types of reception;
- 2.16 the criteria for frequency sharing between the Aeronautical Radionavigation Service and the Communication-Satellite Service (Satellite-to-earth) for frequencies in the vicinity of 4 300 M/Hz_7;
- 2.17 the criteria for frequency sharing between the Radionavigation Service and the Fixed-Satellite Service (Earth-to-space) in the frequency band / 14.0 to 14.3 G/Hz//, and between the Radionavigation-Satellite Service and the Fixed-Satellite Service (Earth-to-space) in the frequency band / 14.3 to 14.4 G/Hz//;
- 3. that until the next competent Administrative Conference all Administrations should use:
 - any C.C.I.R. Recommendation, if applicable, for the values missing from Tables I, Ia and II of Appendix 28,
 - the methods of determining the co-ordination area for frequencies below 1 G/c/s_/ and above 40 G/c/s_/, which may be the subject of a C.C.I.R. Recommendation.



SPACE CONFERENCE

Document No. 366-E 12 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

NEW ZEALAND

DRAFT RESOLUTION / A /

relating to the technical criteria recommended by the C.C.I.R. for sharing between the Space and Terrestrial Services and within the Space Service

The World Administrative Radio Conference, Geneva, 1971

considering

- a) that, in frequency bands shared with equal rights by Space and Terrestrial Services, it is necessary to impose certain technical limitations and co-ordination procedures on each of the sharing services in the interest of controlling mutual interference;
- b) that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose co-ordination procedures in the interest of controlling mutual interference;
- c) that the technical criteria and co-ordination procedures referred to in a) and b) above, and as set forth in the Radio Regulations, are mainly based upon recommendations of the C.C.I.R.;
- d) that, in recognition of the successful sharing of frequency bands by Space and Terrestrial Services, and the continuing improvements in space technology, each Plenary Assembly of the C.C.I.R. subsequent to the Xth Plenary Assembly, Geneva 1963, has improved upon some of the technical criteria recommended by the preceding Plenary Assembly;
- e) that Plenary Assemblies of the C.C.I.R. are held triennally whereas Administrative Radio Conferences, which are empowered to modify the Radio Regulations making substantial use of the recommendations of the C.C.I.R. are in practice held less frequently and with much less regularity;

f) that the International Telecommunication Convention of Montreux 1965, recognizes the right of Members and Associate Members of the I.T.U. to make special agreements on telecommunication matters; however, such agreements shall not be in conflict with the terms of the Convention or of the Regulations annexed thereto, so far as concerns the harmful interference to the radio services of other countries:

is of the opinion

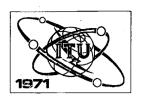
that subsequent Plenary Assemblies of the C.C.I.R. are likely to make further changes in the recommended technical criteria: and

that administrations should be afforded the opportunity to take advantage of the current C.C.I.R. Recommendations on sharing criteria when planning systems for use in frequency bands, shared with equal rights by Space and Terrestrial Services, or between space systems;

therefore resolves that

- 1) each Plenary Assembly of the C.C.I.R. should arrange for the Secretary-General to be informed of those Recommendations of the C.C.I.R. affecting the technical criteria relating to sharing between the Space and Terrestrial Services and within the Space Services:
- 2) following the distribution to administrations of the relevant C.C.I.R. texts, the Secretary-General shall write to administrations asking them to indicate within $\frac{1}{2}$ 60 $\frac{1}{2}$ days, to which of the C.C.I.R. Recommendations or to which specific technical criteria defined in the Recommendations referred to in 1) above they agree for use in the application of the pertinent Radio Regulations:
- 5) the administrations which do not respond to the Secretary-General's inquiry within 60 days shall, for the time being, be deemed to prefer the application of the specific technical criteria referred to in the existing Regulations;
- 4) such administrations described in paragraph 3) may, however, at a later stage communicate their views to the Secretary-General on the applications of the technical criteria referred to in paragraph 1) above;

- 5) in those cases where an administration, in its reply to the Secretary-General's inquiry, indicates that a specific C.C.I.R. Recommendation or a specific technical criteria defined in those Recommendations is not acceptable to it, the relevant technical criteria defined in the Radio Regulations shall continue to apply with respect to cases involving that administration;
- 6) the Secretary-General shall publish, for the information of all administrations, a consolidated list prepared on the basis of the replies to the inquiry, of the C.C.I.R. Recommendations or of the specific relevant technical criteria defined in those Recommendations, and to which administrations each of those Recommendations or specific relevant technical criteria are acceptable or are not acceptable. This list shall also include those administrations mentioned in paragraph 3) above; the list shall be revised if any administration forwards its views in accordance with paragraph 4) above;
- 7) the I.F.R.B. be directed to take into account:
 - a) the applicability of the C.C.I.R. technical criteria consonant with the list referred to in 6) above when making technical examinations with respect to cases involving only administrations to which such criteria are acceptable:
 - b) the applicability of the technical criteria defined in the Radio Regulations consonant with the list referred to in 6) above when making technical examinations with respect to cases involving an administration which does not accept the relevant C.C.I.R. technical criteria;
- 8) if at a later time questions arise concerning the application of the relevant technical criteria to a case involving administrations which are described in paragraph 3) and which have not communicated their views in accordance with paragraph 4) above, the Secretary-General shall inquire of such administrations as to whether or not they would agree to the application of the technical criteria defined in the relevant C.C.I.R. Recommendations referred to in paragraph 1) above. If the answer is in the affirmative, the Secretary-General shall revise the list published pursuant to paragraph 5) above;
- 9) Administrations in planning the introduction of new services shall ensure that no harmful interference is caused or likely to be caused to the services of stations of those administrations which have not indicated their agreement to the application of the specific technical criteria in the relevant C.C.I.R. Recommendations referred to in paragraph 1) above.



SPACE CONFERENCE

Document No. 367-E 12 July 1971 Original: Russian

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

I have received a letter from the Head of the Delegation of the People's Republic of Bulgaria the text of which is attached hereto.

Gunnar PEDERSEN Chairman of the Conference

Annex: 1



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ANNEX

Mr. Gunnar PEDERSEN Chairman of the World Administrative Radio Conference for Space Telecommunications

Dear Mr. Chairman,

I wish to bring to your notice the attached statement by the Delegation of the People's Republic of Bulgaria concerning the participation of the German Democratic Republic, the Democratic Republic of Viet-Nam and the Korean People's Democratic Republic in the work of the Conference.

I request you to publish the text of this statement as an official conference document.

Yours sincerely,

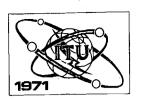
D. ROUSSEV
Deputy Head, Bulgarian Delegation

Annex

The Delegation of the Bulgarian People's Republic to the World Administrative Radio Conference for Space Telecommunications expresses its profound regret that delegations from the sovereign States of the German Democratic Republic, the Democratic Republic of Viet-Nam and the Korean People's Democratic Republic were not invited to take part in the Conference.

The absence of delegations from these countries constitutes a serious infringement of the principles proclaimed by the United Nations and reduces the possibilities of finding an effective solution to the problems confronting this Conference.

D. ROUSSEV
Deputy Head, Bulgarian Delegation



SPACE CONFERENCE

Document No. 368-E 12 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 4

SUMMARY RECORD

OF THE

EIGHTH MEETING OF COMMITTEE 4
(TECHNICAL)

Friday, 9 July 1971, at 0930 hrs

Chairman: Mr. E.F. SANDBACH (Australia)

Subjects discussed:

Document No.

1. Approval of Summary Record of Seventh Meeting 327, 287 Corr. 1

(2. Progress report by Working Group Chairmen

3. Consideration of documents from Working Groups

a) Working Group 4A

295

b) Working Group 4B

301, 303, 302, 278

c) Working Group 4C

294 + Corr. 1 + Corr. 2

d) Working Group 4E

311, 334, 325

4. Documents from Committee 4 Drafting Group

Collective Recommendation

333

Appendix 29 + Annex

336 ·

5. Documents referred to other Committees

308, 309, 330

6. Completion of the work of Committee 4

U.I.T. GENEVE The <u>delegate of France</u> announced that he had been authorized to vote by proxy for the French Overseas Territories (see Annex).

1. Approval of Summary Record of Seventh Meeting (Document No. 327)

The delegate of France pointed out the following corrections:

Page 4, paragraph 2, line 4: replace "system" by "equivalent satellite link", and in line 5, replace "19" by "29".

Page 5: replace the first two lines by "The delegate of France said that it was necessary to adapt the texts of Appendices 1B and 29 where methods of calculating increase of equivalent satellite link noise ...".

The Summary Record was approved subject to those amendments.

The <u>Chairman</u> drew attention to Corrigendum 1 to Document No. 287 which contained an amendment to the Summary Record of the Sixth Meeting. The document was <u>noted</u>.

2. a) Working Group 4A (Document No. 295)

The Chairman took up the outstanding terms and definitions:

- ADD 103B Proposal to replace "an allowable amount" by "a permissible level" in the English text adopted.
- ADD 103C The <u>delegate of the United States of America</u> proposed to rearrange the word order to read "... joining, on all azimuths around this earth station, the points which ..." <u>adopted</u>.
- ADD 103D At the suggestion of the <u>delegate of the Federal Bepublic of</u>
 Germany it was decided to delete the Note altogether.

Document No. 295 as a whole was adopted, as amended.

b) <u>Working Group 4B</u> (Document Nos. 301, 303, 302, 278)

Document No. 301 was adopted.

Document No. 303 was adopted.

Document No. 302

Following a query by the <u>delegate of Denmark</u>, the <u>Chairman of Working Group 4B</u> explained why it had been thought unnecessary to go into detail and why an aggregate value had been given to facilitate comparison.

The <u>delegate of Uganda</u>, supported by the <u>delegate of Nigeria</u>, thought that the wording of paragraph 1.3 was rather weak and did not reflect sufficiently the Working Group's conclusion that sharing was not feasible.

Following a discussion in which proposals for an additional phrase were made by the <u>delegates of Australia</u> and the <u>United Kingdom</u>, it was finally agreed that the following should be added at the end of the paragraph: "... and this shows that sharing in some cases would be very difficult".

Document No. 302 was adopted, as amended.

Document No. 278

The <u>Chairman of Working Group 4B</u> introduced the document, pointing out four instances in which the following phrase should be inserted: "where δ is the angle of arrival above the horizontal plane".

The <u>delegate of Sweden</u> urged the adoption of conservative limits and proposed that the figures -127 dbW/m² and -111 dbW/m² be altered to -129 dbW/m² and -113 dbW/m² respectively.

The <u>detegate of the United Kingdom</u> expressed his appreciation of the efforts of the Chairman of Working Group 4B to reach agreement but stressed that for Western Europe the protection of UHF television services was of paramount importance. He agreed to the Swedish proposal with the addition of a new paragraph 3 to read:

"3. that the transmission of unmodulated carriers shall be avoided,"

The <u>delegate of Sweden</u> associated himself with that proposal, as did the <u>delegates of France</u> and the <u>Federal Republic of Germany</u>.

The <u>delegate of Nigeria</u> said that it was not a question which concerned only the European area, he saw no justification for departing from the value of $-127~\text{dbW/m}^2$ but he was prepared to accept $-128~\text{dbW/m}^2$ for the sake of compromise and reserved the right to make a further intervention if $-129~\text{dbW/m}^2$ were accepted.

The <u>delegate of the United States of America</u> endorsed the position of the delegate of Nigeria which seemed a reasonable compromise.

The <u>delegate of Italy</u> pointed out that whatever figure were introduced it would be provisional, but he did consider it important to have a lower limit of power flux-density and especially to use an energy dispersal system on the satellite carrier.

The <u>delegate of the U.S.S.R.</u> shared the concern expressed by countries which wished to protect their terrestrial services; although his delegation considered -129 db perhaps over-conservative, they would support it for the sake of reaching agreement.

The <u>Chairman</u> put to the vote the proposal to alter the figures to -129 dbW/m^2 and -113 dbW/m^2 , 21 delegations voting for the proposal, 20 against and 3 abstaining. Some confusion having arisen on the voting procedure, the Chairman then asked delegations to vote for either -129 db or -128 dh.

The result of that vote was 27 in favour of -129 db and 22 in favour of -128 db. The limits of -129 dbW/m 2 and -113 dbW/m 2 were therefore adopted.

The additional paragraph proposed by the delegate of the United Kingdom was adopted.

c) Working Group 4C (Document No. 294 + Corr. No.1 + Corr. No.2)

The <u>Chairman of Working Group 4C</u> introduced the draft new Appendix 28, stating that amendments of detail would be incorporated in the blue documents submitted to the Plenary. The Working Group had convened a small Sub-Working Group, 4C-2, under the chairmanship of Mr. Temple (United Kingdom), to deal with the Tables and Calculations. He suggested that the document be considered in three parts: pages 3-22 with Annex B, pages 23-71 (tables and diagrams) and Annex A (simplified calculation method).

<u>Pages 3-22. Annex B + Corr.2 - adopted</u>, with drafting amendments indicated by the delegate of the United States of America.

<u>Tables and diagrams. pages 23-71 + Corr.l - adopted</u>, subject to minor drafting changes.

The Chairman of Sub-Working Group 4C-2 said that his Group was reasonably satisfied that the flow diagram correctly interpreted the outcome of the discussions, he did intend, however, to change the presentation slightly, taking into account suggestions from the Secretariat of the I.F.R.B. If the Committee agreed to the principle of the values indicated on pages 73 and 74, the Sub-Working Group could carry out the simple but tedious calculations and submit the tables to the Plenary meeting.

The <u>delegate of Cameroon</u> pointed out minor corrections on pages 73 and 75 (French text).

The <u>delegate</u> of France noted a discrepancy between Tables I and IA and it was agreed that the figures in Table I should be aligned to those in Table IA. There was a lengthy discussion on a point raised by the <u>delegate</u> of France with regard to Table II in which he felt there should be separate columns for transhorizon and line-of-sight figures. He also said that the question should be considered in association with the Resolution in Document No. 188(Rev.) as the two were closely associated.

At the suggestion of the <u>Chairman</u>, it was <u>agreed</u> to authorize Sub-Working Group 4C-2 (the delegates of the United Kingdom, Turkey and the United States of America together with the delegate of France) to include suggestions offered by the Representative of the I.F.R.B. and finalize the document.

The <u>delegate of the United States of America</u> expressed his appreciation of Mr. del Moral's work as Chairman of Working Group 4C and the latter thanked the members of the Working Group chaired by Mr. Weiss and its Sub-Groups as well as Mr. Sonesson from the Technical Secretariat.

d) Working Group 4E (Document Nos. 311, 325, 334)

Document No. 311 - adopted.

Document No. 325 - <u>adopted</u>, with small corrections indicated by the <u>delegates of France</u> and the <u>United States of America</u>.

Document No. 334 - adopted.

On behalf of the Committee, the $\underline{\text{Chairman}}$ thanked the Chairman of Working Group 4E.

4. Documents from Committee 4 Drafting Group

Collective recommendation (Document No. 333)

The <u>Chairman</u> pointed out drafting amendments on pages 1, 2, 5 and 7, all of which were <u>approved</u>.

The <u>delegate of the United States of America</u> said that "recommends 2.1" should read at the end:

"terrestrial services, and bands shared by space services and to improve utilization of the geostationary satellite orbit".

That amendment was approved.

The <u>delegate of the United Kingdom</u> suggested adding a paragraph "<u>considering</u> m" and a corresponding sentence in the "recommends" part to cover the point that sharing was proposed in the 14-14.3 MHz and 14.3-14.4 MHz band but that no criteria had been established. He said he would hand the text to the Committee 4 Drafting Group.

In reply to the delegate of Austria, the <u>Director of the C.C.I.R.</u> said that additional work needed to be done on sharing criteria in the 149.9-150.05 MHz band for radionavigation and fixed services, in other words Recommendation No. Spa 8 should be retained.

Document No. 333 was adopted, as amended.

Appendix 29 + Annex (Document No. 336) - adopted, subject to correction of any minor errors.

5. <u>Documents referred to other committees</u> (Document Nos. 308, 309, 330)

Document Nos. 308, 309 and 330 were noted.

6. Completion of work of Committee 4

It was <u>agreed</u> that the Chairman of the Committee should himself approve the Summary Record of the final meeting.

The <u>delegate of the United States of America</u> expressed his gratitude to the Chairman for the able way in which he had succeeded in completing the Committee's schedule. Seconding that motion, the <u>delegate of the United Kingdom</u> added his thanks to the Representative of the I.F.R.B., the Director of the C.C.I.R. and the Secretary of the Committee.

The meeting rose at 1330 hrs.

The Secretary:

I. DOLEZEL

The Chairman:

E.F. SANDBACH

Annex: 1

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ANNEX

I, the undersigned, CONSTANTIN Jean Louis André, Head of the Delegation of the I.T.U. member Group of Territories represented by the French Overseas Post and Telecommunication Agency at the World Administrative Radio Conference for Space Telecommunications, authorize the Delegation of France to vote on behalf of my delegation in the Committee 4 meeting convened at 0930 hrs, 9 July 1971.

Geneva, 9 July 1971 (Sgd.) CONSTANTIN

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 369-E
12 July 1971

PLENARY MEETING (FIRST READING)

B. 10

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
4	365	1	Rec. No. Spa 3	

Francois Job Chairman of the Editorial Committee

Annex: Pages B10/01-08



RECOMMENDATION No. Spa 3

To the C.C.I.R. and to Administrations Relating to Frequency Bands Shared between Space Services and between Space and Terrestrial Services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

recognizing

- a) the value to the Conference of the material contained in Document No. 64 (results of C.C.I.R. studies relating to space telecommunications concluded at its Special Joint Meeting);
- b) that further studies on a wide range of problems dealing with space radiocommunications form the subject of C.C.I.R. Questions and Study Programmes approved by the XIIth Plenary Assembly;

considering however

a) that certain C.C.I.R. Recommendations, listed below, call for further work and study:

Recommen	dation	255 1
Kecommen	iaation	333-1

"Frequency sharing between active communication-satellite systems and terrestrial radio services in the same frequency bands"

Recommendation 465

"GENERALIZED EARTH-STATION ANTENNA RADIATION PATTERN FOR USE IN INTERFERENCE CALCULATIONS, INCLUDING COORDINATION PROCEDURES, IN THE FREQUENCY RANGE 2-10 GHz"

Recommendation 466

"COMMUNICATION-SATELLITE SYSTEMS FOR TE-LEPHONY USING FREQUENCY-DIVISION MULTIPLEX —Maximum allowable values of interference in

B10-01

a telephone channel of a geostationary communication-satellite system employing frequency modulation, caused by other geostationary communication-satellite systems"

b) that as a result of the deliberations of this Conference, particularly in relation to the provisions of Article 7 Sections [...], and to other relevant Articles of the Radio Regulations, further information is required to reply to the following current Questions and Study Programmes of the C.C.I.R.:

Question 1-1/4

"Antennae for space systems"

the state of development in antenna design and fabrication;

under Decides 3

the state of development of antennae with improved side- and back-lobe characteristics;

under Decides 4 the polarization characteristics of antennae, particularly in the side-lobe regions and in

planes other than the principal planes;

Question 2-1/4 "TECHNICAL CHARACTERISTICS OF COMMUNICA-TION-SATELLITE SYSTEMS FOR FIXED AND MOBILE, EXCLUDING AERONAUTICAL AND MARITIME MO-

BILE, SERVICES"

under Decides 3 under what conditions and to what extent

would it be feasible for communicationsatellites, operating in the same system or operating in different systems, to share pre-

ferred frequency bands;

under Decides 4 under what conditions and to what extent

would it be feasible for communicationsatellite systems to share preferred frequency

bands with terrestrial services;

Study Programme 2-1A-1/4 "Feasibility of frequency sharing between

COMMUNICATION-SATELLITE SYSTEMS AND TER-

RESTRIAL SERVICES"

under Decides 2 the determination of the preferred technical

characteristics of transmitting and receiving antennae for earth stations at fixed locations, from the standpoint of spectrum sharing with

other radio services;

Study Programme 2-1C/4 "COMMUNICATION-SATELLITE SYSTEMS—Feasibil-

ity of frequency sharing among communica-

tion-satellite systems"

under Decides 1 the criteria which affect interference among

communication-satellites in a given system and between communication-satellite systems, taking into account the two directions of trans-

mission;

under Decides 2 the preferred technical characteristics of trans-

mitting and receiving antennae for earth stations, from the standpoint of frequency sharing within the same system and with other com-

munication-satellite systems;

Study Programme 2-1J/4 "COMMUNICATION-SATELLITE SYSTEMS—Techni-

cal factors influencing the efficiency of use of the geostationary satellite orbit by communication-satellites sharing the same frequency

bands''

under Decides 1 the technical characteristics of communication-

satellite systems which affect the utilization of the geostationary satellite orbit, and the inter-

relationships between them;

under Decides 3 the extent to which it may be feasible and

desirable to adopt preferred technical char-

B10-03

acteristics for different geostationary communication-satellites and earth stations;

under note 1:

Some of the factors which should be taken into account in carrying out these studies:

- the tolerable levels of interference noise in different communication-satellite systems;
- the radiation patterns of the earth station and satellite antennae;
- factors affecting the multiple use of the same frequencies within a single communication satellite;
- polarization discrimination;
- c) that under the terms of Article 9A of the Radio Regulations, frequency assignments to earth stations in certain bands shared with equal rights with [fixed and mobile services] or [terrestrial radiocommunication services] must be co-ordinated with a view to preventing mutual harmful interference;
- d) that the calculation method described in Appendix 28 applies solely to frequencies in the 1-40 G [c/s] range;
- c) that Tables I, [Ia] and II in Appendix 28 do not show numerical values for the parameters of certain space radiocommunication services and terrestrial radiocommunication services sharing frequency bands with equal rights;
- f) that the method of determining the co-ordination area of an earth station as described in Appendix 28 is probably open to improvement and simplification;
- g) that frequency bands have been allocated to the broadcasting satellite service and that the use of satellite transmissions for reception by the general public of sound and television broadcasts may be possible in the future;

- h) that the C.C.I.R. is studying the conditions under which sharing between the broadcasting satellite service and other services may be possible;
- i) that it would be useful to have a clear definition of the term "system noise temperature";
- j) that it would be useful to have clear definitions of the terms "acceptable (or unacceptable) interference" and "harmful interference" for the space radiocommunication, radio astronomy, and terrestrial radiocommunication services;
- k) that it would useful to have specific numerical values of power flux density from space stations of the broadcasting-satellite service which would permit differentiation between "individual reception" and "community reception" in the broadcasting-satellite service;
- 1) that frequency sharing between the aeronautical radionavigation service and the fixed-satellite service (space-to-Earth) has been proposed for the band 4 200 to 4 400 M [c/s];
- m) that frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) has been proposed in the frequency band 14.0 to 14.3 G [c/s], and between the radionavigation-satellite service and the fixed-satellite service (earth-to-space) in the frequency band 14.3 to 14.4 G [c/s];

recommends

- 1. that administrations, recognized private operating agencies, and other participants in the work of the C.C.I.R., consider as a matter of priority, the submission of contributions on these subjects, so that draft Recommendations on them can be prepared at the Meetings of the relevant Study Groups for consideration by the XIIIth Plenary Assembly of the C.C.I.R.;
- 2. that the C.C.I.R. should study or, as appropriate, continue to study:
 - 2.1 the reference antenna patterns for earth station antennae, which may be appropriate for setting minimum standards of performance

with a view to recommending specific patterns for this purpose, in order to improve utilization of the bands shared between the fixed-satellite service and terrestrial radiocommunication services, and of the bands shared by space radiocommunication services, and to improve the utilization of the geostationary satellite orbit;

- 2.2 the reference antenna patterns for satellite antennae, which may be appropriate for setting minimum standards of performance, particularly outside the main beam, in order to improve the utilization of the geostationary satellite orbit and to increase the possibilities for frequency re-use;
- 2.3 the reference cross-polarization antenna patterns which may be appropriate for setting minimum standards of performance and, in this connection, further study:
 - 2.3.1 the portions of the spectrum within which linear-orthogonal or circular-orthogonal polarizations might be most appropriate;
 - 2.3.2 the relative desirability, taking into account technical and orbit utilization factors, of using orthogonal polarizations within a single satellite as against with two satellites;
- 2.4 the necessary limitation of spurious emissions and the frequency tolerances to be observed in both the terrestrial and space radiocommunication services insofar as they may affect sharing of frequency bands;
- 2.5 the criteria of acceptable interference for the various space radiocommunication services and terrestrial radiocommunication services sharing the frequency bands allocated by the present Conference, in order to permit the determination of;
 - 2.5.1 the co-ordination distance and the probability of interference between stations within that distance;
 - 2.5.2 the necessary limits of power flux density set up at the Earth's surface by space stations;

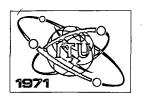
- 2.6 the maximum acceptable level of interference into a geostationary satellite link from any other single interfering geostationary satellite [system] [network] and from the aggregate of all other geostationary satellite [systems] [networks], particularly in the case of:
 - 2.6.1 frequency-modulated telephony signals;
 - 2.6.2 frequency-modulated television signals;
 - 2.6.3 digitally-modulated signals;

and the most appropriate manner in which acceptable interference should be specified in these and other cases;

- 2.7 the interference criteria applicable to frequency sharing between non-geostationary satellite [systems] [networks] and geostationary satellite [systems] [networks];
- 2.8 the possibility of establishing a technical criterion for expressing the efficiency of use of the geostationary satellite orbit;
- 2.5 the data which are not included in Tables I, [Ia] and II of Appendix 28, relating to the space radiocommunication services or terrestrial radiocommunication services sharing frequency bands with equal rights;
- 2.10 the possibility of improving and simplifying the method of determining the co-ordination area as described in Appendix 28.;
- 2.11 the formulation of a calculation method for determining the coordination area of earth stations at frequencies below 1 G[c/s] and above 40 G[c/s];
- 2.12 the conditions for frequency sharing in those bands allocated to the broadcasting-satellite service by the present Conference with a view to making appropriate recommendations as soon as possible so that administrations and the International Frequency Registra-

tion Board shall have the necessary technical data required to carry out examination procedures, in particular regarding Articles 9 and 9A of the Radio Regulations;

- 2.13 the term "system noise temperature" with a view formulating a clear definition of this term applicable to space radiocommunication systems;
- 2.14 the terms "acceptable (or unacceptable) interference" and "harmful interference" with a view to formulating clear definitions appropriate to the radio astronomy service and to the various space radiocommunication and terrestrial radiocommunication services;
- 2.15 the power flux densities required for individual and community reception in the broadcasting-satellite service, with a view to specifying numerical values which will differentiate between these types of reception;
- 2.16 the criteria for frequency sharing between the aeronautical radionavigation service and the fixed-satellite service (space-to-Earth) for frequencies in the vicinity of 4 300 M[c/s];
- 2.17 the criteria for frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) in the frequency band 14·0 to 14·3 G[c/s] and between the radionavigation-satellite service and the fixed-satellite service (Earth-to-space) in the frequency band 14·3 to 14·4 G[c/s].
- 3. that until the next competent Administrative Conference all administrations should use:
 - applicable C.C.I.R. Recommendations for the values missing from Tables I, [Ia] and II of Appendix 28,
 - the methods of determining the co-ordination area for frequencies below 1 G[c/s] and above 40 G[c/s], which may be the subject of a C.C.I.R. Recommendation.



SPACE CONFERENCE

Document No. 570-E 12 July 1971

Original: English

French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

APPENDIX 9

At the meeting of Working Group 6A which took place on 10 July 1971, the representative of the I.F.R.B. raised the question of the amendments to be made to Appendix 9 to the Radio Regulations (List I, International Frequency List and List VIIIA. List of Stations in the Space Service and in the Radio Astronomy Service, pages 481 and 497 to 505 of the Radio Regulations), in particular as a consequence of the new or amended definitions adopted by the Conference, as well as of the revision of Appendix 1A.

A subsequent study has shown that not only the headings of the present 9 Sections of List VIIIA should be amended, but that new Sections should be added.

Time did not permit the preparation of all such amendments in a tabular form. However, Annex 1 hereto attached indicates the amendments to be made to List I as well as to the existing sections of List VIIIA.

As far as the additional Sections required in List VIIIA are concerned, a draft Resolution is submitted, as Annex 2, to Committee 6 for consideration.

P.E. WILLEMS
Chairman
Working Group 6A

Annexes: 2



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ANNEX1

DRAFT

Modifications to Appendix 9 to the Radio Regulations

NOC	Heading : Service Documents	
MOD	(see Articles 8, 9, <u>9A</u> , 10 and 20)	
NOC	LIST I - International Frequency List and Foot-notes 3 and 5	
SUP	Reference in Foot-notes 1, 2, 4 to "Geneva 1959".	
MOD	Foot-note 6, read : See Article 9, Section II and Article 9A Section II of the Radio Regulations.	
MOD	Foot-note 7, read: See Nos. 516, 517, 621, 622, 639BS, 639DM, 639DO and 639DP of the Radio Regulations.	
MOD	Foot-note 8, read : Including dates referred to in Section II of Article 9 and Section IV of Article 9A of the Radio Regulations.	
NOC	LISTS II to VIII	
MOD	LIST VIIIA - List of Space Radiocommunication Stations and Radio Astronomy Stations	
MOD	Section 1 : Earth stations in the Fixed-Satellite Service	
MOD SUP	Section 1: Earth stations in the Fixed-Satellite Service Item 3, Call sign Renumber the columns	
	Item 3, Call sign	

Annex 1 to Document No. 370-E Page 4

MOD	Section 2: Space stations in the Fixed-Satellite Service		
SUP	Item 2, Call sign Renumber the columns		
MOD	Item 8, read : Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is(are) located		
NOC	Item 10 : Remarks		
ADD	e) number of satellites used, if appropriate		
MOD	f) In the case of geostationary satellite:		
	- nominal geographical longitude on the geostationary satellite orbit		
	 arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas 		
	Additional for reaching more reaching pulsars and and additioning		
MOD	Section 3: Earth stations in the Earth Exploration—Satellite Service		
SUP	Item 3, Call sign Renumber the columns		
MOD	Item 6, read : Reception of earth exploration information		
MOD	Item 7, read : Identity of the associated space station(s) with which communication is to be established		
MOD	Section 4: Space stations in the Earth Exploration—Satellite Service		
SUP	Item 2, Call sign Renumber the columns		
MOD	Item 4, read : Transmission of earth exploration information		
MOD	Item 6, read : Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located		

NOC	Item 8 : Remarks
ADD	e) number of satellites used, if appropriate
MOD	f) In the case of geostationary satellite:
	 nominal geographical longitude on the geostationary satellite orbit
	 arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas
	A Principal prints in Manufactural A Vigoro and in the College and
MOD	Section 5: Earth stations in the Radiodetermination- Satellite Service
SUP	Item 2, Call sign
MOD	Replace by "radiodetermination" all references to "radionavigation"
MOD	Item 8, read: Identity of the associated space station(s) with which communication is to be established
	ML gent (The - The Latter) And The Andrew Street gent (Street Street)
MOD	Section 6: Space stations in the Radiodetermination—Satellite Service
MOD	A SECTION OF THE PROPERTY OF T
	Satellite Service
SUP	Satellite Service Item 2, Call sign Replace by "radiodetermination" all references to
SUP MOD	Satellite Service Item 2, Call sign Replace by "radiodetermination" all references to "radionavigation" Item 7, read : Service area or areas on the earth or the name of the locality and country in which the
SUP MOD MOD	Satellite Service Item 2, Call sign Replace by "radiodetermination" all references to "radionavigation" Item 7, read : Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located
SUP MOD MOD NOC	Satellite Service Item 2, Call sign Replace by "radiodetermination" all references to "radionavigation" Item 7, read: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located Item 8: Remarks
SUP MOD MOD NOC ADD	Satellite Service Item 2, Call sign Replace by "radiodetermination" all references to "radionavigation" Item 7, read: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located Item 8: Remarks e) number of satellites used, if appropriate

areas

Annex 1 to Document No. 370-E Page 6

MOD	Section 7: Earth stations in the Space Research Service
SUP	Item 3, Call sign Renumber the columns
MOD	Item 7, read : Identity of the associated space station(s) with which communication is to be established
MOD	Section 8: Space stations in the Space Research Service
SUP	Item 2, Call sign Renumber the columns
MOD	Item 6: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located
NOC	Item 8, Remarks
ADD	e) number of satellites used, if appropriate
MOD	f) In the case of geostationary satellite:
	- nominal geographical longitude on the geostationary satellite orbit
	 arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas
MOD	Section 9: Stations in the Radio Astronomy Service
NOC	Recognition and contract confidence (specific prompt)
1100	Present text

ANNEX 2

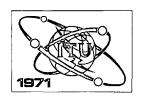
The World Administrative Radic Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that it has modified the definitions which appeared in the Radio Regulations and has adopted a series of new definitions for the services and the various categories of earth and space stations;
- b) that, within the framework of these modifications, it has changed the headings and the contents of the existing nine Sections of List VIIIA (List of Stations in the Space Service and in the Radio Astronomy Service);
- c) that however, in List VIIIA so modified, it is not possible to include all the categories of earth and space stations notified to the I.F.R.B. for inclusion in the Master International Frequency Register;
- d) that the Conference has not had the time to make the required modifications:

decides

to invite the Secretary-General, in collaboration with the I.F.R.B. to take the necessary measures, on the basis of the existing Sections of List VIIIA, to have additional Sections added to this List, so that the particulars of all the earth and space stations notified to the I.F.R.B. under Article 9A of the Radio Regulations, for recording in the Master International Frequency Register, be included.



SPACE CONFERENCE

Document No. 371-E 14 July 1971

Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SUMMARY RECORD

OF THE

EIGHTH MEETING OF COMMITTEE 5

(ALLOCATIONS)

Saturday, 10 July 1971, at 1100 hrs

Chairman: Mr. H.A. KIEFFER (Switzerland)

Subjects discussed		<u>Document No.</u>
1.	Approval of the Summary Records of the third and fifth meetings	256, 305
2.	Adoption of the following Reports:	
	Third Report of Working Group 5 ad hoc	312
	First Report of Working Group 5A	225
	Third Report of Working Group 5A	264
	Fourth Report of Working Group 5A	320



1. Approval of the Summary Records of the third and fifth meetings (Documents Nos. 256 and 305)

a) <u>Document No. 256</u>

The <u>Chairman</u> said that the words "Delegate of the United Kingdom" should be replaced by "Delegate of the United States" at the top of page 3 and that the bottom of page 8 of the French and Spanish texts should read "Sous-Groupe de travail 5 ad hoc-1" and "Subgrupo de trabajo 5 ad hoc-1" respectively.

b) <u>Document No. 305</u>

The <u>Chairman</u> said that, in the second line of the paragraph immediately preceding point 3 on page 7, "proposal F/28/280" should read "proposal F/85/280".

The <u>Delegate of Cuba</u> stated that, with regard to ADD 274B referred to on page 2 of Document No. 305, Cuba wished the present band 132-137 Mc/s to be reduced to 132-136 Mc/s.

The <u>Delegate of Mexico</u>, whose country also was referred to in the note, made the same comment.

The <u>Delegate of Cuba</u> requested that his country should be deleted from MOD 281E referred to at the bottom of page 3 of Document No. 305.

The <u>Chairman</u> invited the speaker to submit the list to the Secretariat in writing.

It was so agreed.

The <u>Delegate of Cuba</u> referred to ADD 287A reproduced on page 4 of the Fourth Report of Working Group 5D (Document No. 241). His country could not accept the new allocation of the band 161.9125-162.0125 Mc/s, since such a measure would require other limitations on the fixed and mobile services, which were very widely used in that band in Cuba.

The comment was <u>noted</u> and the <u>Chairman</u> said that the Committee would, if necessary, revert to the subject later.

2. Adoption of the following Reports:

Third Report of Working Group 5 ad hoc (Document No. 312)

The <u>Chairman of Working Group 5 ad hoc</u> briefly introduced the document and described the measures adopted by the Group following deliberations.

Pages 1 and 2 of the document were adopted.

At the suggestion of the <u>Delegate of the Federal Republic of</u>
<u>Germany</u>, supported by the <u>Delegate of France</u>, it was <u>decided</u> to supplement
the operative part of the recommendation contained in Annex 1 as follows:
"... Recommendation, and to consider further consequential amendments to
this Article, as necessary."

Thus amended, Annex 1 was adopted.

Annex 2 : adopted

Document No. 312 having thus been <u>approved</u>, the <u>Chairman</u> cordially thanked the Chairmen of Working Group 5 ad noc and Sub-Working Group 5 ad hoc-l for the substantial and admirable contribution they had made to the Committee's work in collaboration with the members of their respective Groups.

First Report of Working Group 5A (Document No. 225)

The <u>Chairman</u> recalled that point 2 cf the document had been left in abeyance for later consideration.

Third Report of Working Group 5A (Document No. 264)

The <u>Chairman of Working Group 5A</u> submitted the document, together with various details concerning the work carried out by the Group and on the Annexes to Document No. 264.

The <u>Delegates of Canada</u> and <u>Chile</u>, who had entered reservations in the Working Group, said that, having explained their reservations, they would not revert to the subject.

Pages 1 and 2 of the document were adopted

Annex 1

The <u>Delegate of Cuba</u>, supported by the <u>Delegate of Canada</u>, pointed out that no mention was made of the mobile service on a primary basis in the box relating to the band 2 655-2 690 Mc/s for Region 2.

The <u>Chairman of Working Group 5A</u> replied that the matter was dealt with in Document No. 316, which had been studied by Working Group 5E.

It was therefore decided to revert to the subject when Document No. 316 was considered.

With regard to Region 3, the <u>Delegate of India</u> said that he reserved the right to raise at the Plenary Meeting the question of the term "earth-to-space" between brackets which should, in his opinion, be reversed to read "space-to-earth".

Subject to that reservation, Annex 1 was adopted.

Annex 2

The <u>Delegate of Syria</u>, supported by the <u>Delegate of the United Kingdom</u>, pointed out that Korea was not entitled to be mentioned in MOD 377.

The comment gave rise to an exchange of views by the <u>Delegates of Korea and Italy</u>, the <u>Representative of the I.F.R.B.</u> and the <u>Secretary of the Committee</u>, the latter explaining that the question was whether the present Conference was empowered to make the new allocation to Korea.

As a result of the discussion, it was <u>decided</u> to delete Korea from MOD 377.

Fourth Report of Working Group 5A (Document No. 320)

The Chairman of Working Group 5A introduced the document, which represented the last report of that Group, and provided some additional details.

Page 1 of the document was adopted.

Page 2

4. Frequency band: 6 425-7 750 Mc/s

Paragraph 4.1

Following a comment by the <u>Delegate of Italy</u>, the <u>Secretary of</u> the <u>Committee</u> said that there was in fact no need to amend 392G and that, in the Annex, the abbreviation "MOD" should be replaced by "NOC".

It was so agreed.

The <u>Delegate of the United States</u> expressed concern about the new situation created in the band 7 250-7 300 at present allocated to the Communication-Satellite Service (Space-to-earth) by the Conference's decision to split the definition up into "Fixed-Satellite Service" and

"Mobile-Satellite Service", which meant that it would no longer be possible to use a mobile or movable earth station in the band allocated to the Fixed-Satellite Service. The same problem arose in all cases where the operative regulations provided for the allocation of frequencies to the "Communication-Satellite Service", whereas henceforth only the "Fixed-Satellite Service" would be authorized by virtue of the change of definition. His Delegation therefore proposed the addition in this band, likewise on a primary basis, of "Mobile-Satellite (Space-to-earth)" and to make corresponding changes in those parts of the Table of Frequency Allocations which mentioned the "Fixed-Satellite Service", particularly to take account of ship stations and any other type of transportable station.

The <u>Delegate of Italy</u> considered that the United States proposal was equally valid for uplinks.

The <u>Delegate of the U.S.S.R.</u>, supported by the <u>Delegates of Chile and Cuba</u>, opposed adoption of the proposal, which he considered untimely, as it would require a lengthy and thorough study which the Conference could not undertake.

The <u>Delegate of New Zealand</u> said that he would be in favour of the United States proposal if it did not call into question the definition of mobile stations and movable or transportable stations.

The Secretary of the Committee pointed out that the Master International Frequency Register contained notices of movable stations operating in the fixed service but not operating when in motion. They were hence not regarded as "mobile", since they were only used between fixed points in the Terrestrial Service.

The <u>Delegate of France</u> considered that the comparison could not apply to the <u>Space Services</u>, since the Mobile Terrestrial Services, operating in VHF and UHF, were subject to power limits such that, in its operating zone, a station would have to be immobilized for the requisite co-ordination to be effected. The situation was quite different for a satellite station.

The <u>United Kingdom Delegate</u>, on the basis of Nos. 639AF and 639AD of the Radio Regulations, considered, on the other hand, that the Secretary of the Committee had drawn an extremely just parallel with the situation which obtained in the Fixed Terrestrial Service between mobile stations and movable stations used, for example, in the event of national disaster or catastrophe. However, he supported the view of the U.S.S.R. Delegate and considered that the matter should be shelved owing to the complex nature of the study required and the length of the discussions to which it might give rise.

It was so <u>decided</u>.

Foot-notes 329C and 374A were deleted.

The <u>Delegate of India</u> requested that India should be added to the countries listed in foot-note 392G, but the <u>Chairman</u> pointed out that, in view of the decision which had just been adopted, the text should not be amended.

It was also decided to delete the last paragraph of foot-note 392D.

Paragraph 4.1 was thus <u>approved</u>, as was the Annex to Document No. 320, subject to the amendments introduced.

With regard to paragraph 4.2, the <u>Delegate of the United States</u>, supported during the discussion by the <u>Delegate of Canada</u>, requested the inclusion of a foct-note 393A worded as follows (DT/36 and DT/45):

In Canada and the United States of America the band 6 625-7 125 Mc/s is also allocated on a secondary basis to the Fixed-Satellite Service for Space-to-earth transmission. The power flux-density produced by space stations in this band shall be in accord with Article 7, Section VIII, for Region 2. It shall be at least 6 db lower with respect to Regions 1 and 3. Earth stations receiving signals in this band may not impose restrictions on the physical location or technical parameters of existing or future terrestrial stations of other Administrations.

The <u>Delegate of Cuba</u>, supported by the <u>Delegates of Mexico</u> and the <u>U.S.S.R.</u>, opposed inclusion of the text, whereas the <u>Delegates of Japan</u>, the <u>United Kingdom</u> and <u>Brazil</u> supported the proposal, which was finally adopted by 37 votes to 16, with 13 abstentions.

Paragraph 4.2 was thus approved.

Paragraph 4.3 was also approved.

5. Frequency band: 8 025-8 400 Mc/s
Approved.

6. Frequency band: 14.4-15.25 Gc/s

The <u>Delegate of Australia</u> confirmed the withdrawal of Proposal AUS/10/43 in addition to those mentioned in that paragraph, which was then <u>approved</u>.

7. Frequency band: 38-40 Gc/s

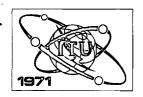
The <u>Delegate of Japan</u> said that he withdrew Proposal J/98/81, on which agreement had already been reached in the Committee.

Paragraph 8 was noted.

Consideration of the Fourth Report of Working Group 5A was thus concluded and the document was approved.

The meeting rose at 1310 hours.

H.A. KIEFFER Chairman



SPACE CONFERENCE

Document No. 372-E 15 July 1971

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 5

SUMMARY RECORD

OF THE

NINTH MEETING OF COMMITTEE 5

(ALLOCATIONS)

Saturday, 10 July 1971, at 1500 hrs

Chairman: Mr. H.A. KIEFFER (Switzerland)

Subjects discussed		Document No.
1.	Joint Report by Working Groups 5A and 5E (Section 7 and Annex 2)	273(Rev.)
2.	Third Report of Working Group 5B	279
3.	United Kingdom: Proposed new foot-note relating to the protection of radio astronomy observations in the band 2 690-2 700 Mc/s	291
4.	Fourth Report of Working Group 5B	280
5.	Fifth Report of Working Group 5B	299
6.	Sixth and last report of Working Group 5B	339



1. Joint Report by Working Groups 5A and 5E (Section 7 and Annex 2) (Document No. 273(Rev.))

In view of the effect the revised text of foot-note 364C (Document No. 316) would have on the fixed satellite service, the Delegate of New Zealand, supported by the Delegate of Canada, proposed a further foot-note, 364D, as follows: "In the bands 2 500-2 535 Me/s and 2 655-2 690 Me/s new tropospheric scatter systems are not permitted. Existing tropospheric scatter systems may continue to operate in these bands." The proposal was opposed by the Delegates of the U.S.S.R., Portugal, Spain and Chile and it was decided to postpone further discussion of Document No. 273(Rev.) until Document No. 316 was examined.

2. Third Report of Working Group 5B (Document No. 279)

Page 5

The Delegate of the United Kingdom wished to withdraw the reservations expressed by his country in paragraphs 20.2 and 21.2.

The Committee took note of the additional technical information provided by the <u>Delegation of Japan</u> with respect to Proposal J/98/81 which had not been supported.

Annex A, pages 7 and 8

The following corrections to the text were agreed. Replace
"ADD 352E" on page 7 by "ADD 352K", and on the third line of that foot-note
insert the words "radical at" before "rest" and replace the word "of" by "at".

Delete foot-note 353 from the 1 660-1 670 Mc/s band, page 7.

The Delegate of Morocco requested that his country's name be deleted from foot-note 354A to the 1 660-1 650 Me/s band.

Annex B, pages 9 and 10

The <u>Secretary</u> pointed out the following correction to be made to the French text only: the figures "4 700-4 900" in the first table on page 9 should read "4 700-4 990".

Annex C, pages 11 and 12

The Delegate of the Federal Republic of Germany said that in his country, due to the number of mobile stations operating in the 10.6-10.68 Ge/s band, the Radio Astronomy Service could not be guaranteed protection in that band. He proposed the addition of the following foot-note: "In the Federal Republic of Germany the 10.6-10.68 Ge/s band is allocated to the Radio Astronomy Service on a secondary basis". The foot-note was accepted.

The <u>Delegates of Australia</u> and the <u>United Kingdom</u> requested that their countries names be withdrawn from foot-note 405A. It was agreed that foot-note 405A could, as a result, be deleted from the Radio Regulations.

The document, as amended, was adopted.

The Chairman of Committee 7 drew Committee 5's attention to the fact that Committee 7, in consultation with the Delegation concerned, had decided to delete RR 326 in view of the protection afforded the Radio Astronomy Service in the 600 Gc/s band by RR 332.

3. United Kingdom: Proposed new foot-note relating to the protection of radio astronomy observations in the band 2 690-2 700 Mc/s (Document No. 291)

The Chairman of I.U.C.A.F. made the statement which appears at the Annex to the present document. The statement was noted.

In introducing Document No. 291, which dealt with the problems mentioned in the statement by the Representative of I.U.C.A.F., the Delegate of the United Kingdom said that the words "or out of band radiation" should be inserted in the third line, second paragraph, on page 2 after "emissions". He explained that the proposed power flux-density limitation would probably curtail the upper edge of the Broadcasting Satellite band by about 10 Mc/s.

The Delegate of Denmark, supported by the Delegates of the United States of America, Syria, France and Sweden, said that although he understood the problems faced by the Radio Astronomy Service he thought the figure of -277 dbW/m²/Hz unrealistic and impossible to obtain in practice and, furthermore, that RR 116A precluded the Radio Astronomy Service from claiming a higher degree of protection than any other service.

In view of the lack of support for its proposal, the <u>Delegation</u> of the United Kingdom reserved its right to revert to the matter in the Plenary.

4. Fourth Report of Working Group 5B (Document No. 280)

Annex, page 9

The Delegation of Cuba requested that MOD 218 be deleted.

It was decided by 36 votes to 16 with 10 abstentions that Alternative B would appear in the final text for the 136-137 Mc/s band.

The following countries requested to be deleted from foot-note ADD 281AA: Italy, Japan and Mexico.

Other countries requested to be included in foot-note ADD 281AA, in which the list of countries now reads: Bulgaria, China, Cuba, Cyprus, Czechoslovakia, Ethiopia, Ghana, Hungary, Indonesia, India, Iran, Iraq, Korea, Kuwait, Pakistan, Phillippines, Poland, Portugal, Roumania, Senegal, Spain, Syria, the United Arab Republic and the U.S.S.R.

Page 10

It was agreed to delete the mention "(Space-to-space)" which had been included in error under the Meteorological Satellite Service in the 137-138 Me/s band.

After several countries had indicated their wish to be included or deleted from foot-notes MOD 281C and MOD 281E, it was agreed that, since the services in these foot-notes did not come under the terms of reference of the Conference and as there had been no change of substance in the 137-138 Mc/s band, Committee 5 was not competent to include additional countries in those foot-notes. Committee 5 was, however, competent to delete countries from foot-notes where this would improve the situation for the services concerned.

The <u>Delegation of Morocco</u> requested that Morocco be deleted from foot-note MOD 218C, and the <u>Delegation of Cuba</u> requested that Cuba be deleted from foot-note MOD 281E.

The Delegation of Belgium requested that Belgium be included in foot-note $\frac{1}{2} \times \times \frac{1}{2}$.

Page 11

It was agreed that foot-note /*** / to the 143.65-144 Mc/s band for Region 1 should have the same text as foot-note /*** / at the foot of page 10.

It was agreed that the words "space telecommand and" in MOD 319A, second line, be placed in square brackets to draw the attention of the drafting group to the fact that this mention should be deleted as it was now included in the definition of the Space Research Service.

Page 12

It was agreed to delete the square brackets and words "/existing or planned /" in MOD 356A, tenth line.

Page 13

It was agreed to put the words "and earth sciences satellite" in ADD 356AB, fourth line, in square brackets and to delete the words "/existing or planned /" in the same foot-note, eighth line, and the 2 290-2 300 Me/s band for Region 2. The Chairman of Working Group 5C pointed out that the foot-note in question would be discussed when Document No. 237(Rev.) was examined later.

The Delegation of Cuba wished its reservations on the additional allocation mentioned in MOD 365A and MOD 356AB to be recorded.

The document, as amended, was adopted.

5. Fifth Report of Working Group 5B (Document No. 299)

Annex A, page 5

The following amendments were agreed. Delete the words "/ operating or planned /" from ADD 405BA fifth line, and ADD 405BAA fifth line. Replace the figures "14.4-15.25 Gc/s" in ADD 405BAA, first line, by "14.4-15.35 Gc/s". Insert the foot-note 405BAA in the framed part of the Table for the 15.25-15.35 Gc/s band.

The <u>Delegation of Cuba</u> reserved its right to revert to the question of including ADD 405BAA in the 15.25-15.35 Gc/s band for the Fixed and Mobile Services.

Page 6

It was agreed to replace the words "METEOROLOGICAL-SATELLITE" in the 51-52 Gc/s band and both "METEOROLOGICAL-SATELLITE" and "EARTH SCIENCES-SATELLITE" in the 65-66 Gc/s band by "EARTH EXPLORATION SATELLITE".

Page 13

Following an objection from the Delegate of Cuba, it was agreed to delete paragraph e).

6. Sixth and last report of Working Group 5B (Document No. 339)

Page 2, Sections 4 and 5

After some discussion on the effects of the proposed modification of foot-note 285A it was decided to maintain the text of that foot-note as it appeared in the Annex, page 7. The Delegations of Japan, the Federal Republic of Germany and Finland maintained their right to revert to this subject later.

Page 3, Section 6

As Proposal F/41/82 (ADD 318B) had received no support in the Working Group, the Delegation of France put forward the following modified proposal for a foot-note (ADD 318B) to be placed in the framed part of the Table for Regions 1 and 2: "In France and the Department of Guyane the frequency $434~\rm Mc/s \pm 0.25~\rm Me/s$ may be used for space operations Earth-to-space subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected.". The proposal was adopted.

Page 3, Section 7

The <u>Delegate of France</u> said that if the part of the text of MOD 350A in square brackets referred by Working Group 5B to Committee 5 for decision was approved his delegation was prepared to withdraw its proposal in Document No. 197. It was agreed to defer discussion on that point until Documents Nos. 197 and 214 were examined.

Page 4, Section 11

The Chairman pointed out that Working Group 5B had only been concerned with the last sentence of MOD 392F. The Chairman of Working Group 5C which had considered the first sentence, in square brackets in the text, said it had been decided not to use that part of the text, but instead to put the Meteorological Satellite Service as a primary service in the framed part of the Table for the band 7 450-7 550 Me/s.

Page 4, paragraphs 12.2 and 12.3

The <u>Delegate of the United States of America</u> suggested that, in view of the definitions adopted by the Plenary meeting the previous day, foot-note 405BB was no longer required.

The Chairman of Working Group 5C said that, as a result of the withdrawal of Proposals AUS/10/43 and CAN/14/80 by their respective Delegations, foot-notes ADD 409G and ADD 470A were no longer required.

It was agreed to delete all three foot-notes from the Annex (pages 7 and 8).

The Chairman pointed out that Section 15 had already been dealt with under item 3 of the agenda.

The Document, as amended, was adopted.

The Chairman, on behalf of Committee 5, thanked the Chairman of Working Group 5B and Working Group 5B for their very useful work.

The meeting rose at 1850 hrs.

The Chairman

H.A. KIEFFER

Annex: 1

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ANNEX

STATEMENT BY THE CHAIRMAN OF I.U.C.A.F.

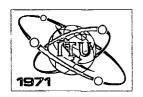
Mr. Chairman, the Inter-Union Commission for the Allocation of Frequencies was set up by the International Council of Scientific Unions to represent the scientific interests of the International Scientific Radio Union, the International Astronomical Union, and the Committee for Space Research. As Chairman, I have sent to you a telegram which, with your permission, I would like to read:

"I.U.C.A.F. views with dismay the proposals to allocate the band 2 670 to 2 690 MHz to the Broadcasting Satellite Service. Serious consequences to the Radio Astronomy Service cannot be avoided without an adequate interval between frequencies allocated to satellite-borne transmitters and the band 2 690 to 2 700 MHz allocated to the Radio Astronomy Service. Further, an extension of this radio astronomy band to include 2 670 to 2 690 MHz shared with Ground Service has been requested by I.U.C.A.F. and proposed by administrations of several countries. I.U.C.A.F. asks that the urgent needs of the Radio Astronomy Service should be given full consideration in this band."

I would like to explain that this telegram is based on the work of the Special Joint Meeting of Study Groups of the C.C.I.R. in February 1971. In their report they draw attention to Recommendation No. Spa 11 of the E.A.R.C., Geneva, 1963, which states that the next Administrative Radio Conference should give further consideration to the provision of improved frequency allocations to radio astronomy. The report continues - Therefore the S.J.M. concludes that administrations, in seeking to afford protection to particular radio astronomical observations should take all practical steps to reduce, to the absolute minimum amplitude, harmonic radiations and other spurious emissions falling within the bands of frequencies to be protected for radio astronomy taking into account, in particular, the signal levels causing interference, which are given in Annex I to Report 224.2.

My Commission, I.U.C.A.F., has noted proposals that the band 2 690 to 2 700 MHz, which is at present allocated exclusively to radio astronomy, should be extended by a further 20 MHz on a shared basis. It would then be possible for some observatories to make observations with great sensitivity over the band 2 670 to 2 700 MHz. There are difficulties in sharing with Ground-based Services, but there are very much greater difficulties in sharing with satellite-borne transmitters. I.U.C.A.F. is therefore seriously concerned about proposals to allocate frequencies to the Broadcasting Satellite Service which would include the band 2 670 to 2 690 MHz. There would be two serious consequences if these proposals were adopted in their present form. Within the presently allocated band, 2 690 to 2 700 MHz, there may be spurious transmissions from the Broadcasting Satellite Service at adjacent frequencies. These broadcasts cannot be avoided by siting the radio observatory away from populated areas. Secondly, the extension of the band 2 670-2 690 MHz on a shared basis would present very great difficulties if there are powerful transmissions from space directly within this band.

I would like to suggest that the main consideration is to project the band already exclusively allocated to radio astronomy, namely 2 690 to 2 700 MHz. If it is possible to apply to that band the interference criteria set out by C.C.I.R. in the Report of the Special Joint Meeting, then it will be possible to continue radio astronomical observations within that band. If those criteria can be applied specifically to the band 2 690-2 700 MHz, it seems possible that some limited form of sharing will be useful in the extended band including 2 670-2 690 MHz.



SPACE CONFERENCE

Completion of Committee's work

12.

Document No. 373-E 15 July 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS -- GENEVA -- 1971

COMMITTEE 5

SUMMARY RECORD

OF THE

TENTH MEETING OF COMMITTEE 5 (ALLOCATIONS)

Saturday, 10 July 1971, at 2100 hrs

Chairman: Mr. H.A. KIEFFER (Switzerland)

Sub	jects discussed	Document No.
1.	Note from Working Group 50	214, 197
2.	Third Report from Working Group 5C (continued)	237(Rev.), DT/100
3.	Fourth Report from Working Group 50 (continued)	238(Rev.)
4.	Third Report from Working Group 5D (continued) and Draft Recommendation	240 341
5.	Sixth Report from Working Group 5D (continued) Proposal from United Kingdom/Sweden/Norway	318 293(Rev.)
6.	Proposals from France	319
7.	Proposal from United States of America	323
8.	Second Report from Working Group 5B (continued)	187(Rev.)
9.	Proposals for Article 6, France, India, United States of America	85, 245, 322
10.	Fourth Report from Working Group 5E Proposal from India	316(Rev.) 273(Rev.)
11.	Statement by Observer from the International Press Telecommunications Committee	115, 201



1. Note from Working Group 50 (Documents Nos. 214, 197)

The <u>Delegate of France</u> said he now wished to propose the text of 350A as given in Document No. 339, with the deletion of the square brackets, i.e. the addition of "and transmit and receive signals for the earth exploration satellite service".

That proposal was supported by the Delegates of Belgium and Spain.

The <u>Delegate of the United Kingdom</u> understood that the reference inside the square brackets had been deleted and asked whether the French delegation could consider a secondary allocation for the earth exploration service. The <u>Delegate of France</u> said he could agree to that suggestion.

The <u>Delegates of New Zealand</u>, the <u>United States of America</u> and <u>Kenya</u> also supported the proposal, as modified by the United Kingdom.

The <u>Secretary of the Committee</u> reassured the <u>Delegate of Poland</u> that his records showed that for Region 1 the Fixed Service remained in the Table on a primary basis.

The modified proposal was adopted.

2. Third Report from Working Group 5C (Document No. 237 (Rev.)

Paragraph 1.1 and Appendix A

The <u>Secretary of the Committee</u> confirmed the comment by the <u>Delegate of Cuba</u> that FIXED MOBILE except Aeronautical Mobile would appear in the Table for Region 2.

With reference to foot-note 324A, the <u>Delegate of Australia</u> felt that with the new definition of the Meteorological Satellite Service 324A could be deleted in both the 1 670-1 690 and the 1 690-1 700 MHz bands. The <u>Delegate of the United Kingdom</u> on the contrary thought the foot-note was useful in the 1 670-1 690 band, because the Fixed and Mobile Services were on an equal primary basis but that it could be removed from the 1 690-1 700 MHz band where those services were on a secondary basis. The <u>Delegate of the Federal Republic of Germany</u> preferred the retention of 324A in both bands.

The <u>Chairman</u> put to the vote the inclusion of foot-note 324A in the 1 670-1 690 MHz band and it was decided to <u>retain</u> it by 20 votes to 3 with 18 abstentions.

In the 1 690-1 700 MHz band it was decided to <u>delete</u> the foot-note, 9 votes in favour of retention, 12 against and 9 abstentions.

Appendix C

The Chairman of Working Group 5C said the square brackets around / space research and / should be removed.

The <u>Delegate of Sweden</u> said that his country should not appear in foot-note 356A on page 9 of DT/100 and also in Document No. 280.

With regard to foot-note 356AB, the <u>Delegate of the United States</u> of <u>America</u> referred to the action already taken on <u>Document No. 280 in</u> relation to the Space Research Service and thought that Space Research and Earth Exploration Satellite Services should be treated separately. The Delegate of Spain shared that view.

The Secretary referred to page 9 of DT/100 which gave two alternatives for the text of 356AB and the Chairman explained that if figures could be agreed upon for Region 1 the other points could be dealt with by the Editorial Committee. The 2 096-2 120 MHz band had been suggested and those figures were finally adopted, subject to objection by the Delegates of India, Pakistan and the United Arab Republic who thought the Earth Exploration Satellite Service should be on a secondary basis and the preference of the Delegate of the United Kingdom for a foot-note "Subject to agreement between the Administrations concerned".

The <u>Chairman</u> assured the <u>Delegate of Syria</u> that the Secretariat would produce a document showing all the allocations.

Appendix D - adopted

3. Fourth Report from Working Group 5C (continued) (Document No. 238 (Rev.)

Appendix A

The <u>Chairman</u> noted that there were divergencies of opinion: the <u>Delegate of Cuba</u> supported by the <u>Delegates of Chile</u> and <u>Venezuela</u> proposed that the service be on a secondary basis in Region 2, and the <u>Delegate of Australia</u>, supported by the <u>Delegates of New Zealand</u>, <u>Japan</u> and the <u>Philippines</u> proposed primary status in Region 3, with a foot-note that the location of earth stations would be subject to agreement between the Administrations concerned.

The Australian proposal was put to the vote and was <u>rejected</u> (12 votes in favour, 12 against).

The Cuban proposal was put to the vote and was also <u>rejected</u> (13 votes in favour, 13 against and 11 abstentions).

The Table was therefore maintained without change.

The Delegates of New Zealand and Cuba reserved the right to raise Document No. 238

The <u>Delegates</u> of the <u>Federal Republic of Germany</u>, Italy and <u>Roumania</u> referred to <u>footnote</u> 394E in which they would prefer to see "subject to agreement between the Administrations concerned", the <u>Delegate of Roumania</u> asking whether the W.M.O. really needed a bandwidth of 40 MHz. The <u>representative from the W.M.O.</u> said that after thorough discussion it had been concluded that 40 or even 45 MHz was required for the service. The <u>Delegate of the Federal Republic of Germany agreed not to press his point.</u>

The foot-note was adopted.

4. Third Report from Working Group 5D (continued) (Documents Nos. 240, 341)

The <u>Delegates of France and Greece</u> agreed not to press for the adoption of foot-note 402A (in Document No. 240).

Annex 1 to Document No. 341 - Draft Recommendation on the future use of certain bands between 40 and 275 Gc/s by the Radiocommunication Services

The Observer from I.C.A.O. suggested an additional paragraph under "recommends" to read as follows:

- "... should consider
- a) allocating, in addition, ...
- b) the advantages to be gained by allocating all or part of each of the bands concerned to either the Aeronautical Service or the Maritime Service on an exclusive basis."

That suggestion was supported by the <u>Delegates of Denmark</u>, <u>France</u>, <u>Belgium</u>, <u>Sweden</u>, <u>India and Kenya</u>.

The <u>Delegate of New Zealand</u> felt that future Conferences should be given complete freedom to take whatever action they considered appropriate; the <u>Delegates of the United States of America</u>, <u>Iraq</u>, and the <u>United Kingdom shared that view</u>.

The <u>Chairman</u> suggested that the Annex be adopted as it stood, with a small amendment proposed by the Delegate of Italy.

It was so agreed.

Annex 2 - Draft Recommendation on the future use of the 41 - 43 Gc/s band by the ixed and obile .ervices

Adopted.

5. Sixth Report from Working Group 5D (continued) (Document No. 318) and Proposal by the United Kingdom/Sweden/Norway (Document No. 293 (Rev.))

The <u>Delegate of the United Kingdom</u> introduced the proposal in Document No. 293 which replaced the original proposal in Documents Nos. 108 and 244; in his view the introduction of such a Maritime Mobile Satellite Service on a secondary basis (thus causing no harm to other services) and the inclusion of the allocation in the frequency Table would be a demonstration of the Conference's wisdom and foresight.

The Delegate of Sweden added that the draft Recommendation represented only a gesture whereas action was required soon.

The proposal was supported by the <u>Delegates of New Zealand</u>, <u>Pakistan</u>, <u>Argentina</u>, <u>Greece</u>, and the <u>Observer from the C.I.R.M.</u>, the latter saying that his own organization and I.M.C.O. had practical experience and know that the service could work on a secondary basis.

The proposal was opposed by the <u>Delegates of France</u>, <u>Italy</u>, <u>United Arab Republic</u>, <u>Uganda</u>, the <u>United States of America</u> and <u>Japan</u>, who thought that the 400 MHz band was an inappropriate allocation in view of its congestion.

The proposal was put to the vote and <u>rejected</u> (17 votes in favour, 40 against and 3 abstentions).

The draft Recommendation in Appendix B to Document No. 318 was adopted, subject to drafting amendments.

6. Proposals from France (Document No. 319)

The <u>Delegate of France</u> indicated that the figures in the first line of ADD 354D should be altered to "1 700-1 700.2 Mc/s" and that the last part of the note should read "... for the requirements of geodesy and ionospheric research".

As a consequence, the reference to 354D was to be deleted in the upper half of the table.

The proposals to add foot-notes 2850 and 354D were adopted.

7. Proposal from the United States of America (Document No. 323)

The Delegate of the United States of America introduced the document, which was supported by the Delegates of Denmark, the Federal Republic of Germany and Austria. The Delegate of New Zealand agreed with the proposal but would prefer it to be on an equal primary basis with the existing services in the band.

The <u>Delegate of the U.S.S.R.</u> had no objection provided the service did not appear on an exclusive basis.

The <u>Chairman</u> put to the vote the allocation of the bandwidth on an exclusive basis, and it was adopted by 31 votes to 21 with 3 abstentions.

The Delegate of the United Kingdom asked for foot-note 314 (secondary basis) to be included in the Table.

The <u>Delegate of the U.S.S.R.</u> proposed the introduction of a note stating that in the Soviet Union the band 406-406.1 MHz was also allocated to the Fixed and Mobile except Aeronautical Mobile Service.

The <u>Delegate of Denmark</u> found the United Kingdom addition acceptable but not the U.S.S.R. proposal, as it was in contradiction with ADD 317A; perhaps a solution would be to indicate a certain timetable for the operation of the Fixed and Mobile Services. The <u>Delegate of the U.S.S.R.</u> said he could not accept that.

The <u>Delegates of Poland</u>, <u>Czechoslovakia</u>, <u>Cuba</u>, <u>Iraq</u>, <u>Syria</u>, <u>Hungary</u>, <u>Sweden</u>, <u>Uganda</u>, <u>Kenya</u>, <u>Tanzania</u>, the <u>United Arab Republic</u>, <u>Bulgaria</u> and <u>Ethiopia</u> asked to be included in the note proposed by the Delegate of the <u>U.S.S.R.</u>

The <u>Delegate of Norway</u>, in reply to the <u>Delegate of Austria</u>, said that he had calculated that the second harmonic of video carriers of channel 9 in Europe added up to 406.50 MHz and he wondered whether the United States had taken that into account as radiation from high-power TV stations might make operation difficult in the bands proposed.

The <u>Delegate of the United States of America</u> proposed modifying 317A by deleting "on a world-wide exclusive basis solely".

The Chairman pointed out that if the Radio Astronomy Services were to begin at 406.1 MHz the foot-note would not be needed. That suggestion was supported by the Delegates of the United Kingdom, Italy and the U.S.S.R. and opposed by the Delegate of New Zealand.

The <u>Chairman</u> put to the vote the proposal to include both Radio Astronomy and the Mobile Satellite Service in the 406-406.1 MHz band, the result of the vote was 15 in favour, 29 against and 2 abstentions.

It was therefore <u>decided</u> that the Radio Astronomy Service would be shown in the table as starting at 406.1 MHz.

The foot-notes 314, 317A and the foot-note requested by the U.S.S.R. and other delegations would be included.

The <u>Delegate of Poland</u> remarked that a solution might have been arrived at more easily had all the allocations been presented together. The <u>Delegate of Sweden</u> supported by the <u>Delegate of Syria</u> wished to place on record that the difficulties encountered were a demonstration of the disadvantages of the service by service as opposed to frequency by frequency method of dealing with proposals.

8. Second report from Working Group 5B (continued) (Document No. 187(Rev.))

The <u>Delegate of India</u>, referring to his reservation in paragraph 5.2, proposed a footnote 332A in line with footnote 332, to read as follows: "In India the band 608-614 Mc/s is also allocated to radio astronomy".

Adopted.

9. Proposals for Article 6 from France, India, the United States of America (Documents Nos. 85, 322, 245)

Following the suggestion that Documents Nos. 85 and 322 be considered together, the <u>Delegate of the United States of America</u> said he thought the French proposal in Document No. 85 was to be preferred. Consequential amendments to 951 and 952 might be necessary.

The <u>Delegates of Denmark</u>, <u>Sweden</u> and <u>Norway</u> were in favour of allowing public correspondence from aircraft but were against the Maritime Service bands being used for such a purpose, as possible over-demand and congestion had not been taken into account. The <u>Delegate of Sweden</u> added

Document No. 373-E Page 8

that I.A.T.A. and I.C.A.O. had said there was no need to provide the facility and that was one reason why the Special Joint Meeting had not proposed bands, but public correspondence was the responsibility of the telecommunication authorities.

The proposal in Document No. 85 was put to the vote. The result of the vote was 10 for, 9 against and 13 abstentions, and the addition would therefore be included in the Report to the Plenary.

The <u>Chairman</u> then put to the vote notes MOD 951 and MOD 952 in Document No. 322. They were adopted by 14 votes to 8 with 10 abstentions.

The Delegate of the United Kingdom pointed out that the first line of each note should read "Airoraft earth stations ..."

Document No. 245

The Delegate of India introduced the proposals MOD 415 and MOD 417.

Adopted.

10. Fourth Report from Working Group 5E and proposal from India (Documents Nos. 316 (Rev.), 273 (Rev.) and 331)

The Chairman of Working Group 5E regretted having to submit a report which did not contain concrete proposals for all the bands considered.

Paragraph 1 and Annex A

The <u>Chairman</u> indicated that -129 dbW/m² should be inserted in ADD 332A (the detail given in Document No. 344).

The <u>Delegate of the United Kingdom</u> said that after those figures the words "(see Recommendation ...)" should be added and that in the second line the words "frequency modulated television" be inserted before "stations".

Adopted, as amended.

Paragraph 2.1 - noted.

Paragraph 2.2

The Delegate of India referred to the Indian proposal in Document No. 331 which dealt with experimental satellite broadcasting; that proposal would be modified to bring it in line with the -129 dbW/m² previously adopted.

The proposal gave rise to a lengthy debate in which doubts were expressed about the protection afforded to fixed services, the availability of sufficient data and the inclusion in the Radio Regulations of an Allocation for experimental purposes. Several delegations supported the proposal, and the <u>Delegate of India</u> agreed to incorporate in ADD 339B amendments suggested to cover points raised in the discussion.

The principle of a foot-note was <u>adopted</u> in principle by 35 votes to 13, with 5 abstentions, with the understanding that the wording and figures had yet to be approved in Plenary.

The <u>Delegate of Syria</u> reserved the right to refer to the matter in Plenary meeting as did the <u>Delegates of Uganda</u>, <u>Kenya</u> and <u>Tanzania</u>. Paragraphs 4.1, 4.3 - 4.12 were noted.

Paragraphs 4.2, 4.13 - 18, Annex B

Drafting amendments were indicated by the $\frac{\text{Delegates of the}}{\text{Eederal Republic of Germany}}$, the United Kingdom and the $\frac{\text{Secretary of the}}{\text{Committee}}$.

Annex B - adopted.

MOD 361 - adopted.

ADD 361A - adopted.

- ADD 361B

The <u>Delegates of Syria</u> and <u>Pakistan</u> queried the reference to Article 7 when figures were inserted in similar foot-notes elsewhere. The <u>Chairman of Committee 4</u> explained that in the other bands referred to the figures were only provisional, in fact, the contents of the square bracket might well be removed by the Editorial Committee.

The Delegate of Venezuela raised the point of the ambiguity of "regional" in the third line; the Delegate of Cuba said he would not exercise his right to revert to the question.

Adopted.

MOD 362 - adopted.

ADD 364C - adopted.

ADD 364D

The new text for the note proposed by the Delegate of New Zealand

"In the bands 2500-2535 MHz and 2655-2690 MHz new tropospheric scatter systems are not permitted. Existing tropospheric scatter systems may continue to operate in these bands"

was put to the vote and adopted by 18 votes to 12, with 5 abstentions.

It was pointed out that the new 364D was in contradiction with the text of 364C just adopted, the Delegate of the U.S.S.R. considering that the vote itself had been based on a misunderstanding. A lengthy discussion ensued in which it was suggested that the note might be applied only to the upper 35 MHz, or on a regional basis. Following an explanation by the Delegate of Brazil which was supported by the Delegates of New Zealand, Canada, the United States of America, the United Kingdom and Japan, it was decided to include in the Committee's report both footnotes as they had been adopted, indicating the discrepancy and leaving it to the Editorial Committee to make the necessary adjustments.

The Secretary noted that the text should read: "... Fixed and Mobile except Aeronautical Mobile Services only." The Chairman said that Switzerland was to be deleted and Bulgaria added. In reply to the concern expressed by the Delegates of Ethiopia and Uganda, the Delegate of Italy said it was his understanding that the provision did not exempt the countries mentioned from applying the sharing criteria applicable in that band.

Adopted. '

11. Statement by the Observer from the International Press Telecommunications
Committee (Documents Nos. 115, 201)

The Observer from I.P.T.C. made the statement annexed hereto.

Documents Nos. 115 and 201 were noted.

12. Completion of the work of Committee 5

The <u>Chairman</u> thanked the Chairmen of Committee 5 Working Groups, all members of the Committee, the Secretariat and the I.F.R.B. who had enabled him to cope with the work of Committee 5 and expressed the hope that good use would be made of the provisions they had adopted.

The Delegate of India in turn thanked Mr. Kieffer for his excellent work.

The meeting rose at 0500 hrs.

Chairman:

H.A. KIEFFER

Annex: 1

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ANNEX

1. Documents Nos. 115 and 201 deal with Press radiocommunications and in particular with the Multi-Destination Services provided under Radio Regulation 417.

These services form the principal channel for news to many countries in Asia, Africa, Central America and South America, amounting in all to about one-third of the inhabited area of the earth. Their importance to the spread of information and knowledge cannot be over-stated.

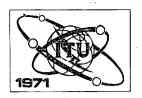
- 2. Space radiocommunications provide a means of improving the reliability of these services by replacing the present short-wave beams by satellite links. The I.P.T.C. is very grateful to the Indian Delegation for proposing, and to the Committee for accepting the proposal, that Radio Regulation 417 be modified to include space communications.
- The I.P.T.C. would, however, draw the Committee's attention to the similarity between the technical parameters of such a News Distribution Service and the Community Broadcast-Satellite Service. Both would cover about the same regions, both would serve a multiplicity of earth stations, both would require satellites at about the same place in the geostationary orbit and both would produce the same earth power flux=density. (This similarity does not exist in the Terrestrial Services.)

Moreover, the purposes of the two services are identical, to inform, educate and entertain: only the method of treatment of the messages after reception at the earth stations are different, being complementary rather than competitive. Indeed, the two media have already a common link, for broadcasting organizations use the press agency messages in the preparation of newscasts.

Merging of the press and broadcasting radiocommunications, e.g. on a time-sharing basis, would have the following advantages:

- i) fewer frequency allocations would be required.
- ii) fewer satellites would be required,
- iii) fewer earth stations would be required,
- iv) costs would be reduced.

- 4. The I.P.T.C. understands that the objection to sharing between the Press and Broadcasting Services is the administrative advantage of clear-cut distinctions between the various services into which users' requirements have been divided. But this policy has not always been found practicable, and in the present case it clearly conflicts with the Committee's prime responsibility, which is to ensure the economical use of the spectrum. The I.P.T.C., therefore, suggests that the Committee seeks some method of overcoming the administrative objection to the sharing of frequencies in the space element of the transmissions of these complementary mass information media.
- In conclusion, the I.P.T.C. would point out that the Press itself has little to gain from its proposal, for any extra revenue from the sale of newspapers would be off-set by the higher cost of radiocommunications. The real beneficiaries would be the general public in the countries concerned and this is an additional reason why the Committee should give the proposal careful consideration.



Corrigendum to
Document No. 374
14 July 1971
Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FIFTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

0. On page 4 replace the framed part of the Table for the frequency band 400.05 - 401 MHz by the following:

MHz				
eres e de qualita de del desenve e e que la entre de de de entre e servicio de del de el composito de del de e A composito de la composito de composito de la composito della composito de la composito del la composito de la composito della				
400.05-400.15	STANDARD FREQUENCY SATELLITE . 312AB 313 314			
400.15-401	METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Maintenance telemetering)			
	SPACE RESEARCH (Telemetering and tracking)			
	313 314			

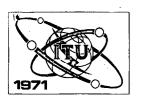
SUP 312A

ADD 312AB

In this band the standard frequency is 400.1 MHz. Emissions associated herewith shall be maintained within + 25 kHz.

- 2. On page 6 in the framed part of the Table in the box 406 406.1 MHz delete foot-note 317.
- 3. On page 8, in the third line of footnote MOD 322, replace the words "the fixed service" by "the fixed and mobile services"
- 4. On page 14, in the sixth line of each footnote ADD 352F and 352I, replace the word "these" by "the aeronautical mobile (R) and maritime mobile services".





Document No. 374-E 13 July 1971

Original: English

French

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FIFTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

ARTICLE 5 - TABLE OF FREQUENCY ALLOCATIONS

Frequency bands between 235 Ma/s and 1700 Mc/s

Committee 5 adopted the revised provisions reproduced in the Annex to the present Report which are submitted to the Plenary for first reading.

H.A. KIEFFER Chairman

Annex



ANNEX

Mc/s

	Allocation to Services				
	Region 1	Region 2	Region 3		
•	235-267				
MOD		FIXED MOBILE			
		201A 305 305A 308A 309):		
MOD	267–272				
		FIXED MOBILE Space Operation (Telem	netering) 309A 309B		
		308A			
MOD	272–273				
		FIXED MOBILE SPACE OPERATION (Telem	netering) 309A		
		308A			
	273-328.6				
MOD		FIXED MOBILE			
		308A 310 310A			

ADD 305A

In New Zealand the band 235-239.5 Mc/s is also allocated to the aeronautical radionavigation service.

ADD 308A

The bands 240-328.6 Mc/s and 335.4-399.9 Mc/s may also be used by the mobile-satellite service. The use and development of this service shall be subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

MOD 310

Radio astronomy observations in the band 322-328.6 Mc/s are carried out in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in using this band.

ADD 310A

In India, the band 322-328.6 Mc/s is also allocated to the radio astronomy service.

Mc/s

Allocation to services					
Region 1 Region 2 Region 3					
328.6-335.4					
AERONAUTICAL RADIONAVIGATION					
311					

MOD

NOC 311

Mc/s

	Allocation to services			
	Region 1	Region 2	Region 3	
MOD	335.4-399.9			
	•	FIXED MOBILE		
		308A		
	399.9-400.05			
MOD		RADIONAVIGATION_SATE	LLITE	
		285C 311A		

MOD 311A

In Bulgaria, Cuba, Greece, Hungary, Indonesia, Iran, Kuwait, Lebanon, the United Arab Republic, Syria and Yugoslavia, the band 399.9-400.05 Mc/s is also allocated to the fixed and mobile services (see Recommendation No. Spa 8).

	400.05-401	
		METEOROLOGICAL AIDS
MOD		METEOROLOGICAL-SATELLITE (Maintenance telemetering)
		SPACE RESEARCH (Telemetering and tracking)
		313 314

SUP 312A

Mc/s

Allocation to services			
Region 1	Region 2	Region 3	
401-402			
	METEOROLOGICAL AIDS SPACE OPERATION (Telem Meteorological-Satelli (Earth-to-Space)		
	Fixed Mobile except aeronaut	ical mobile	
	314 315 315B 315C 316		
402-403			
	METEOROLOGICAL AIDS Meteorological-Satelli (Earth-to-Space)	te	
	Ta: 3		
	Fixed Mobile except aeronaut	ical mobile	
	314 315 316 315C		

ADD 3150

In the band 401-403 Mc/s, Earth Exploration-Satellite applications, except Meteorological-Satellites, may also be authorized for earth-to-space transmissions subject to not causing harmful interference to stations operating in accordance with the Table.

403-406	
	METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile
	314 315 316

MOD

MOD

Mc/s

Allocation to services					
Region 1 Region 2 Region 3					
406-406.1					
MOBILE-SATELLITE (Earth-to-Space)					
314 317 317A 317B					

This band is reserved solely for the use and development of emergency position-indicating radiobeacon (EPIRB) systems using space techniques.

ADD 317B

ADD 317A

In Bulgaria, Cuba, Ethiopia, Hungary, Uganda, Poland, the United Arab Republic, Sweden, Syria, Tanzania, Czechoslovakia and in the U.S.S.R., the band 406-406.1 Mc/s is also allocated to the fixed and mobile except aeronautical mobile services.

	FIXED
	MOBILE except aeronautical mobile RADIO ASTRONOMY
	314 317
410-420	
	FIXED MOBILE except aeronautical mobile

MOD

MOD

MOD 317

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

Note to Committee 7: MOD 317 contains the same text as ADD 233A at 37.75-38.25 Mc/s and MOD 286 at 151-153 Mc/s.

Mc/s

Allocation to services				
Region 1	Region	2	Region 3	
420-430	420-450			
FIXED				
MOBILE except aeronautical mobile				
Radiolocation				
318 319				
430-440		RADIOLO	CATION	
AMATEUR		Amateur		
RADIOLOCATION		Amateur		
318 319 319B 32 0 321 322				
440-450				
FIXED				
MOBILE except aeronautical mobile				
Radiolocation	1			
318 319 319A		318 319A	319B 323 324	
450–460				
	FIXED MOBILE			
	318 319A			

MOD 318

Radio altimeters may also be used until 31 December 1974 in the band 420-460 Mc/s. However, after this date, they may be authorized to continue to operate on a secondary basis except in U.S.S.R. where they will continue to operate on a primary basis.

MOD 319A

The band 449.75-450.25 Mc/s may be used for space telecommand and space research (Earth-to-Space), subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 319B

In France and the French Department of Guinea (Region 2) the frequency 434 Mc/s ± 0.250 Mc/s may be used for Space Operation (Earth-to-Space) subject to agreement among the administrations concerned and those having services, operating in accordance with the Table, which may be affected.

MOD 322

In Denmark, Norway and Sweden, the bands 430.432 Mc/s and 438.440 Mc/s are also allocated to the fixed service.

Mc/s

Allocation to services					
Region 1 Region 2 Region 3					
460–470					
FIXED MOBILE Meteorological—Satellite (Space—to-earth) 318A					
324C					

MOD

ADD 324C

Earth exploration-satellite service applications other than the meteorological-satellite service may also be authorized in this band for space-to-earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table,

Mc/s

	Allocation to services		
	Region 1	Region 2	Region 3
	470–582	470–890	470–585
	BROADCASTING		BROADCASTING
	582-606 BROADCASTING	BROADCASTING	335
	RADIONAVIGATION		585-610
	325 326 327 328 329		RADIONAVIGATION
	606_790		329A 336 337
	BROADCASTING		610-890
MOD	326 329 330 330A 331 332 332A		FIXED
	790–890		MOBILE
	FIXED		BROADCASTING
	BROADCASTING	1	
MOD	329 331 333 334	325A 332 332A	329A 332 332A 338 339
	890–942	890-942	890-942
	FIXED	FIXED	FIXED
	BROADCASTING	RADIOLOCATION	MOBILE
	Radiolocation		BROADCASTING
			Radiolo c ation
	329 331 333 339A	339A 340	339 339A

ADD 325A

In Argentina, the band 602-608 Mc/s is allocated to the radio astronomy service.

ADD 329A

In India, the band $608-614~{\rm Mc/s}$ is also allocated to the radio astronomy service.

ADD 332A

Within the frequency band 620.790 Mc/s, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service, subject to agreement among the administrations concerned and affected / (see Articles 9 and 9A or Resolution ...) /. Such stations shall not produce a power flux-density in excess of the value -129 dbW/m² (see Recommendation ...) within the territories of other administrations without the consent of those administrations.

MOD 340

In Region 2, the frequency 915 Mc/s is designated for industrial, scientific and medical purposes. Emissions must be confined within the limits of \pm 13 Mc/s of that frequency. Radiocommunication services operating within these limits must accept any harmful interference that may be experienced from the operation of industrial, scientific and medical equipment.

Mc/s

Allocation to Services		
Region 1	Region 2	Region 3
1 350-1 400	1 350- 1 400	
FIXED		
MOBILE	RADIOLOCATIO	N
RADIOLOCATION		
349 349A	349 349A	

ADD 349A

Radio astronomical observations on the Hydrogen line displaced towards lower frequencies are carried out in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in their future planning of the band 1 350-1 400 Mc/s.

MOD

MOD

1 427-1 429	FIXED
	MOBILE except aeronautical mobile
	SPACE OPERATION (Telecommand)

MOD

1 525-1 535		1 525-1 535		1 525-1 535	
FIXED	350B	SPACE OPERATION (Telemetering)		FIXED	350B
SPACE OPERATION (Telemetering		Fixed		SPACE OPERATION (Telemetering)	350A
Mobile except aeronautical mobile	350 c	Mobile	350D	Mobile	
Earth Explorat: Satellite	ion-	Earth Explorati Satellite	on-	Earth Exploration	on-

NOC 349

MOD 350A

Space stations employing frequencies in the band 1 525-1 535 Mc/s for telemetering purposes may also transmit tracking signals in this band.

Mc/s

	Allocation to Services		
	Region 1	Region 2	Region 3
	1 535-1 542.5		
MOD		MARITIME MOBILE-SATELLI	ITE
		352 352D 352E	i
	1. 542.5-1 543.5		
MOD	AERONAUTICAL MOBILE (R)-SATELLITE MARITIME MOBILE-SATELLITE		
		352 3 52D 352F	
	1 543.5-1 558.5		
MOD		AERONAUTICAL MOBILE (R)	-SATE LLITE
		352 352D 352G	
	1 558.5-1 636.5		
MOD		AERONAUTICAL RADIONAVIG	ATION
		352 352A 352B 352D	352K
	1 636.5-1 644		
MOD		MARITIME MOBILE-SATELLI	TE
		352 352D 352H	
	1 644-1 645		
MOD		AERONAUTICAL MOBILE (R) MARITIME MOBILE-SATELLI	_satellite te
!		352 352D 352I	
1	1 645-1 660		
MOD		AERONAUTICAL MOBILE (R)	_SATELLITE
		352 352D 352J	

SUP 351

NOC 352

MOD 352A

The bands 1 558.5-1 636.5 Mc/s, 4 200-4 400 Mc/s, 5 000-5 250 Mc/s and 15.4-15.7 Gc/s are reserved on a world-wide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities.

MOD 352B

The bands 1 558.5-1 636.5 Mc/s, 5 000-5 250 Mc/s and 15.4-15.7 Gc/s are also allocated to the aeronautical mobile (R) service for the use and development of systems using space radio communication techniques. Such use and development is subject to agreement and co-ordination among administrations concerned and those having services operating in accordance with the Table, which may be affected.

SUP 352C

NOC 352D

ADD 352E

Limited to transmissions from space stations to earth stations in the maritime mobile—satellite service for communication and/or radio—determination purposes. Transmissions from coast stations directly to ship stations, or between ship stations, are also authorized when such transmissions are used to extend or supplement the satellite—to—ship links.

ADD 352F

Limited to transmissions from space stations to earth stations in the aeronautical mobile (R) and maritime mobile-satellite services for communication and/or radiodetermination purposes. Transmissions from land stations to mobile stations, or between mobile stations, of these services, are also authorized. The utilization of this band is subject to prior operational co-ordination between the two services.

ADD 352G

Limited to transmissions from space stations to earth stations in the aeronautical mobile (R) satellite service for communication and/or radiodetermination purposes. Transmissions from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

ADD 352H

Limited to transmissions from earth stations in the maritime mobile-satellite service to space stations for communication and/or radiodetermination purposes. Transmissions from ship stations directly to coast stations, or between ship stations, are also authorized when such transmissions are used to extend and supplement the ship-to-satellite links.

ADD 352I

Limited to transmissions from earth stations in the aeronautical mobile (R) and maritime mobile—satellite services to space stations for communication and/or radiodetermination purposes. Transmissions from mobile stations to land stations, or between mobile stations, of these services, are also authorized. The utilization of this band is subject to prior operational co-ordination between the two services.

ADD 352J

Limited to transmissions from earth stations in the aeronautical mobile (R)-satellite service to space stations for communication and/or radiodetermination purposes. Transmissions from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement aircraft-to-satellite links.

ADD 352K

Radio astronomy observations on important spectral lines due to the hydroxyl radicle OH at frequencies 1 612.231 Mc/s and 1 720.53 Mc/s are carried cut in a number of countries under national arrangements; the bands observed being 1 611.5-1 612.5 Mc/s and 1 720-1 721 Mc/s respectively. Administrations should bear in mind the needs of radio astronomy service in their future planning of the bands 1 558.5-1 636.5 Mc/s and 1 710-1 770 Mc/s.

Mc/s

	Allocation to services	
Region 1	Region 2	Region 3
1 660-1 670		
	METEOROLOGICAL AIDS RADIO ASTONOMY	3
	353A 354 354A 35	54B

MOD

SUP 353

MOD 353A

In view of the successful detection of two hydroxyl spectral lines in the regions of 1 665 Mc/s and 1 667 Mc/s by astronomers, administrations are urged to give all practicable protection in the band 1 660-1 670 Mc/s for future research in radio astronomy particularly by eliminating air-to-ground transmissions in the Meteorological Aids Service in the band 1 664.4-1 668.4 Mc/s as soon as practicable.

MOD 354A

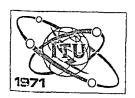
In Algeria, Bulgaria, Cuba, Hungary, Kuwait, Lebanon, Pakistan, Poland, the United Arab Republic, Yugoslavia, Roumania, Czechoslovakia and the U.S.S.R., the bands 1 660-1 670 Mc/s and 1 690-1 700 Mc/s are also allocated to the fixed service and the mobile, except aeronautical mobile, service.

Mc/s

		Allocation to services	
	Region 1	Region 2	Region 3
MOD	1 670-1 690	METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-Earth) 324A	
		FIXED MOBILE except Aeronautical Mobile	
		353 354	
	1 690-1 700	1 690-1 700	
MOD	METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-Earth)	METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-Earth)	
	Fixed Mobile except aeronautical mobile		
	324C 353 354A	324C 354A 354C	

ADD 324C

Earth exploration-satellite service applications other than the meteorological-satellite service may also be authorized in this band for Space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.



Addendum to
Document No. 375
14 July 1971

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

Original : English

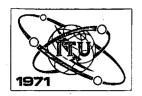
PLENARY MEETING

SIXTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

1. On page 6, at the bottom insert:

MOD 364A

In Algeria, Bulgaria, Hungary, India, Israel, Kuwait, Lebanon, Morocco, Pakistan, the Philippines, Poland, the United Arab Republic, Yugoslavia, Roumania, Czechoslovakia and the U.S.S.R., the band 2 690-2 700 Mc/s is also allocated to the fixed and mobile services.



Cornigendum to
Document No. 375
14 July 1971
Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SIXTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

1. On page 2, replace the text of foot-note MOD 356A by the following:

MOD 356A

In Region 2, in Australia and Japan the band 1 750 - 1 850 Mc/s may also be used for Earth-to-Space transmissions, and in Regions. 2 and 3 the band 2 200 - 2 290 Mc/s, may also be used for Space-to-Earth transmissions, in the space research service subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

- 2. On page 3, in foot-note ADD 356AB insert after "In Regions 2 and 3 and in Spain, in the band ...";
- 3. On page 4, in foot-note ADD 356AC delete: "..., except in Spain, ..." and add at the end of the footnote:

 [(see 356AB)];
- 4. On page 5, in the framed part of the Table
 - in the box 2500 2550 MHz for Region 1 delete "364E";
 - in the box 2 655 2 690 MHz for Region 1 against FIXED 364C add "/ 364D/" and in the same box delete "364E" and "364H";
 - in the box 2 655 2 690 MHz for Regions 2 and 3 delete "364H".
- 5. On page 7, delete the foot-note "ADD 364H"
- 6. On page 13, in the framed part of the Table, in the box 7 450 7 550 MHz delete "392F", and delete the foot-note "MOD 392F".





Document No. 375-E 13 July 1971

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Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SIXTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

ARTICLE 5 - TABLE OF FREQUENCY ALLOCATIONS

Frequency bands between 1700 Mc/s and 8500 Mc/s

Committee 5 adopted the revised provisions reproduced in the Annex to the present Report which are submitted to the Plenary for first reading.

H.A. KIEFFER Chairman

Annex



A B E E X Mc/s

Allocation to Services			
Region 1	Region 2	Region 3	
1 700-1 710 FIXED SPACE RESEARCH (Space-to-Earth) Mobile	1 700- 1 710 FIXED MOBILE SPACE RESEARCH (Space-to-Earth)	1 700-1 710 FIXED MOBILE SPACE RESEARCH (Space-to-Earth)	
354D	354D	354D	

3541

ADD 354D

The band 1 700-1 700.2 Mc/s may be used, on a secondary basis, for the transmission on board satellites of frequencies harmonically related to those emitted in the bands 149.9-150.05 Mc/s and 399.9-400.05 Mc/s for the requirements of ionospheric investigation and geodesy.

SUP 355A

MOD 356A.

In Region 2, in Australia and Japan the band 1 750-1 850 Mc/s, and in Regions 2 and 3 the band 2 200-2 290 Mc/s, may also be used for Earth-to-Space transmissions, in the space research service subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

Mc/s

	Allocation to Services		
	Region 1	Region 2	Region 3
	1 710-1 770	1 710-1 770	
MOD	FIXED Mobile		FIXED HOBILE
	352K 356	352K	356A
	1 770-1790	1 770-1 790	
MOD	FIXED Meteorological- Satellite 356AA Mobile		FIXED MOBILE Meteorological- Satellite 356AA
	356		356A
	1 790 2 290	1 790-2 290	
MOD	FIXED Mobile		FIXED MOBILE
	356 356A 356ABA 356AC		356A 356AB 356ABA

ADD 356AB

In Regions 2 and 3 in the band 2 025-2 120 Mc/s Earth-to-Space transmissions in the earth exploration-satellite services may be authorized, with equality of right to operate with stations of other space radiocommunication services in the band and subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 356ABA

In Region 2, Australia and Spain in the band 2 025-2 120 Mc/s and in Regions 1 and 3 in the band 2 110-2 120 Mc/s Earth-to-Space transmissions in the space research service may be authorized with equality of right to operate with other space radiocommunication services in these bands, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 356AC

In Region 1, except in Spain, in the band 2 096-2 120 Mc/s Earth-to-Space transmissions in the earth exploration-satellite services may be authorized with equality of right to operate with stations of other space radiocommunication services in the band and subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

Hc/s

Allocation to Services			
Region 1	Region 2	Region 3	
2 290-2 300 FIXED SPACE RESEARCH (Space-to-Earth) 356C Mobile	2 290-2 300 FIXED MOBILE SPACE RESEARCH (Space-to-Earth)	2 290-2 300 FIXED MOBILE SPACE RESEARCH (Space-to-Earth)	

FIOD.

SUP 356B

MHz

	Allocation to Services		
	Region 1	Region 2	Region 3
	2 450-2 500	2 450-2 500	
MOD	FIXED MOBILE Radiolocation	FIXED MOBILE RADIOLOCATION	
	357 361	357	
	2 500=2 550	2 500–2 535	
MOD	BROADCASTING- SATELLITE	BROADCASTING-SATELLI	TE
	361B	361B	
	FIXED 364C MOBILE except aeronautical mobile	FIXED-SATELLITE (Space-to-Earth) FIXED 364C MOBILE except aeronautical mobile	
		361A 364E	
		2 535–2 550	
		BROADCASTING-SATELLI FIXED 364C	
	361A 362 364E 364F	MOBILE except aerona	utical mobile
MOD	2 550 – 2 65 5		
		BROADCASTING-SATELLI FIXED 364C MOBILE except aerona	_
		362 363 364F	
MOD	2 655-2 690 BROADCASTING- SATELLITE 361B FIXED 364C MOBILE except aeronautical mobile 363 364E 364F 364G 364H	2 655-2 690 BROADCASTING- SATELLITE 361B FIXED-SATELLITE (Earth-to-Space) FIXED 364C	

MOD 361 In France and the United Kingdom, the band 2 450-2 500 MHz is allocated on a primary basis to the Radiolocation Service and, on a secondary basis,

to the Fixed and Mobile Services.

ADD 361A In France the band 2 500-2 550 MHz is also allocated on a primary basis to the Radiolocation Service and, on a secondary basis, to the Fixed and Mobile Services. In Canada, the band 2 500-2 550 MHz is also allocated on a primary basis to the Radiolocation Service.

ADD 361B

The use of the band 2 500-2 690 MHz
by the Broadcasting-Satellite Service is limited
to domestic and regional systems for community
reception and such use is subject to agreement
among administrations concerned and those having
services operating in accordance with the Table,
which may be affected /(see Articles 9 and 9A or
Resolution No. xxx) / . The power flux-density
at the surface of the earth shall not exceed those
given in Article 7 Nos. 470NH-470NK.

MOD 362 In the United Kingdom, the band 2 500-2 600 MHz is also allocated, on a secondary basis, to the Radiolocation Service.

ADD 364C When planning new tropospheric scatter radio-relay links in the band 2 500-2 690 MHz, all possible measures shall be taken to avoid directing the antennae of these links towards the geostationary orbit.

ADD 364D In the band 2 655-2 690 MHz new systems using tropospheric scatter are not authorized. Existing systems may continue to operate in this band.

ADD 364E

The use of the bands 2 500-2 535 MHz and 2 655-2 690 MHz by the Fixed-Satellite Service is limited to domestic and regional systems and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected. In the direction Space-to-Earth, the power flux-density at the surface of the earth shall not exceed \(\).....see Article 7.

ADD 364F

In Bulgaria, Iran, Portugal and the U.S.S.P., the band 2 500-2 690 MHz is allocated to the Fixed and Mobile except Aeronautical Mobile Services only.

ADD 364G

Radio astronomy observations are being carried out in the band 2 670-2 690 MHz in a number of countries under national arrangements. Administrations should hear in mind the needs of the radio astronomy service in their future planning of this band.

ADD 364H

To protect the Radio Astronomy Service, transmissions in the Broadcasting Satellite Service in the band 2 655-2 690 MHz shall not result in spurious emissions in the band 2 690-2 700 MHz with a power flux-density at the earth's surface exceeding -277 dbW/m²/Hz.

MHz

		Allocation to Services	
	Region 1	Region 2	Region 3
MOD	3 400-3 600 FIXED MOBILE FIXED- SATELLITE (Space-to- Earth) Radiolocation	3 400-3 500 RADIOLOCATION FIXED-SATELLITE (Space-to-Earth) Amateur 376	
MOD	372 373 374 375 3 600-4 200 FIXED FIXED- SATELLITE (Space-to- Earth) Mobile	3 500-3 700 FIXED MOBILE RADIOLOCATION FIXED- SATELLITE (Space-to- Earth)	3 500-3 700 RADIOLOCATION FIXED- SATELLITE (Space-to- Earth) Fixed Mobile 377 378
	374	3 700-4 200 FIXED MOBILE FIXED-SATELLITE (Space-to-Earth) 379	

SUP 374A

MOD 377

In China and Japan the band 3 500-3 700 MHz is also allocated to the fixed and mobile services.

MHz

	Allocation to services		
	Region 1	Region 2	Region 3
MoD	4 200-4 400		·
עטויו		AERONAUTICAL RADIONAVIGATION	
	† 	352A 379A 381 382 383	3

ADD 379A

The standard frequency-satellite service and the time signal-satellite service may be authorized to use the frequency 4 202 MHz for Space-to-Earth transmissions and the frequency 6 427 MHz for Earth-to-Space transmissions. Such transmissions shall be confined within the limits of + 2 MHz of these frequencies and shall be subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected.

D	4 700-4 9 9 0	FIXED MOBILE	
	÷	354 382A 382B	

Mod

ADD 382A

Radio astronomy observation on the Formaldehyde line (rest frequency 4 829.649 MHz) are being carried out in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in their future planning of the band 4 825-4 835 MHz.

ADD 382B

Radio astronomy observations are being carried out in the band 4 950-4 990 MHz in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in their future planning of this band.

MHz

Allocation to Services		
Region 1	Region 2	Region 3
4 990-5 000	4 990-5 000	4 990–5000
FIXED MOBILE RADIO ASTRONOMY	RADIO ASTRONOMY	FIXED MOBILE RADIO ASTRONOMY
365	383A	365

MOD

MOD 365

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

5 000-5 250

MOD

AERONAUTICAL RADIONAVIGATION

352A 352B 383B

ADD 383B

The band 5 000-5 250 MHz is also allocated to the fixed-satellite service for connection between one or more earth stations at specified fixed points and satellites used by the aeronautical mobile service (\mathbb{R}) and/or the radiodetermination service.

Such use and development shall be subject to agreements and co-ordination between Administrations concerned and those having services operating in accordance with the Table, which may be affected.

MHz

Allocation to Services			
	Region 1	Region 2	Region 3
	5 725-5 850	5 725-5 850	
MOD	RADIOLOCATION FIXED- SATELLITE (Earth-to- Space)	RADIOLOCATION Amateur	
	Amateur		
	354 388 390 391 391A	389 391 391A	

ADD 391A

Radio astronomy observations are being carried out in the bands 5 750-5 770 MHz and 36.458-36.488 GHz in a number of countries under national arrangements; administrations are urged to take all practicable steps to protect radio astronomy observations in these bands from harmful interference.

MOD	5 850-5 925 FIXED MOBILE FIXED- SATELLITE (Earth-to- Space)	5 850-5 92 RADIOLOCATION Amateur	5 850-5 925 FIXED MOBILE FIXED- SATELLITE (Earth-to- Space) Radiolocation	
!	391	391	391	
	5 925-6 425			
MOD	FIXED MOBILE FIXED-SATELLITE (Earth-to-Space)			

SUP 392A

MH z

	Allocation to services			
Region 1	Region 2	Region 3		
6 425-7 250				
FIXED MOBILE				
	379A 392AA 392B 393	·		

ADD 392AA

In Canada and the United States of America, the band 6 625-7 125 MHz is also allocated, on a secondary basis, to the Fixed-Satellite Service for Space-to-Earth transmissions. The power flux density produced by space stations in this band shall be in accord with Article 7, Section VIII, for Region 2. It shall be at least 6 db lower in Regions 1 and 3. receiving Earth stations in this band may not impose restrictions on the locations or technical parameters of existing or future terrestrial stations of other countries.

MOD 392B

The band 7 145-7 235 MHz may be used for Earth-to-Space transmissions in the space research service, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

7 250-7 300

FIXED-SATELLITE

(Space-to-Earth)

392D 392G

SUP 3920

MOD

MOD 392D

As an exception, passive fixedsatellite systems also may be accommodated in the band 7 250-7 750 MHz subject to:

- a) agreement between administrations concerned and those whose services, operating in accordance with the Table, may be affected;
- b) the co-ordination procedure laid down in Articles 9 and 9A.

Such systems shall not cause any more interference at active earth station receivers than would be caused by fixed or mobile services. Power-flux density limitations at the earth's surface after reflection from the passive fixed-satellites shall not exceed those prescribed in these Regulations for active fixed-satellite systems.

MHz

Allocation to services				
Region 1	Region 2	Region 3		
7 300-7 450	•			
	FIXED MOBILE FIXED-SATELLITE (Space-to-Earth) 392D			
7 450-7 550				
	FIXED MOBILE FIXED-SATELLITE (Space-to-Earth)			
,	METEOROLOGICAL-SATELLI (Space-to-Earth)	ITE		
	392D 3 92F			

MOD

MOD

MOD 392F

The Meteorological-Satellite Service may use the band 7 450-7 550 MHz for Space-to-Earth transmissions on a primary basis.

MHz

:	Allocation to services		
	Region 1	Region 2	Region 3
	7 550-7 750		
MOD		FIXED MOBILE FIXED-SATELLITE (Space-to-Earth)	
		392 D	
•	7 900–7 975		
MOD		FIXED MOBILE FIXED-SATELLITE (Earth-to-Space)	
	7 975-8 025		
MOD		FIXED-SATELLITE (Earth-to-Space)	
		392А 392Н	

NOC 392G NOC 392H

MHz

Allocation to services			
Region 1	Region 2	Region 3	
8 025-8 400	8 025-8 400	8 025-8 400	
FIXED MOBILE FIXED-SATELLITE (Earth-to- Space) Earth Exploration Satellite (Space-to- Earth)	FIXED MOBILE FIXED-SATELLITE (Earth-to- Space) EARTH EXPLORATION- SATELLITE (Space-to- Earth)	FIXED MOBILE FIXED-SATELLITE (Earth-to- Space) Earth Exploration- Satellite (Space-to-Earth)	
394 394B 394E	3 94E	394 394 ^{II}	

The band 8 175-8 215 MHz is also allocated to the meteorological-satellite service for Earth-to-Space transmissions.

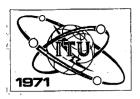
	FIXED	
•	MOBILE	
	SPACE RESEARCH	
	(Space-to-Earth)	

SUP 3940

ADD 394E

MOD

MOD



SPACE CONFERENCE

Document No. 376-E 13 July 1971 Original: French

> English Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

REPORT OF THE AD HOC GROUP OF COMMITTEE 6

DRAFT NEW RESOLUTION ZAZ

relating to the technical criteria recommended by the C.C.I.R. for sharing between the space and terrestrial services and within the space service

The World Administrative Radio Conference, Geneva, 1971

considering

- a) that, in frequency bands shared with equal rights by space and terrestrial services, it is necessary to impose certain technical limitations and co-ordination procedures on each of the sharing services in the interest of controlling mutual interference;
- b) that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose co-ordination procedures in the interest of controlling mutual interference;
- c) that the technical criteria and co-ordination procedures referred to in a) and b) above, and as set forth in the Radio Regulations, are mainly based upon recommendations of the C.C.I.R.;
- d) that, in recognition of the successful sharing of frequency bands by space and terrestrial services, and the continuing improvements in space technology, each Plenary Assembly of the C.C.I.R. subsequent to the Xth Plenary Assembly, Geneva, 1963, has improved uponsome of the technical criteria recommended by the preceding Plenary Assembly;
- e) that Plenary Assemblies of the C.C.I.R. are held triennally whereas Administrative Radio Conferences, which are empowered to modify the Radio Regulations making substantial use of the recommendations of the C.C.I.R. are in practice held less frequently and with much less regularity;
- that the International Telecommunication Convention of Montreux, 1965, recognizes the right of Members and associated Members to make special agreements on telecommunication matters; however, such agreements shall not be in conflict with the terms of the Convention or of the Regulations annexed thereto, so far as concerns the harmful interference to the radio services of other countries;



is of the opinion

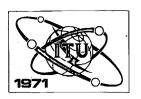
that subsequent Plenary Assemblies of the C.C.I.R. are likely to make further changes in the recommended technical criteria; and

that administrations should be afforded the opportunity to take advantage of the current C.C.I.R. Recommendations on sharing criteria when planning systems for use in frequency bands, shared with equal rights by space and terrestrial services, or between space systems.

therefore resolves that

- 1. each Plenary Assembly of the C.C.I.R. should arrange for the Secretary-General to be informed of those Recommendations of the C.C.I.R. affecting the technical criteria relating to sharing between the space and terrestrial services and within the space services:
- 2. following the distribution to administrations of the relevant C.C.I.R. texts, the Secretary-General shall write to administrations asking them to indicate within 120 days, to which of the C.C.I.R. Recommendations or to which specific technical criteria defined in the Recommendations referred to in 1. above they agree for use in the application of the pertinent Radio Regulations;
- 3. the administrations which do not respond to the Secretary-General's inquiry within 120 days shall be deemed to wish the application for the time being of the specific technical criteria referred to in the existing Regulations;
- 4. in those cases where an administration, in its reply to the Secretary-General's inquiry, indicates that a specific C.C.I.R. Recommendation or a specific technical criteria defined in those Recommendations is not acceptable to it, the relevant technical criteria defined in the Radio Regulations shall continue to apply with respect to cases involving that administration;
- the Secretary-General shall publish, for the information of all administrations, a consolidated list prepared by the I.F.R.B. on the basis of the replies to the inquiry, of the C.C.I.R. Recommendations or of the specific relevant technical criteria defined in those Recommendations, and to which administrations each of those Recommendations or specific relevant technical criteria are acceptable or are not acceptable. This list shall also include those administrations mentioned in paragraph 3. above;
- 6. the I.F.R.B. be directed to take into account:
 - a) the applicability of the C.C.I.R. technical criteria consonant with the list referred to in 5. above when making technical examinations with respect to cases involving only administrations to which such criteria are acceptable;

- b) the applicability of the technical criteria defined in the Radio Regulations consonant with the list referred to in 5. above when making technical examinations with respect to cases involving an administration which does not accept the relevant C.C.I.R. technical criteria.
- 7. If, at a later date, questions arise concerning the application of the relevant technical criteria to a case involving administrations described in paragraph 3 above, the I.F.R.B. shall inquire of the administrations concerned whether or not they would agree to the application of the technical criteria defined in the relevant C.C.I.R. Recommendations referred to in paragraph 1 above. If the answer is in the affirmative, the list published pursuant to paragraph 5 above shall be updated.
- 8. Administrations, when putting into service new stations, or changing the characteristics of existing stations, shall ensure that no harmful interference is caused, or likely to be caused, to the services of stations of those administrations which have not indicated their agreement to the application of the specific technical criteria in the relevant C.C.I.R. Recommendations referred to in paragraph 1 above.



SPACE CONFERENCE

Document No. 377-E 12 July 1971

Original: English

French

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FOURTH REPORT OF COMMITTEE 6
(REGULATIONS)

ARTICLE 9

The modifications and additions to the text of Article 9 appearing in the Annex to the present Report were adopted by Committee 6.

M.K. BASÜ Chairman

Annex: 1



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ANNEX

MODIFICATIONS TO ARTICLE 9

MOD

Notification and recording in the Master International Frequency Register of Frequency Assignments to
Terrestrial Radiocommunication Stations

MOC Section I

Notification of Frequency Assignments and Co-ordination Procedure to be Applied in Appropriate Cases

ADD

1 The expression frequency assignment, wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called Master Register).

(MOD)

o For the notification and recording in the Master International Frequency Register of frequency assignments to radio astronomy and space radiocommunication stations, see Article 9A.

Annex to Document No. 377-E

(MOD) 486

§ 1.(1) Any frequency assignment² to a fixed, land, broadcasting³, radionavigation land, radiolocation land or standard frequency station, or to a ground-based station in the meteorological aids service, shall be notified to the International Frequency Registration Board.

(MOD) 486.2

2 In the case where a frequency is used by numerous stations under the jurisdiction of the same administration, see Appendix 1 (Section E, II, Column 5a, paragraphs 2c and 2d).

(MOD) 486.3

3 With respect to assignments to broadcasting stations in the bands allocated exclusively to the broadcasting service between 5 950 kc/s and 26 100 kc/s, see Article 10.

- a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration⁴; or
- b) if the frequency is to be used for international radiocommunication; or
- c) if it is desired to obtain international recognition of the use of the frequency.

MOD 486.4

4 The attention of administrations is specifically drawn to the application of the provisions of Nos. 486 a) and 486 c) in those cases where they make a frequency assignment to a station in the terrestrial radiocommunications, located within co-ordination area of an earth station (see No. 492A), in a band which terrestrial radiocommunications share with equal rights with space radiocommunications in the frequency spectrum above 1 Gc/s.

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NOC 487

(2) Similar notice shall be given for any frequency to be used for the reception of mobile stations by a particular land station in each case where one or more of the conditions specified in No. 486 are applicable.

NOC 488

(3) Specific frequencies prescribed by these Regulations for common use by stations of a given service (for example, international distress frequencies 500 kc/s and 2 182 kc/s, frequencies of ship radiotelegraph stations operating in their exclusive high frequency bands, etc.), shall not be notified to the Board.

NOC 489

§ 2.(1) For any notification under Nos. 486 or 487 an individual notice for each frequency assignment shall be drawn up as prescribed in Sections A or B of Appendix 1, which specify the basic characteristics to be furnished, according to the case. It is

recommended that the notifying administration should also supply the additional data called for in that Appendix, together with such further data as it may consider appropriate.

MOD 490

(2) When stations of the same service, such as the land mobile service, use a band of frequencies above 28 000 kc/s in a specific area or areas, an individual notice should be drawn up, as prescribed in Section C of Appendix 1, which specifies the basic characteristics to be furnished, for each frequency on which there are assignments within the band; however, the particulars should relate only to a typical station. This does not apply to broadcasting stations or to other stations in the terrestrial radiocommunications to which the provisions of Sub-Section IIB of this article apply.

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MOD 491

§ 3.(1) Whenever practicable each notice should reach the Board before the date on which the assignment is brought into use. It must reach the Board not earlier than ninety days before the date on which it is to be brought into use, but in any case not later than thirty days after the date it is actually brought into use. However, for a frequency assignment to one of the terrestrial radiocommunication stations mentioned in Sub-Section IIB of this article or in No. 639AQ, the notice must reach the Board not earlier than three years and not later than ninety days before the date on which the assignment is to be brought into use.

MOD 492

(2) Any frequency assignment, the notice of which reaches the Board more than thirty days after the notified date of putting into use, or in the case of a notice concerning an assignment to a terrestrial radiocommunication station mentioned in Sub-Section IIB of this article and which reached the Board less than ninety days before it is taken into use, shall, where it is to be recorded, bear a remark in the Master Register to indicate that it is not in conformity with No. 491.

MOD 492A

§ 3A. (1) Before an administration notifies to the Board, or brings into use any frequency assignment to a terrestrial radiocommunication station for transmitting in a band allocated with equal rights to space radiocommunications (Space-to-Earth) and terrestrial radiocommunications in the frequency spectrum above 1 Gc/s; it shall initiate co-ordination of the proposed assignment with the administration responsible for the receiving earth station concerned if the assignment is for use within the co-ordination area of an existing receiving earth station or of one for which the co-ordination procedure referred to in No. 639AN has been initiated. For the purpose of effecting co-ordination, it shall send to any other such administration, by the fastest possible means, a copy of a diagram drawn to an appropriate scale indicating the location of the terrestrial radiocommunication station and all other pertinent details of the proposed frequency assignment, and the approximate date on which it is planned to begin operations.

ADD 492A.1

MOD 492A.2

2 Calculated, in relation to the fixed or mobile service, in accordance with the procedures described in appendix \(\sum_{28} \)/.

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MOD 492B

(2) An administration with which co-ordination is sought under No. 492A shall immediately by telegram acknowledge receipt of the co-ordination data. If no acknowledgement is received within fifteen days of despatch, the sender may despatch a telegram requesting acknowledgement of receipt of the co-ordination data, to which the receiving administration shall respond. Upon receipt of the co-ordination data an administration shall promptly examine the matter with regard to interference which would be caused to the services rendered by its eartl stations operating in accordance with the Convention and these Regulations, or to be so operated within the next three years, with the proviso that in this latter case co-ordination specified in No. 639AN has been effected or that the co-ordination procedure has already been initiated; and shall, within an overall period of sixty days from despatch of the co-ordination data, either notify the administration requesting co-ordination of its agreement to the proposals or, if this is not possible,

ADD 492B.1

Criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

indicate the reasons therefor and make such suggestions as it may be able to offer with a view to a satisfactory solution to the problem.

110D 492C

- (3) No co-ordination under No. 492A is required when an administration proposes:
 - c) to bring into use a terrestrial radiocommunication station which is located, in relation to an earth station, outside co-ordination area; cr
 - b) to change the characteristics of an existing assignment in such a way as not to exceed the permissible level of interference to the earth stations of other administrations.

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Page 12

MOD 492D

- (4) An administration seeking co-ordination may request the Board to endeavour to effect co-ordination, in those cases where:
 - a) an administration with which co-ordination is sought under No. 492A fails to acknowledge receipt under No. 492B within a period of thirty days of despatch of the co-ordination data;
 - b) an administration which has acknowledged receipt under No. 492B fails to give a decision within a period of ninety days of despatch of the co-ordination
 - c) there is a disagreement between the administration seeking co-ordination and an administration with which co-ordination is sought as to the acceptable level of interferenc, or
 - d) co-ordination between administrations is not possible for any other reason.

In so doing, it shall furnish the Board with the necessary information to enable it to endeavour to effect such co-ordination.

MOD 492E

(5) Either the administration seeking co-ordination or an administration with which co-ordination is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.

MOD 492F

(6) Where the Board receives a request under No. 492D a), it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.

ADD 492FA

(7) Where the Board receives an acknowledgement following its action under No. 492F, or where the Board receives a request under No. 492D b), it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.

Annex to Document No. 377-E

ADD 492FB

(8) Where the Board receives a request under No. 4920 d), it shall endeavour to effect co-ordination in accordance with the provisions of No. 492A. Where the Board receives no acknowledgement to its request for co-ordination within the period specified in No. 492B, it shall act in accordance with the provisions of No. 492F.

ADD 492FC

(9) Where an administration fails to reply within thirty days of the Board's telegram requesting an acknowledgement sent under No. 492F, or fails to give a decision in the matter within sixty days of the Board's telegram of request sent under No. 492FA, it shall be deemed that the administration with which co-ordination was sought has undertaken that no complaint will be made in respect of any harmful interference which may be caused by terrestrial radiocommunication stations to the services rendered by its earth station.

MOD 492G

(10) Where necessary, as part of the procedure under No. 492D, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.

ADD 492GA

(11) In the event of continuing disagreement between one administration seeking to effect co-ordination and one with which co-ordination has been sought, provided that the assistance of the Board has been requested, the administration seeking co-ordination may, after sixty days from the date of the request for the assistance of the Board, taking into consideration the provisions of No. 491, send its notice concerning the proposed assignment to the Board.

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ADD 492GB

§ 3 B. Where the Board receives information from an administration in accordance with the provisions of No. 639AQ in reply to a request for co-ordination for an earth station, it shall consider as notifications under the present Section only that information relating to assignments to existing terrestrial radiocommunication stations or to those to be brought into use within the time limits defined in No. 491. Such notifications shall be examined by the Board with respect to the provisions of Nos. 570AB and 570AD, as appropriate, and shall be treated accordingly.

(MOD) 493

§ 3 C.(1) Whatever the means of communication, including telegraph, by which a notice is transmitted to the Board, it shall be considered complete if it contains at least those appropriate basic characteristics specified in Appendix 1.

NOC 494

(2) Complete notices shall be considered by the Board in the order of their receipt.

NOC 495

§ 4. When a service or regional agreement has been concluded, the Board shall be informed of the details of this agreement.

MOD Sub-section IIA Procedure to be followed in cases not covered by Sub-section IIB of this article

MOD Sub-section IIB Procedure to be followed in cases where stations in the fixed or mobile service are in the same frequency band as, and within the co-ordination area of, an established earth station or one for which co-ordination has been effected or initiated.

NOC 570AA § 23A. The Board shall examine each notice.

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NOC 570AB

a) with respect to its conformity with the Convention, the Table of Frequency Allocations and other provisions of the Radio Regulations (with the exception of those relating to the co-ordination procedure and the probability of harmful interference);

NOC 570AC

b) with respect to its conformity with the provisions of No. 492A relating to co-ordination of the use of the frequency assignment with the other administrations concerned;

(MOD) 570AD

c) where appropriate, with respect to the probability of harmful interference to the service rendered by an earth receiving station for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 639RM, and if the corresponding frequency assignment

Annex to Document No. 377-E Page 19

to the space transmitting station has not, in fact, caused harmful interference to any frequency assignment in conformity with No. 501 or 570AB, as appropriate, previously recorded in the Master Register.

NOC 570AE

§ 23 B. Depending upon the findings of the Board subsequent to the examination prescribed in Nos. 570AB, 570AC and 570AD, further action shall be as follows:

NOC 570AF

§ 23 C:(1) Finding unfavourable with respect to No. 570AB.

MOD 570AG

(2) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be examined immediately with respect to Nos. 570AC and 570AD.

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ADD 570AGA

(3) If the finding is favourable with respect to No. 570AC or 570AD, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

ADD 570AGB

(4) If the finding is unfavourable with respect to No. 570AC or 570AD, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. Should the administration insist upon reconsideration of the notice, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column.

ADD 570AGC

- (5) The period of one hundred and twenty days mentioned in Nos. 570AGB and 570AX shall count from:
 - the date when the assignment to the terrestrial radiocommunication station which received an unfavourable finding is brought into use, if the assignment to the earth station is then in use.
 - otherwise, from the date when the assignment to the earth station is brought into use.

But if the assignment to the earth station has not been brought into use by the notified date, the period of one hundred and twenty days shall be counted from this date. Allowance may be made for the additional period mentioned in No. 570BF.

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(MOD) 570AH

(6) Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

(MOD) 570AI

(7) If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of No. 570AH.

MOD 570AJ

(8) If the notifying administration resubmits the notice with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be treated in accordance with the provisions of Nos. 570AG and 570AGA or 570AGB, as appropriate.

(MOD) 570AK

(9) If the notifying administration resubmits the notice with modifications which, after re-examination, result in a favourable finding by the Board with respect to No. 570AB, the notice shall be treated under the provisions of Nos. 570AL to 570AX. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in Column 2d.

NOC 570AL

 \S 23D.(1) Finding favourable with respect to No. 570AB.

NOC 570AM

(2) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has been successfully completed with all administrations whose earth stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

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NOC 570AN

(3) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has not been applied, and the notifying administration requests the Board to effect the required co-ordination, the Board shall take the appropriate action necessary and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with No. 570AM. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of No. 570AD.

NOC 570A0

(4) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has not been applied, and the notifying administration does not request the Board to effect the required co-ordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

NOC 570AP

(5) Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedure mentioned in No. 570AC has been successfully completed with all administrations whose earth stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

NOC 570AQ

(6) Where the notifying administration resubmits the notice with a request that the Board effect the required co-ordination, it shall be treated in accordance with the provisions of No. 570AN. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

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NOC 570AR

(7) Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the co-ordination, it shall be examined by the Board with respect to the provisions of No. 570AD. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

NOC 570AS

§ 23E.(1) Finding favourable with respect to Nos. 570AB and 570AD.

NOC 570AT

(2) The assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

NOC 570AU

§ 23F.(1) Finding favourable with respect to No. 570AB but unfavourable with respect to No. 570AD.

NOC 570AV

by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

NOC 570AW

(3) Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to No. 570AD, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.

MOD 570AX

(4) Should the notifying administration resubmit the notice, either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of No. 570AW to be applied, and should that administration insist upon reconsideration of the notice, but should

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the Board's finding remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column. The period of one hundred and twenty days shall count from the date indicated in No. 570AGC.

SUP 570AY

NOC 570AZ

§ 23 G.(1) thange in the Basic Characteristics of Assignments already recorded in the Master Register

MOD 570BA

characteristics of an assignment already recorded, as specified in Appendix 1 (except those entered in Columns 3 and 4a of the Master Register), shall be examined by the Board according to Nos. 570AB and 570AC and, where appropriate, No. 570AD, and the provisions of Nos. 570AF to 570AX inclusive applied. Where the change should be recorded, the assignment shall be amended according to the notice.

NOC 570BB

(3) However, in the case of a change in the basic characteristics of an assignment which is in conformity with No. 570AB, should the Board reach a favourable finding with respect to No. 570AC, and, where its provisions are applicable, with respect to No. 570AD, or find that the change does not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. In addition, the date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.

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Page 30

NOC 570BC

§ 23 H. In applying the provisions of the whole of this Sub-Section, any resubmitted notice which is received by the Board more than two years after the date of its return by the Board, shall be considered as a new notice.

NOC 570BD

\$ 23 I.(1) Recording of Frequency Assignments notified before being brought into use.

NOC 570BE

(2) If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to Nos. 570AB and 570AC and, where appropriate, with respect to No. 570AD, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

NOC 570BF

(3) If, within the period of thirty days after the projected date of bringing into use, the Board receives confirmation from the notifying administration of the date of putting into use; the special symbol shall be deleted from the Remarks Column. In the case where the Board, in the light of a request from the notifying administration received before the end of the thirty-day period, finds that exceptional circumstances warrant an extension of this period, the extension shall in no case exceed one hundred and fifty days.

MOD 570BG

(4) In the circumstances described in No. 570AX, and as long as an assignment which received an unfavourable finding cannot be resubmitted as a consequence of the provisions of No. 570AGC, the notifying administration may ask the Board to enter the assignment provisionally in the Master Register, in which event a special symbol to denote the provisional nature of the entry shall be entered in the Remarks Column. The Board shall delete this symbol when it receives from the notifying administration, at the end of the period specified in No. 570AX, the information relating to the absence of complaint of harmful interference.

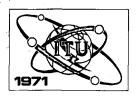
Annex to Document No. 377-E Page 32

NOC 570BH (5) If the Board does not receive this confirmation within the period referred to in No. 570BF or at the end of the period referred to in No. 570BG, as appropriate, the entry concerned shall be cancelled.

NOC Section VIII - Miscellaneous provisions

ADD 635A \$47A. (1) If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:

- a) preparation of the diagram showing co-ordination area referred to in No. 492A;
- b) computation of the interference level, as referred to in No. 492B;
- c) any other assistance of a technical nature for completion of the procedures in this article.
- ADD 635B (2) In making a request to the Board under 635A, the administration shall furnish the Board with the necessary information.



SPACE CONFERENCE

Corrigendum No. 1 to
Document No. 378-E
26 July 1971
Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES'

OF THE

THIRD PLENARY MEETING

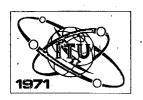
Friday, 9 July 1971, at 1500 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

The Algerian Delegation has requested that the text of item 4 on page 3 of Document No. 378 be amended to read as follows:

"The <u>delegate of Algeria</u>, speaking on behalf of the African Group and in agreement with Mr. Butler (Liberia) who was not present at the Conference, proposed that Mr. Basu (India) be confirmed as Chairman of Committee 6, and that Mr. Bodede (Nigeria) be elected Vice-Chairman of that Committee."





SPACE CONFERENCE

Document No. 378-E 13 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

THIRD PLENARY MEETING

Friday, 9 July 1971, at 1500 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Sub	jects discussed:	Document No.
1.	Minutes of the first Plenary Meeting	129
2.	Minutes of the second Plenary Meeting	175
3.	Minutes of the Extraordinary Plenary Meeting held on 30 June 1971	262
4.	Chairmanship and Vice-Chairmanship of Committee	6 -
5.	Situation of certain countries with respect to the Convention	Addenda 1, 2 and 3 to Doc. No. 94
6.	Report by the Credentials Committee	252
7.	Request for admission to the Conference by U.R.T.N.A.	Addendum 1 to Doc. No. 93
8.	First report by the Budget Control Committee	228
9•	Draft recommendation relating to the use of satellite communication systems in the event of natural disasters	224
10.	First reading of texts submitted by the Editorial Committee	
	a) Series B.1 b) Series B.2 c) Series B.3	283 296 313



<u>Document No. 378-E</u> Page 2

Subjects discussed (contd.):

Document No.

- 11. Decision as to dates for submission of statements for inclusion in the Final Protocol
 - 12. Message from the Minister of Posts and Telecommunications of the Republic of the Ivory Coast

The <u>delegate of Algeria</u>, speaking on behalf of the African Group, proposed the addition to the agenda of a new item : Chairmanship and Vice-Chairmanship of Committee 6.

It was so agreed.

1. Minutes of the first Plenary Meeting (Document No. 129)

Approved.

2. Minutes of the second Plenary Meeting (Document No. 175)

The <u>delegate of Spain</u> made the statement reproduced in Annex 1.

The minutes of the second Plenary Meeting (Document No. 175) were approved.

3. <u>Minutes of the Extraordinary Plenary Meeting held on 30 June 1971</u> (Document No. 262)

The minutes of the Extraordinary Plenary Meeting (Document No. 262) were approved.

The <u>delegate of the U.S.S.R.</u> once more expressed his delegation's gratitude to the Chairman and to all delegations who had expressed their sympathy in connection with the great loss recently suffered by his country, and referred to the courage and spirit of self-sacrifice of the astronauts who had lost their lives.

4. Chairmanship and Vice-Chairmanship of Committee 6

The <u>delegate of Algeria</u>, speaking on behalf of Mr. Butler (Liberia), who was unavoidably absent, and of the African Group, proposed that Mr. Basu (India) be confirmed as Chairman of Committee 6, and that Mr. Bodede (Nigeria) be elected Vice-Chairman of that Committee.

The delegates of Ethiopia, Morocco, Ghana and Democratic Republic of the Congo supported the proposal.

The Chairman declared those nominations confirmed.

The <u>delegates of India</u> and <u>Nigeria</u> expressed their gratification at the confidence and trust thus displayed in their delegations.

5. Situation of certain countries with respect to the Convention (Addenda 1, 2 and 3 to Document No. 94)

The <u>Chairman</u> drew attention to the fact that Belgium and Cyprus had now ratified the 1965 Montreux Convention and Uruguay had acceded thereto.

The <u>Secretary-General</u> announced that a ratification had just been received from Chile.

The <u>Chairman</u> stated that in accordance with 251 of the Convention the delegations of the following countries represented at the Conference were not entitled to vote but might sign the Final Acts: Colombia, Ghana, Liberia, Panama, Philippines.

The <u>delegate of the Philippines</u> regretted the delay in ratification by his Government, but said that the instrument of ratification would be duly forwarded to the I.T.U. Secretariat.

The <u>delegate of Belgium</u> said that purely domestic reasons had led to delay and he was glad his Government had recently been able to ratify the Convention.

The <u>delegate</u> of <u>Ghana</u> said that his Government's failure to ratify had been due to an administrative oversight, but that had now been corrected and the instrument of ratification should be deposited within a few weeks.

6. Report by the Credentials Committee (Document No. 252)

The <u>Chairman</u> stated that, in Document No. 252, 2) should be deleted from against Uruguay on page 7.

The Chairman of Committee 2 said that since the Committee's last meeting on 25 June, in accordance with the procedure recommended in Document No. 252, paragraph 5, he had duly examined and found in order credentials submitted by the following delegations: Democratic Republic of Congo, Gabon, Ghana, Greece, Niger, Paraguay, Togo and Pakistan, and provisional credentials from the delegation of Panama. Credentials had not yet been received from the delegations of: Upper Volta, Malagasy Republic, Mali and Tunisia.

The <u>Chairman</u> noted with regret that there were still four delegations which under 638 of the Convention were not entitled to vote or to sign the Final Acts.

The <u>delegate of Upper Volta</u> said that a telegram from his Government had arrived the previous day conferring credentials on the head of the delegation, but omitting to state that written confirmation was following.

The <u>delegate of Tunisia</u> apologised for the delay and said his delegation hoped to receive credentials by the beginning of the following week.

The <u>delegate of Rwanda</u> said that paragraph 2(d) of Document No. 252 appeared to be an extension of the provisions of the Convention which in 634, 635 and 636 listed only three criteria for the acceptance of credentials.

The Chairman of Committee 2 said that point had been discussed at length in the Working Group, and it had reached the conclusion that credentials containing no restrictions entitled their holders to vote and to sign the Final Acts. The Committee had based its examination of credentials on the definition of Delegate in 404 of the Convention.

The report by Committee 2 (Document No. 252) was approved.

7. Request for admission to the Conference by U.R.T.N.A. (Document No. 93, Add.1)

Approved.

8. First report by the Budget Control Committee (Document No. 228)

The Chairman said that Document No. 228 had been submitted as an interim report when it had become clear that the Conference budget as approved by the Council would be exhausted in less than six weeks. More accurate figures would be available the following week, in accordance with 676 of the Convention. He proposed that further discussion of the financial position be postponed pending their submission, and that the Plenary should in the meantime merely ratify the Steering Committee's recommendation that the Conference should continue until the end of the following week.

It was so agreed.

9. <u>Draft recommendation relating to the use of satellite communication systems in the event of natural disasters</u> (Document No. 224)

The delegate of the Philippines said that the World Administrative Radio Conference, which had met in Geneva in 1959, recognizing the devastating effects of natural disasters and the needs of Red Cross societies for rapid communication links to enable them to cope with such catastrophes, had adopted Recommendation No. 34. Since that time untold suffering had been caused to humanity by various natural catastrophes and his country, which had been visited by several devastating typhocns in recent years, had decided to take all possible steps to counteract such disasters. It had therefore submitted Resolution 2717 to the 25th Session of the United Nations General Assembly. However, a more specific resolution was required to deal with the disruption of communications which frequently ensued, and to enable governments and relief organizations to assess requirements and to co-ordinate their activities. He therefore introduced draft Recommendation No. K (Document No. 224) which was designed to supplement the provisions of Recommendation No. 34 by providing for the use of satellite communication systems in the event of natural disasters.

The delegates of Japan, Chile, Argentina, Indonesia, China, Venezuela, Malaysia, India, Nigeria, Syria and United Arab Republic supported the draft recommendation. The delegate of Pakistan also endorsed it but requested clarification of its last paragraph.

The <u>delegate of the United Kingdom</u> warmly supported the draft recommendation but pointed out that the location of a transportable earth station would depend on a number of factors and that, in fact, there appeared to be a need for a complete transportable communication system. Furthermore, it would be essential to provide for the waiving of co-ordination procedure requirements when a disaster occurred. He proposed that the last two paragraphs of draft Recommendation No. K be replaced by the following wording:

"requests

the C.C.T.R. to study standard specifications and preferred frequencies for integrated mobile and transportable fixed communication systems including transportable earth stations for use in disaster areas;

invites administrations concerned

to waive the requirements of co-ordination procedures in accordance with the Radio Regulations where they are within co-ordination distance of disaster areas".

The <u>delegate of Iran</u> supported the draft recommendation and the United Kingdom amendment, and suggested that epidemics and disease should be added to the list of natural disasters.

To meet a point made by the Observer from the World Meteorological Organization, the <u>delegate of the United Kingdom</u> agreed to the addition, at the end of his proposed amendment, of the words "and to co-operate in this matter fully with international organizations".

The <u>Secretary-General</u> proposed the addition of a paragraph inviting the <u>Secretary-General</u> to ensure co-ordination with international organizations and to transmit the recommendation to the <u>United Nations</u>, whose <u>Economic and Social Council</u> was actively concerned with the question.

It was <u>agreed</u> that the delegate of the Philippines should convene a drafting group consisting of the delegates of the United Kingdom, Syria and Iran, representatives of the Secretary-General and the C.C.I.R., and the Chairmen of Committee 5 and Committee 6, to re-draft the recommendation.

10. First reading of texts submitted by the Editorial Committee

The Chairman of Committee 7 said that when the Committee had begun its work of making drafting changes to text submitted to it by Committees 4 and 6, it did not have before it all the new definitions that had been agreed on. It therefore suggested that the Plenary Meeting should allow it to insert the new definitions, where necessary, in the texts submitted for second reading.

It was so agreed.

Series B.1 (Document No. 283)

Page B.1/01

The <u>delegate of New Zealand</u>, supported by the <u>delegate of the United Kingdom</u>, suggested that the reference to foot-note 1 should be moved to the second word of ADD 84BHA and that the last words of that paragraph should be amended to read "of that other body".

Approved, as amended.

Page B.1/02

The <u>delegate of Senegal</u> pointed out that the title of MOD 84BC did not refer to an earth satellite, and that it might therefore be more accurate to omit the word "earth's" before "equator".

The <u>Director of the C.C.I.R.</u> said that, since the definition essentially represented an abbreviation of the Special Joint Meeting's text concerning an earth satellite, the word should be retained.

The <u>Chairman of Committee 4</u> suggested that the title of MOD 84BC should end with "(of an Earth Satellite)".

The <u>delegate of Spain</u> considered that the word "between" in that definition should be replaced by "determined by".

The <u>delegate of the United Kingdom</u> said that the word "the" should be inserted before "geostationary satellite orbit" at the end of MOD 84BG.

Approved. as amended.

Page B.1/03

The <u>Chairman</u> said that the question of the frequencies to be mentioned in the title of Article 5 would be settled in connection with texts appearing in Series B.4.

The <u>delegate of Canada</u> suggested that, since some of the allocations in Article 5 were above 40 Gc/s, the number "40" should be placed in square brackets.

The <u>Chairman of Committee 6</u> said that MOD 93 had been considered by Committee 4 and had then been passed on to Committee 6 for examination in connection with Articles 9 and 9A. Since Committee 6 had not yet referred its findings to Committee 7, it would be glad if the Plenary Meeting would defer a decision on that point.

On that understanding, Page B.1/03 was approved.

Page B.1/04

The <u>delegate of Canada</u> said that the square brackets round the word "Recommendations" in (MOD) 470A should be removed.

The <u>delegate of the United Kingdom</u> suggested that the word "so" should be deleted from the penultimate line of the foot-note 470AA.1.

The <u>Director of the C.C.I.R.</u> suggested that the word "latest" in foot-note 470AA.2 should be replaced by "most recent".

Approved, as amended.

Page B.1/05

The <u>delegate of Argentina</u> suggested that, notwithstanding proposed foot-note ADD 84AB.1 in Series B.3, the word "terrestrial" should be inserted before "station" in ADD 470BA, MOD 470C and ADD 470CA, to clarify matters for users of the Radio Regulations.

The <u>Chairman of Committee 7</u> said that such an insertion would necessitate similar additions throughout the Radio Regulations and would therefore not be practicable.

The <u>delegate of Canada</u> suggested that the word "maximum" should be inserted before "power" in MOD 470C and ADD 470CA, to bring the English text into line with the French.

The <u>delegate of the United Kingdom</u> pointed out that the notion of "maximum" power was conveyed by the phrase "shall not exceed".

The <u>delegate of Pakistan</u> said that his delegation wished to enter a reservation concerning MOD 470B, which his country would find it very difficult to apply.

Approved:

b) <u>Series B.2</u> (Document No. 296)

Page B.2/01

Approved.

Page B.2/02

The <u>delegate of Denmark</u> suggested that the preamble should make it clear that the Conference was using as a basis, not the 1959 Radio Regulations, but the version amended by the 1963, 1966 and 1967 Administrative Radio Conferences.

It was so agreed.

Document No. 378-E Page 10

The <u>Chairman</u>, supported by the <u>delegate of Mexico</u>, suggested that the date of 1 January 1973 should be inserted in the space in the second paragraph.

It was so agreed.

Approved, as amended.

Pages B.2/03 and B.2/04

Approved.

Page B.2/05

The <u>Chairman of Committee 4</u> suggested that the number "IX" in the title should be placed in square brackets, as the sections might well have to be renumbered.

Approved, as amended.

Page B.2/06

The <u>delegate of Canada</u> suggested that the English text of <u>considering</u> c) should be aligned with the French by replacing the word "investigation" by "research".

The <u>delegate of Spain</u> suggested that the words "the satellite" in the fourth line of the <u>resolves</u> paragraph should be replaced by "these satellites,".

The <u>delegate</u> of the <u>United Kingdom</u> suggested that the opening phrase of the <u>resolves</u> paragraph should be altered to read: "that Administrations may continue to permit the transmission of radio waves from ionospheric research satellites in orbit above the ionosphere in the MF and HF bands provided that ..."

Approved, as amended.

Pages B.2/07 and B.2/08

The <u>delegate of Chile</u> suggested that the word "and" in the last line of page B.2/07 should be replaced by "or", to make it clear that the calculation method in question was not the same for frequencies below 1 Gc/s and those above 40 Gc/s.

The <u>Chairman of Committee 4</u> said he did not think that the use of the word "and" implied that the same method was used for both calculations.

The <u>delegate of Mexico</u> thought that the problem could be solved by using the word "methods" in the plural on page B.2/07, as was done in the last paragraph on page B.2/08.

After a brief discussion, it was <u>decided</u> to leave the final wording to Committee 7.

The <u>delegate of the United States of America</u> said that square brackets should be placed round the number "Ia" in <u>considering</u> c), the first sub-paragraph under <u>invites</u> and the first sub-paragraph under <u>recommends</u>, since the Table in question might be renumbered or even deleted.

He also suggested that the second line of <u>considering</u> c) should be altered to read "... values for all the necessary parameters of space radiocommunication ...".

After a brief discussion on a point raised by the <u>delegate of Niger</u> concerning <u>considering</u> a), it was <u>decided</u>, at the suggestion of the <u>Chairman of the I.F.R.B.</u>, to amend the third line of the paragraph to read "... equal rights between the terrestrial radiocommunication services and the space radiocommunication services must be ...".

Approved, as amended.

c) <u>Series B.3</u> (Document No. 313)

Page B.3/01

The <u>delegate of Argentina</u> suggested that the word "object" in MOD 84AE should be replaced by "spacecraft".

The <u>delegate of New Zealand</u> said he could not agree with that suggestion, as the object in question might be the moon, a planet or some other body.

After a brief discussion, it was <u>decided</u> to leave the definition unchanged.

Approved.

Page B.3/02

The <u>delegate of Spain</u> suggested that the French and Spanish texts of the last line of ADD 84APA should be aligned with the English.

Document No. 378-E Page 12

The <u>delegate of the United Arab Republic</u> suggested that the words "and in particular those" in ADD 84APA should be deleted.

Approved, as amended.

Page B.3/04

The <u>delegate of the United Kingdom</u> said that the last alternative under ADD 84APB seemed to preclude the use of the Broadcasting-Satellite Service for such purposes as general educational television programmes to schools, as the definition implied that only a limited number of schools could be covered.

The <u>delegate of Brazil</u> said that the issue had been thoroughly discussed in the <u>ad hoc</u> Group of Committee 5 and in that Committee itself, and that proposals to make the definition more restrictive or broader had been rejected. The concept of community reception was not new and, indeed, had been studied at many C.C.I.R. meetings and the present proposal was based on an S.J.M. text; the key word of the proposal was "intended", which carried the notion that the Broadcasting-Satellite Service was intended to reach the general public directly. The content of messages to groups, on the other hand, was the sole concern of administrations, and could not be incorporated in a definition. In those circumstances, the proposed text seemed to be satisfactory.

The <u>delegate of Israel</u> suggested that the difficulty might be removed by deleting the words "and intended", since the intention was already made clear in the definition of the Broadcasting-Satellite Service in MOD 84AP.

The <u>delegate of India</u> said that the notion of community reception was to make it possible to use signals more beneficially than for individual reception, by distributing them to limited areas such as schools and colleges.

The <u>delegate of the United Kingdom</u> pointed out that the definition of community reception, which was covered by that of the Broadcasting-Satellite Service, was made unduly restrictive by its wording.

The <u>Chairman of Committee 7</u>, supported by the <u>delegate of Italy</u>, suggested that the problem might be solved if the last part of the definition were amended to read:

- "... and intended for use by the general public :
 - at one location, or
 - through a distribution system covering a limited area."

The <u>delegate of the United States of America</u>, supported by the <u>delegates of France</u>, <u>Spain</u> and <u>Mexico</u>, proposed that the definition should remain unchanged.

It was so agreed.

The <u>Chairman of Committee 7</u> said that the French and Spanish texts of the last phrase of MOD 84AQ should be aligned with the English.

The <u>delegate of Canada</u> pointed out that the last word in the first line of MOD 84AQ should be "radionavigation".

Approved, as amended.

Pages B.3/05 and B.3/06

Approved.

11. Decision as to dates for submission of statements for inclusion in the Final Protocol

The <u>Secretary of the Conference</u> suggested that, on the assumption that the signing ceremony would take place on the evening of Friday, 16 July, statements for inclusion in the Final Protocol should be submitted not later than 1800 hours on Wednesday, 14 July. A conference document containing those statements would be distributed the following morning, and counter-statements should be submitted by 1800 hours on Thursday, 15 July. It should be indicated clearly that the statements were to be included in the Final Protocol, not merely to be issued as conference documents.

Those dates were approved.

Document No. 378-E Page 14

12. Message from the Minister of Posts and Telecommunications of the Republic of the Ivory Coast

The <u>Chairman</u> announced that H.E. Mr. Souleymane Cissoko, the Minister of Posts and Telecommunications of the Republic of the Ivory Coast, had visited Geneva recently and had intended to address the Conference, but had unfortunately been prevented from doing so. His message would be reproduced in Annex 2 to the minutes of the current meeting.

The meeting rose at 1840 hrs.

Secretary of the Conference : Clifford STEAD

Chairman of the Conference : Gunnar PEDERSEN

Annexes: 2

ANNEX 1

Mr. Chairman,

The purpose of my intervention is to provide some details on co-operation in telecommunications between Spain and Equatorial Guinea.

The most important features of this co-operation can be summed up as follows:

- On 20 July 1968, Spain inaugurated and handed over to Equatorial Guinea television installations valued at 200 million pesetas (\$2,857,000). In July 1969, the Spanish Government, at the request of the Guinean authorities, began sending out and is now maintaining at its expense a team of seventeen technicians responsible for the technical and economic management of the television services.
- On 12 October 1969, the Governments of Spain and the Republic of Equatorial Guinea signed a Basic Technical Co-operation Agreement which was followed by a Supplementary Technical Assistance Agreement for Telecommunication Services on 4 December 1969, under which a form of financing amounting to 23 million pesetas (\$ 328,571) was decided upon for the period 1970 1974 for these services. This technical assistance is being provided via the Compañía Telefónica Nacional de España. The sum provided for includes an amount of 15,780,000 pesetas (\$ 225,428) for television technical assistance costs for the year 1970.
- On 29 May 1971, seven co-operation agreements were initialled in Madrid between the Governments of Spain and Equatorial Guinea; one of these agreements deals with technical co-operation for television. This agreement covers the training of Guinean staff by means of fellowships and theoretical and practical courses at the Spanish School of Broadcasting, the free supply of filmed and recorded material and of Spanish technicians to help operate the facilities installed.

Annex 1 to Document No. 378-E Page 16

Mr. Chairman, I wish to express my confidence that this co-operation between Spain and Equatorial Guinea, based as it is on the mutual respect of independence and sovereignty, will continue undiminished in the future. I should also like to take advantage of this occasion, Mr. Chairman, to repeat, on behalf of my Delegation, the satisfaction which we have felt at the presence, for the first time at a World Administrative Conference for Telecommunications, of representatives of the Republic of Equatorial Guinea, to which we wish every success in its economic and social development and as a Member of the International Telecommunication Union.

I would ask you, Mr. Chairman, to see that my statement appears in extenso in the Minutes of this Meeting.

ANNEX 2

MESSAGE FROM HIS EXCELLENCY SOULEYMANE CISSOKO MINISTER OF POSTS AND TELEGRAPHS OF THE REPUBLIC OF THE IVORY COAST

It gives me great pleasure to greet this august assembly, met on the occasion of the World Administrative Radio Conference for Space Telecommunications. "Space techniques": not so long ago, these words were the stuff of dreams and science fiction - today, they are household words. In the course of 1970 alone, 114 launchings of all kinds of satellites were notified to the I.T.U. The developing countries also entered into the space age, not because they were anxious to engage in a prestige operation but because they saw a further possibility of making up some of their leeway.

The antennae of communication-satellite stations can now be seen rising amid palm and banana trees. Links with the outside world are extremely important for our countries and satellite telecommunications offered an economic solution for establishing our international circuits. These were the motives which impelled us to join INTELSAT, the first world-wide commercial system. It is also why we are closely following the progress of certain regional projects which we should be glad to see become operational in the near future.

The satellite broadcasting and television distribution services can also be extremely useful to us. The reception of information and particularly educational programmes by community antennae are a particularly convenient solution to the problem raised by the scattered nature of our rural populations and their feeble economic resources.

The African countries are also taking part in space research. Numerous more advanced states have set up in our territories telecommand and telemetering stations in which young local technicians are employed and trained.

The possibilities afforded by satellites for the meteorological aids services are also a considerable asset for our countries, whose major business is agriculture.

Finally, the maritime and aeronautical services established in Africa expect a great deal from space radiocommunications for purposes of navigational safety and control.

For all these various reasons, the African countries owed it to themselves to take an active part in this Conference. Your burden, Gentlemen, is a heavy one, and your agenda is very full, but this is a good time to prepare the ground for the future.

A substantial proportion of your work will be concerned with the sharing of the already congested frequency spectrum. If possible, the frequency bands allocated to space radiocommunications should not be extended at the expense of the other services, particularly radio relays, which also have heavy requirements. The frequencies above 10 Gc/s offer sufficient scope from this standpoint.

The frequency spectrum belongs to all the Members of the Union. It must not be unfairly monopolized by a certain number who make no real use of it. An assignment procedure must be established on principles of justice and fairness. From this point of view, the International Telecommunication Union is, in my opinion, the appropriate body to ensure effective co-ordination, taking into account the requirements of each. In view of the importance assumed by geostationary satellites, this co-ordination should also extend to positions on the geostationary orbit. Every effort should be made to respect the rights of all and to avoid interference with terrestrial services and with the other space services. In this connection, spacecraft should be equipped with devices to ensure cessation of emissions at any time as required.

I have already made the point that our countries expect a great deal from direct or semi-direct sound and television broadcasting from satellites. However, all steps must be taken to ensure that each State can maintain its sovereignty with regard to the reception of broadcasts in its territory.

As President Houphouet Boigny has repeatedly stated, the Ivory Coast has "adhered without reservation, and even with enthusiasm, to the principles on which the United Nations was founded: freedom of the peoples, peace between men and between peoples, the respect of the individual, and mutual international aid to promote human happiness by universal brotherhood". On this basis, it will consistently endeavour to ensure that outer space is used exclusively for peaceful purposes to bring about better co-operation and a franker exchange of views between men.

I cannot conclude this statement without paying tribute to the International Telecommunication Union and particularly to its Secretary-General, Mr. Mili, for the enormous task which they have accomplished, for the unceasing assistance they have given us and for the spirit of understanding in which they have always attempted to meet our requirements, particularly large with regard to training.

Long live space telecommunications.

Long live the International Telecommunication Union.



SPACE CONFERENCE

Document No. 379-E 13 July 1971 Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

The Head of the Delegation of the People's Republic of Poland has sent me the letter reproduced in the Annex.

Gunnar PEDERSEN Chairman of the Conference

Annex: 1



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Geneva, 12 July 1971

Mr. Gunnar Pedersen, Chairman of the World Administrative Radio Conference for Space Telecommunications

Geneva

Dear Mr. Chairman,

I am sending you herewith a statement by the Head of the Delegation of the People's Republic of Poland on the participation in the Conference of the People's Republic of China, the German Democratic Republic, the Democratic Republic of Viet-Nam and the Korean People's Democratic Republic.

We request you to publish this statement as an official conference document.

Yours sincerely,

J. RUTKOWSKI Deputy Head of the Delegation of the People's Republic of Poland

Annex: 1

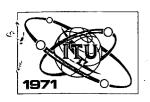
Annex

Geneva, 12 July 1971

The Delegation of the People's Republic of Poland to the World Administrative Radio Conference for Space Telecommunications wishes to confirm herewith the views it expressed in the Credentials Committee on 17 June 1971 / Document No. 167(Rev.) /. It regrets the failure to invite representatives of the People's Republic of China, the Democratic Republic of Viet-Nam and the Korean People's Democratic Republic to take part in the Conference.

The Polish Delegation considers that the absence of the German Democratic Republic, which was not invited to attend the Conference, must also be considered as a serious blow to the principle of universality of the international organizations.

The German Democratic Republic is a sovereign country in Central Europe, possessing a large industrial and economic potential. It also has a substantial radiocommunication infrastructure. The absence of this State from the Conference constitutes a serious obstacle to the satisfactory settlement of problems relating to frequency utilization in Central Europe.



SPACE CONFERENCE

Document No. 380-E

13 July 1971 Original: English

French

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

FIFTH REPORT OF COMMITTEE 6

(REGULATIONS)

The texts appearing in the Annexes to the present report, concerning

- the modifications to Appendix 1
- the modifications to Appendix 1A
- the new Appendix 1B

were adopted by Committee 6.

M.K. BASU Chairman

Annexes: 3



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ANNEX 1

MODIFICATIONS TO APPENDIX 1

- 1. At the end of Section A of Appendix 1, read:
 - "Supplementary information:
 - a) Reference frequency, if any, and any co-ordination required by No. 492A.
 - b) Indicate the name of any administration with which an agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement."
- 2. At the end of Sections B and C of Appendix 1, read:
 "Supplementary information:
 - a) Any co-ordination required by No. 492A.
 - b) Indicate the name of any administration with which an agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement."

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ANNEX 2

MODIFICATIONS TO APPENDIX 1A

Spa

MOD

NOTICES RELATING TO SPACE RADIOCOMMUNICATION AND RADIO ASTRONOMY STATIONS

(see Article 9A)

Section A. General instructions

- 1. A separate notice shall be sent to the International Frequency Registration Board for notifying:
 - each new frequency assignment,
 - any change in the characteristics of a frequency assignment recorded in the Master International Frequency Register (hereinafter called the Master Register),
 - any total deletion of a frequency assignment recorded in the Master Register.
- 2. When submitting notices under No. 639BA for earth and space transmitting assignments and under No. 639BB for space and earth receiving assignments, separate notice shall be submitted to the Board for each assignment to an earth or space station. In the case of a passive satellite system, only earth transmitting and receiving assignments shall be notified.
- 3. In the case of a satellite system employing multiple space stations with the same general characteristics, a separate notice shall be submitted for each space station:
 - when it is aboard a geostationary satellite, or

- when it is aboard a non-geostationary satellite except when a number of satellites have the same radio frequency characteristics and orbital characteristics (excluding the ascending node position). In this case one notice covering all such space stations may be submitted.
- 4. The following basic information shall be shown on the notice:
 - (a) the serial number of the notice and the date on which the notice is sent to the Board;
 - (b) the name of the notifying administration:
 - (c) sufficient data to identify the particular satellite network in which the earth or space station will operate;
 - (d) whether the notice reflects:
 - (1) the first use of a frequency by a station,
 - (2) a change in the characteristics of a frequency assignment recorded in the Master Register (indicate whether the change is areplacement, addition or deletion of existing characteristics), or
 - (3) a deletion of an assignment in all of its notified characteristics;
 - (e) reference to the weekly circular providing the advance publication information required in accordance with No. 639AA;
 - (f) basic characteristics as outlined in section B, C, D, E or F as appropriate:
 - (g) any other information which the administration considers to be relevant, e.g. any factors taken into account when applying Appendix 28 for the determination of co-ordination area and also an indication that the assignment concerned would be operating in accordance with No. 115, information concerning the use of the notified frequency if such use is restricted, or, in the case of notices pertaining to space stations, if the transmissions of the station are to be permanently switched off after a certain period.

Section B. Basic characteristics to be furnished in notices relating to frequencies used by earth stations for transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in k[c/s] up to 30 000 k[c/s] inclusive, and in M[c/s] above 30 000 k[c/s] (see number 85)

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in k[c/s] (see number 89)

- Item 3 Date of putting into use
 - (a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of putting the frequency assignment into use.
 - (b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4(a)), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).
- Item 4 Identity and location of the transmitting earth station.
 - (a) Indicate the name by which the station is known or the name of the locality in which it is situated.
 - (b) Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.
 - (c) Indicate the geographical co-ordinates (in degrees and minutes) of the transmitter site.
- [tem 5 Station(s) with which communication is to be established

Identify the associated receiving space station(s) by reference to the notification thereof or in any other appropriate manner, or, in the case of a passive satellite, the identity of the satellite and the location of the receiving earth station(s).

Item 6 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix $10.\,$

- Item 7 Class of emission, necessary bandwidth and description of transmission
 - (a) Indicate the class of emission of the assignment
 - (b)* Indicate the carrier frequency or frequencies
 of the emission(s)
 - (c)* Indicate for each carrier the class of emission, necessary bandwidth and description of transmission, in accordance with Article 2 and Appendix 5.
- Item 8 Power characteristics of the transmission
 - (a)* Indicate for each carrier the peak power supplied to the input of the antenna;
 - (b) Indicate the total peak power and the maximum power density per c/s supplied to the input of the antenna averaged over the worst $\frac{\mu}{k}$ c/s/ band, for carriers below 15 G/c/s/ or averaged over the worst 1 M/c/s/ band, for carriers above 15 G/c/s/.
- Item 9 Transmitting antenna characteristics
 - (a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see number 100).
 - (b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).
 - (c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for co-ordination.
 - (d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.
 - (e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation;

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

- (f) Indicate in degrees clockwise from true North the planned range of operating azimuthal angles for the direction of maximum radiation
- (g)* Indicate the type of polarization of the transmitted wave in the direction of maximum radiation; also indicate the sense in the case of circular polarization and the plane in the case of linear polarization
- (h) Indicate the altitude (metres) of the antenna above mean sea level

Item 10* Modulation characteristics

For each carrier, according to the nature of the signal modulating the carrier and the type of modulation, indicate the following characteristics:

- (a) Carrier frequency-modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband; indicate the lowest and highest frequencies of the baseband and the r.m.s. frequency deviation of the test tone as a function of baseband frequency.
- (b) Carrier frequency-modulated by a television signal; indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristic and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals.
- (c) Carrier phase-shift-modulated by a pulse code modulation signal (PCM/PSK); indicate the bit rate and the number of phases.
- (d) Amplitude-modulated carrier (including single sideband); indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used.
- (e) For all other types of modulation, provide such particulars as may be useful for an interference study.
- · (f) For any type of modulation as applicable indicate the characteristics of energy dispersal.

^{*} This information need only be supplied in the notice when such information has been used as a pasis to effect co-ordination with another administration.

Annex 2 to Document No. 380-E Page 10

Item 11 Maximum hours of operation

Indicate in GMT the maximum hours of operation on the frequency of each carrier.

Item 12 Co-ordination

Indicate the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance with Nos. 639AJ and 639AN and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 13 Agreements

Indicate also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 14 Operating administration or company

Indicate the name of the operating administration or company and the postal and telegraphic address of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section C. Basic characteristics to be furnished in notices relating to frequencies to be received by earth stations

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in kc/s up to 30~000~k/c/s/ inclusive, and in Mc/s above 30~000~k/c/s/. (See number 65)

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band (see number 89).

Item 3 Date of putting into use

(a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.

- (b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4 (a)), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).
- Item 4 Identity and location of the receiving earth station
 - (a) Indicate the name by which the receiving earth station is known or the name of the locality in which it is situated.
 - (b) Indicate the country in which the receiving earth station is located. Symbols from the Preface to the International Frequency List should be used.
 - (c) Indicate the geographical co-ordinates (in degrees and minutes) of the receiver site.
- Item 5 Station(s) with which communication is to be established:

Identify the associated transmitting space station(s) by reference to the notification thereof or in any other appropriate manner, or, in the case of a passive satellite, the identity of the satellite(s) and the associated transmitting 'earth station(s).

Item 6 Class of station, and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 7 Class of emission, necessary bandwidth and description of the transmission to be received
 - (a) Indicate the class of emission of the assignment to be received.
 - (b)* Indicate the carrier frequency or frequencies to be received.
 - (c)* Indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission, in accordance with Article 2 and Appendix 5.
- Item 8 Earth station receiving antenna characteristics
 - (a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see number 100).
- * This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

- (b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).
- (c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for co-ordination.
- (d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.
- (e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation.
- (f) Indicate in degrees, clockwise from true North, the planned range of operating azimuthal angles for the direction of maximum radiation.
- (g) Indicate the altitude (metres) of the antenna above mean sea level.

Item 9 Noise temperature

Indicate the lowest equivalent satellite link noise temperature in degrees Kelvin (see number 103A) under "quiet sky conditions". This value shall be indicated for the nominal value of the angle of elevation when the associated transmitting station is aboard a geostationary satellite and, in other cases, for the minimum value of angle of elevation.

Item 10 Maximum hours of reception

Indicate in GMT the maximum hours of reception of the frequency of each carrier.

Item 11 Co-ordination

Indicate the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance with Nos. 639AJ and 639AN and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 12 Agreements

Indicate also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 13 Operating administration or company

Indicate the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

Section D. Basic characteristics to be furnished in notices relating to frequencies used by space stations for transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in k[c/s] up to 30 000 k[c/s] inclusive, and in M[c/s] above 30 000 k[c/s.] (see number 85). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in k[c/s] (see number 89).

Item 3 Date of putting into use

- (a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of putting the frequency assignment into use.
- (b) Whenever the assignment is changed in any of its basic characteristics as shown in this Section (except in the case of a change in Item 4), the cate to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity of the space station(s)

Indicate the identity of the space station(s).

Item 5 Orbital information

(a) In the case of a space station aboard a geostationary satellite indicate the nominal geographical longitude on the geostationary satellite orbit and the longitudinal and inclination tolerances. Indicate also:

- (1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
- (2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and
- (3) in the event that the arc stated in paragraph (2) above is less than the arc stated in paragraph (1) above, provide the reasons therefor.
 - Note: The arcs specified in (1) and (2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.
- (b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period and the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Service area

Indicate the service area or areas on the earth or the name of the locality and country in which the associated receiving station(s) is (are) located.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 8 Class of emission, necessary bandwidth and description of transmission
 - (a) Indicate the class of emission of the assignment.
 - (b)* Indicate the carrier frequency or frequencies.

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

- (c)* Indicate, for each carrier, the class of emission, necessary bandwidth and description of transmission, in accordance with Article 2 and Appendix 5.
- Item 9 Power characteristics of the transmission
 - (a)* Indicate for each carrier the peak power supplied to the input of the antenna,
 - (b) Indicate the total peak power and the maximum power density per cycle per second input of the antenna averaged over the worst 4 k/c/s/ band for carriers below 15 G/c/s/ or averaged over the worst 1 M/c/s/ band for carriers above 15 G/c/s/
- Item 10 Space station transmitting antenna characteristics

For each service area:

- (a) In the case of a space station aboard geostationary satellite, indicate the gain of the space station transmitting antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6; 10, 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated.
- (b) In the case of a space station aboard non-geostationary satellite, indicate the isotropic gain of the space station transmitting antenna in the main direction of radiation and the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of radiation as a reference.
- (c)* Indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization; also indicate the worst case axial ratio in the half power beamwidth.
- (d) Indicate for geostationary satellite, the pointing accuracy of the antenna.

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

Item 11 * Modulation characteristics

For each carrier, according to the nature of the signal modulating carrier and the type of modulation, indicate the following characteristics:

- (a) Carrier frequency-modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband; indicate the lowest and highest frequencies of the baseband and the r.m.s. frequency deviation of the test tone as a function of baseband frequency.
- (b) Carrier frequency-modulated by a television signal; indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristic and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals.
- (c) Carrier phase-shift-modulated by a pulse code modulation signal (PCM/PSK); indicate the bit rate and the number of phases.
- (d) Amplitude modulated carrier (including single sideband); indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used.
- (e) For all other types of modulation, provide such particulars as may be useful for an interference study.
- (f) For any type of modulation as applicable indicate the characteristics of energy dispersal.

Item 12 Maximum hours of operation

Indicate in GMT the maximum hours of operation on the frequency of each carrier.

Item: 13 Co-ordination

Indicate the name of any administration cr group of administrations with which the use of the space system to which the space station belongs has been successfully co-ordinated in accordance with No. 639AJ.

^{*} This information need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration.

Item 14 Agreements

Indicate also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 15 Operating administration or company

Indicate the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section E. Basic characteristics to be furnished in notices relating to frequencies to be received by space stations.

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in k[c/s] up to 30 000 k[c/s] inclusive, and in M[c/s] above 30 000 k[c/s.] (see number 85). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in k[c/s] (see number 89).

Item 3 Date of putting into use

- (a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.
- (b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4. Identity of the receiving space station(s)

Indicate the identity of the receiving space station(s).

Item 5 Orbital information

- (a) In the case of a space station aboard a geostationary satellite, indicate the planned numinal geographical longitude on the geostationary satellite orbit and the planned longitudinal and inclination tolerances. Indicate also:
 - (1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
 - (2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and
 - (3) in the event that the arc stated in paragraph (2) above is less than the arc stated in paragraph (1) above, provide the reasons therefor.
 - Note: The arcs specified in (1) and (2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.
- (b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period and the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Associated transmitting earth station(s)

Identify the associated transmitting earth station(s) by reference to the notification thereof or in any other appropriate manner.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 8 Class of emission, necessary bandwidth and description of the transmission(s) to be received
 - (a) Indicate the class of emission of the assignment to be received.
 - (b)* Indicate the carrier frequency or frequencies of the transmissions(s) to be received.
 - (c)* Indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission(s) to be received, in accordance with Article 2 and Appendix 5.
- Item 9 __Space station receiving antenna characteristics

For each receiving beam :

- (a) In the case of a space station aboard geostationary satellite, indicate the gain of the space station receiving antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6, 10, 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated.
- (b) In the case of a space station aboard non-geostationary satellite, indicate the isotropic gain of the space station receiving antenna in the main direction of radiation and the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of radiation as a reference.
- (c)* Indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization, also indicate the worst case axial ratio in the half power beamwidth.
- * This information need only be supplied in the notice when such information has been used as a basis to effect oc-ordination with another administration.

(d) Indicate, for geostationary satellite, the pointing accuracy capability of the antenna.

Item 10 Noise temperature

Indicate the total receiving system noise temperature (°K) at the input of the space station receiver.

Item 11 Maximum hours of reception

Indicate in GMT the maximum hours of reception of the frequency of each carrier.

Item 12 Co-ordination

Indicate the name of any administration or group of administrations with which the use of the space system to which the space station belongs has been successfully co-ordinated in accordance with No. 639AJ.

Item 13 Agreements

Indicate also if appropriate the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 14 Operating administration or company

Indicate the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

NOC Section F.

FORM OF NOTICE *) FOR USE WHEN NOTIFYING TO THE INTERNATIONAL FREQUENCY REGISTRATION BOARD A FREQUENCY ASSIGNMENT OR A CHANGE TO AN ASSIGNMENT RECORDED IN THE MASTER INTERNATIONAL FREQUENCY REGISTER

(SEE ARTICLE 9A)

Earth station (transmitting (Section B of Appendix 1A) (T) (receiving (Section C of Appendix 1A) (R)

(b)	Notifying administration				(a) Notic	e No.
		(d1) New assignment	(d2) Change	(d3) Deletion of an assignment	(e) Refe	tity of [satellite network] rence of weekly circular ting to No. 639AA
1	Assigned frequency	4a. ————————————————————————————————————	of earth station			for I.F.R.B. use
2	Assigned frequency band in kc/s	4b Count	try			

Longitude and latitude of earth station site

		ation and ervice	mission ent	Carrier frequency	Class of emission, necessary bandwidth		ower teristics			Antenna	characte	ristics		Altitude	Modulation		Maximum	
	Station(s) with which communication is established	Class of station nature of servic performed	Class of emission of assignment	(frequencies)		Peak power	98 Total peak	neity	(a) pic	dg Half (B) power beam-	Minimur & angle & of ele-	98 Azi- Wathal	Pola- * riza- tion	(m) 8g(R)	characteris- tics **	satellite link noise temperature	hours of operation on each carrier (G.M.T.) 10(R)	
١	5	6	7a	7ъ	7 c	8a(T)	8b(T)88	(T)	9a(T)	9b(T)	9e (T)		9g(T)	9h.(T)	10(T)	9(R)	11(T)	
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13(R)	14(T)	Operating administration or company		11(R), 12(T) 12(R), 13(T)	
13(R)	14(T)	Now and address of administration	Other information (g)	22(11), 1)(1)	ARI COMO

- * The actual size of the notice is a matter for individual administrations.
- ** This information need only be supplied when such information has been used as a basis to effect co-ordination with another administration.

Name and address of administration

Date of putting into use

NOTE: For radiation diagram $\sqrt{9}c(T)$, $8c(R)\sqrt{2}$ and horizon elevation angle diagram $\sqrt{9}d(T)$, $8d(R)\sqrt{2}$ attach the relevant information to this form.

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FORM OF NOTICE*) FOR USE WHEN NOTIFYING TO THE INTERNATIONAL FREQUENCY REGISTRATION BOARD A FREQUENCY ASSIGNMENT OR A CHANGE TO AN ASSIGNMENT RECORDED IN THE MASTER INTERNATIONAL FREQUENCY REGISTER

		Spac	e station (tra	ansmitting (Section D	of Appendix 3	lA) (T) lA) (R)											
(b) Notifying administration kc/s kc/s Assigned frequency Assigned frequency band in kc/s Date of putting into use	5 Or		New assignment	(d2) Char me of space station	nge		Deleti an ass	ion of signment				(a) Dat (c)	ntity of /satel	lite network	Por I.F.R.B. use		,
·	1		's nominal long tolerance 5 (a) +	gitude and Tolerance		of inclination nolination toler 5b)		t	in spa	d of object	ect	and	itudes of apoge perigee 5b)		Number of space stations 5b)		
Service area or station(s) with which communication is established	Class of station and nature of service performed	Class of emission & of assignment	Carrier frequency (frequencies) **	Class of emisonecessary bear and descriptic transmission **	nwidth on of	Peak power **	Met Total peak Tower peak	Maximum power density	Geo- stationary satellite pointing accuracy 9d(R) 10d(T)	Polar: zation ** 9c(1	1- n t	xiulation charac- ceristics **	Receiving system noise Temperature	Maximum hours of operation t each service area or station (G.M.T.)		lnformation (g)	
4(R), 15(T) Operating administration or company 4(R), 15(T) Name and address of administration						Other informa	tion (g		12(R), 13(T) C		t/	(5a. (5a.	2) less than (3) : For antenna	visible arc t characterist	arc, service arc and reasons o be attached. ics [10a(T) or 10b(T) and 9a remation to this form.		

^{*} The actual size of the notice is a matter for individual administrations.

^{**} This information need only be supplied when such information has been used as a basis to effect co-ordination with another administration.

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ANNEX 3

APPENDIX 1B

ADVANCE PUBLICATION INFORMATION TO BE FURNISHED FOR A SATELLITE NETWORK

Section A. General instructions

- Item 1 Information shall be provided separately for each satellite network.
- Item 2 Information to be furnished for each satellite network shall include general characteristics (Section B), and, as applicable, characteristics in the earth-to-space direction (Section C), characteristics in the space-to-earth direction (Section D), and characteristics for space-to-space relay (Section E).
- Section B. General characteristics to be furnished for a satellite network
- Item 1 Identity of the satellite network

Provide a separate and clear identity of the satellite network and, if applicable, the identity of the satellite system of which it will form a part.

Item 2 Operational date

Indicate the date by which the satellite network is expected to be brought initially into operation.

Item 3 Administration or group of administrations submitting the advance information

Give the name of the administration or the names of the administrations of the group submitting the advance information on the satellite network and the postal and telegraphic addresses of the administration(s) to which any communication should be sent.

Item 4 Orbital information relating to the space station(s)

- (a) In the case of a space station aboard a geostationary satellite, give the planned nominal geographical longitude on the geostationary satellite orbit and the planned longitudinal and inclination tolerances. Indicate also
 - (1) the arc of the geostationary orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
 - (2) the arc of the geostationary orbit within which the space station could provide the required service to its associated earth stations or service areas; and
 - (3) in the event that the arc stated in paragraph (2) above is less than the arc stated in paragraph (1) above, provide the reasons therefor.
 - Note: The arcs specified in (1) and (2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.
- (b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period and the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites having the same characteristics used.
- Section C. Characteristics of the satellite network in the "Earth-Space" direction

Item 1 "Earth-Space" service area(s)

Indicate the service area(s) on the earth associated with each receiving antenna of the space station.

Item 2 Class of stations and nature of service

For each "Earth-Space" service area, indicate the class of the stations in the satellite network and the nature of the service to be performed, using the symbols shown in Appendix 10.

Item 3 Frequency range

For each "Earth-Space" service area, indicate the frequency range within which the carriers will be located.

- Item 4 Power characteristics of the transmitted wave
 - (a) For each "Earth-Space" service area indicate the maximum spectral power density (W/Hz) to be delivered to the antenna of the transmitting earth stations (the bandwidth over which this is averaged depends on the nature of the service concerned).
 - (b) If available, indicate, for each "Earth-Space" service area, the actual radiation pattern (relative to isotropic) of the transmitting earth station antenna having the highest off-beam equivalent isotropically radiated spectral power density.
- Item 5 Characteristics of space station receiving antennae

For each "Earth-Space" service area,

- (a) in the case of a space station aboard a geostationary satellite, indicate the estimated gain of the space station receiving antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6, 10, 20 db and 10 db intervals thereafter as necessary, below the maximum gain, shall be indicated.
- (b) in the case of a space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station receiving antenna in the main direction of reception and the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of reception as a reference.

Item 6 Noise temperature of the receiving space station

For each "Earth-Space" service area, indicate, when other than simple frequency changing transponder is used aboard the space station, the lowest total receiving system noise temperature.

Section D. Characteristics of the satellite network in the "Space-Earth" direction

Item 1 "Space-Earth" service area(s)

Indicate the service area(s) on the earth associated with each transmitting antenna of the space station.

Item 2 Class of stations and nature of service

For each "Space-Earth" service area, indicate the class of the stations in the satellite network and the nature of the service to be performed, using the symbols shown in Appendix 10.

Item 3 Frequency range

For each "Space-Earth" service area, indicate the frequency range within which the carriers will be located.

Item 4 Power characteristics of the transmission

For each "Space-Earth" service area, indicate the maximum spectral power density (W/Hz) to be delivered to the transmitting antenna of the space station (the bandwidth over which this is averaged depends on the nature of the service concerned).

Item 5 Characteristics of space station transmitting antennae

For each "Space-Earth" service area

(a) in the case of a space station aboard a geostationary satellite, indicate the estimated gain of the space station transmitting antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to gain of 2, 4, 6, 10, 20 db and 10 db intervals thereafter as necessary, below the maximum gain, shall be indicated.

- (b) in the case of a space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station transmitting antenna in the main direction of transmission and the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of transmission as a reference.
- Item 6 Characteristics of receiving earth stations
 - (a) For each "Space-Earth" service area, indicate, when other than simple frequency changing transponder is used aboard the space station, the lowest total receiving system noise temperature of the earth stations.
 - For each "Space-Earth" service area and for each projected usage, indicate, when simple frequency changing transponders are used on the space station, the lowest equivalent satellite link noise temperature and the associated value of transmission gain evaluated from the output of the receiving antenna of the space station to the output of the receiving antenna of the earth station. For each projected usage, indicate also the receiving antenna(e) of the space station to which each simple frequency changing transponder will be connected.
 - (b) If available, indicate for each "Space-Earth" service area the actual radiation pattern (relative to isotropic) of the receiving earth static antenna having the highest off-beam level. When a simple frequency changing transponder is used on the space station, indicate also, if available, the pattern associated with each equivalent satellite link noise temperature indicated above.

^{*} A different usage will be considered to take place when different types of carriers are employed (different by virtue of maximum power spectral density), or when different types of receiving earth stations are employed (different by virtue of receiving antenna gain).

Annex 3 to Document No. 380-E Page 30

Section E. Characteristics to be furnished for space-to-space relay

Where the satellite network is connected to another satellite network by means of space-to-space relay, indicate the following:

- (a) name(s) of the satellite network(s) to which the satellite network is connected
- (b) transmit and receive frequency bands
- (c) class of emission
- (d) nominal e.i.r.p. on the beam axis.

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 381-E 13 July 1971

PLENARY MEETING (FIRST READING)

B. 11

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
6	377	1	Art. 9	

Francois Job Chairman of the Editorial Committee

Annex: Pages B11/01-15



[ARTICLE 9]

MOD Notification and Recording in the Master International Frequency
Register of Frequency Assignments ¹ to Terrestrial
Radiocommunication Stations ²

NOC Section I. Notification of Frequency Assignments and Co-ordination Procedure to be Applied in Appropriate Cases

- (MOD) 486 § 1. (1) Any frequency assignment ³ to a fixed, land, broadcasting ⁴, radionavigation land, radiolocation land or standard frequency station, or to a ground-based station in the meteorological aids service, shall be notified to the International Frequency Registration Board,
 - a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration ⁵; or
- NOC

 ¹ The expression frequency assignment, wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called Master Register).
- (MOD) ² For the notification and recording in the Master International Frequency Register of frequency assignments to radio astronomy and space radiocommunication stations, see Article 9A.
- (MOD) 486.2 3 In the case where a frequency is used by numerous stations under the jurisdiction of the same administration, see Appendix 1 (Section E, II, Column 5a, paragraphs 2c and 2d).
- (MOD) 486.3 4 With respect to assignments to broadcasting stations in the bands allocated exclusively to the broadcasting service between 5 950 kHz and 26 100 kHz, see Article 10.
- MOD 486.4 ⁵ The attention of administrations is specifically drawn to the application of the provisions of Nos. 486 a) and 486 c) in those cases where they make a frequency assignment to a terrestrial station, located within co-ordination area of an earth station (see No. 492A), in a band which terrestrial radiocommunication services share with equal rights with space radiocommunication services in the frequency spectrum above 1 GHz.

- b) if the frequency is to be used for international radiocommunication; or
- c) if it is desired to obtain international recognition of the use of the frequency.¹
- NOC 487 (2) Similar notice shall be given for any frequency to be used for the reception of mobile stations by a particular land station in each case where one or more of the conditions specified in No. 486 are applicable.
- NOC 488 (3) Specific frequencies prescribed by these Regulations for common use by stations of a given service (for example, international distress frequencies 500 kHz and 2 182 kHz, frequencies of ship radiotelegraph stations operating in their exclusive high frequency bands, etc.), shall not be notified to the Board.
- NOC 489 § 2. (1) For any notification under No. 486 or No. 487 an individual notice for each frequency assignment shall be drawn up as prescribed in Sections A or B of Appendix 1, which specify the basic characteristics to be furnished, according to the case. It is recommended that the notifying administration should also supply the additional data called for in that Appendix, together with such further data as it may consider appropriate.
- MOD 490 (2) When stations of the same service, such as the land mobile service, use a band of frequencies above 28 000 kHz in a specific area or areas, an individual notice should be drawn up, as prescribed in Section C of Appendix 1, which specifies the basic characteristics
- MOD 486.4 ¹ The attention of administrations is specifically drawn to the application of the provisions of Nos. 486 a) and 486 c) in those cases where they make a frequency assignment to a terrestrial station, located within co-ordination area of an earth station (see No. 492A), in a band which terrestrial radiocommunication services share with equal rights with space radiocommunication services in the frequency spectrum above 1 GHz.

to be furnished, for each frequency on which there are assignments within the band; however, the particulars should relate only to a typical station. This does not apply to broadcasting stations or to other terrestrial stations to which the provisions of Sub-Section IIB of this article apply.

MOD 491 § 3. (1) Whenever practicable, each notice should reach the Board before the date on which the assignment is brought into use. It must reach the Board not earlier than ninety days before the date on which it is to be brought into use, but in any case not later than thirty days after the date it is actually brought into use. However, for a frequency assignment to one of the terrestrial stations mentioned in Sub-Section IIB of this article or in No. 639AQ, the notice must reach the Board not earlier than three years and not later than ninety days before the date on which the assignment is to be brought into use.

MOD 492 (2) Any frequency assignment, the notice of which reaches the Board more than thirty days after the notified date of bringing into use, or in the case of a terrestrial station mentioned in Sub-Section IIB of this article, any frequency assignment, the notice of which reached the Board less than ninety days before it is brought into use, shall, where it is to be recorded, bear a remark in the Master Register to indicate that it is not in conformity with No. 491.

MOD 492A § 3A. (1) Before an administration notifies to the Board, or brings into use any frequency assignment to a terrestrial station ¹ for transmitting in a band allocated with equal rights to terrestrial radio-

SUP 492A.1

ADD 492A.2 Appendix 28 contains criteria relating only to co-ordination between earth stations and stations in the fixed or the mobile service. Until the C.C.I.R., in accordance with Recommendation No. Spa[3], provides criteria for other terrestrial radiocommunication services, the criteria to be used in effecting co-ordination between earth stations and terrestrial stations other than those of the fixed or the mobile service, shall be agreed between the administrations concerned.

communication services and space radiocommunication services (space-to-Earth) and in the frequency spectrum above 1 GHz, it shall initiate co-ordination of the proposed assignment with the administration responsible for the receiving earth station concerned if the assignment is for use within the co-ordination area ¹ of an existing receiving earth station or of one for which the co-ordination procedure referred to in No. 639AN has been initiated. For the purpose of effecting co-ordination, it shall send to any other such administration, by the fastest possible means, a copy of a diagram drawn to an appropriate scale indicating the location of the terrestrial station and all other pertinent details of the proposed frequency assignment, and the approximate date on which it is planned to bring the station into

MOD 492B

(2) An administration with which co-ordination is sought under No. 492A shall acknowledge receipt of the co-ordination data immediately by telegram. If no acknowledgement is received within fifteen days of despatch, the administration seeking co-ordination may despatch a telegram requesting acknowledgement of receipt of the co-ordination data, to which the receiving administration shall reply. Upon receipt of the co-ordination data an administration shall promptly examine the matter with regard to interference ² which would be caused to the services rendered by its earth stations operating in accordance with the Convention and these Regulations, or to be so operated within the next three years, with the proviso that in this latter case co-ordination specified in No. 639AN has been effected

MOD 492A.3 ¹ Calculated, in the case of the fixed or mobile service, in accordance with the procedures described in Appendix 28.

ADD 492B.1 ² Criteria to be employed in evaluating interference levels shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

or that the co-ordination procedure has already been initiated; and shall, within an overall period of sixty days from despatch of the co-ordination data, either notify the administration requesting co-ordination of its agreement to the proposals or, if this is not possible, indicate the reasons therefor and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

- MOD 492C (3) No co-ordination under No. 492A is required when an administration proposes:
 - a) to bring into use a terrestrial station which is located, in relation to an earth station, outside the co-ordination area; or
 - b) to change the characteristics of an existing assignment in such a way as not to exceed the acceptable level of interference to the earth stations of other administrations.
- MOD 492D (4) An administration seeking co-ordination may request the Board to endeavour to effect co-ordination, in those cases where:
 - a) an administration with which co-ordination is sought under No. 492A fails to acknowledge receipt under No. 492B within thirty days of dispatch of the coordination data;
 - b) an administration which has acknowledged receipt under No. 492B but fails to give a decision within ninety days of dispatch of the co-ordination;
 - c) there is disagreement between the administration seeking co-ordination and an administration with which co-ordination is sought as to the acceptable level of interference; or

d) co-ordination between administrations is not possible for any other reason.

In so doing, it shall furnish the Board with the necessary information to enable it to endeavour to effect such co-ordination.

- MOD 492E (5) Either the administration seeking co-ordination or an administration with which co-ordination is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.
- MOD 492F (6) Where the Board receives a request under No. 492D a), it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.
- ADD 492FA (7) Where the Board receives an acknowledgement following its action under No. 492F, or where the Board receives a request under No. 492D b), it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.
- ADD 492FB (8) Where the Board receives a request under No. 492D d), it shall endeavour to effect co-ordination in accordance with the provisions of No. 492A. Where the Board receives no acknow ledgement of its request for co-ordination within the period specified in No. 492B, it shall act in accordance with No. 492F.
- ADD 492FC (9) Where an administration fails to reply within thirty days of dispatch of the Board's telegram sent under No. 492F requesting an acknowledgement, or fails to give a decision in the matter within sixty days of dispatch of the Board's telegram of request sent under No. 492FA, it shall be deemed that the administration with which co-ordination was sought has undertaken that no complaint will be

made in respect of any harmful interference which may be caused by terrestrial stations to the services rendered by its earth station.

- MOD 492G (10) Where necessary, as part of the procedure under No. 492D, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.
- ADD 492GA (11) In the event of continuing disagreement between one administration seeking to effect co-ordination and one with which co-ordination has been sought, provided that the assistance of the Board has been requested, the administration seeking co-ordination may, after sixty days from the date of the request for the assistance of the Board, taking into consideration the provisions of No. 491, send its notice concerning the proposed assignment to the Board.
- ADD 492GB § 3 B. Where the Board receives information from an administration in accordance with the provisions of No. 639AQ in reply to a request for co-ordination for an earth station, it shall consider as notifications under the present Section, only that information relating to assignments to existing terrestrial stations or to those to be brought into use within the time limits defined in No. 491. Such notifications shall be examined by the Board with respect to the provisions of Nos. 570AB and 570AD, as appropriate, and shall be treated accordingly.
- (MOD) 493 § 3 C. (1) Whatever the means of communication, including telegraph, by which a notice is transmitted to the Board, it shall be considered complete if it contains at least those appropriate basic characteristics specified in Appendix 1.
- NOC 494 (2) Complete notices shall be considered by the Board in the order of their receipt.
- NOC 495 § 4. When a service or regional agreement has been concluded, the Board shall be informed of the details of this agreement.

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Sub-Section IIA. Procedure to be followed in cases not covered by MOD Sub-Section IIB of this Article Sub-Section IIB. Procedure to be followed in cases where [terrestrial] stations [in the fixed or mobile service] are in the same frequency band as, and within the co-ordination area of, an existing earth station or one for which co-ordination has been effected or initiated 570AA §23A. The Board shall examine each notice, NOC with respect to its conformity with the Convention, the NOC 570AB Table of Frequency Allocations and other provisions of the Radio Regulations (with the exception of those relating to the co-ordination procedure and the probability of harmful interference); b) with respect to its conformity with the provisions of NOC 570AC No. 492A relating to co-ordination of the use of the frequency assignment with the other administrations concerned; where appropriate, with respect to the probability of (MOD) 570AD harmful interference to the service rendered by an earth receiving station for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 639BM, and if the corre-

sponding frequency assignment to the space transmitting station has not, in fact, caused harmful inter-

ference to any frequency assignment in conformity with No. 501 or 570AB, as appropriate, previously recorded in the Master Register.

- NOC 570AE § 23 B. Depending upon the findings of the Board subsequent to the examination prescribed in Nos. 570AB, 570AC and 570AD, further action shall be as follows:
- NOC 570AF § 23 C. (1) Finding unfavourable with respect to No. 570AB.
- MOD 570AG (2) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be examined immediately with respect to Nos. 570AC and 570AD.
- ADD 570AGA (3) If the finding is favourable with respect to No. 570AC or 570AD, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.
- ADD 570AGB (4) If the finding is unfavourable with respect to No. 570AC or 570AD, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. Should the administration insist upon reconsideration of the notice, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column.
- ADD 570AGC (5) The period of one hundred and twenty days mentioned in Nos. 570AGB and 570AX shall count:

- from the date when the assignment to the terrestrial station which received an unfavourable finding is brought into use, if the assignment to the earth station is then in use;
- otherwise, from the date when the assignment to the earth station is brought into use.

But if the assignment to the earth station has not been brought into use by the notified date, the period of one hundred and twenty days shall be counted from this date. Allowance, if necessary, may be made for the additional period mentioned in No. 570BF.

- (MOD) 570AH (6) Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.
- (MOD) 570AI (7) If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of No. 570AH.
- MOD 570AJ (8) If the notifying administration resubmits the notice with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be treated in accordance with the provisions of No. 570AG and No. 570AGA or No. 570AGB, as appropriate.
- (MOD) 570AK (9) If the notifying administration resubmits the notice with modifications which, after re-examination, result in a favourable finding by the Board with respect to No. 570AB, the notice shall be treated under the provisions of Nos. 570AL to 570AX. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in Column 2d.

- NOC 570AL § 23D. (1) Finding favourable with respect to No. 570AB.
- NOC 570AM (2) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has been successfully completed with all administrations whose earth stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.
- NOC 570AN (3) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has not been applied, and the notifying administration requests the Board to effect the required co-ordination, the Board shall take appropriate action and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with No. 570AM. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of No. 570AD.
- NOC 570AO (4) Where the Board finds that the co-ordination procedure mentioned in No. 570AC has not been applied, and the notifying administration does not request the Board to effect the required co-ordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.
- NOC 570AP (5) Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedure mentioned in No. 570AC has been successfully completed with all administrations whose earth stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt

by the Board of the resubmitted notice shall be entered in the Remarks Column.

- NOC 570AQ (6) Where the notifying administration resubmits the notice with a request that the Board effect the required co-ordination, it shall be treated in accordance with the provisions of No. 570AN. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.
- NOC 570AR (7) Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the co-ordination, it shall be examined by the Board with respect to the provisions of No. 570AD. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.
- NOC 570AS § 23E. (1) Finding favourable with respect to Nos. 570AB and 570AD.
- NOC 570AT (2) The assignment shall be recorded in the Master Register.

 The date of receipt by the Board of the notice shall be entered in Column 2d.
- NOC 570AU § 23F. (1) Finding favourable with respect to No.570AB but unfavourable with respect to No. 570AD.
- NOC 570AV (2) The notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.
- NOC 570AW (3) Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to No. 570AD, the assignment

shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.

MOD 570AX (4) Should the notifying administration resubmit the notice, either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of No. 570AW to be applied, and should that administration insist upon reconsideration of the notice, but should the Board's finding remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column. The period of one hundred and twenty days shall count from the date indicated in No. 570AGC.

SUP 570AY

NOC 570AZ § 23 G. (1) Change in the Basic Characteristics of Assignments already recorded in the Master Register.

MOD 570BA (2) A notice of a change in the basic characteristics of an assignment already recorded, as specified in Appendix 1 (except those entered in Columns 3 and 4a of the Master Register), shall be examined by the Board according to Nos. 570AB and 570AC and, where appropriate, No. 570AD, and the provisions of Nos. 570AF to 570AX inclusive applied. Where the change should be recorded, the assignment shall be amended according to the notice.

- NOC 570BB (3) However, in the case of a change in the basic characteristics of an assignment which is in conformity with No. 570AB, should the Board reach a favourable finding with respect to No. 570AC, and, where its provisions are applicable, with respect to No. 570AD, or find that the change does not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. In addition, the date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.
- (MOD) 570BC § 23H. In applying the provisions of this Sub-Section, any resubmitted notice which is received by the Board more than two years after the date of its return by the Board, shall be considered as a new notice.
- NOC 570BD § 23 I. (1) Recording of Frequency Assignments notified before being brought into use.
- NOC 570BE (2) If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to Nos. 570AB and 570AC and, where appropriate, with respect to No. 570AD, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.
- (MOD) 570BF (3) If, within the period of thirty days after the projected date of bringing into use, the Board receives confirmation from the notifying administration of the date of bringing into use, the special symbol shall be deleted from the Remarks Column. In the case where the Board, in the light of a request from the notifying administration received before the end of the thirty-day period, finds that exceptional circumstances warrant an extension of this period, the extension shall in no case exceed one hundred and fifty days.
- MOD 570BG (4) In the circumstances described in No. 570AX, and as long as an assignment which received an unfavourable finding cannot be re-

submitted as a consequence of the provisions of No. 570AGC, the notifying administration may ask the Board to enter the assignment provisionally in the Master Register, in which event a special symbol to denote the provisional nature of the entry shall be entered in the Remarks Column. The Board shall delete this symbol when it receives from the notifying administration, at the end of the period specified in No. 570AX, the information relating to the absence of complaint of harmful interference.

NOC	570BI	I (5) If the Board does not receive this confirmation within period referred to in No. 570BF or at the end of the period referred to in No. 570BG, as appropriate, the entry concerned shall be calcelled.						
NOC		Section VIII . Miscellaneous provisions						
NOC		Gettom vill . Indeedmendous provisions						
ADD	635A	§ 47 A. (1) If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:						
		 a) preparation of the diagram showing the co-ordination area referred to in No. 492A; 						
		b) computation of the interference level, as referred to in No. 492B;						
		c) any other assistance of a technical nature for completion of the procedures in this article.						
ADD	635B	(2) In making a request to the Board under 635A, the administration shall furnish the Board with the necessary information.						

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 382-E 13 July 1971

PLENARY MEETING (FIRST READING)

B. 12

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
6	380	1	Appendix 1	

Francois Job Chairman of the Editorial Committee

Annex: Pages B12/01-30



APPENDIX[1]

NOC Section A. Basic Characteristics to be Furnished for Notification under No. 486 of the Regulations

MOD Supplementary information:

- a) Reference frequency, if any, and any co-ordination required by No. 492A.
- b) The name of any administration with which an agreement has been concluded to excéed the limits prescribed in these Regulations and the contents of such agreement.

NOC Section B. Basic Characteristics to be Furnished for Notification under No. 487 of the Regulations

Supplementary information:

- a) Any co-ordination required by No. 492A.
- b) The name of any administration with which an agreement has been concluded to exceed the limits prescribed in these Regulations and the contents of such agreement.

NOC Section C. Basic Characteristics to be Furnished for Notification under No. 490 of the Regulations

Supplementary information:

- a) Any co-ordination required by No. 492A.
- b) The name of any administration with which an agreement has been concluded to exceed the limits prescribed in these Regulations and the contents of such agreement.

APPENDIX 1A

MOD

Spa

Notices Relating to Space Radiocommunication and Radioastronomy Stations

(See Article 9A)

Section A. General Instructions

- 1. A separate notice shall be sent to the International Frequency Registration Board for notifying:
 - each new frequency assignment,
 - any change in the characteristics of a frequency assignment recorded in the Master International Frequency Register (hereinafter called the *Master Register*),
 - any total deletion of a frequency assignment recorded in the Master Register.
- 2. When submitting notices under No. 639BA for earth and space transmitting assignments and under No. 639BB for space and earth receiving assignments, separate notice shall be submitted to the Board for each assignment to an earth or space station. In the case of a passive satellite system, only earth transmitting and receiving assignments shall be notified.
- 3. In the case of a satellite system employing multiple space stations

with the same general characteristics, a separate notice shall be submitted for each space station:

- when it is aboard a geostationary satellite, or
- when it is aboard a non-geostationary satellite except when a number of satellites have the same radio frequency characteristics and orbital characteristics (excluding the ascending node

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position). In the latter case, one notice covering all such space stations may be submitted.

- 4. The following basic information shall be shown on the notice:
 - a) the serial number of the notice and the date on which the notice is sent to the Board;
 - b) the name of the notifying administration;
 - c) sufficient data to identify the particular satellite network in which the earth or space station will operate;
 - d) whether the notice reflects:
 - (1) the first use of a frequency by a station,
 - (2) a change in the characteristics of a frequency assignment recorded in the Master Register (indicate whether the change is a replacement, addition or deletion of existing characteristics), or
 - (3) a deletion of an assignment in all of its notified characteristics;
 - e) reference to the weekly circular providing the advance publication information required in accordance with No. 639AA;
 - f) basic characteristics as outlined in Section B, C, D, E, or F as appropriate;
 - g) any other information which the administration considers to be relevant, e.g. any factors taken into account when applying Appendix 28 for determination of the co-ordination area and also an indication that the assignment concerned would be operating in accordance with No. 115, information concerning the use of the notified frequency if such use is restricted, or, in the case of notices pertaining to space stations, if the transmissions of the station are to be permanently switched off after a certain period.

Section B. Basic Characteristics to be Furnished in Notices relating to Frequencies used by Earth Stations for Transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in kHz up to 30000 kHz inclusive, and in MHz above 30000 kHz (see No. 85)

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. 89)

Item 3 Date of bringing into use

- a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of bringing the frequency assignment into use.
- b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in *Item 4 a*), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity and location of the transmitting earth station

- a) Indicate the name by which the station is known or the name of the locality in which it is situated.
- b) Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.
- c) Indicate the geographical co-ordinates (in degrees and minutes) of the transmitter site.

Item 5 Station(s) with which communication is to be established

Identify the associated receiving space station(s) by reference to the notification thereof or in any other appropriate manner, or,

in the case of a passive satellite, the identity of the satellite and the location of the receiving earth station(s).

Item 6 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 7 Class of emission, necessary bandwidth and description of transmission
 - a) Indicate the class of emission of the assignment.
 - b) 1 Indicate the carrier frequency or frequencies of the emission(s).
 - $c)^1$ Indicate for each carrier, the class of emission, necessary bandwidth and description of transmission, in accordance with Article 2 and Appendix 5.

Item 8 Power characteristics of the transmission

- $a)^1$ Indicate for each carrier, the peak power supplied to the input of the antenna.
- b) Indicate the total peak power and the maximum power density per Hz supplied to the input of the antenna averaged over the worst 4 kHz band for carriers below 15 GHz, or averaged over the worst 1 MHz band for carriers above 15 GHz.

Item 9 Transmitting antenna characteristics

- a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see No. 100).
- b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

- c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for co-ordination.
- d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.
- e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation.
- f) Indicate in degrees, clockwise from True North, the planned range of operating azimuthal angles for the direction of maximum radiation.
- g) ¹ Indicate the type of polarization of the transmitted wave in the direction of maximum radiation; also indicate the sense in the case of circular polarization and the plane in the case of linear polarization.
- h) Indicate the altitude (metres) of the antenna above mean sea level

Item 101 Modulation characteristics

For each carrier, according to the nature of the signal modulating the carrier and the type of modulation, indicate the following characteristics:

a) Carrier frequency modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband: indicate the lowest and highest frequencies of the baseband and the r.m.s.

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

frequency deviation of the test tone as a function of baseband frequency.

- b) Carrier frequency modulated by a television signal; indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristic and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals.
- c) Carrier phase-shift modulated by a pulse code modulation signal (PCM/PSK); indicate the bit rate and the number of phases.
- d) Amplitude modulated carrier (including single sideband): indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used.
- e) For all other types of modulation, provide such particulars as may be useful for an interference study.
- f) For any type of modulation as applicable indicate the characteristics of energy dispersal.

Item 11 Maximum hours of operation

Indicate in G.M.T. the maximum hours of operation on the frequency of each carrier.

Item 12 Co-ordination

Give the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance with Nos. 639AJ and 639AN and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 13 Agreements

Give also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 14 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic address of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section C. Basic Characteristics to be furnished in Notices relating to Frequencies to be received by Earth Stations

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz. (See No. 85).

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. 89).

Item 3 Date of bringing into use

- a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.
- b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a

change in *Item 4a*)), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity and location of the receiving earth station

- a) Indicate the name by which the receiving earth station is known or the name of the locality in which it is situated.
- b) Indicate the country in which the receiving earth station is located. Symbols from the Preface to the International Frequency List should be used.
- c) Indicate the geographical co-ordinates (in degrees and minutes) of the receiver site.

Item 5 Station(s) with which communication is to be established

Identify the associated transmitting space station(s) by reference to the notification thereof or in any other appropriate manner, or, in the case of a passive satellite, the identity of the satellite(s) and the associated transmitting earth station(s).

Item 6 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

Item 7 Class of emission, necessary bandwidth and description of the transmission to be received

- a) Indicate the class of emission of the assignment to be received.
- b) 1 Indicate the carrier frequency or frequencies to be received.

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

c) ¹ Indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission, in accordance with Article 2 and Appendix 5.

Item 8 Earth station receiving antenna characteristics

- a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see No. 100).
- b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).
- c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for coordination.
- d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.
- e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation.
- f) Indicate in degrees, clockwise, from True North, the planned range of operating azimuthal angles for the direction of maximum radiation.
- g) Indicate the altitude (metres) of the antenna above mean sea level.

Item 9 Noise temperature

Indicate the lowest equivalent satellite link noise temperature in degrees Kelvin (see No. 103A) under "quiet sky conditions". This value shall be indicated for the nominal value of the angle of

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

elevation when the associated transmitting station is aboard a geostationary satellite and, in other cases, for the minimum value of angle of elevation.

Item 10 Maximum hours of reception

Indicate in G.M.T. the maximum hours of reception of the frequency of each carrier.

Item 11 Co-ordination

Give the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance with Nos. 639AJ and 639AN and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 12 Agreements

Give also, if appropriate, the name of any administration with which agreement has been concluded to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 13 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

Section D. Basic Characteristics to be furnished in Notices relating to Frequencies used by Space Stations for transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz (see

No. 85). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. 89).

Item 3 Date of bringing into use

- a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of bringing the frequency assignment into use.
- b) Whenever the assignment is changed in any of its basic characteristics as shown in this Section (except in the case of a change in *Item* 4), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity of the space station(s)

Indicate the identity of the space station(s).

Item 5 Orbital information

- a) In the case of a space station aboard a geostationary satellite indicate the nominal geographical longitude on the geostationary satellite orbit and the longitudinal and inclination tolerances. Indicate also:
- (1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
- (2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and

(3) in the event that the arc defined in paragraph (2) above is less than the arc defined in paragraph (1) above, provide the reasons therefor.

Note: The arcs specified in (1) and (2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.

b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period, the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Service area

Indicate the service area or areas on the Earth or the name of the locality and country in which the associated receiving station(s) is (are) located.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 8 Class of emission, necessary bandwidth and description of transmission
 - a) Indicate the class of emission of the assignment.
 - b) 1 Indicate the carrier frequency or frequencies.
 - $c)^{-1}$ Indicate, for each carrier, the class of emission, necessary bandwidth and description of transmission, in accordance with Article 2 and Appendix 5.

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 9 Power characteristics of the transmission

- a) ¹ Indicate for each carrier the peak power supplied to the input of the antenna.
- b) Indicate the total peak power and the maximum power density per cycle per second input of the antenna averaged over the worst 4 kHz band for carriers below 15 GHz or averaged over the worst 1 MHz band for carriers above 15 GHz.

Item 10 Space station transmitting antenna characteristics For each service area:

- a) In the case of a space station aboard a geostationary satellite, indicate the gain of the space station transmitting antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated.
- b) In the case of a space station aboard a non-geostationary satellite, indicate the isotropic gain of the space station transmitting antenna in the main direction of radiation and indicate the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of radiation as a reference.
- $c)^{\ 1}$ Indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization; also indicate the worst case axial ratio in the half power beamwidth.
- d) Indicate for a geostationary satellite, the pointing accuracy of the antenna.

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 111 Modulation characteristics

For each carrier, according to the nature of the signal modulating carrier and the type of modulation, indicate the following characteristics:

- a) Carrier frequency modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband: indicate the lowest and highest frequencies of the baseband and the r.m.s. frequency deviation of the test tone as a function of baseband frequency.
- b) Carrier frequency modulated by a television signal: indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristics and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals.
- c) Carrier phase-shift-modulated by a pulse code modulation signal (PCM/PSK): indicate the bit rate and the number of phases.
- d) Amplitude modulated carrier (including single sideband): indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used.
- e) For all other types of modulation, provide such particulars as may be useful for an interference study.
- f) For any type of modulation as applicable, indicate the characteristics of energy dispersal.

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 12 Maximum hours of operation

Indicate in G.M.T. the maximum hours of operation on the frequency of each carrier.

Item 13 Co-ordination

Give the name of any administration or group of administrations with which the use of the space system to which the space station belongs has been successfully co-ordinated in accordance with No. 639AJ.

Item 14 Agreements

Give also, if appropriate, the name of any administration with which agreement has been concluded to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 15 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section E. Basic Characteristics to be furnished in Notices relating to Frequencies to be received by Space Stations

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz (see No. 85). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. 89).

Item 3 Date of bringing into use

- a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.
- b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in *Item* 4), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity of the receiving space station(s) Indicate the identity of the receiving space station(s).

Item 5 Orbital information

- a) In the case of a space station aboard a geostationary satellite, indicate the planned nominal geographical longitude on the geostationary satellite orbit and the planned longitudinal and inclination tolerances. Indicate also:
 - (1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas; and
 - (2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and
 - (3) in the event that the arc defined in paragraph (2) above is less than the arc defined in paragraph (1) above, provide the reasons therefor.

Note: The arcs specified in (1) and (2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.

b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period and the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Associated transmitting earth station(s)

Identify the associated transmitting earth station(s) by reference to the notification thereof or in any other appropriate manner.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

- Item 8 Class of emission, necessary bandwidth and description of the transmission(s) to be received
 - a) Indicate the class of emission of the assignment to be received.
 - b) 1 Indicate the carrier frequency or frequencies of the transmission(s) to be received.
 - $c)^{\,1}$ Indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission(s) to be received, in accordance with Article 2 and Appendix 5.

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 9 Space station receiving antenna characteristics

For each receiving beam:

- a) In the case of a space station aboard a geostationary satellite, indicate the gain of the space station receiving antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated.
- b) In the case of a space station aboard a non-geostationary satellite, indicate the isotropic gain of the space station receiving antenna in the main direction of radiation and indicate the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of radiation as a reference.
- c) Indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization, also indicate the worst case axial ratio in the half power beamwidth.
- d) Indicate, for a geostationary satellite, the pointing accuracy capability of the antenna.

Item 10 Noise temperature

Indicate the total receiving system noise temperature (°K) at the input of the space station receiver.

Item 11 Maximum hours of reception

Indicate in G.M.T. the maximum hours of reception of the frequency of each carrier.

¹ This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 12 Co-ordination

Give the name of any administration or group of administrations with which the use of the space system to which the space station belongs has been successfully co-ordinated in accordance with No. 639AJ.

Item 13 Agreements

Give also, if appropriate, the name of any administration with which agreement has been conducted to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 14 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

Section F. Basic Characteristics to be furnished in Notices relating to Frequencies to be received by Radio Astronomy Stations

Item 1 Observed frequency

Indicate the centre of the frequency band observed, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz.

Item 2 Date of bringing into use

- a) Indicate the date (actual or foreseen, as appropriate) when reception of the frequency band begins.
- b) Whenever there is a change in any of the basic characteristics, as shown in this Section (except in the case of a change in *Item 3b)*), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 3 Name and location of the station

- a) Indicate the letters "RA".
- b) Indicate the name by which the station is known or the name of the locality in which it is situated or both.
- c) Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.
- d) Indicate the goegraphical co-ordinates (in degrees and minutes) of the station site.

Item 4 Bandwidth

Indicate the width of the frequency band observed by the station.

Item 5 Antenna characteristics

Indicate the antenna type and dimensions, effective area and angular coverage in azimuth and elevation.

Item 6 Maximum hours of reception

Indicate in G.M.T. the maximum hours of reception of the frequency band shown in *Item* 1.

Item 7 Noise temperature

Indicate the over-all receiving system noise temperature (°K).

Item 8 Class of observations

Indicate the class of observations to be taken on the frequency band shown in *Item* 1. Class A observations are those in which the sensitivity of the equipment is not a primary factor. Class B

observations are those of such a nature that they can be made only with advanced low-noise receivers using the best techniques.

Item 9 Operating administration or company

Indicate the identity of the operating administration or company and the postal and telegraphic addresses of the administration to which communication should be sent on urgent matters regarding interference and question referring to the technical operation of stations (see Article 15).

SCITON (G): FORM OF NOTICE (EARTH STATION)

FORM OF NOTICE* FOR USE WHEN NOTIFYING TO THE INTERNATIONAL FREQUENCY REGISTRATION BOARD A FREQUENCY ASSIGNMENT OR A CHANGE TO AN ASSIGNMENT RECORDED IN THE MASTER INTERNATIONAL FREQUENCY REGISTER

(SEE ARTICLE 9A)

Notifying administration k M 1 Assigned frequency 2 Assigned frequency barkHz 3 Date of bringing into use	Hz d in		dl) New assig	As	ange			(d3) De ass	(Section I (Section C	an			(c) Id	ate	lite network		. 639AA
Station(s) with which communication is established	Class of station and nature of service performed	Class of emission of assignment	Carrier frequency (frequencies) **	Class of emission, necessary bandwidth and description of transmission **	Peak power **	Total peak power	Maximum power sit density	6.(L) Isotropic gain	Half power beam-	characock Winimum angle of Second Sec	teristics	** Polarization	Altitude (m) 8g(R) 9h(T)	Modulation character-istics	Lowest equivalent satellite link noise temperature	Maximum hours of operation on each carrier (G.M.T.)	Supplementary information (g)
5 Ba(R), 14a(T)			=		Other inf			20(1)	74(1)	74.1)	300	'5(4)					

13b(R), 14b(T)

* The actual size of the notice is a matter for individual administra-

Name and address of administration

FORM OF NOTICE* FOR USE WHEN NOTIFYING TO THE INTERNATIONAL FREQUENCY REGISTRATION BOARD A FREQUENCY ASSIGNMENT OR A CHANGE TO AN ASSIGNMENT RECORDED IN THE MASTER INTERNATIONAL FREQUENCY REGISTER

(b)	Space station (d1) New assign	receiving	(section D of Appendix (Section E of Appendix (d2) Change	(d3) Deletion of assignment	an	(a) (c) .	Notice No Date dentity of sat						
2 Assigned frequency band in kHz 3 Date of bringing into use	Name of spa 5 Orbital infor	ice station										1.	or F.R.B.	
	Satellite's r tolerance Longitu	5 a) +	de and longitude Tolerance	Angle of inclina tolerance	tion or orbit a	nd incli	ination	space	of object in	and perigr	of apogee ee b)	Number	of space stations 5b)	
Service area or station(s) with which communication is established	Class of station and nature of service performed egglement assignment	Carrier frequency frequencies)	Class of emissic bandwidth and of transm **	description	Peak power **	Total peak power	Maximum power density	Polarization ** 9c(R) 10c(T)	Geo- stationary satellite pointing accuracy 9d(R) 10d(T)	Modulation charac teristics	Receiving system system noise temper- ature	Maximum hours of operation to each service area or station (G.M.T.)	Supplementai	ry information (g)

14a(R), 15a(T) 14b(R), 15b(T)

Operating administration or company

Name and address of administration

- * The actual size of the notice is a matter for individual administra-
- ** This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Other information (g)

12(R), 13(T) COORD/ 13(R), 14(T) Agreement/

NOTE: For antenna characteristics [10a(T) or 10b(T) and 9a(R) or 9b(R)] attach the relevant information to this form.

Information on visible arc, service arc and reasons if service arc is less than visible are to be attached (5a.1, 5a.2, 5a.3).

ADD

APPENDIX 1B

Spa

Advance Publication Information to be furnished for a Satellite Network Section A. General Instructions

- Item 1 Information shall be provided separately for each satellite network.
- Item 2 Information to be furnished for each satellite network shall include general characteristics (Section B), and, as applicable, characteristics in the Earth-to-space direction (Section C), characteristics in the space-to-earth direction (Section D), and characteristics for space-to-space relay (Section E).

Section B. General characteristics to be furnished for a satellite network.

Item 1 Identity of the satellite network

Clearly identity, of the satellite network and, if applicable, identify the satellite system of which it will form a part.

Item 2 Date of bringing into use

Indicate the date by which the satellite network is expected to be brought initially into use.

Item 3 Administration or group of administrations submitting the advance information

B12-25

Give the name of the administration or the names of the administrations in the group submitting the advance information on the satellite network and the postal and telegraphic addresses of the administration(s) to which any communication should be sent.

Item 4 Orbital information relating to the space station(s)

- a) In the case of a space station aboard a geostationary satellite, give the planned nominal geographical longitude on the geostationary satellite orbit and the planned longitudinal and inclination tolerances. Indicate also:
 - the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the earth's surface, from its associated earth stations or service areas;
 - 2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and
 - 3) in the event that the arc defined in paragraph 2) above is less than the arc defined in paragraph 1) above, provide the reasons therefor;
 - Note: The arcs specified in 1) and 2) will be indicated by the geographical longitude of the projection of the extremes of these arcs on the surface of the earth.
- b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period, the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used having the same characteristics.

Section C. Characteristics of the Satellite Network in the Earth-to-Space direction

Item 1 Earth-to-space service area(s)

Indicate the service area(s) on the Earth associated with each receiving antenna of the space station.

Item 2 Class of stations and nature of service

For each Earth-to-space service area, indicate the class of the stations in the satellite network and the nature of the service to be performed, using the symbols shown in Appendix 10.

Item 3 Frequency range

For each Earth-to-space service area, indicate the frequency range which the carriers will be located.

Item 4 Power characteristics of the transmitted wave

- a) For each Earth-to-space service area indicate the maximum spectral power density (W/Hz) to be delivered to the antenna of the transmitting earth stations (the bandwidth over which is averaged depends on the nature of the service concerned).
- b) If available, indicate, for each Earth-to-space service area, the actual radiation pattern (relative to isotropic) of the transmitting earth station antenna having the highest offbeam equivalent isotropically radiated spectral power density.

Item 5 Characterisites of space station receiving antennae

For each Earth-to-space service area:

a) in the case of a space station aboard a geostationary satellite, indicate the estimated gain of the space station receiving

antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated:

b) in the case of a space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station receiving antenna in the main direction of reception and indicate the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of reception as a reference.

Item 6 Noise temperature of the receiving space station

For each Earth-to-space service area, when other than a simple frequency changing transponder is used aboard the space station indicate the lowest total receiving system noise temperature.

Section D. Characteristics of the Satellite Network in the Space-to-Earth Direction

Item 1 Space-to-Earth service area(s)

Indicate the service area(s) on the Earth associated with each transmitting antenna of the space station.

Item 2 Class of stations and nature of service

For each space-to-Earth service area, indicate the class of the stations in the satellite network and the nature of the service to be performed, using the symbols shown in Appendix 10.

Item 3 Frequency range

For each space-to-Earth service area, indicate the frequency range within which the carriers will be located.

Item 4 Power characteristics of the transmission

For each space-to-Earth service area, indicate the maximum spectral power density (W/Hz) to be delivered to the transmitting antenna of the space station (the bandwidth over which this is averaged depends on the nature of the service concerned).

Item 5 Characteristics of space station transmitting antennae

For each space-to-Earth service area:

- a) in the case of a space station aborad a gesotationary satellite, indicate the estimated gain of the space station transmitting antenna by means of gain contours plotted on a map of the earth's surface. The isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated.
- b) in the case of space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station transmitting antenna in the main direction of transmission and indicate the antenna radiation pattern in those directions which can intersect with the earth's surface, taking the gain in the main direction of transmission as a reference

Item 6 Characteristics of receiving earth stations

a) For each space-to-Earth service area, when other than a simple frequency changing transponder is used aboard the space station, indicate the lowest total receiving system noise temperature of the earth stations.

For each space-to-Earth service area and for each projected usage 1, when simple frequency changing transponders

¹ A different usage will be considered to take place when different types of carriers are employed (different by virtue of maximum power spectral density), or when different types of receiving earth stations are employed (different by virtue of receiving antenna gain).

are used on the space station, indicate the lowest equivalent satellite link noise temperature and the associated value of transmission gain evaluated from the output of the receiving antenna of the space station to the output of the receiving antenna of the earth station. For each projected usage, indicate also the receiving antenna(e) of the space station to which each simple frequency changing transponder will be connected.

b) If available, indicate for each space-to-Earth service area the actual radiation pattern (relative to isotropic) of the receiving earth station antenna having the highest off beam level. When simple frequency changing transponders are used on the space station, indicate also, if available, the pattern associated with each equivalent satellite link noise temperature indicated above.

Section E. Characteristics to be furnished for Space-to-Space Relay

Where the satellite network is connected to one or more satellite networks by means of space-to-space relay, indicate the following:

- a) identity or identities of the other satellite network(s) to which the satellite network is connected;
- b) transmit and receive frequency bands;
- c) classes of emission;
- d) nominal equivalent isotropically radiated power(s) on the beam axis.

INTERNATIONAL TELECOMMUNICATION UNION

SPACE CONFERENCE

Geneva, 1971

Addendum No. 1 to Document No. 383-E 15 July 1971 Original: English

MEMORANDUM BY THE SECRETARIAT

As agreed at the Eighth Plenary Meeting, the following foot-note relative to the band 435-438 MHz should be included in the draft revision of Article 5:

"320A In the band 435-438 MHz, the Amateur Satellite Service may be authorized, on condition that harmful interference shall not be caused to other services operating in accordance with the Table of Frequency Allocations. Administrations authorizing such use shall ensure that any harmful interference caused by emissions from amateur satellites is immediately eliminated in accordance with the provisions of No. 1567 bis."



INTERNATIONAL TELECOMMUNICATION UNION

Ε

SPACE CONFERENCE

Geneva, 1971

Document No. 383-E 15 July 1971

PLENARY MEETING (FIRST READING)

B. 13

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
5	338 362 374		Table of Frequency Allocations	ţ=
	375 385			-2

François JoB
Chairman of the Editorial
Committee

Annex: Pages B13/01-59



/ARTICLE 5_7

kHz

Allocation to Services									
Region 1	Region 2	Region	3						
	1 800-2 000								
NOC	F M	MATEUR 'IXED MOBILE except aeronau mobile AADIONAVIGATION	ıtical						
	1	.98							

SUP 199 SUP 199.1

kHz

Region 1	Region 2	Region 3					
2 170-2 194							
MOBILE (distress and calling)							
	201 201A						

ADD 201A

Frequencies 2 182 kHz, 3 023.5 kHz, 5 680 kHz, 8 364 kHz, 121.5 MHz, 156.8 MHz and 243 MHz may also be used, in accordance with the procedures in force, for search and rescue operations concerning manned space Vehicles.

The same applies to frequencies 10 003 kHz $_{
m LHz}$ 14 993 kHz and 19 993 kHz, but in these cases emissions must be confined in a band of \pm 3 kHz about the frequency.

kHz

	All	ocation to Serv	vices	
Region 1	n E	Region 2		Region 3
2 300-2 498	NOC	2 300–2 495		NOC
		(6)		
-1	*			
2 498–2 502		2 495- 2 505		
STANDARD FREQUENCY			STANDARI	FREQUENCY
203 203A			203 2034	ı
2 502-2 625	NOC	2 505–2 625		NOC

ADD 203A

The bands 2 501-2 502 kHz, 5 003-5 005 kHz, 10 003-10 005 kHz, 15 005-15 010 kHz, 19 990-19 995 kHz, 20 005-20 010 kHz and 25 005-25 010 kHz are also allocated, on a secondary basis, to the space research service.

SUP 204

kHz

2 850-3 025	
1 1 20	AERONAUTICAL MOBILE (R)
	201A
4 995-5 005	
	STANDARD FREQUENCY
	203A 210

kHz

	Allocation to Services	
Region 1	Region 2	Region 3
5 480-5 680		
	AERONAUTICAL MOBILE (R)	
	201A	
5 680-5 730		
	AERONAUTICAL MOBILE (OR)	
	201A	
7 000-7 100	AMATEUR AMATEUR-SATELLITE	
8 195-8 815	MARITIME MOBILE	
	201A 213	
9 995-10 005	STANDARD FREQUENCY	
	201A 203A 214	

SUP 215

14 000-14 350

AMATEUR

211A 218

ADD 211A

The band 14 000-14 250 kHz, is also allocated to the amateur-satellite service.

kHz

Region 1	Region 2 Region 3
14 990–15 010	
	STANDARD FREQUENCY
	201A 203A 219
15 762-15 768	
	FIXED
18 030-18 036	
	FIXED

SUP 215A

18 036-19 990
FIXED
221B

ADD 221B

The band 18 052-18 068 kHz is also allocated on a secondary basis to the space research service.

19 990-20 010
STANDARD FREQUENCY
201A 203A 220

SUP 221 SUP 221A

kHz

Allocation to Services								
Region 1	Region 2	Region 3						
21 000-21 450								

21 850-21 870			
* * * * * * * * * * * * * * * * * * *	15	RADIO ASTRONOMY	
21 870-22 000			ST. ST.
		AERONAUTICAL FIXED AERONAUTICAL MOBILE (R)	

ADD 221C

In Bulgaria, Hungary, Poland, Roumania, Czechoslavakia and the U.S.S.R. the band 21 850-21 870 kHz is also allocated to the aeronautical fixed and the aeronautical mobile (R) services. The administrations concerned will take all practicable steps to protect radio astronomy observations from harmful interference.

23 350-24 990		
	FIXED LAND MOBILE	
	222 222A	

ADD 222A

In Argentina the band 24 528-24 538 $_{\rm kHz}$ may be used by the space research service, subject to agreement between the administrations concerned and those having services operating in accordance with the Table, which may be affected.

kHz

	Allocation to Services	
Region 1	Region 2	egion 3
24 990-25 010		
	STANDARD FREQUENCY	
	203A 223	

MHz

Region 1	Region 2	Region 3
28-29.7		
40	AMATEUR AMATEUR-SATELLITE	
		11.1%
29.7-30.005	FIXED 228 2 MOBILE	229 231 232
30.005-30.010		
	SPACE OPERATION (Sate	ellite identifi- ion)
	FIXED 228 229 231 MOBILE SPACE RESEARCH	,
30.010-37.750		
) (H)	FIXED 228 229 23 MOBILE	0 231

ADD 233A

In Argentina the bands 36.65 to 36.85 MHz, 41.15 to 41.35 MHz and 45.65 to 45.85 MHz, and in Argentina and Brazil the band 170.55 to 170.95 MHz, are allocated to the radio astronomy service and no assignments shall be made to the fixed and mobile services in these bands.

233A

MHz

	Allocation to Services	
Region 1	Region 2	Region 3
37 . 75 - 38 . 25	NAME	
	FIXED 228 229 231 MOBILE Radio Astronomy	
	233AA	

SUP 233

ADD 233AA

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

38.25-41		
	FIXED MOBILE	228 229 230 231
	235 236	236A

235

The band 39.986-40.020 MHz is also allocated on a secondary basis to the space research service.

ADD 236A

The band 40.980-41.015 MHz is also allocated on a secondary basis to the space research service, in particular for measurements of the differential Faraday effect.

MHz

Allocation to Services		
Region 1	Region 2	Region 3
41–47	41–50	41–44
BROADCASTING Fixed 228 237	FIXED 228 231 237 MOBILE	FIXED 228 237 MOBEL 236A
Mobile	- 1	44–50
236A	233A 236A	NOC
238 239 240 241		e

		80-87
NOC	NOC	FIXED MOBILE
		254 255 256 257 261 266

MOD 267

In New Zealand, the bands $87\text{--}88~\mathrm{MHz}$ and $94\text{--}108~\mathrm{MHz}$ are allocated to the fixed and mobile services.

Allocation to Services		
Region 1	Region 2	Region 3
117.975-132		
	AERONAUTICAL MOBILE (R)	
	201A 273 273A	
132-136		
	AERONAUTICAL MOBILE (R)	
	273A 274 274A 274B	275

MOD 274

In Bulgaria, Japan, Poland, Portugal, Portuguese Oversea Provinces in Region 1 south of the equator, Roumania, Sweden, Czechoslovakia and the U.S.S.R., existing stations in the aeronautical mobile (OR) service will continue to operate for an unspecified period, on a primary basis.

ADD 274A

In Regions 2 and 3, stations of the fixed and mobile services may continue to use this band until 1 January 1976.

Until that date, frequency assignments to the aeronautical mobile (R) service shall be co-ordinated between the administrations concerned and shall be protected from harmful interference.

ADD 274B

In Cuba and Mexico, the band 132-136 MHz is also allocated to the fixed and mobile services.

MOD 275

In Burundi, Ethiopia, Gambia, Malawi, Nigeria, Portuguese Oversea Provinces in Region 1 south of the equator, Rhodesia, Rep. of South Africa, Rwanda, and Sierra Leone, the band 138-144 MHz is allocated to the fixed and mobile services. In these countries, existing stations in the fixed and mobile services may continue to operate in the band 132-136 MHz until 1 January 1976.

SUP 276

SUP 277

Allocation to Services		
Region 1	Region 2	Region 3
136–137	SPACE RESEARCH (Space-to-Earth) 281A 281AA	•

MOD 278

In New Zealand the band 138-144 MHz is allocated to the aeronautical mobile (OR) service.

SUP 279

ADD 281AA

In Bulgaria, China, Cyprus, Korea, Cuba, Spain, Ethiopia, Ghana, Hungary, India, Indonesia, Iran, Iraq, Kuwait, Pakistan, Philippines, Poland, Portugal, the United Arab Republic, Roumania, Senegal, Syria, Czechoslovakia and the U.S.S.R., the band 136-137 MHz is also allocated to the fixed and mobile services.

SUP 281B

Allocation to Services		
Region 1	Region 2	Region 3
137-138		
Y-	SPACE OPERATION (Telemetering and track METEOROLOGICAL-SATELLITE SPACE RESEARCH (Space-to-Earth)	
	275A 279A 281C 281E	

MOD 281C

In Algeria, Bulgaria, Hungary, Kuwait, Lebanon, Poland, the United Arab Republic, Roumania, Czechoslavakia, the U.S.S.R. and in Yugoslavia, the band 137-138 MHz is also allocated to the aeronautical mobile (OR) service.

SUP 281D

MOD 281E

In Malaysia, Pakistan and the Philippines, the band 137-138 MHz is also allocated to the fixed and mobile services.

SUP 281F

MHz

Allocation to Services		
Region 1	Region 2	Region 3
138-143.6 AERONAUTICAL MOBILE (OR)	138-143.6 FIXED MOBILE Radiolocation * Space Research (Space-to- Earth)	138-143.6 FIXED MOBILE Space Research (Space-to- Earth)
275 281G 282 282A 283	283▲	278 279A 284

[* Radiolocation in Region 2 is a permitted service.]
(RR 137 b)

ADD 281G

In the F.R. of Germany, the band 138-140 MHz is also allocated on a secondary basis to the space research service (space-to-Earth).

ADD 283A

In Argentina, the frequency 138.540 MHz + 7.5 kHz and the band 143.6-143.65 MHz may be used by the space research service (telecommand), subject to agreement between the administrations concerned and those having services operating in accordance with the Tatle, which may be affected.

 MHz_{-}

Allocation to Services		
Region 1	Region 2	Region 3
143.6-143.65	143.6-143.65	143.6-143.65
AERONAUTICAL MOBILE (OR) SPACE RESEARCH (Space-to-Earth)	FIXED MOBILE SPACE RESEARCH (Space-to-Earth) Radiolocation*	FIXED MOBILE SPACE RESEARCH (Space-to- Earth)
275 283	283▲	278 279A 284
143.65-144	143.65-144	143.65-144
AERONAUTICAL MOBILE (OR)	FIXED MOBILE Radiolocation* Space Research (Space-to-Earth)	FIXED MOBILE Space Research (Space-to- Earth)
275 282A 283	×	278 279A 284

[* Radiolocation in Region 2 is a permitted service. RR 1376]

ADD 282A

In Belgium, France, Israel, Italy, Netherlands and the United Kingdom the bands 138-143.6 MHz and 143.65-144 MHz are also allocated on a secondary basis to the space research service (space-to-Earth).

SUP 282

MOD 283

In Austria, Denmark, Greece, Norway, Netherlands, Portugal, F.R. of Germany, United Kingdom, Sweden, Switzerland and Turkey, the band 138-144 MHz is also allocated to the fixed and mobile, except aeronautical mobile (R) services.

MHz

Allocation to Services	
Region 2	Region 3
+	
amateur Amateur-Satellite	
	Region 2

SUP 284A

146-149.9	146-148	NOC
FIXED MOBILE except aeronautical mobile (R)		
	148-149.9	NOC
285 285∆		

MOD 285A

The band 148-149.9 MHz may be authorized for space telecommand, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected. The bandwidth of an individual transmission shall not exceed \pm 15 kHz.

 \mathtt{MHz}

Allocation to Services				
Region 1 Region 2 Region 3				
149.9-150.05				
RADIONAVIGATION—SATELLITE				
285B	285C		$\hat{x} = \hat{x}_{_{\parallel}} .$	

MOD 285B

In Austria, Bulgaria, Cuba, Hungary, Iran, Kuwait, Pakistan, Poland, the United Arab Republic, Roumania, and Yugoslavia, the band 149.90-150.05 MHz is also allocated to fixed and mobile services (see Recommendation No. Spa 8).

ADD 2850

Emissions of the radionavigation-satellite service in the bands 149.90-150.05 MHz and 399.90-400.05 MHz may also be used by receiving earth stations of the space research service.

Allocation to Services				
Region 1	Region 2	Region 3		
150.05-151	150.05-174	150.05-170		
FIXED MOBILE except aeronautical mobile (R) RADIO ASTRONOMY	FIXED MOBILE	FIXED MOBILE		
285 286 286A	•			
151-153				
FIXED MOBILE except aeronautical mobile (R) RADIO ASTRONOMY Meteorological Aids / Permitted Service /	•			
285 286 28 6 A				
153-154				
FIXED MOBILE except aeronautical mobile (R) Meteorological Aids / Permitted Service/				
285 286A				
154-156				
FIXED MOBILE except aeronautical mobile (R)				
285		201A 287 287A 290		
156–174		170-174 NCC		
FIXED MOBILE except aeronautical mobile				
201A 285 287 287A 288	201A 233A 287 287A			

MOD 286

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

ADD 287A

In the frequency bands designated for the maritime mobile service in accordance with Appendix 18 of the Radio Regulations, the use of satellite systems for safety and distress may be authorized on certain channels on an exclusive basis in the band 157.3125-157.4125 MHz for transmissions from ships to satellites and in the band 161.9125-162.0125 MHz for transmissions from satellites to ships. The date on which satellite systems may be brought into use shall not be earlier than 1 January 1976 (see Resolution No. Spa B).

MHz

Allocation to Services					
Region 1 Region 2 Region 3					
235–267					
	FIXED MOBILE				
	201A 305 305A 308A	309			
267-272					
	FIXED MOBILE Space Operation (Te	lemetering) 309A 309B			
-	308A				
272–273					
	SPACE OPERATION (Te FIXED MOBILE	lemetering) 309A			
	3 08A				
273-328.6					
	FIXED MOBILE				
	308A 310 310A				

ADD 305A

In New Zealand the band 235-239.5 $\rm MHz$ is also allocated to the aeronautical radionavigation service.

ADD 308A

The bands 240-328.6 MHz and 335.4-399.9 MHz may also be used by the mobile-satellite service. The use and development of this service shall be subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

MOD 310

Radio astronomy observations in the band 322-328.6 MHz are carried out in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in using this band.

ADD 310A

In India, the band 322-328.6 MHz is also allocated to the radio astronomy service.

MHz

Allocation to Services		
Region 1	Region 2	Region 3
328.6-335.4		,
	AERONAUTICAL RADIONAVIGAT	CION
	311	· .

MHz

Allocation to Services				
Region 1	Region 2	Region 3		
335.4-399.9	35.4–399.9			
	FIXED MOBILE			
	308A			
399.9-400.05	к ж			
	RADIONAVIGATION_SATE	LITE		
	285C 311A			

MOD 311A

In Bulgaria, Cuba, Greece, Hungary, Indonesia, Iran, Kuwait, Lebanon, the United Arab Republic, Syria and Yugoslavia, the band 399.9-400.05 MHz is also allocated to the fixed and mobile services (see Recommendation No. Spa 8).

400.05-400.15	
	STANDARD FREQUENCY SATELLITE
	312AB · 313 314
400.15-401	
	METEOROLOGICAL AIDS
ŭ ş	METEOROLOGICAL_SATELLITE (Maintenance telemetering)
	SPACE RESEARCH (Telemetering and tracking)
	313 314

SUP 312A

ADD 312AB

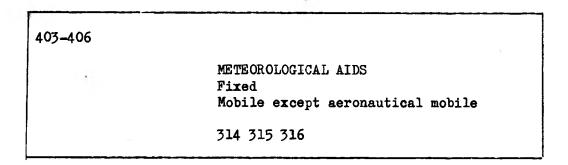
In this band the standard frequency is 400.1 MHz. Emissions must be confined in a band of \pm 25 kHz about this frequency.

MHz

Allocation to Services					
Region 1	Region 1 Region 2 Region 3				
401–402					
ă.	METEOROLOGICAL AIDS SPACE OPERATION (Telemetering) 315A				
	Fixed Meteorological-Satellite (Earth-to-space) Mobile except aeronautical mobile				
	314 315 315B 315C 316				
402-403					
	METEOROLOGICAL AIDS				
	Fixed Meteorological-Satellite (Earth-to-space) Mobile except aeronautical mobile				
314 315 3150 316					

ADD 3150

In the band 401-403 MHz, earth exploration—satellite applications, other than the meteorological—satellite service, may also be used for Earth-to-Space transmissions on condition that no harmful interference is caused to stations operating in accordance with the Table.



Allocation to Services				
Region 1 Region 2 Region 3				
406-406.1				
MOBILE -SATELLITE (Earth-to-space)				
314 317A 317B				

ADD 317A

This band is reserved solely for the use and development of emergency position-indicating radiobeacon (EPIRB) systems using space techniques.

ADD 317B

In Bulgaria, Cuba, Ethiopia, Hungary, Uganda, Poland, the United Arab Republic, Sweden, Syria, Tanzania, Czechoslovakia and in the U.S.S.R., the band 406-406.1 MHz is also allocated to the fixed and mobile except aeronautical mobile services.

406.1-410		
	FIXED MOBILE except aeronautical mobi	ile
	314 317	111
410-420		
	FIXED MOBILE except aeronautical mobile	ile
	314	

MOD 317

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

MHz

Allocation to Services				
Region 1		Region 2		Region 3
420-430	NOC	420-450		
	1,00			
430-440			RADIOLO	CATION
AMATEUR RADIOLOCATION	ī		Amateur	
318 319 319B	3 20 321 322			
440-450	NOC			
- 1-		h · ·		
		1	318 319A	319B 323 324

MOD 318

Radio altimeters may also be used until 31 December 1974 in the band 420-460 MHz. However, after this date, they may be authorized to continue to operate on a secondary basis except in the U.S.S.R. where they will continue to operate on a primary basis.

MOD 319A

The band 449.75-450.25 MHz may be used for space telecommand and space research (Earth-to-space), subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 319B

In France and the French Department of Guyana (Region 2) the frequency 434 MHz ± 0.25 MHz may be used for Space Operation (Earth-to-space) subject to agreement among the administrations concerned and those having services, operating in accordance with the Table, which may be affected.

MOD 322

In Denmark, Norway and Sweden, the bands $430-432~\mathrm{MHz}$ and $438-440~\mathrm{MHz}$ are also allocated to the fixed and mobile services.

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
460-470	9		
	FIXED MOBILE Meteorological-Satel (Space-to-Earth) 3	.lite 518A	
9.5	324C		

ADD 324C

Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in this band for space-to-earth transmissions on condition that no harmful interference is caused to stations operating in accordance with the Table.

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
470–582 NOC	470-890	470-585 NOC	
582-606	BROADCASTING		
BROADCASTING RADIONAVIGATION		585–610	
325 327 328 329		RADIONAVIGATION	
606 –7 90		329A 336 337	
BROADCASTING		610-890	
329 330 330A 331 332 332A	3	FIXED	
79 0– 8 9 0 NOC	:	MOBILE	
		BROADCASTING	
	325A 332 332A	329A 332 332A 338 339	
89 0- 942 NOC	890-942 NOC	890–942	
		FIXED	
		MOBILE	
		BROADCASTING _339B_7	
	,_,	Radiolocation	
		339 339A	

ADD 325A In Argentina, the band 602-608 MHz is allocated to the radio astronomy service.

SUP 326

ADD 329A In India, the band 608-614 MHz is also allocated to the radio astronomy service.

ADD 332A

Within the frequency band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting—satellite service, subject to agreement among the administrations concerned and those having services which may be affected / (see Articles 9 and 9A or Resolution ...) / Such stations shall not produce a power flux-density in excess of the value—129 dbW/m² (see Recommendation No. Spa DD) within the territories of other administrations without the consent of those administrations.

_ ADD 339B

In India, the band 845-935 MHz is also allocated for use in the experimentation of satellite broadcasting of television with frequency modulation including energy dispersal, subject to agreement with the administrations having services operating in accordance with the Table which may be affected.

For the protection of terrestrial television services, the power flux-density limit given in foot-note 332A will apply; and for the protection of fixed and mobile services operating in this band, the power flux-density limits as per Article 7, 470NI and 470MB will apply.

MOD 340

In Region 2, the frequency 915 MHz is designated for industrial, scientific and medical purposes. Emissions must be confined within the limits of \pm 13 MHz of that frequency. Radiocommunication services operating within these limits must accept any harmful interference that may be experienced from the operation of industrial, scientific and medical equipment.

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
1 350-1 400	1 350- 1 400		
FIXED			
MOBILE	RADIOLOCATIO	N	
RADIOLOCATION			
349 349A	349 349A		

ADD 349A

Radio astronomical observations on the Hydrogen line displaced towards lower frequencies are carried out in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in their future planning of the band 1 350-1 400 $\,\mathrm{MHz}_{2}$.

1 427-1 429	SPACE OPERATION (Telecommand)
	FIXED
7	MOBILE except aeronautical mobile

1 525-1 535 SPACE OPERATION (Telemetering) 350A	1 525-1 535 SPACE OPERATION (Telemetering) 350A	1 525-1 535 SPACE OPERATION (Telemetering) 350A
FIXED 350B Earth Exploration— Satellite	Earth Exploration- Satellite Fixed	FIXED 350B Earth Exploration— Satellite
Mobile except aeronautical mobile 3500	Mobile 350D	Mobile

MOD 350A

Space stations employing frequencies in the band 1 525-1 535 $\,\mathrm{MHz}$ for telemetering purposes may also transmit tracking signals in this band.

Allocation to Services			
Region 1	Reg	ion 2	Region 3
1 535-1 542.5			
	MARITIME M	OBILE_SATELL	ITE
	352 352D	352E	
1 542.5-1 543.5			=
		AL MOBILE (R OBILE—SATELL	
	352 3520	352F	
1 543.5-1 558.5			·
	AERONAUTIC	AL MOBILE (R)_satellite
	352 352D	352G	
1 558.5-1 636.5	· ·— ··		
	AERONAUTIC	AL RADIONAVIO	GATION
1	352 352A	352B 352D	352K
1 636.5-1 644			
	MARITIME MOBILE-SATELLITE		
	352 3 52D	352H	
1 644-1 645			
	AERONAUTICAL MOBILE (R)_SATELLITE MARITIME MOBILE_SATELLITE		
	352 352D	352I	
1 645-1 660		4	* - 1
	AERONAUTIC	AL MOBILE (R)	-satellite
	352 352D	352J	

MOD 352A

The bands 1 558.5-1 636.5 MHz, 4 200-4 400 MHz, 5 000-5 250 MHz and 15.4-15.7 GHz are reserved on a world-wide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities.

MOD 352B

The bands 1 558.5-1 636.5 MHz, 5 000-5 250 MHz and 15.4-15.7 GHz are also allocated to the aeronautical mobile (R) service for the use and development of systems using space radiocommunication techniques. Such use and development is subject to agreement and co-ordination among administrations concerned and those having services operating in accordance with the Table, which may be affected.

SUP 352C

ADD 352E

The use of this band is limited to transmissions from space stations to earth stations in the maritime mobile-satellite service for communication and/or radiodetermination purposes. Transmissions from coast stations directly to ship stations, or between ship stations, are also authorized when such transmissions are used to extend or supplement the satellite-to-ship links.

ADD 352F

The use of this band is limited to transmissions from space stations to earth stations in the aeronautical mobile (R) and maritime mobile-satellite services for communication and/or radiodetermination purposes. Transmissions from land stations directly to mobile stations, or between mobile stations, of the aeronautical mobile (R) and maritime mobile services, are also authorized. The utilization of this band is subject to prior operational co-ordination between the two services.

ADD 352G

The use of this band is limited to transmissions from space stations to earth stations in the aeronautical mobile (R) satellite service for communication and/or radiodetermination purposes. Transmissions from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

ADD 352H

The use of this band is limited to transmissions from earth stations in the maritime mobile-satellite service to space stations for communication and/or radiodetermination purposes. Transmissions from ship stations directly to coast stations, or between ship stations, are also authorized when such transmissions are used to extend and supplement the ship-to-satellite links.

ADD 352I

The use of this band is limited to transmissions from earth stations in the aeronautical mobile (R) and maritime mobile—satellite services to space stations for communication and/or radio—determination purposes. Transmissions from mobile stations directly to land stations, or between mobile stations, of the aeronautical mobile (R) and maritime mobile services, are also authorized. The utilization of this band is subject to prior operational co-ordination between the two services.

ADD 352J

The use of this band is limited to transmissions from earth stations in the aeronautical mobile (R)-satellite service to space stations for communication and/or radio-determination purposes. Transmissions from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement aircraft-to-satellite links.

ADD 352K

Radio astronomy observations on important spectral lines due to the hydroxyl radicle OH at frequencies 1 612.231 MHz and 1 720.530 MHz are carried out in a number of countries under national arrangements; the bands observed being 1 611.5-1 612.5 MHz and 1 720-1 721 MHz respectively. Administrations should bear in mind the needs of radio astronomy service in their future planning of the bands 1 558.5-1 636.5 MHz and 1 710-1 770 MHz.

MHz

Allocation to Services		
Region 1 Region 2 Region 3		
1 660-1 670		
	METEOROLOGICAL AIDS RADIO ASTRONOMY	
	353A 354 354A 354B	

SUP 353

MOD 353A

In view of the successful detection of two hydroxyl spectral lines in the regions of 1 665 MHz and 1 667 MHz by astronomers, administrations are urged to give all practicable protection in the band 1 660-1 670 MHz for future research in radio astronomy particularly by eliminating air-to-ground transmissions in the meteorological aids service in the band 1 664.4-1 668.4 MHz as soon as practicable.

MOD 354A

In Algeria, Bulgaria, Cuba, Hungary, Kuwait, Lebanon, Pakistan, Poland, the United Arab Republic, Roumania, Czechoslovakia, the U.S.S.R., and Yugoslavia, the bands 1 660-1 670 MHz and 1 690-1 700 MHz are also allocated to the fixed service and the mobile except aeronautical mobile, service.

MHz

Allocation to Services		
Region 1	Region 2	Region 3
1 670 − 1 690	METEOROLOGICAL AIDS FIXED METEOROLOGICAL SATELLITE 324A (Space-to-Earth) MOBILE except Aeronautical Mobile	
1 690-1 700	35 ⁴ 1 690-1 700	
METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-Earth)	METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-Earth)	
Fixed Mobile except aeronautical mobile		
324C 354A .	324C 354A 354C	

SUP 353

MHz

Allocation to Services			
Region 1 Region 2 Region 3		Region 3	
1 700-1 710	1 700-1 710	•	
FTXED SPACE RESEARCH (Space-to- Earth) Mobile		RESEARCH e—to—Earth)	
3'54D	354D		

ADD 354D

The band 1 700-1 700.2 MHz may be used, on a secondary basis, for the transmission from space stations on board satellites of frequencies harmonically related to those emitted in the bands 149.9-150.05 MHz and 399.9-400.05 MHz for the requirements of ionospheric investigation and geodesy.

SUP 355A

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
1 710-1 770	1 710-1 770		
FIXED Mobile		FIXED MOBILE	
352K 356	0	352K 356A	
1 770-1 790	1 770-1 790		
FIXED Meteorological— Satellite 356AA Mobile		FIXED MOBILE Meteorological— Satellite 356AA	
356	1 20 7	356A	
1 790-2 290	1 790-2 290		
FIXED Mobile		FIXED MOBILE	
356 356AB 356ABA 356AC		356A 356AB 356ABA	

MOD 356A

In Region 2, in Australia and Japan the band 1 750-1 850 MHz may also be used for Earth-to-space transmissions, and in Regions 2 and 3 the band 2 200-2 290 MHz may also be used for space-to-Earth transmissions, in the space research service subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 356AB

In Regions 2 and 3 and in Spain, in the band 2 025-2 120 MHz Earth-to-space transmissions in the earth exploration-satellite services may be authorized with equality of right to operate with stations of other space radiocommunication services in the band and subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 356ABA

In Region 2, Australia and Spain in the band 2 025-2 120 MHz and in Regions 1 and 3 in the band 2 110-2 120 MHz Earth-to-space transmissions in the space research service may be authorized with equality of right to operate with other space radiocommunication services in these bands, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 356AC

In Region 1, in the band 2 096-2 120 MHz, Earth-to-space transmissions in the earth exploration-satellite services may be authorized with equality of right to operate with stations of other space radio-communication services in the band and subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected / see 356AB/.

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
2 290-2 300	2 290-2 300		
FIXED SPACE RESEARCH (Space-to- Earth) Mobile 756C		RESEARCH	

SUP 356B

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
2 450-2 500	2 450-2 500		
FIXED MOBILE Radiolocation	FIXED MOBILE RADIOLOCATION		
357 361	3 57		
2 500-2 550	2 500-2 535		
FIXED 364C MOBILE except aeronautical mobile BROADCASTING— SATELLITE 361B	FIXED 364C FIXED—SATELLITE (Space—to—Earth) MOBILE except aeronaut: BROADCASTING—SATELLITE 361A 364E		
	2 535-2 550 FIXED 364C MOBILE except aeronaut: BROADCASTING-SATELLITE		
361A 362 364F	361A		
2 550-2 655			
	FIXED 364C MOBILE except aeronautical mobile BROADCASTING—SATELLITE 361B 362 363 364F		
2 655 -2 690	2 655-2 690		
FIXED 364C \(\square 364D \) MOBILE except aeronautical mobile BROADCASTING— SATELLITE 361B	FIXED 364C /364D/ FIXED-SATELLITE (Earth-to-Space) MOBILE except aeronautical mobile BROADCASTING-SATELLITE 361B		
363 364F 364G	364E 364G		

MOD 361

In France and the United Kingdom, the band 2 450-2 500 MHz is allocated on a primary basis to the radiolocation service and, on a secondary basis, to the fixed and mobile services.

ADD 361A

In France the band 2 500-2 550 MHz is also allocated on a primary basis to the radiolocation service and, on a secondary basis, to the fixed and mobile services. In Canada, the band 2 500-2 550 MHz is also allocated on a primary basis to the radiolocation service.

ADD 361B

The use of the band 2 500-2 690 MHz by the broadcasting-satellite service is limited to domestic and regional systems for community reception and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected / (see Articles 9 and 9A or Resolution No.) 7. The power flux-density at the surface of the earth shall not exceed those given in Article Nos. 470NH-470NK.7

MOD 362

In the United Kingdom, the band 2 500-2 600 MHz is also allocated, on a secondary basis, to the radiolocation service.

MOD 364A

In Algeria, Bulgaria, Hungary, India, Israel, Kuwait, Lebanon, Morocco, Pakistan, the Philippines, Poland, the United Arab Republic, Roumania, Czechoslovakia, the U.S.S.R., and Yugoslavia, the band 2 690-2 700 MHz is also allocated to the fixed and mobile services.

ADD 364C

When planning new tropospheric scatter radio-relay links in the band 2 500-2 690 MHz, all possible measures shall be taken to avoid directing the antennae of these links towards the geostationary satellite orbit.

∠ADD 364D

In the band 2 655-2 690 MHz new systems using tropospheric scatter are not authorized. Existing systems may continue to operate in this band.

ADD 364E

The use of the bands 2 500-2 535 MHz and 2 655-2 690 MHz by the fixed-satellite service is limited to domestic and regional systems and such use is subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected. In the direction space-to-Earth, the power flux-density at the surface of the Earth shall not exceed see Article 7.

ADD 364F

In Bulgaria, Iran, Portugal and the U.S.S.R., the band 2 500-2 690 MHz is allocated to the fixed and mobile services with the exception of the aeronautical mobile service.

ADD 364G

Radio astronomy observations are being carried out in the band 2 670-2 690 MHz in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in their future planning of this band.

MOD 365

In making assignments to stations of other services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
3 400-3 600	3 400-3 500		
FIXED FIXED- SATELLITE (Space-to- Earth) MOBILE	FIXED-SATELLITE (Space-to-Earth) RADIOLOCATION Amateur 376		
Radiolocation 372 373 374 375 3 600-4 200 FIXED FIXED- SATELLITE (Space-to- Earth) Mobile	3 500-3 700 FIXED FIXED- SATELLITE (Space-to- Earth) MOBILE RADIOLOCATION	3 500-3 700 FIXED- SATELLITE (Space-to- Earth) RADIOLOCATION Fixed Mobile 377 378	
374	3 700-4 200 FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE 379		

SUP 374A

MOD 377

In China and Japan the band 3 500-3 700 MHz is also allocated to the fixed and mobile services.

MHz

Allocation to Services					
Region l		Region 2	Region 3		
4 200-4 400					
AERONAUTICAL RADIONAVIGATION					
	352A 379A 381 382 383				
4 400-4 700					
	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 392A				
4 700-4 990					
		FIXED MOBILE			
		354 382A 382B			

ADD 379A

The standard frequency-satellite service and the time signal-satellite service may be authorized to use the frequency 4 202 MHz for space-to-Earth transmissions and the frequency 6 427 MHz for Earth-to-space transmissions. Such transmissions shall be confined within the limits of ±2 MHz of these frequencies and shall be subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 382A

Radio astronomy observations on the formaldehyde line (rest frequency 4 829.649 MHz) are being carried out in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in their future planning of the band 4 825-4 835 MHz.

ADD 382B

Radio astronomy observations are being carried out in the band 4 950-4 990 MHz in a number of countries under national arrangements. Administrations should bear in mind the needs of the radio astronomy service in their future planning of this band.

MHz

	Allocation to Services	
Region 1	Region 2	Region 3
5 000-5 250		
	AERONAUTICAL RADIONAVIGAT	ION
	352A 352B 383B	

ADD 383B

The band 5`000-5 250 MHz is also allocated to the fixed-satellite service for connection between one or more earth stations at specified fixed points on the Earth and satellites used by the aeronautical mobile (R) service and/or the radiodetermination service.

Such use and development shall be subject to agreements and co-ordination between administrations concerned and those having services operating in accordance with the Table, which may be affected.

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
5 725-5 850	5 725-5 850	1	
FIXED- SATELLITE (Earth-to-Space)	RADIOLOCATION Amateur		
RADIOLOCATION			
Amateur			
354 388 390 391 391A	389 391 391A	-	

ADD 391A

Radio astronomy observations are being carried out in the bands 5 750-5 770 MHz and 36.458-36.488 GHz in a number of countries under national arrangements. Administrations are urged to take all practicable steps to protect radio astronomy observations in these bands from harmful interference.

5 850-5 925	5 8 5 0-5 92 5	5 850-5 92 5
FIXED FIXED- SATELLITE (Earth-to-Space) MOBILE	NOC	FIXED FIXED- SATELLITE (Earth-to-Space) MOBILE Radiolocation
391		391
5 925-6 425		
	FIXED FIXED-SATELLITE (Earth-to-Space MOBILE	e)

SUP 392A

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
6 425-7 250			
	FIXED MOBILE 379A 392AA 392B 393		
	FIXED—SATELLITE (Space—to—Earth)		
	392D 392G		

ADD 392AA

In Canada and the United States of America, the band 6 625-7 125 MHz is also allocated on a secondary basis to the fixed-satellite service for space-to-earth transmissions. In Region 2, the power flux-density produced by space stations in this band shall be in accordance with Article 7, Section VIII (No. 470NM). In the Regions 1 and 3, it shall be at least 6 dB lower. Receiving earth stations in this band may not impose restrictions on the locations or technical parameters of existing or future terrestrial stations of other countries.

MOD 392B

The band 7 145-7 235 MHz may be used for Earth-to-space transmissions in the space research service, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

SUP 392C

MOD 392D

As an exception, passive fixed-satellite systems also may be accommodated in the band 7 250-7 750 MHz subject to:

- a) agreement between administrations concerned and those whose services, operating in accordance with the Table, may be affected:
- b) the co-ordination procedure laid down in Articles 9 and 9A.

Such systems shall not cause any more interference at active earth station receivers than would be caused by fixed or mobile services. Power flux-density limitations at the earth's surface after reflection from the passive fixed-satellites shall not exceed those prescribed in these Regulations for active fixed-satellite systems.

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
7 300-7 450			
	FIXED FIXED—SATEILITE (Space—to—Earth) MOBILE		
	3920		
7 450-7 550			
	FIXED FIXED—SATEILITE (Space—to—Earth) METEOROLOGICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—SATEILICAL—S	EII.ĮŢE	
	392D		
7 550-7 750			
· E	FIXED FIXED—SATEILITE (Space—to—Earth) MOBILE		
	392D		

MHz

Allocation to Services			
Region 1	Region 2	Region 3	
7 900-7 975			
	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	÷	
7 975-8 025	-		
	FIXED-SATELLITE (Earth-to-space)		
	392A 392H		

MHz

A	llocation to Services	
Region 1	Region 2	Region 3
8 025-8 400	8 025-8 400	8 025-8 400
FIXED FIXED—SATELLITE (Earth-to-Space) MOBILE Earth Exploration— Satellite (Space-to-Earth) 394 394B 394E	EARTH EXPLORATION— SATELLITE (Space—to—Earth) FIXED FIXED—SATELLITE (Earth—to—Space) MOBILE 394E	FIXED FIXED—SATELLITE (Earth-to-Space) MOBILE Earth Exploration— Satellite (Space-to-earth) 394 394E
8 400-8 500		
	FIXED MOBILE SPACE RESEARCH (Space-to-Earth)	
4	394A 394D -	

SUP 3940

ADD 394E

The band 8 175-8 215 MHz is also allocated to the meteorological-satellite service for Earth-to-space transmissions.

Allocation to Services			
Region 1	Region 2	Region 3	
10.6-10.68			
	FIXED MOBILE RADIO ASTRONOMY Padiolocation		
*	404A		

ADD 404A

In the F.R. of Germany, in the band 10.6-10.68 GHz, the Radio Astronomy Service is a secondary service.

10.68-10.7

RADIO ASTRONOMY
405B

SUP 4.05A

10.7-10.95	(T)		- 1	-	
	FIXED MOBILE	1			
10.95-11.2	10.95-11.2				
FIXED FIXED-SATELLITE (Space-to- Earth) (Earth-to- Space) MOBILE	FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE		ŵ		
11.2-11.45					

FIXED MOBILE

11.45-11.7

FIXED
FIXED-SATELLITE
(Space-to-Earth)
MOBILE

Allocation to Services				
Region 1	Region 2	Region 3		
FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING- SATELLITE	FIXED FIXED—SATELLITE (Space—to—Earth) MOBILE except aeronautical mobile BROADCASTING BROADCASTING— SATELLITE D, E To, E To, E	FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING SATELLITE		
_A_7	12.2-12.5 FIXED MOBILE except aeronaut BROADCASTING	ti c al mobile		

ADD

In the band 11.7-12.2 GHz in Region 3 and in the band 11.7-12.5 GHz in Region 1, existing and future fixed, mobile and broadcasting services shall not cause harmful interference to broadcasting-satellite stations operating in accordance with the decisions of the appropriate broadcasting frequency assignment planning conference (see Recommendation No. /.../) and this requirement shall be taken into account in the decisions of that conference.

ADD

Terrestrial radiocommunication services in this band shall be introduced only after the elaboration and approval of plans for the space radiocommunication services, so as to ensure compatibility between the uses that each country decides for this band.

ADD

The use of the band 11.7-12.2 GHz by the broad-casting-satellite and fixed-satellite services is limited to domestic systems and is subject to previous agreement among administrations concerned and those having services, operating in accordance with the Table, which may be affected.

GHz

Allocation to Services				
Region 1	Region 2	Region 3		
12.5-12.75 FIXED-SATELLITE (Space-to-Earth) (Earth-to-Space)	12.5-12.75 FIXED FIXED-SATELLITE (Earth-to-Space) MOBILE except aeronautical mobile	12.5-12.75 FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE except aeronautical mobile		
12.75-13.25	FIXED MOBILE			
13.25-13.4				
0.23	AERONAUTICAL RADIONAV	IGATION		
1	405BC 406 407			
13.4-14				
10(1)	RADIOLOCATION			
	405BC 407 408 409			

ADD 405BA

In Austria, Bulgaria, Cameroon, Congo (Brazzaville), the Ivory Coast, Gabon, Ghana, Hungary, Iraq, Israel, Jordan, Kuwait, Libya, Mali, Poland, Syria, United Arab Republic, Roumania, Czechoslovakia, Togo and the U.S.S.R., the band 12.5-12.75 GHz is also allocated to the fixed and mobile services except the aeronautical mobile service.

ADD 405BB

In Algeria, Belgium, Denmark, Spain, Finland, France, Greece, Luxembourg, Monaco, Nigeria, Norway, the Netherlands, Portugal, the Federal Republic of Germany, Senegal, Sweden, Switzerland and Tunisia, the band 12.5-12.75 CHz is also allocated on a secondary basis to the fixed and mobile services, except the aeronautical mobile service.

MOD 407

In Albania, Bulgaria, Hungary, Poland, Roumania, Czechoslovakia and the U.S.S.R., the bands 13.25-13.5 GHz, 14.175-14.3 GHz, 15.4-17.7 GHz, 23.6-24 GHz, 24.05-24.25 GHz and 33.4-36 GHz are also allocated to the fixed and mobile services.

MOD 408

In Sweden, the bands 13.4-14 GHz, 15.7-17.7 GHz and 33.4-36 GHz are also allocated to the fixed and mobile services.

Allocation to Services				
Region 1	Region 1 Region 2 Region 3			
14-14.3	FIXED-SATELLITE (Earth-to-Space) RADIONAVIGATION 405BC 407	,		
14.3-14.4	FIXED-SATELLITE (Earth-to-Space) RADIONAVIGATION-SA	TELLITE		
14.4-14.5	FIXED FIXED-SATELLITE (Earth-to-Space) MOBILE			
ll l	405BD 405BE			

ADD 405BC

The band 13.25-14.2 GHz may also be used on a secondary basis for Earth-to-space transmissions in the space research service, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 405BD

The band 14.4-15.35 GHz may also be used on a secondary basis for epace-to-Earth transmissions in the space research service, subject to agreement among the administrations concerned and those having services, operating in accordance with the Table, which may be affected.

ADD 405BE

Radio astronomy observations on the formaldehyde line (rest frequency 14.489 GHz) are being carried out in a number of countries under national arrangements. In making assignments to stations in the fixed and mobile services, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference in the band 14.485-14.515 GHz.

Allocation to Services			
Region 1	Region 2	Region 3	
14.5-15.25	FIXED MOBILE 405BD 405BE		
15.25-15.35	FIXED MOBILE 405 BD		

SUP 409A

SUP 409B

17.7-19.7		FIXED FIXED—SATELLITE (Space—to-Earth) MOBILE	
19.7-21.2	_	FIXED-SATELLITE (Space-to-Earth) 409E	

SUP 409D

ADD 409E

In Japan, the bands 19.7-21.2 GHz and 29.5-31 GHz are also allocated to the fixed and mobile services. This additional use shall not impose any limitation to the power flux density of space stations in the fixed-satellite service.

Allocation to Services				
Region l	Region 2 Region			
21.2-22		-1		
	EARTH EXPLORATION—SAT (Space—to—Earth) FIXED MOBILE	ELLITE,		
22-22.5	FIXED MOBILE			
	410A			
22.5-23		22.5-23		
FIXED MOBILE		FIXED MOBILE BROADCASTING BROADCASTING— SATELLITE		
		<u></u>		
23-23.6				
	FIXED MOBILE			

ADD 410A

The band 22.21-22.26 GHz is also allocated to the radio astronomy service for observations of a spectral line due to water vapour (rest frequency 22.235 GHz). Administrations are urged to give all practicable protection in this band for future research in radio astronomy.

/ADD 410B

In Region 3, the broadcasting-satellite service is also authorized in the band 22.5-23.0 GHz, subject to power flux density limits for the protection of the terrestrial services in this band.

23.6-24

RADIO ASTRONOMY

407

GHz

Allocation to Services				
Region 1 Region 2 Region 3				
24-24.05 AMATEUR AMATEUR-SATELLITE				
24.05-24.25	RADIOLOCATION Amateur 407 410			

MOD 410

The frequency 24.125 GHz is designated for industrial, scientific and medical purposes. Emissions must be confined within the limits of ± 125 MHz of that frequency. Radiocommunication services operating within those limits must accept any harmful interference that may be experienced from the operation of industrial, scientific and medical equipment.

25.25-27.5	FIXED MOBILE	
27.5-29.5	FIXED FIXED—SATELLITE (Earth—to—Space) MOBILE	
29.5-31	FIXED-SATELLITE (Earth-to-Space) 409E	•

Allocation to Services			
Region 1		Region 2	Region 3
31-31.3			9
		FIXED MOBILE Space research 412H 412HA	

ADD 412HA

Radio astronomy observations in the band 31.2-31.3 GHz are carried out in a number of countries under national arrangements. Administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

FIXED

MOBILE

391A 412E

GHz 40-58.2

	Allocation to services					
Region 1	Region 2	Region 3				
40-41	FIXED-SATELLITE (Earth-to-space)					
41-43	BROADCASTING-SATELLITE					
43–4 8	AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION-SAT	v-sateilite				
48 - 50	(Not allocated)					
50~51	FIXED-SATELLITE (Space-to-earth)					
51-52	EARTH EXPLORATION—SATELLITE SPACE RESEARCH					
52-54.25	SPACE RESEARCH (Passive) 412I	The state of the s				
54,25-58.2	INTER-SATELLITE	The second of the second				

ADD

412I All emissions in this band are prohibited. The use of passive sensors by other services is also authorized.

58.2-92

Allocation to services						
Region 1	Region 2	Region 2 Region				
58 .2-59	PACE RESEARCH (Pass	sive)				
59 – 64	NTER-SATELLITE	-				
64–65	PACE RESEARCH (Pass	sive)				
65-66	ARTH EXPLORATION-SAT PACE RESEARCH	ELLITE				
66-71	ERONAUTICAL MOBILE-S ARITIME MOBILE-SATEI ERONAUTICAL RADIONAV ARITIME RADIONAVIGAT	LITE TGATION—SAT				
71-84	Not allocated)		843			
84–86	BROADCASTING-SATELL	ITE	-			
86-92	ADIO ASTRONOMY PACE RESEARCH (Pas	sive)				

92-142

Allocation to services					
Region 1		Region 2		Region 3	
92–95		D-SATELLITE th-to-space)			
95–101	MARIT AERON	AUTICAL MOBILE-SATE IME MOBILE-SATELLIT AUTICAL RADIONAVIGA IME RADIONAVIGATION	TE ATTON-SATE		
101-102	SPAC	E RESEARCH (Passive	,)		
102-105		D_SATELLITE ce-to-earth)			
105–130	INTE 412J	R-SATELLITE	,		
130–140	RADI SPAC 412I	O ASTRONOMY E RESEARCH (Passive	»)		1
140–142		D-SATELLITE th-to-space)			

ADD 412J Radio astronomy observations on the carbon monoxide line at 115.271 GHz are carried out in a number of countries under national arrangements. In making assignments to other services in the Table, administrations should bear in mind the need to protect radio astronomy observations from harmful interference in the band 115.16-115.38 GHz.

 GHz

142-230

Allocation to services					
Region 1		Region 2	Region 3		
142–150	MARI AERO	NAUTICAL MOBILE-SATEL TIME MOBILE-SATELLITE NAUTICAL RADIONAVIGAT TIME RADIONAVIGATION-S	ION—SATELLITE		
150-152		D_SATELLITE ce-to-earth)			
152-170	(Not	allocated)			
170-182	INTER	R-SATELLITE			
182-185	SPACE 412I	E RESEARCH (Passive)			
185-190	INTER	-SATELLITE			
190-200	MARIT AERON	AUTICAL MOBILE—SATELL IME MOBILE—SATELLITE AUTICAL RADIONAVIGATION—SA	ON-SATEILITE		
200–220	(Not	allocated)			
220-230	FIXED	-SATELLITE			

230-275

	Allocation to services				
Region 1		Region 2 Region 3			
230–240		O ASTRONOMY E RESEARCH (Passive)	,		
240–250	(Not	allocated)			
250-265	MART' AERO	NAUTICAL MOBILE-SATELLITE FIME MOBILE-SATELLITE NAUTICAL RADIONAVIGATION- TIME RADIONAVIGATION-SATE	-SATELLITE		
265–275	FIXE	D-SATELLITE			
Above 275	(Not	allocated)			

B 14

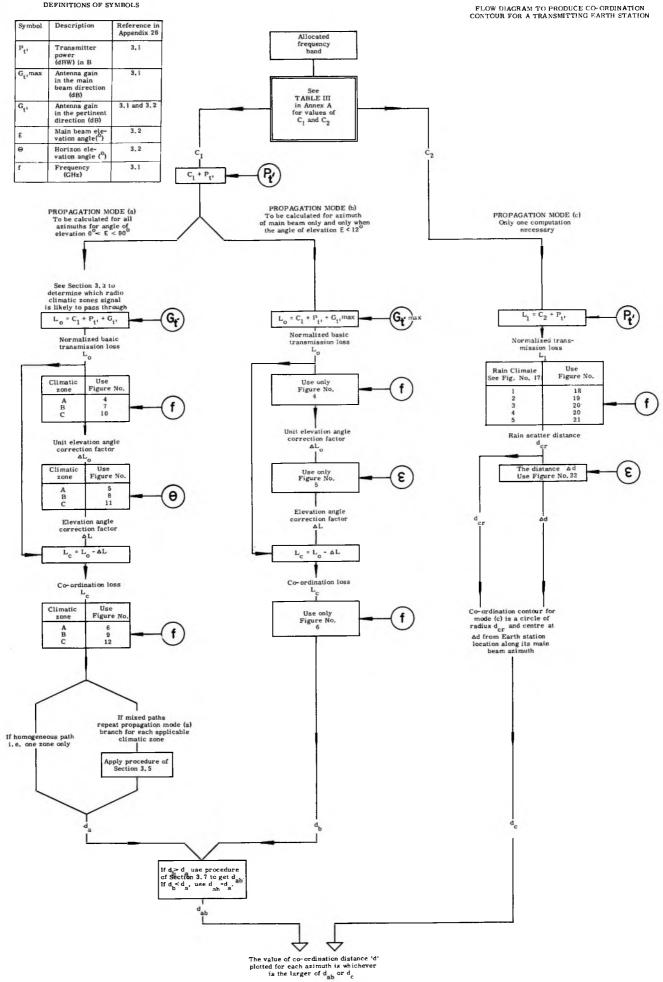
Addendum No. 1 to
Document No. 384-E
15 July 1971

PLENARY MEETING (FIRST READING)

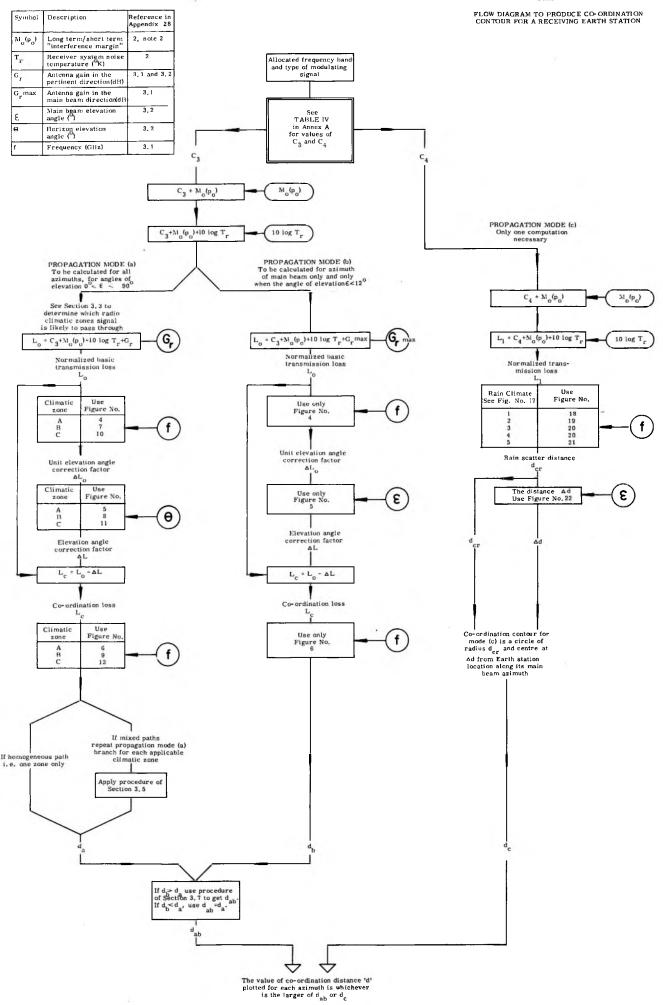
The two attached graphs complete Document No. Bl4



FLOW DIAGRAM 1 DEFINITIONS OF SYMBOLS



FLOW DIAGRAM 2



INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 384-E

14 July 1971

PLENARY MEETING (FIRST READING)

B14

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Commenst
4	284	1	Appendix 28	

Francois Job Chairman of the Editorial Committee

Annex: Pages B14/01-47



ADD

APPENDIX 28

Procedure for Determination of the Co-ordination Area around an Earth Station in Frequency Bands between 1 and 40 GHz shared between Space and Terrestrial Radiocommunication Services

1. Objectives

The co-ordination area (see No. 103D) is determined by calculating, in all directions from the earth station, the co-ordination distances (see No. 103B), and drawing to scale on an appropriate map the co-ordination contour (see No. 103C).

It must be Emphasized that the Presence or Installation of a Terrestrial Station within the Co-ordination Area of an Earth Station would not Necessarily Preclude the Successful Operation of Either the Earth Station or that Terrestrial Station, Since the Procedure is Based on the most unfavourable Case Assumptions as Regards Interference.

For the determination of the co-ordination area two cases may have to be considered:

- 1) for the earth station when it is receiving (and hence capable of being interfered with by terrestrial stations);
- 2) for the earth station when it is transmitting (and hence capable of interfering with terrestrial stations).

Where an earth station is intended to operate with a variety of classes of emissions, the earth station parameters to be used in the determination of the co-ordination contour shall be those which lead to the greatest co-ordination distances, for each earth station antenna beam and in each allocated frequency band which the earth station proposes to share with the terrestrial services.

The procedure given in this Appendix for calculating co-ordination distance is fairly complex. For this reason it is considered useful to present in Annex A a simplified version of this procedure which will assist a user in following the necessary steps to produce co-ordination contours.

The simplified presentation is given for certain allocated frequency bands.

It is suggested to draw, together with the co-ordination contour, auxiliary contours based on less unfavourable assumptions than those chosen for determination of the co-ordination contour. These auxiliary contours may be used during subsequent negotiations between the administrations concerned with a view to eliminating from the discussions (without the need for more precise calculations) the case of certain existing or planned stations located within the co-ordination area. The procedure for obtaining these auxiliary contours is explained in Annex B to this Appendix.

2. Permissible values of interference

The permissible interference power (in dBW) in the reference bandwidth to be exceeded for no more than p percent of the time at the receiver input of a station suffering interference, from each source of interference, is given by the general formula below:

$$P_r(p) = 10 \log_{10} (kT_rB) + J + M(p) - W$$
 (1)

where

$$M(p) = M(p_o/n) = M_o(p_o)$$
 (1a)

with

k = Boltzmann's constant (1.38×10^{-23} joule per °K);

T_r = thermal noise temperature of the receiving system (°K);

B = reference bandwidth (in Hz) (bandwidth, of concern to the interfered with system, over which the interference power can be averaged);

J = ratio (in dB) of the permissible long term (20% of the time) interfering power to the thermal noise power in the receiving system;¹

p_o = percentage of the time during which the interference from all sources may exceed the permissible value;

n = number of expected entries of interference, assumed to be uncorrelated;

^{1, 2, 3} see notes below.

- p = percentage of the time during which the interference from one source may exceed the permissible value; since the entries are not likely to occur simultaneously: $p = p_0/n$;
- M_o(p_o)= ratio (in dB) between the permissible interference powers during p_o% and 20% of the time respectively, for all entries of interference;²
- M(p) = ratio (in dB) between the permissible interference powers during p% of the time for one entry of interference, and during 20% of the time for all entries of interference, respectively;
- W = equivalence factor (in dB) relating the effect of interference to that of thermal noise of equal power in the reference bandwidth.³

Tables I and II list values for the above parameters.

Notes

- 1) The factor J (in dB) is defined as the ratio of total permissible long term (20% of the time) interference power in the system, to the long term thermal noise power in a single receiver. For example, in a 50-hop terrestrial hypothetical reference circuit, the total allowable additive interference power is 1 000 pW0p (C.C.I.R. Recommendation 357-1) and the mean thermal noise power in a single hop may be assumed to be 25 pW0p. Therefore, since in a FDM/FM system the ratio of the interference noise power to the thermal noise power in a 4 kHz band is the same before and after demodulation, J = 16 dB. In a fixed-service satellite system, the total allowable interference power is also 1 000 pW0p (C.C.I.R. Recommendation 356-2), but the thermal noise contribution of the down path is not likely to exceed 7 000 pW0p, hence J ≤ −8.5 dB. In digital systems it may be necessary to protect each communication path individually, and in that case, long term interference power may be of the same order of magnitude as long-term thermal noise, hence J = 0 dB.
- ²⁾ M_o (p_o) (in dB) is the "interference margin" between the long-term (20%) and the short term (p_o%) allowable interference powers. For analogue radio-relay and fixed-satellite systems in bands between 1 and 15 GHz, this is the ratio (in dB) between 50 000 and 1 000 pW0p (17 dB). In the case of digital systems, M_o (p_o) may tentatively be set equal to the fading margin which depends, inter alia, on the local rain climate.

3) The factor W (in dB) is the ratio of thermal noise power to interference power, in the reference bandwidth, producing the same interference effect after demodulation (e.g. in a FDM/FM system it would be expressed for equal voice channel performance; in a digital system it would be expressed for equal bit error probabilities). For FM signals, it is defined as follows:

$$W = 10 \log_{10} \begin{cases} & \text{Interfering power in the receiving system after demodulation} \\ & & \\ \hline & \\ & & \\ \hline & & \\ \hline & & \\ & & \\ \hline & & \\ \hline & & \\ & & \\ \hline & & \\ & & \\ \hline & & \\ & & \\ \hline & & \\ & & \\ \hline & & \\ & & \\ \hline & & \\ & & \\ \hline$$

Also, when the wanted signal uses FM modulation with r.m.s. modulation indices which are greater than unity, W is approximately 4 dB, regardless of the characteristics of the interfering signal. For low-index FDM/FM systems a very small reference bandwidth (4 kHz) has been used in order to avoid the necessity of dealing with a large range of characteristics of both wanted and unwanted signals upon which, for greater reference bandwidths, the value of W would depend.

When the wanted signal is digital, W is usually equal to or less than 0 dB, regardless of the characteristics of the interfering signal.

3. Determination of co-ordination distance for near great circle propagation mechanisms

When determining the co-ordination distance for an earth station, a number of mechanisms of radio-wave propagation need to be considered. This section deals with the determination of co-ordination distance in conditions associated with super-refraction, ducting, scattering and reflection due to irregularities in the refractive index of the lower atmosphere in the absence of precipitation. The determination of the co-ordination distance associated with propagation due to scattering from hydrometeors is discussed in Section 4.

3.1 Normalized basic transmission loss L_o (0.01)

To facilitate the graphical determination of the co-ordination distance, it is convenient to normalize the percentage of time to 0.01% and the frequency to 4 GHz.

The first step in the determination of the co-ordination distance is the calculation of a normalized basic transmission loss L_o (0.01) given by:

$$L_{o}(0.01) = P_{t'} + G_{t'} + G_{r} - P_{r}(p) - F(p) - 20 \log_{10}(f/4)$$
 (2)

where

- Pt' = maximum available transmitting power (in dBW) in bandwidth B at the input to the antenna of an interfering station *;
- $G_{t'}$ = gain (in dB relative to isotropic) of the transmitting antenna of the interfering station. If the interfering station is an earth station, this is the isotropic gain in the pertinent direction. If it is a terrestrial station, $P_{t'}$ and $G_{t'}$ are combined in the main beam equivalent isotropically radiated power E, for which the values given in Table II shall be used.

When $G_{t'}$ is the gain in the main direction of radiation it is denoted $G_{t'}$ max.

- G_r = gain (in dB relative to isotropic) of the receiving antenna of the station suffering interference. If that station is an earth station, this is the isotropic gain in the pertinent direction; in the case of a terrestrial station, the maximum antenna gain is to be used. When G_r is the main beam gain, it is denoted G_r max. (In the case of terrestrial stations, see Table I);
- F(p) = correction factor in dB to relate the effective percentage of the time p to 0.01% (see Figure 1);
- f = operating frequency in GHz.

The "pertinent direction" referred to in the definitions of $G_{t'}$ and G_{r} is usually the direction toward the physical horizon on the azimuth considered (see Section 3.2) except when an earth station points its main beam at elevation angles below 12°. In the latter case, the path of minimum

^{*} Primes refer to the parameters associated with the interfering station.

transmission loss may not be the horizon path but rather the main beam path (see Section 3.6).

When considering moving satellites, $G_{t'}$ or G_r (whichever pertains to the earth station antenna) is variable with time. In such cases, it is suggested that an equivalent time-invariant earth station antenna gain should be used.* This equivalent gain is either 10 dB less than the maximum horizon antenna gain or is that value of horizon antenna gain exceeded for no more than 10% of the time, whichever is the greater.

3.2 Antenna gain at the earth station horizon for geostationary satellites

The gain component of the earth station antenna in the direction of the physical horizon around an earth station is a function of the angular separation ϕ between the antenna main beam direction and the horizon direction under consideration. Therefore, knowledge of the angle ϕ is required for each azimuth.

The elevation ϵ and azimuth α of geostationary satellites as seen from an earth station at a latitude λ are uniquely related. Figure 2 shows the permissible location arcs of geosynchronous equatorial satellites in a rectangular elevation/azimuth plot, each arc corresponding to an earth station latitude.

Specific relative satellite longitudes may not be known beforehand, but even when they are, the possibility of the addition of a new satellite, or the repositioning of an existing one suggests that all or a portion of the applicable arc be considered to hold satellites.

With the correct arc or segment of arc chosen and suitably marked, the horizon profile $\theta(\alpha)$ is superimposed on the plot of Figure 3, which shows

^{*} This equivalent antenna gain should not be used when the earth station antenna points in the same direction for appreciable periods of time (e.g., when working to space probes or to satellites which are almost geostationary).

an example for an earth station located at 45°N latitude for a satellite expected to be located somewhere between relative longitudes of 10°E and 45°W, with the site horizon profile drawn as shown.

For each point on the local horizon θ (α), the smallest distance to the arc is determined and measured on the elevation scale. The example of Figure 3 shows the determination of the off-beam angle φ at an azimuth $\alpha_0 = 210^\circ$ with a horizon elevation $\theta = 4^\circ$.

If this is done for all azimuths (in suitable increments, e.g., 5°), a relationship $\varphi(\alpha)$ results. The relationship $\varphi(\alpha)$ may be used to derive a function for the horizon antenna gain, $G(\alpha)$, by using the actual earth station antenna pattern, or a formula giving a good approximation; for example, in cases where the ratio between the antenna diameter and the wavelength exceeds 100, the following equation should be used:

$$\begin{array}{ll} G(\phi) = 32 - 25 \log_{10} \phi \ (dB) & (1^{\circ} \leqslant \phi \leqslant 48^{\circ}) \\ = -10 \ dB & (48^{\circ} < \phi \leqslant 180^{\circ}) \end{array}$$

The application of this gain equation to the φ (α) plot yields the desired horizon antenna gain as a function of azimuth.

The parameters used above are defined as follows:

- α = azimuthal angle under consideration, east of True North.
- φ = the smaller angle between the main beam direction of the earth station antenna and the straight line connecting the earth station to the physical horizon on azimuth α .
- ε = earth station main beam elevation angle above horizontal plane.
- λ = latitude of earth station.
- θ = elevation angle of the physical horizon above the horizontal plane on azimuth α .

3.3 Climatic Zones

The world has been divided into three basic radio-climatic regions termed Zones A, B and C, respectively.

These Zones are defined as follows:

- Zone A: land, with the exception of a coastal strip the width of which is either 100 km or that distance from the actual coast at which the terrain begins to exceed an altitude of 1000 m, whichever is the lesser distance.
- Zone B: sea, at latitudes greater than 23.5° (North or South), excluding the Mediterranean and Black Seas, but including the coastal strip defined above wherever land borders on sea at latitudes greater than 23.5°.
- Zone C: sea, at latitudes smaller than 23.5° (North or South), including the Mediterranean and Black Seas, and the coastal strip defined above wherever land borders on sea at latitudes smaller than 23.5°.
- 3.4 Procedure for the determination of the co-ordination distance for propagation mode (a)

To obtain the co-ordination distance for Zone A, it is necessary to subtract from $L_o(0.01)$ a correction Δ L which accounts for the difference in basic transmission loss over paths that have different horizon elevation angles at the earth station. Δ L is computed in two steps. First a correction Δ L_o for unit/elevation angle (i.e. for a 1° elevation angle) is obtained from Figure 4 as a function of the normalized basic transmission loss and the frequency. Linear interpolation should be used between the curves of Figure 4 for frequencies not shown.

For any other horizon elevation angle θ , the horizon angle correction ΔL (in dB) is obtained from Figure 5 using the value of ΔL_0 previously obtained from Figure 4. If values are required at elevation angles other than those indicated, linear interpolation should again be used.

In cases where the elevation angle is less than 0.2°, ΔL is always 0 dB.

The horizon angle correction ΔL as obtained should be subtracted from the normalized basic transmission loss to result in a "co-ordination loss" $L_c\colon$

$$L_{c} = L_{o}(0.01) - \Delta L \tag{3}$$

This co-ordination loss, used with the appropriate frequency in Figure 6, yields the co-ordination distance.

In a similar manner, the Zone B and Zone C co-ordination distance can be determined using Figures 7, 8 and 9 for Zone B and Figures 10, 11 and 12 for Zone C.

Distances so obtained are, for reference purposes, to be labelled d_{aA} , d_{aB} and d_{aC} for Zones A, B and C, respectively.

3.5 Co-ordination distance for mixed paths

3.5.1 Two Zones

The procedure to be followed in the case of a mixed path involving two zones is illustrated by the example shown in Figure 13(b). The earth station is situated in Zone A at a distance of 75 km from Zone B. The graphical presentation described below is particularly useful where more than one boundary between zones may be involved, as in this example.

It is assumed that, at a frequency of 4 GHz, the normalized basic transmission loss L_o (0.01) is 200 dB, and that the horizon elevation angle is zero degrees. This results in identical values of 200 dB for L_o in any zone (which would, of course, not be the case if the horizon elevation angle were greater than 0.2°). The procedure is as follows:

i) Determine the distance entirely in Zone A that would give the co-ordination loss. Mark this distance (in this case it is 350 km) from the origin along the abscissa axis of linear graph paper as indicated by the point A (Figure 13 a));

- ii) determine the distance entirely in Zone B that would give the same co-ordination loss. Mark this distance (in this case it is 530 km) from the origin along the ordinate axis of the chart as indicated by the point B;
- iii) draw a straight line between points A and B representing these distances from the origin;
- iv) starting from the origin, the distance of 75 km from the earth station to Zone B is set off along the abscissa axis of the chart as indicated by the point A₁;
- v) starting from point A, the Zone B path length of 375 km is then set off parallel to the ordinate axis of the chart as indicated by the point B_1 ;
- vi) the further distance in the next Zone A region is then measured parallel to the abscissa axis from the point B₁ to the point of intersection of the mixed path curve as indicated by X. On Figure 13a), this distance is 30 km;
- vii) the co-ordination distance is the sum of the distances OA_1 , A_1B_1 and B_1X and is equal to 75 + 375 + 30 = 480 km.

The distance, B_1X can also, more precisely, be found numerically from the total distance in Zones A, $OA_1 + B_1X$ given by

$$OA_1 + B_1X = OA \frac{(1 - A_1B_1)}{OB}$$

whence:

$$B_1X = OA(1 - \frac{A_1B_1}{OB}) - OA_1.$$

Hence,

$$B_1X = 350 (1 - \frac{375}{530}) - 75 = 27 \text{ km}$$

3.5.2 Three Zones

In some special cases, the mixed path involves all three radioclimatic Zones A, B and C. A solution to this problem can be found in adding a third dimension to the procedure to be followed for mixed paths involving only two Zones. Theoretically, it means that the third coordinate has to be determined for a point having coordinates corresponding to the known distances in the first two Zones and lying in a plane defined by three points on the axes X, Y and Z, corresponding to distances in Zones A, B and C, respectively, that would give the required basic transmission loss.

In practice, the procedure can be reduced to a simple graphical method shown in Figure 14, assuming for example a co-ordination loss (L_c) of 200 dB, at a frequency of 4 GHz. It is required to find the co-ordination distance from the earth station in the direction given in Figure 14a). Here an earth station is situated in Zone A at a distance of 75 km in a given azimuthal direction Tone B. In the same azimuthal direction Zone B is 375 km long and followed by an unknown portion in Zone C (Figure 14 a)).

In this case, the procedure to be applied should be as follows (Figure 14 b)):

- i) Repeat the same procedure as for mixed paths involving only two Zones, given in steps (i) to (v) above, and continue as follows:
- ii) From the point B_1 draw a line parallel to the line AB to intersect the abscissa axis as indicated by the point D.
- iii) Determine the distance entirely in Zone C that would give the co-ordination loss. Mark this distance (in this case it is 930 km) from the origin along the ordinate axis of the chart as indicated by the point C. Draw a straight line between the points C and A.
- iv) At the point D, draw a line parallel to the ordinate axis to intersect the line CA as indicated by X.
- v) The distance between the points D and X, which is the unknown distance in Zone C, is found to be 75 km.

vi) The co-ordination distance is then the sum of the distances $OA_1 + A_1B_1 + DX$ and in this example is equal to 75 + 375 + 75 = 525 km.

The distance DX can also, more precisely, be found numerically from the formula:

$$DX = OC \left(1 - \frac{OA_1}{OA} - \frac{A_1B_1}{OB}\right)$$

Hence,

$$DX = 930 (1 - \frac{75}{350} - \frac{375}{530}) = 73 \text{ km}$$

The distance obtained from either the single zone case (Section 3.4), or the multi-zone case (Section 3.5), whichever is applicable, is to be labelled d_a .

3.6 Determination of the co-ordination distance for propagation mode (b)

If the main beam of the earth station antenna is elevated less than 12° for long periods of time, as may be the case in operation with geostationary satellites, the co-ordination distance in the azimuthal direction of the main beam is determined in the same manner as above but the antenna elevation angle ε is used instead of the horizon angle θ , and the antenna main beam gain is used instead of the gain towards the horizon. In all such cases, the Zone A curves should be used irrespective of the actual Zone involved.

This procedure yields a distance for propagation mode (b), to be labelled d_b.

When considering non-geostationary satellites, interference via the main beam path should only be considered when the earth station antenna points in the same direction for appreciable periods of time (e.g. when working to space probes or to satellites which are almost geostationary).

3.7 Evaluation of results from propagation modes (a) and (b)

If propagation mode (b) is applicable, then the distance obtained for propagation mode (b) is compared with that of propagation mode (a) and where the co-ordination distance resulting from the main beam calculation exceeds that from the horizon path calculation, the procedure illustrated in Figure 15 should be used as follows to obtain the co-ordination contour for great circle propagation mechanisms:

- i) Draw two straight lines from the earth station at azimuthal angles of $\pm 5^{\circ}$ relative to the azimuth of the main beam till they intersect the co-ordination contour obtained according to propagation mode (a);
- ii) from the point corresponding to the co-ordination distance derived according to propagation mode (b) in the azimuthal direction of the main beam, draw two straight lines to join these two intersections;
- iii) these two lines so drawn constitute the part of the co-ordination contour to be used in the sector $\pm 5^{\circ}$ relative to the azimuthal direction of the main beam;
- iv) outside the preceding sector $\pm 5^{\circ}$ the co-ordination contour for the great circle propagation mechanisms is the one obtained for propagation mode (a).

For reference purposes, the distances obtained after application of procedures set forth in Sections 3.4 to 3.7 are to be labelled d_{ab} .

4. Determination of co-ordination distance for propagation mode (c) (scattering from hydrometeors)

The determination of co-ordination distance for scattering from hydrometeors (rain scatter) is predicated on a path geometry which is substantially different from that of the great circle propagation mechanisms.

4.1 Normalized transmission loss L_1 (0.01)

To determine the co-ordination distance associated with rain scatter, it is necessary to calculate a normalized transmission loss, given by:

$$L_{1}(0.01) = P_{t'} + \Delta G - P_{r}(p) - F_{1}(p,f)$$
(4)

where:

- ΔG = difference (in dB) between the maximum gain of terrestrial station antennae in the frequency band under investigation and the value of 42 dB. When the earth station in a transmitting station, the values shown in Table I should be used; when it is a receiving station, the values shown in Table II should be used.
- $F_1(p, f) = \text{correction factor (in dB) to relate the effective percentage of the time p to 0.01%, in the frequency band under consideration (see Figure 16).}$

All other parameters have been defined in Section 2. For terrestrial stations, values of P_{t^\prime} are listed in Table II.

4.2 Rain-climatic zones

The world has been divided into five basic rain-climatic zones numbered 1 to 5 as shown in Figure 17.

4.3 Procedure for the determination of rain scatter co-ordination distance

To obtain the rain scatter co-ordination distance for rain-climatic zone 1, the normalized transmission loss (obtained by solving equation (4)), is used together with the appropriate frequency in Figure 18 to yield the rain scatter distance $d_{\rm cr}$.

Figures 19 to 21 show corresponding curves for rain-climatic zones 2 to 5. In all cases that rain climate is to be chosen which corresponds to the location of the earth station. Due to the peculiar geometry associated with rain scatter propagation, the centre of the rain scatter co-ordination contour does not coincide with the location of the earth station by a distance Δd .

The rain scatter distance d_{cr} , together with the elevation angle ϵ of the main beam of the earth station antenna are used in Figure 22 to obtain the distance denoted Δd . The distance Δd is measured from the earth station location along the azimuth of the main beam of the earth station antenna a circle of radius d_{cr} is drawn around the point so reached. The circle is the rain scatter contour.

The rain scatter co-ordination distance, to be labelled d_e , is the distance from the earth station site to the rain scatter co-ordination contour on the azimuth under consideration.

5. Minimum value of co-ordination distance

In the process of determining the co-ordination distance for propagation mode a) or b), if values result which would require the co-ordination distance curves to be extended to distances of less than 100 km, the co-ordination distance (d_d or d_a) for the propagation mode under consideration shall be 100 km.

In the process of determining the co-ordination distance for propagation mode c), if values result which would require the rain scatter distance curves to be extended to distances of less than 100 km, the rain scatter distance (d_{cr}) shall be 100 km, used with the appropriate value of Δd .

6. The co-ordination distance

On any azimuth, the greatest of the co-ordination distances d_a , d_b , or d_c , for any of the three propagation modes, represents the co-ordination

distance and is to be used for the co-ordination procedure. An example of a co-ordination contour in shown in Figure 23.

7. Parameters for calculation

The values of parameters necessary for the determination of the co-ordination contour are given in Table I in the case of a transmitting earth station, and in Table II in the case of a receiving earth station.

In certain cases, an administration may have reason to believe that, for its specific earth station, a departure from the values associated with the earth station, as listed in Table II, may be justified. Attention is drawn to the fact that for specific systems the bandwidths B or, as e.g. in the case of demand assignment systems, the percentages of the time p and p_0 may have to be changed from the values given in Table II.

To aid in subsequent negotiations between administrations (as discussed in Annex B), it has been found useful to isolate from equation (2) two composite parameters associated only with terrestrial stations, an interference sensitivity factor $S = G_r - P_r(p)$ for the case of transmitting earth stations, and the e.i.r.p. $E = P_{t'} + G_{t'}$ for the case of receiving earth stations. Values for S and E are given in Tables I and II, respectively.

If it becomes necessary to calculate the co-ordination distance in a band not shown in Table 1 or II, the values associated with the nearest allocated frequency band for the same service should be used.

TABLE I

Parameters required for the Determination of Co-ordination Distance for a Transmitting
Earth Station

Space Radiocommunication service designation		Space Operation (Telecommand)	Fixed Satellite	Fixed Satellite	Fixed Satellite	Fixed Satellite	Fixed Satellite	Fixed Satellite	Fixed Satellite	Fixed Satellite
Frequency band	Frequency bands (GHz)		2·655- 2·690	4-400– 4-700	5·850– 6·425	7·900– 7·975 8·025– 8·400	10·95– 11·20	12·5 - 12·75	14·4 – 14·5	27·5 – 29·5
Modulation of station 1)	Modulation of terrestrial station 1)		A	A	A	A	A	A	A	A
	p _o (%)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0-003
	n	2	1	1	2	2	2	2	2	1
Interference	p(%)	0.005	0.01	0.01	0-005	0,005	0.005	0.005	0.005	0.003
Parameters and criteria	J(dB)	16	9	9	16	16	16	16	16	0
	$M_0(p_0)(dB)$	17	17	17	17	17	17	17	17	30
	W(dB)	0	0	0	0	0	0	0	0	0
	B(Hz)	4.10 ³	4.10 ²	4.10 ³	4.10 ³	4.10 ³	4.10 ³	4.10 ³	4.10 ³	10 ⁶
Terrestrial station	G _r (dB) ²⁾	35	52 3)	52 3)	45	47	50	50	50	50
parameters	ΔG(dB)	-7	10	10	3	5	8	8	8	8
	T _r (°K)	750	500	500	750	750	1500	1500	1500	3200
Auxiliary	S(dBW)	166	192	192	176	178	178	178	178	154
parameters	P _r (p)(dBW) in B	-131	-140	-140	-131	-131	-128	-128	-128	-104

 $^{^{1)}}$ A = analogue modulation — N = digital modulation.

²⁾ Feeder losses are not included in the values for G_r.

³⁾ In these bands the parameters for the terrestrial station associated with transhorizon systems have been used.

Table II. — Parameters required for the Determination of Co-ordination Distance for a Receiving Earth Station

Space Radiocommi Service designa	ation	Space Operation ¹ (Telemetering)	Meteorological ¹ Satellite		(Deep Research Space; Manned)		rixed Salellile	T:	rixed Satellite	T.:1 C111.	rixed Satellite	(Near Earth) Space	(Deep Research Space)	71. 7 C T 11.	Fixed Satellite	T.: - Second	rixed Satellite	Fixed Satellite	Earth 1 Exploration
		1.525-	1.670-	1.7	00-	2.5	00-	3.4	00	7-3	00-	8-4	00–	10-	95–	11.	7–	17.7–	21.21
Formula (CH)		1.535	1.690	1.7	10	2.5	35	4.2	00	7.7	50	8.5	00	11.	20	12.	2	19.7	22.0
Frequency band (GHz)				2.2	90–									11.	45-	12.	5–		
				2.3	00									11.	70	12-	75		
Modulation at earth station (2)			•	<u> </u>		A	N	A	N	A	N	-	_	A	N	A	N	N	
	p _o (%)			0.1	0.001	0.03		0.03	0-003	0.03	0.003	0.1	0.001	0.03	0.003	0.03	0.003	0.003	
	n			2	1	3		3	3	3	3	2	1	2	1	2	1	1	
Interference parameters	p (o/o)			0.05	0.001	0.01		0.01	0.001	0.01	0.001	0.05	0.001	0.015	0-003	0.015	0.003	0.003	
and criteria	J (dB)			_		-8		-8	0	-8	0	_	_	8	0	-8	0	0	
- E	Mo (p ₀) (dB)			_		17		17	5 3)	17	5 3)	_	_	17	5 3)	17	5 3)	5 3)	
	W (dB)					4		4	0	4	0	_	_	4	0	4	0	0	
	E (dBW) in B	55	55	62 4) 6)	62 4) 6)	92 6)		55	55	55	55	25 4)	254)	55	55	55	55	355)	
Terrestrial station Parameters	P _{t'} (dBW) in B	13	13	10 4) 6)	10 4) 6)	40 6)		13	13	13	13	-17 ⁴	-17 ⁴⁾	5	5	5	5	-15 ⁵⁾	
r atailicicis	ΔG (dB)	0	0	10 ⁶)	10 ⁶⁾	10 6)		0	0	0	0	0	0	0	0	0	0	0	
Reference bandwidth	B (Hz)			1	1	10 ¹		10 ¹	10 1	10 ¹	10 ¹	1	1	10 ¹	10 ¹	10 ¹	10 ¹	10 1	
Permiss. interf. power	P _r (p) (dbW)			-220	-220				_	_		220	-220	_			-		

Parameters associated with these services may vary over a rather wide range. Further study is required before representative values become available.
 A = analogue modulation; N = digital modulation.
 See note (*) in Section (2). M₀(p₀) may assume values between 5 and 40 dB, depending on frequency, rain climate and system design.
 These values are estimates for 1 Hz bandwidth and are 30 dB below the total power assumed for emission.
 These values assume an r.f. bandwidth of no less than 100 MHz, and are 20 dB below total power assumed per emission.
 In these bands, the parameters for the terrestrial stations associated with transhorizon systems have been used.

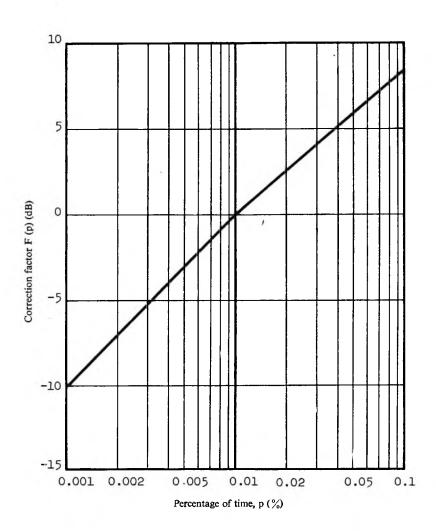


FIGURE 1

Correction factor F (p) for percentages of the time p other than 0.01%

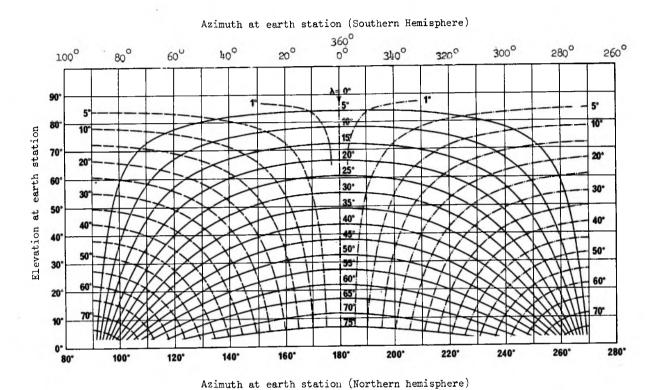
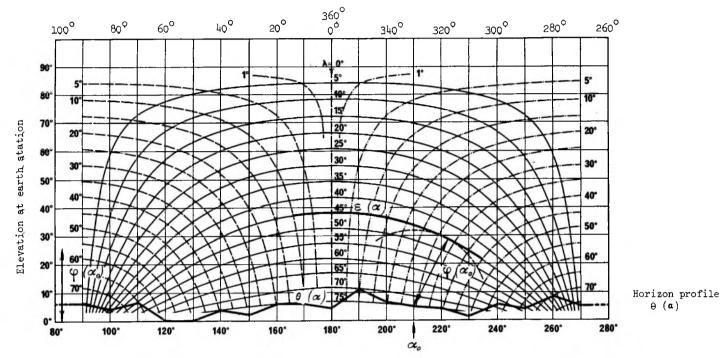


FIGURE 2 Position arcs of geostationary satellites

arc of geostationary satellite orbit visible from earth station at terrestrial latitude λ; difference in longitude between earth station and the sub-satellite point:
 — satellite longitude E of earth station longitude;
 — satellite longitude W of earth station longitude;
 — longitude 0 relative to the earth station.

Azimuth at earth station (Southern Hemisphere)



Azimuth at earth station (Northern hemisphere)

FIGURE 3

Example of derivation of 6

- arc of geostationary satellite orbit visible from earth station at terrestrial latitude λ difference in longitude between earth station and the sub-satellite point :
- - satellite longitude W of earth station longitude;

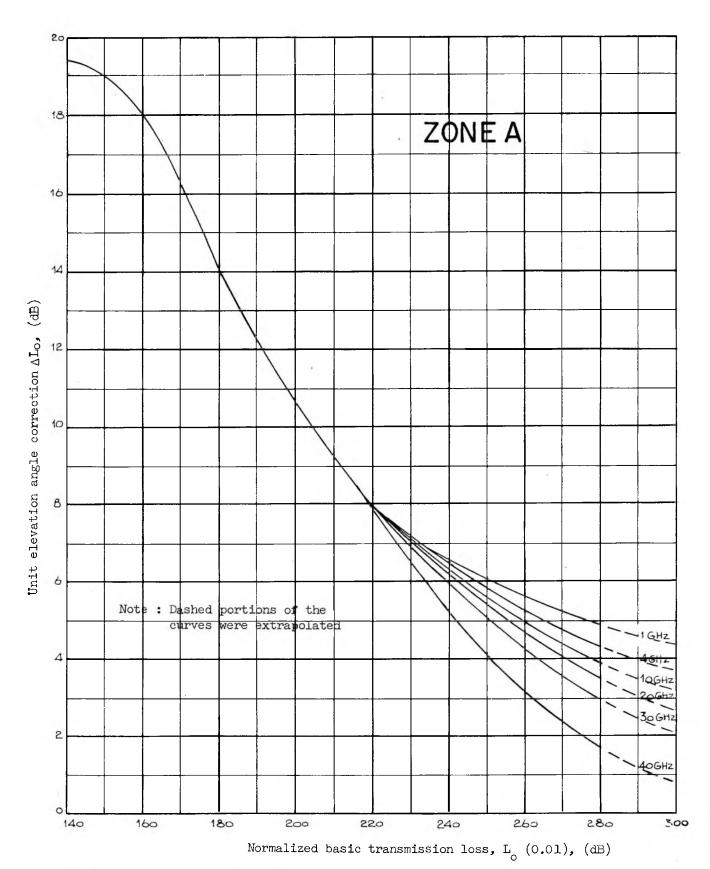


Figure 4 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone A

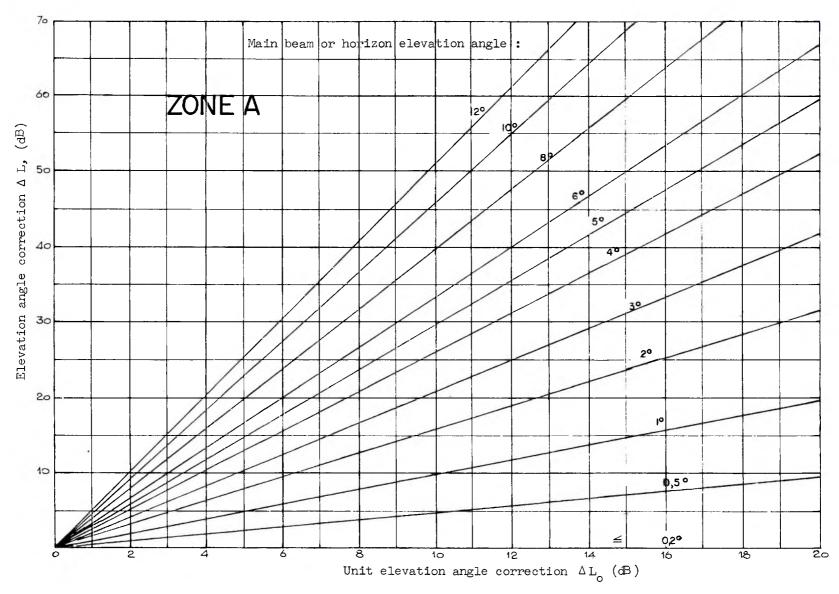


Figure 5 - Elevation angle correction, Zone A

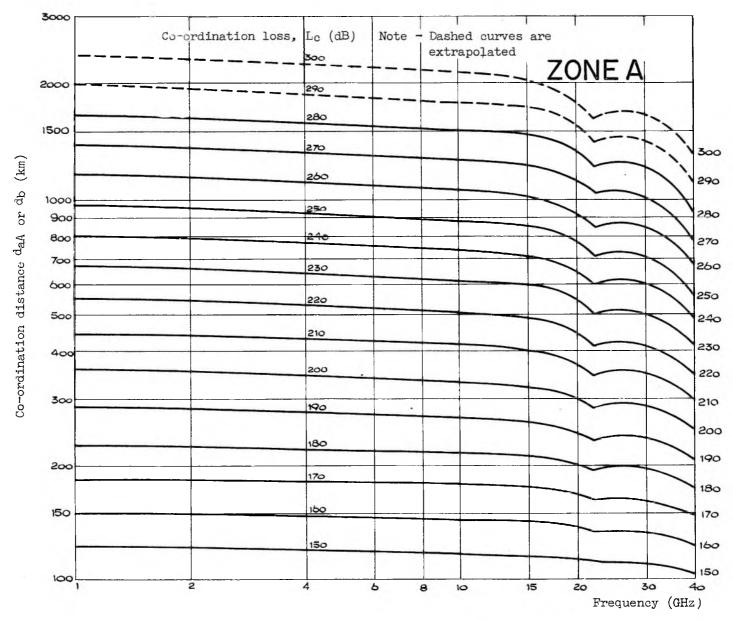


Figure 6 - Co-ordination distance d_{aA} or d_b as a function of frequency and co-ordination loss, Zone A

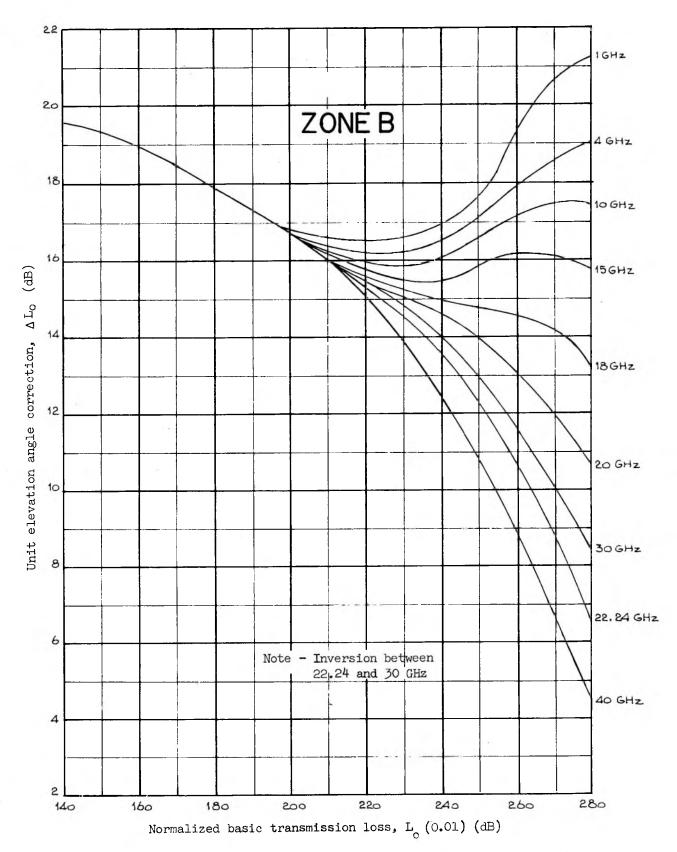


Figure 7 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone B

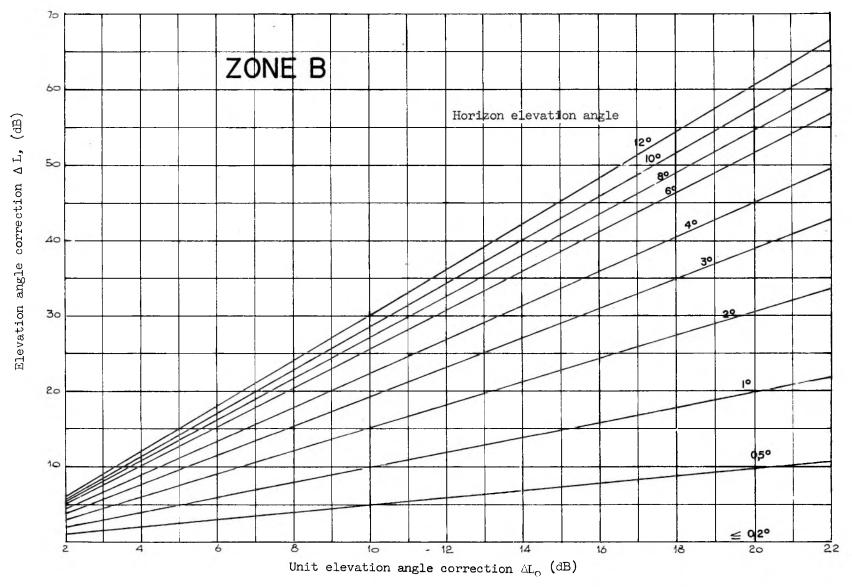


Figure 8 - Elevation angle correction, Zone B

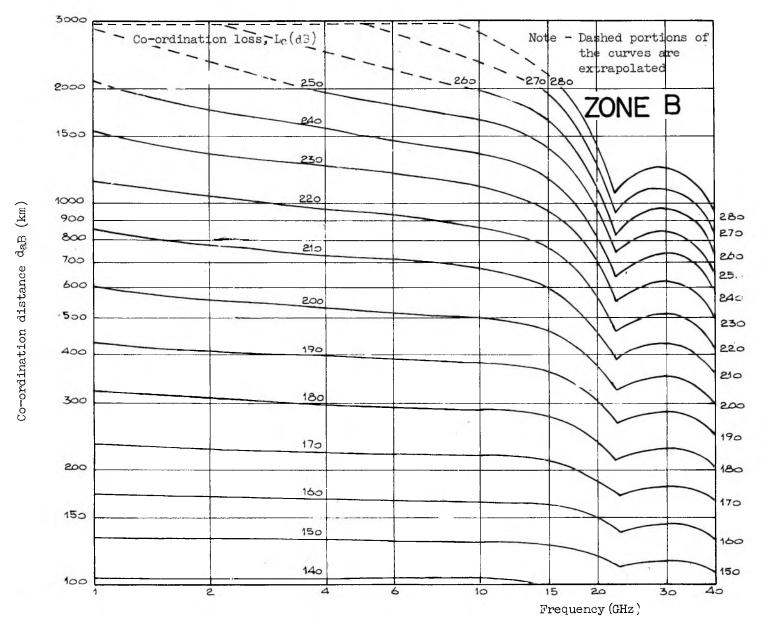


Figure 9 - Co-ordination distance d_{aB} as a function of frequency and co-ordination loss, Zone ${\ensuremath{\mathtt{B}}}$

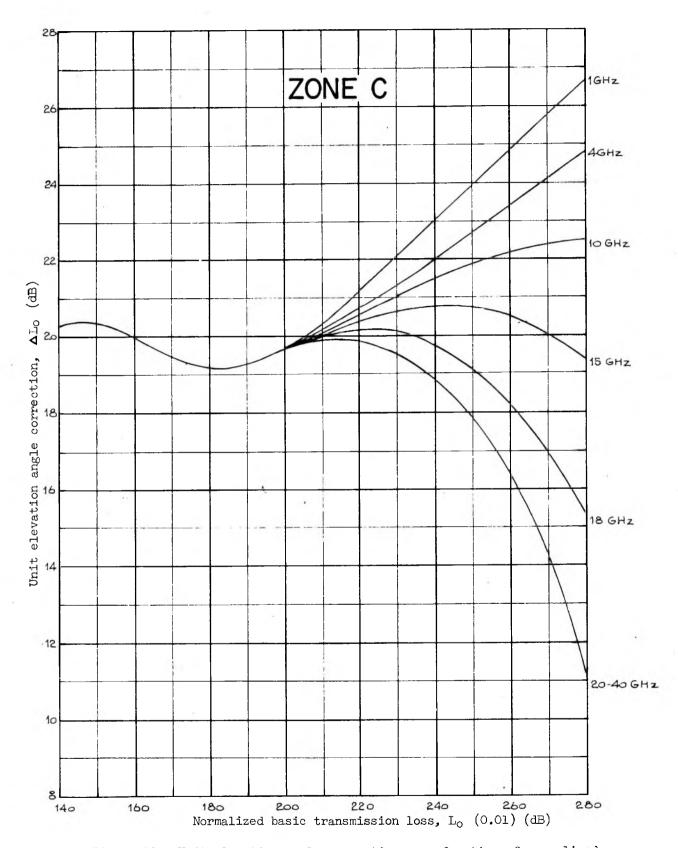


Figure 10 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone C

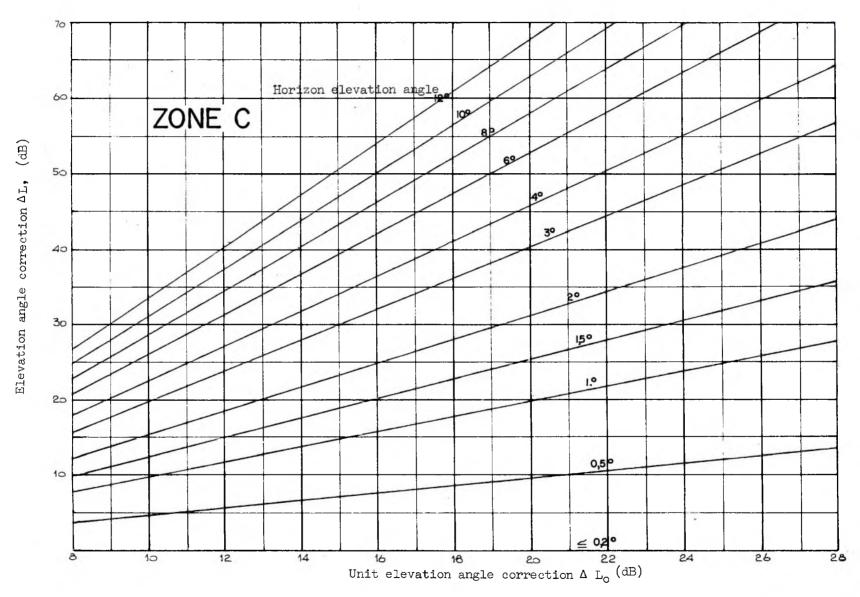


Figure 11 - Elevation angle correction, Zone C

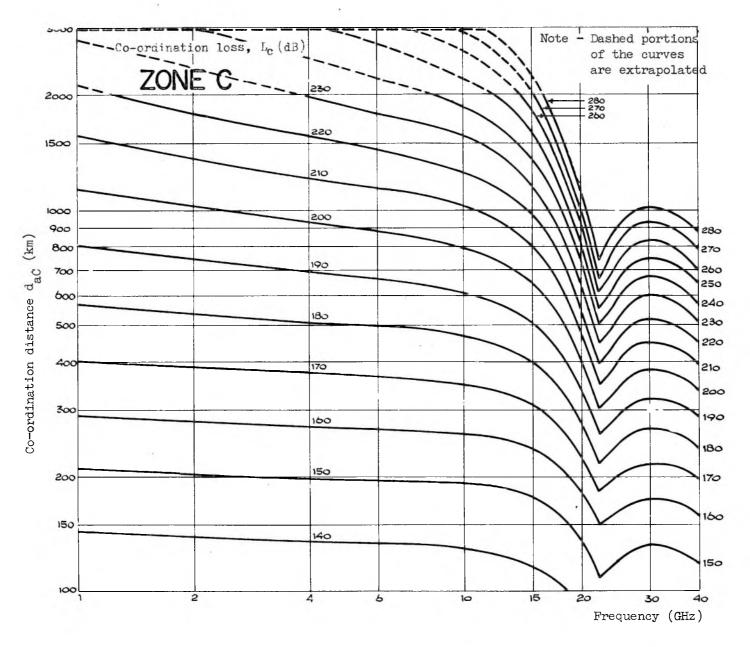


Figure 12 - Co-ordination distance daC as a function of frequency and co-ordination loss, Zone C

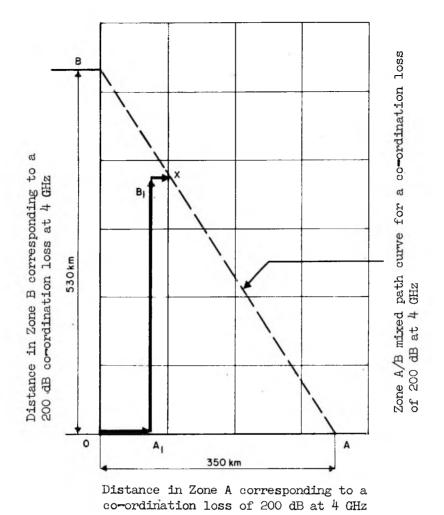


Figure 13a

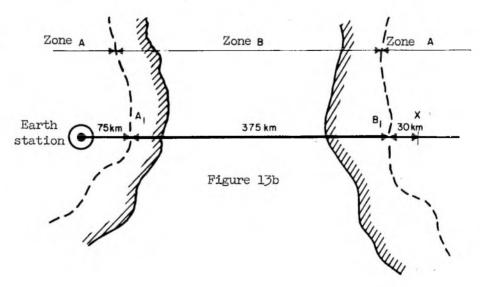


Figure 13 - Example of co-ordination distance calculation for a mixed path

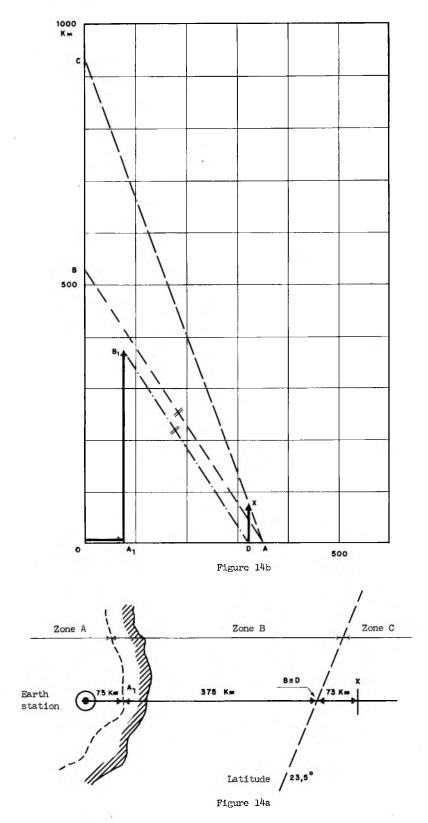


Figure 14 - Example of determination of co-ordination distance for mixed paths involving Zones Λ_\bullet B and C

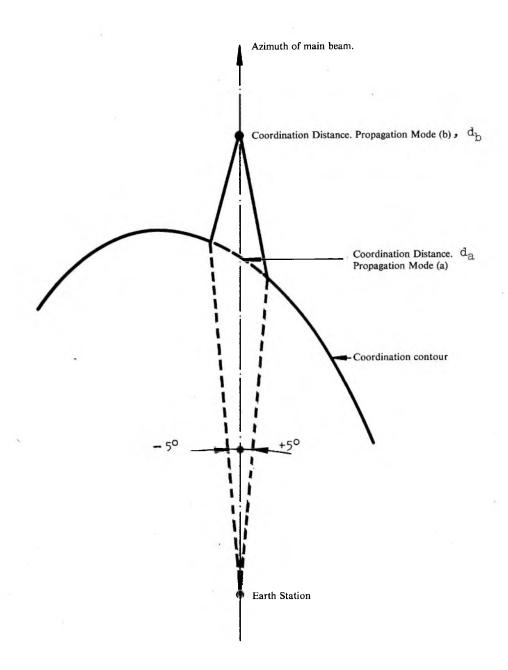
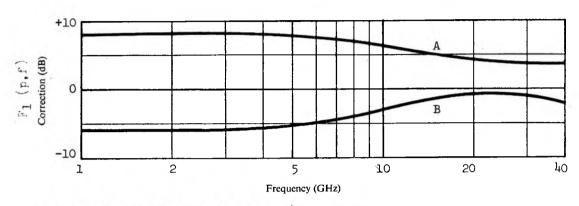


FIGURE 15

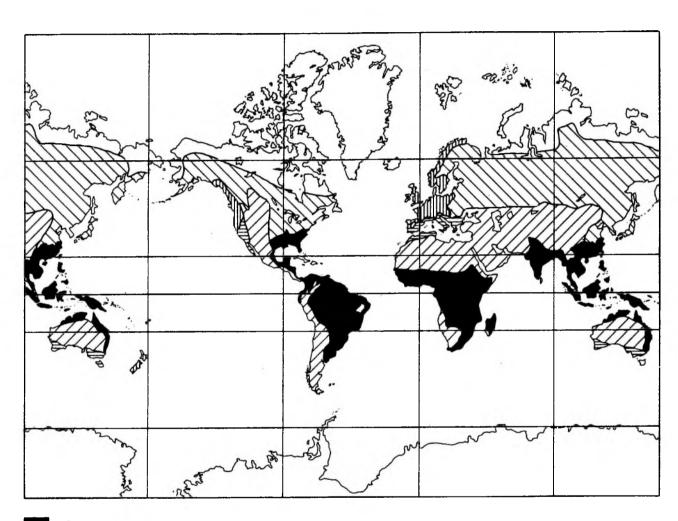
Example of the determination of the coordination distance in the case where the elevation of the earth station main beam is less than 12°



A: Correction for 0.1% of the time B: Correction for 0.001% of the time All rain climates

FIGURE 16

Correction factor to relate the effective percentage of time to 0.01%, as a function of frequency for rain scatter



1 2

FIGURE 17

4

Rain climates of the world

5

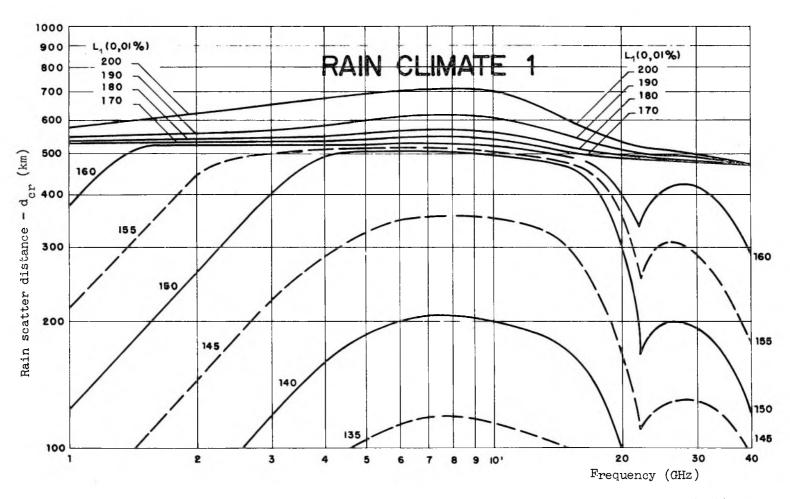


Figure 18 - Rain scatter distance as a function of frequency and normalized co-ordination loss - Rain Climate 1

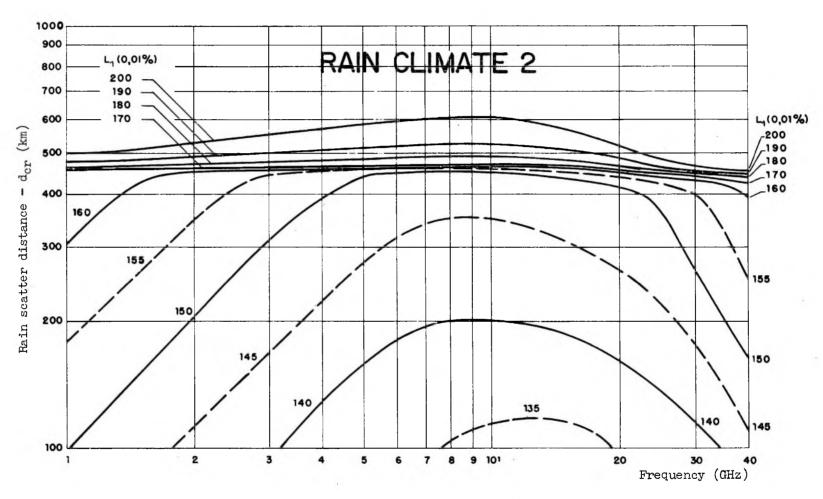


Figure 19 - Rain scatter distance as a function of frequency and normalized co-ordination loss Rain Climate 2

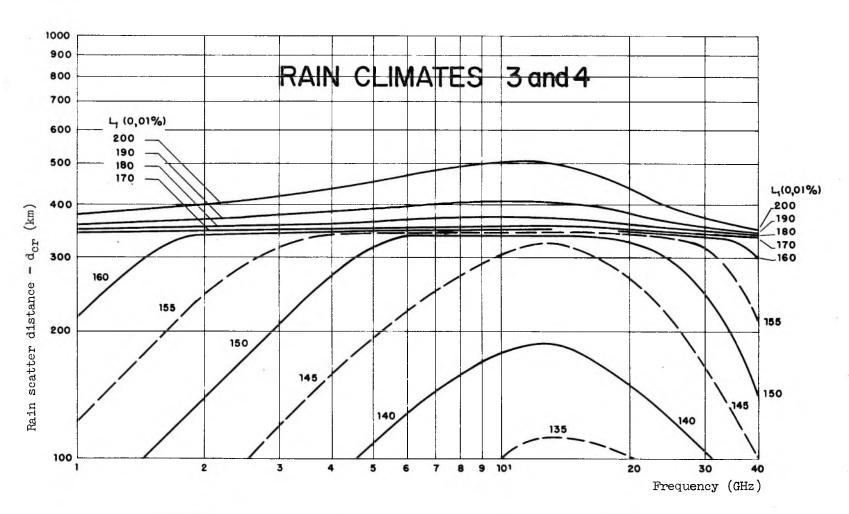


Figure 20 - Rain scatter distance as a function of frequency and normalized transmission loss Rain Climates 3 and 4

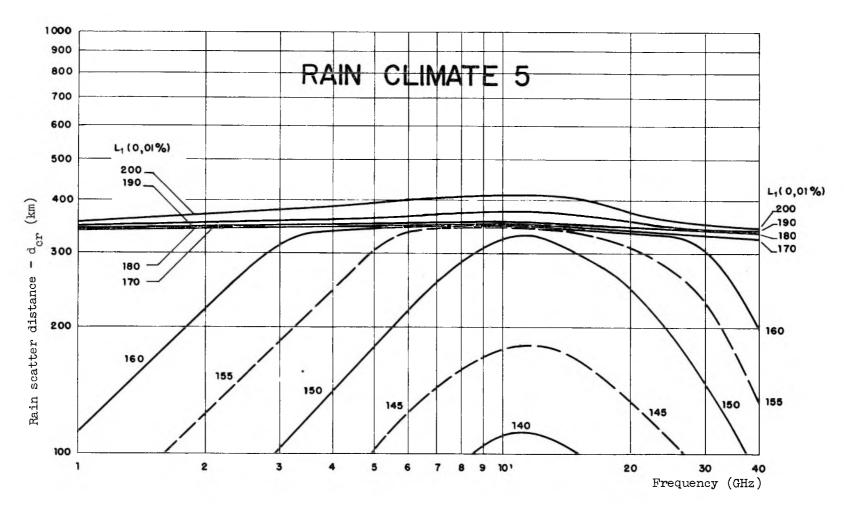


Figure 21 - Rain scatter distance as a function of frequency and normalized transmission loss
Rain Climate 5

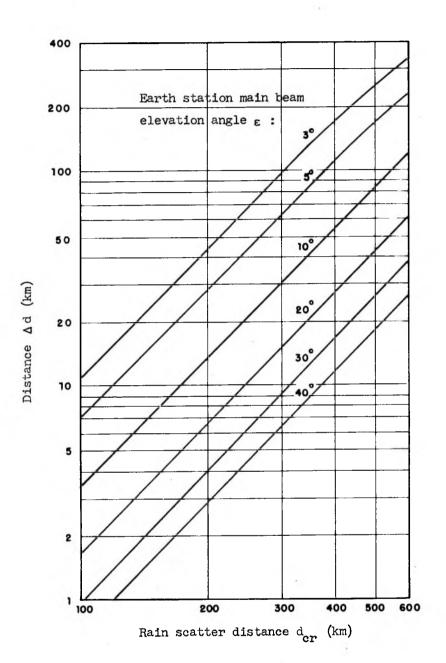
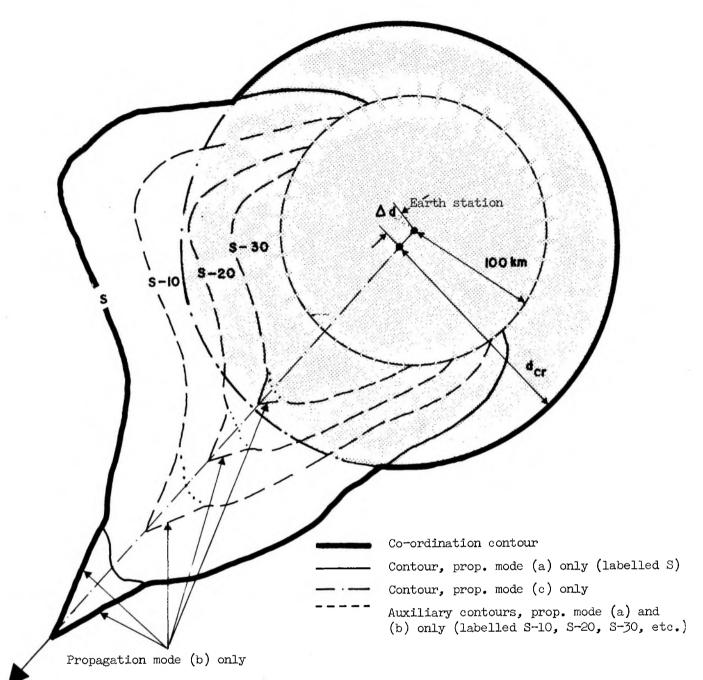


Figure 22 - The distance $\Delta\,d$ as a function of rain scatter distance $d_{\mbox{cr}}$ and earth station main beam elevation angle $\epsilon.$



If by using the auxiliary contours it is seen that a terrestrial station can be eliminated with respect to the great circle propagation mechanism then:

- i) if that terrestrial station is outside of the shaded area (rain-scatter mode), it may be eliminated from any further consideration;
- ii) if that terrestrial station is within the shaded area (rain-scatter mode), it must still be considered, but simply for the rain-scatter propagation mode only.

Figure 23 - Example of contours for a transmitting earth station

ANNEX A TO APPENDIX 28

Determination of Co-ordination Distance in allocated Frequency Bands

1. Article 9A requires co-ordination distances to be determined only in the particular frequency bands given in Article 5 and listed in Tables III and IV of this Annex. For each of these frequency bands it is convenient to combine those parameters which depend only upon the frequency and types of system using the band. The resulting value of the combined parameters is then a given constant for a particular allocated frequency band and type of earth station.

Earth station transmission

2. In the bands allocated for earth station transmission (Table III), use is made of constants C_1 and C_2 derived in the following manner:

For propagation by modes (a) and (b):

$$C_1 = G_r - P_r(p) - 20 \log f/4 - F(p)$$

= S - 20 log (f/4) - F(p)

For propagation by mode (c):

$$C_2 = -P_r(p) - F_1(p,f) + \Delta G$$

The normalized basic transmission loss $L_o(0.01)$ and the normalized transmission loss $L_1(0.01)$ are given by:

$$\begin{array}{l} L_{o}(0.01) = P_{t^{'}} + G_{t^{'}} + C_{1} \\ L_{1}(0.01) = P_{t^{'}} + C_{2} \end{array}$$

The values of C_1 and C_2 for bands allocated for earth station transmission are given in Table III, together with the reference bandwidth (B) which is used in calculating $P_{\mathbf{t}'}$.

Earth station reception

3. In the bands used for earth station reception (see Table IV) use is made of constants C_3 and C_4 which are derived in the following manner:

For propagation by modes (a) and (b):

$$C_3 = E - (10 \log kB + J - W) - F(p) - 20 \log (f/4)$$

For propagation by mode (c):

$$C_4 = P_{t'} - (10 \log kB + J - W) - F_1(p,f) + \Delta G$$

The normalized basic transmission loss $L_o(0.01)$ and the normalized transmission loss $L_I(0.01)$ are given by:

$$\begin{split} L_{\text{o}}(0.01) &= G_{\text{r}} + C_{3} - 10 \text{ log } T_{\text{r}} - M(\text{p}) \\ L_{\text{I}}(0.01) &= C_{4} - 10 \text{ log } T_{\text{r}} - M(\text{p}) \end{split}$$

The values of C_3 and C_4 for bands allocated for earth station reception are given in Table IV.

Flow diagrams

4. The procedure for determining co-ordination distance is illustrated by Flow Diagrams 1 and 2 in this Annex. The steps required to determine co-ordination distances for a transmitting earth station are shown in Flow Diagram 1, and those for a receiving earth station are shown in Flow Diagram 2. The symbols used in these diagrams are defined in the main text of Appendix 28.

TABLE III

Earth station Transmission (See Flow Diagram 1)

Allocated Frequency Bands (GHz)	C ₁ (dBW)	C ₂ (dBW)	Reference Bandwidth B (Hz)		
1.427 - 1.429	178	127	4 × 10 ³		
2.655 - 2.690	196	150	4 × 10 ³		
4-408 - 4-700	191	150	4 × 10 ³		
5.850 - 6.425	175	136	4 × 10 ³		
7-900 - 7-975 8-025 - 8-400	175	138	4 × 10 ³		
10.95 - 11.20	172	137	4 × 10 ³		
12·50 - 12·75	171	137	4 × 10 ³		
14-40 - 14-50	170	137	4 × 10 ³		
27-5 - 29-5	142	112	1 × 10 ⁶		

TABLE IV Earth Station Reception (see Flow Diagram 2)

Allocated frequency Bands (GHz)	Designation radiocommun	on of space ication service	Type of modulating signal ¹	C ₃ (dBW)	C₄ (dBW)		
1.525-1.535	Space oper (Telemeteri		_				
1.670-1.690	Meteorolog	gical satellite	_	_	_		
1 700 1 710	S	Near Earth	_	-	_		
1·700-1·710 2·290-2·300	Space research	Deep space manned		_	_		
2.500-2.535	Fixed satell	lite	A	A 277			
3·400-4·200 Fixed satellite			A	236	194		
3·400-4·200	Fixed sates	me	N	234	188		
7.300-7.750	Fixed satel	lita	A	230	194		
7-300-7-730	Fixed satellite		N	228	186		
8·400-8·500	Near earth		_	-	_		
8-400-8-300	Space	Deep space		_			
10.95-11.20	77° 1 41	···	A	225	184		
11.45-11.70	Fixed satellite		N	220	176		
11.7 -12.2	Fixed satell	lita	A	224	184		
12.5 -12.75	rixed saten	e	N	219	176		
17.7 -19.7	Fixed satell	lite	N	176	154		
21-2 -22-0	Earth explo	oration satellite	_	_			

 $^{^{1}}$ A = Analogue Modulation. N = Digital Modulation.

ANNEX B TO APPENDIX 28

Determination and use of Auxiliary Contours

1. Introduction

For great circle propagation mechanisms, modes (a) and (b), auxiliary contours are of great value in eliminating certain existing or planned terrestrial stations falling within the co-ordination area without recourse to precise and arduous calculations. The work of both the earth station administration and the affected administrations is therefore eased during subsequent negotiations if these auxiliary contours are supplied.

2. Determination of the auxiliary contours

Two types of contours can be determined, depending on whether the earth station is used for transmission or reception.

2.1 Transmitting earth station

The concours are determined in the same way as the corresponding co-ordination contour for propagation modes (a) and (b), but using terrestrial station interference sensitivity factor S values (in dbW) which are 5, 10, 15, 20 dB etc. lower than the value (given in Table I of Appendix 28) corresponding to the co-ordination contour.

2.2 Receiving earth station

The contours are determined in the same way as the corresponding co-ordination contour, for propagation modes (a) and (b), but using terrestrial station e.i.r.p. values (in dBW) 5, 10, 15, 20 dB, etc. lower than the value (given in Table II of Appendix 28) corresponding is the co-ordination contour.

3. Use of auxiliary contours

The auxiliary contours, the co-ordination contour for great circle propagation (modes (a) and (b)) and the co-ordination contour for

rain scatter (mode (c)) are all plotted on the same diagram for a given shared band. An illustrated example is given in Figure 25 for a transmitting earth station.

For each terrestrial station situated within the co-ordination area, a two-stage procedure may be applied, one for the great circle propagation mechanism and the other for rain scatter.

3.1 Great circle propagation mechanism (modes (a) and (b))

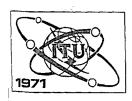
If a transmitting terrestrial station is outside the co-ordination area corresponding to modes (a) and (b), it need not be considered further with respect to modes (a) and (b).

For each transmitting terrestrial station situated within the coordination area corresponding to modes (a) and (b), the e.i.r.p. value in the direction of the earth station is determined. If this value is less than the value associated with the nearest contour defining an area outside of which the station is situated, the station may be considered not to cause more than a permissible level of interference and therefore may be eliminated from further considerations with respect to modes (a) and (b).

For each receiving terrestrial station, the analogous procedure may be applied, using the interference sensitivity factor instead of the e.i.r.p. value.

3.2 Elimination of a terrestrial station and rain scatter mechanism (mode (c))

Terrestrial stations eliminated by the above procedure from further consideration with regard to propagation modes (a) and (b) need, nevertheless, be further considered with regard to propagation mode (c) when they lie within the rain scatter co-ordination area.



SPACE CONFERENCE

Addendum to
Document No. 385
14 July 1971
Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SEVENTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

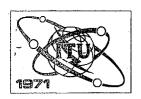
On page 7, <u>replace</u> in the framed part of the Table the frequency band 22-23 GHz by the following:

Allocation to Services						
Region 1	Region 2	Region 3				
22-22.5						
	FIXED MOBILE	·				
	410A					
22.5-23						
FIXED MOBILE		FIXED MOBILE BROADCASTING BROADCASTING- SATELLITE A A				

and add the following foot-note:

ADD [A]

In Region 3, the Broadcasting-Satellite Service is also authorized in the band 22.5-23.0 GHz, subject to power flux density limits for the protection of the terrestrial services in this band.



SPACE CONFERENCE

Corrigendum to
Document No. 385
14 July 1971
Original: English

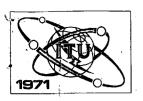
WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SEVENTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

On page 8, in the framed part of the Table in the box 24 - 24.05 GHz delete foot-note "408A",





SPACE CONFERENCE

Document No. 385-E

13 July 1971

Original: English

French Spanish

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SEVENTH REPORT OF COMMITTEE 5 (ALLOCATIONS)

ARTICLE 5 - TABLE OF FREQUENCY ALLOCATIONS

Frequency bands between 10.6 Gc/s and 40 Gc/s

Committee 5 adopted the revised provisions reproduced in the Annex to the present Report which are submitted to the Plenary for first reading.

H.A. KIEFFER Chairman

Annex



ANNEX

 \mathtt{GHz}

		Allocation to services		
	Region 1	Region 2	Region 3	
	10.6-10.68			
MOD		FIXED MOBILE RADIO ASTRONOMY Radiolocation		
		404A		
	ADD 404A 10.6-10 seconda	In the F.R. of German 0.68 GHz, the Radio Astron ry service.	y, in the band nomy Service is a	
	10.68-10.7			
MOD		RADIO ASTRONOMY 405B		
	SUP 405A NOC 405B			
	10.7-10.95			
MOD		FIXED MOBILE		
	10.95-11.2	10.95-11.2		
MOD	FIXED MOBILE FIXED-SATELLITE (Space-to-	FIXED MOBILE FIXED-SATELLITE (Space-to-Earth)		
	Earth) (Earth-to- Space)			
	11.2-11.45			
MOD		FIXED MOBILE	•	
	11.45-11.7			
MOD		FIXED MOBILE FIXED-SATELLITE (Space-to-Earth)		

Allocation to services		
Region l	Region 2	Region 3
11.7-12.5	11.7-12.2	11.7-12.2
BROADCASTING- SATELLITE BROADCASTING FIXED MOBILE except aeronautical mobile	FIXED-SATELLITE (Space-to-Earth) BROADCASTING- SATELLITE BROADCASTING FIXED MOBILE except aeronautical mobile	BROADCASTING- SATELLITE BROADCASTING FIXED MOBILE except aeronautical mobile
	∠ō, <u>e</u> 7	_a_7
	∠D, <u>E</u> 7 12.2 - 12.5	_A_7
	FIXED MOBILE except aero BROADCASTING	onautical mobile
_a_7		

ADD

In the band 11.7-12.2 GHz in Region 3 and in the band 11.7-12.5 GHz in Region 1, existing and future fixed, mobile and broadcasting services shall not cause harmful interference to broadcasting-satellite stations operating in accordance with the provisions of the appropriate broadcasting frequency assignment planning conference (see Recommendation No. $(\underline{\cdot \cdot \cdot \cdot})$) and this requirement shall be taken into account in the decisions of that conference.

ADD

/ D 7 Terrestrial services in these bands shall be introduced only after the elaboration of agreed and approved plans for the space services, so as to ensure compatibility between the uses that each country decides for this band.

ADD

The use of the band 11.7-12.2 GHz by the broadcasting-satellite and the fixed-satellite services is limited to domestic systems and is subject to previous agreement among administrations concerned and those having services, operating in accordance with the Table, which may be affected.

M

·	Allocation to services		
	Region 1	Region 2	Region 3
	12.5-12.75	12.5-12.75	12.5-12.75
MOD	FIXED-SATELLITE (Space-to-Earth) (Earth-to-Space) 405BA 405BB	FIXED-SATELLITE (Earth-to-Space) FIXED MOBILE except aeronautical mobile	FIXED-SATELLITE (Space-to-Earth) FIXED MOBILE except aeronautical mobile
	12.75-13.25		
MOD		FIXED MOBILE	
	13.25-13.4		
MOD		AERONAUTICAL RADIONA	AVIGATION ·
		405BC 406 407	
	13.4-14		
MOD		RADIOLOCATION	·
		405BC 407 408 409	

ADD 405BA

In Austria, Bulgaria, Cameroon, Congo (Brazzaville), the Ivory Coast, Spain, Gabon, Ghana, Hungary, Iraq, Israel, Jordan, Kuwait, Libya, Mali, Poland, Syria, United Arab Republic, Roumania, Czechoslovakia, Togo and the U.S.S.R., the band 12.5-12.75 GHz is also allocated to the fixed and mobile except aeronautical mobile services.

ADD 405BB

In Algeria, Belgium, Denmark, Spain, Finland, France, Greece, Luxembourg, Monaco, Nigeria, Norway, the Netherlands, Portugal, the Federal Republic of Germany, Senegal, Sweden, Switzerland and Tunisia, the band 12.5-12.75 GHz is also allocated, on a secondary basis, to the fixed and mobile except aeronautical mobile services.

MOD 407

In Albania, Bulgaria, Hungary, Poland, Roumania, Czechoslovakia and the U.S.S.R., the bands 13.25-13.5 GHz, 14.175-14.3 GHz, 15.4-17.7 GHz, 23.6-24 GHz, 24.05-24.25 GHz and 33.4-36 GHz are also allocated to the fixed and mobile services.

MOD 408

In Sweden, the bands 13.4-14 GHz, 15.7-17.7 GHz and 33.4-36 GHz are also allocated to the fixed and mobile services.

	Allocation to services		
	Region 1	Region 2	Region 3
MOD	14-14.3	RADIONAVIGATION FIXED-SATELLITE (Earth-to-Space) 405BC 407	
MOD	14.3-14.4	RADIONAVIGATION-SAFIXED-SATELLITE (Earth-to-Space)	ATELLITE
MOD	14 .4- 14 . 5	FIXED MOBILE FIXED-SATELLITE (Earth-to-Space) 405BD 405BE	

ADD 405BC

The band 13.25-14.2 GHz may also be used, on a secondary basis, for Earth-to-Space transmissions in the space research service, subject to agreement among the administrations concerned and those having services operating in accordance with the Table, which may be affected.

ADD 405BD

The band 14.4-15.35 GHz may also be used, on a secondary basis, for Space-to-Earth transmissions in the space research service, subject to agreement among the administrations concerned and those having services. operating in accordance with the Table, which may be affected.

ADD 405BE

Radio astronomy observations on the Formaldehyde line (rest frequency 14.489 GHz) are being carried out in a number of countries under national arrange-In making assignments to stations in the fixed and mobile services, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference in the band 14.485-14.515 GHz.

GHz

	Allocation to services		
	Region l	Region 2	Region 3
MOD	14.5-15.25	FIXED MOBILE 405BD 405BE	·
MOD	15.25-15.35	FIXED MOBILE 405 BD	
	SUP 409A SUP 409B		
MOD	17.7-19.7	FIXED MOBILE FIXED-SATELLITE (Space-to-Earth)	
MOD	19 .7- 21 . 2	FIXED-SATELLITE (Space-to-Earth) 409E	

SUP 409D

ADD 409E

In Japan, the bands 19.7-21.2 GHz and 29.5-31 GHz are also allocated to the fixed and mobile services. This additional use shall not impose any limitation to the power flux density of space stations in the fixed-satellite service.

GHz

	Allocation to services		
	Region l	Region 2	Region 3
MOD	21.2-22	FIXED MOBILE EARTH EXPLORATION (Space-to-Earth	
MOD	22-23	FIXED MOBILE 410A	
MOD	23-23.6	FIXED MOBILE	·

ADD 410A

The band 22.21-22.26 GHz is also allocated to the radio astronomy service for observations of a spectral line due to water vapour (rest frequency 22.235 GHz). Administrations are urged to give all practicable protection in this band for future research in radio astronomy.

MOD RADIO ASTRONOMY
407

GHz

i	Allocation to services		
	Region l	Region 2	Region 3
MOD	24 - 24 . 05	AMATEUR AMATEUR-SATELLITE 408A	
MOD	24.05-24.25	RADIOLOCATION Amateur 407 410	

. MOD 410

The frequency 24.125 GHz is designated for industrial, scientific and medical purposes. Emissions must be confined within the limits of ± 125 MHz of that frequency. Radiocommunication services operating within those limits must accept any harmful interference that may be experienced from the operation of industrial, scientific and medical equipment.

NOC	25.25-27.5	FIXED MOBILE
MOD	27 . 5 - 29 . 5	FIXED MOBILE FIXED—SATELLITE (Earth-to-Space)
MOD	29.5-31	FIXED-SATELLITE (Earth-to-Space) 409E

GHz

	Allocation to services		
	Region 1	Region 2	Region 3
	31-31.3		
MOD		FIXED MOBILE Space research	·
		412H 412I	
	31.3-31.5		
NOC		RADIO ASTRONOMY	·
		412A	

ADD 412I

Radio astronomy observations in the band 31.2-31.3 GHz are carried out in a number of countries under national arrangements. Administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

36-40		
	FIXED MOBILE	
	391A 412E	

MOD



SPACE CONFERENCE

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Document No. 386-E(Rev.)
15 July 1971
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WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

EIGHTH AND LAST REPORT OF COMMITTEE 5 (ALLOCATIONS)

ARTICLE 5 - TABLE OF FREQUENCY ALLOCATIONS

Frequency bands

10 000-10 500 MHz

25 600-26 100 kHz

148.25 MHz + 15 kHz

420-450 MHz

460-470 MHz

611-613 MHz

790-960 MHz

845-890 MHz

1 215-1 300 MHz

2 300-2 450 MHz

3 300-3 500 MHz

5 650-5 925 MHz

10 000-10 500 MHz

1 535-1 660 MHz

1 540-1 660 MHz

1 660-1 670 MHz

1 690-1 700 MHz

1 690-1 700 MHz

1 670-1 690 MHz

1 670-1 690 MHz

1 690-1 700 MHz 2 655-2 690 MHz

3 500-5 700 MHz

Frequencies

4 202 MHz

6 727 MHz

Frequency bands

6 625-7 125 MHz

8 025-8 400 MHz

8 025-8 400 MHz

11.7-12.5 GHz



N.B. This revised edition corrects and completes the original version dated 14 July 1971.

Document No. 386-E(Rev.)
Page 2

1. Resolution No. Spa 2 relating to Space Vehicles in Distress and Emergency

Committee 5 decided that Resolution No. Spa 2 should be abrogated.

2. Frequency band 10 000-10 500 MHz

Foot-note ADD 402A presented by Working Group 5D for adoption in Document No. 240 was found to be outside the competence of the Conference. On the invitation of the Chairman, the delegations of France and Greece did not press their proposal. The proposed foot-note read:

"In France and Greece the band 10 000-10 500 MHz is also allocated to the aeronautical radionavigation service."

3. Frequency band 25 600-26 100 kHz

- 3.1 The Committee <u>adopted</u> the agreement reached in Working Group 5E (Document No. 281, para. 1), that there would be no allocation in this band to the Broadcasting-Satellite Service and, consequently, <u>adopted</u> the status quo between 25 600 kHz and 26 100 kHz.
- 3.2 The Delegation of the United Kingdom withdrew its proposal in deference to the views of a majority of delegations, stressing that they do not withdraw on technical grounds since the technical arguments advanced against making allocations to the Broadcasting-Satellite Service in this band, were not accepted.
- 3.3 The Delegations of New Zealand and Sweden concurred with the majority view reluctantly.

4. Frequency band 148.25 MHz + 15 kHz

In view of the decision to amend foot-note 285A, the Delegation of the F.R. of Germany reserved the right to revert, if necessary, to this question in Plenary.

5. Frequency band 420-450 MHz

5.1 With respect to the use of space techniques by the Amateur Service, by 31 against, 26 for with 9 abstentions, the Committee was against such use. The proposal to add a new foot-note ADD 320A, which is reproduced hereunder, therefore was not retained.

"ADD 320A In the band 435-438 MHz the amateur-satellite-service may be authorized on condition that harmful interference shall not be caused to other services operating in accordance with the Table of Frequency Allocations. Administrations authorizing such use shall ensure that any harmful interference caused by emissions from amateur satellites is immediately eliminated."

In view of this decision, Document No. 315, containing fuller justification for the proposal, was left for consideration in Plenary should the Delegation of the United Kingdom so request.

5.2 The Delegation of the U.S.A. reserved the right to revert to this question if necessary in Plenary.

6. Frequency band 460-470 MHz

In view of the decision to add a foot-note ADD 324C in favour of the Earth Exploration-Satellite Service (Space-to-Earth) the following delegations were unable to accept this foot-note and reserved the right to revert to the question if necessary in Plenary; Cuba, Chile, Malaysia, Kenya, Pakistan, Syria, Tanzania and Uganda.

7. Frequency bands 453-455 MHz and 611-613 MHz

Proposal G-S-N/293(Rev.) seeking allocations in the bands 453-455 MHz (Space-to-Earth) and 611-613 MHz (Earth-to-Space), on a secondary basis, to the Maritime Mobile-Satellite Service to be inserted in the framed part of the Table for the three Regions, together with a foot-note ADD 322A, were examined and rejected by 17 for, 40 against, with 3 abstentions.

8. Frequency band 790-960 MHz

- 8.1 After detailed examination of proposals seeking allocations to the Broadcasting-Satellite Service in this band, the Committee decided that there would be no allocation to the Broadcasting-Satellite Service on a world-wide basis.
- 8.2 The Delegations of Syria, Uganda, Kenya and Tanzania reserved the right to revert to this question if necessary in Plenary.

9. Frequency band 845-890 MHz

The Brazilian Delegation proposed the inclusion of a foot-note as follows:

"In Brazil the band 845-890 MHz is also allocated to the fixed service. Time did not permit of its examination and the Chairman suggested that the text be passed to Plenary for consideration."

- 10. Frequency bands 1 215-1 300 MHz, 2 300-2 450 MHz, 3 300-3 500 MHz, 5 650-5 925 MHz, 10 000-10 500 MHz
 - 10.1 The Committee adopted the conclusions of Working Group 5C against the use of space techniques by the Amateur Service in these frequency bands.
 - 10.2 The Delegations of New Zealand, the U.S.A., Israel and Italy reserved the right to revert to this subject in Plenary if they still so desired.
- 11. Frequency band 1 535-1 660 MHz

The Delegation of the U.S.S.R. was strongly in favour of the status quo for the band 1 535-1 550 MHz and reserved the right to reopen this question in Plenary if it still so desires.

12. Frequency band 1 540-1 660 MHz

The Committee decided to make no change to foot-note 352D.

13. Frequency bands 1 660-1 670 MHz and 1 690-1 700 MHz - Foot-note 354A

The Delegation of Austria requested to be inserted in foot-note 354A. The Committee considered that it would appear that the question of competence of the Conference was involved. The Delegation reserved the right to revert to this question in Plenary if still so desired.

14. Frequency bands 1 690-1 700 MHz, 1 670-1 690 MHz

The Delegation of India reserved the right to revert to this question in Plenary if it still so desired.

15. Frequency band 1 690-1 700 MHz

The foot-note proposed by the Delegation of the United Kingdom in Document No. 291 was presented. In view of the lack of support for its proposal the Delegation of the United Kingdom reserved its right to revert to the matter if necessary in the Plenary.

16. Frequency bands 1 670-1 690 MHz, 1 690-1 700 MHz

Upon adoption by the Committee of foot-notes 356AB, 356ABA and 356AC, the Delegation of India reserved its right to revert to the matter if necessary in the Plenary.

17. Frequency band 2 655-2 690 MHz

With respect to the allocation adopted for the Fixed-Satellite Service in this band for Region 3 for use in the upward direction, the Delegation of India reserved its right to revert to the matter if necessary in the Plenary in connection with the direction of the transmission.

18. Frequency band 3 500-5 700 MHz

Regarding the revision of foot-note 377 with respect to changing the category of the service from alternative allocations to additional services (Nos. 145 and 142 of the Radio Regulations refers), the Committee had no difficulty in adopting this change by changing the term "allocated" to "also allocated" for the two countries appearing in the foot-note, e.g. China and Japan; however, the Committee was unable to adopt the recommendation of Working Group 5A with respect to adding the name of Korea to the foot-note. The Delegation of Korea recognized the difficulty and reluctantly decided not to press his request.

19. Frequencies 4 202 MHz and 6 727 MHz

Foot-note ADD 379A was adopted by 22 in favour 9 against and 3 abstentions. The Delegations of the United Kingdom and the United States reserved the right to revert to this question in the Plenary if still so desired.

20. Frequency band 6 625-7 125 MHz

Foot-note 392AA was adopted. The Delegation of Cuba reserved the right to revert to the matter if necessary in the Plenary.

21. Frequency band 8 025-8 400 MHz

The Delegation of Australia advised that it wished to have its name removed from foot-note 394 and invited attention to the consequential change in the framed part of the Table.

22. Frequency band 8 025-8 400 MHz

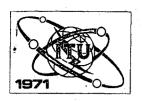
Upon the adoption of the allocation to the Earth Exploration-Satellite Service in Region 3 as a primary service, the Delegation of New Zealand reserved the right to revert to the matter if necessary in the Plenary. In connection with the Region 2 allocation to this service, the Delegation of Cuba reserved the right to revert to the matter if necessary in the Plenary.

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Page 6

23. Frequency band 11.7-12.5 GHz

Foot-notes A, D and E were <u>provisionally adopted</u> subject to the conclusions of Committee 6 with respect to the related procedures. The Committee <u>decided</u> that further time was necessary before these foot-notes could be finalized and accordingly requested that they be shown in square brackets.

H.A. KIEFFER Chairman



SPACE CONFERENCE

Document No. 386-E

14 July 1971 .

Original: English

French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

EIGHTH AND LAST REPORT OF COMMITTEE 5 (ALLOCATIONS)

ARTICLE 5 - TABLE OF FREQUENCY ALLOCATIONS

Frequency bands

10 000-10 500 MHz

25 600-26 100 kHz

148.25 MHz + 15 kHz

420-450 MHz

460-470 MHz

611-613 MHz

790-960 MHz

845-890 MHz

1 215-1 300 MHz

2 300-2 450 MHz

3 300-3 500 MHz 5 650-5 925 MHz

10 000-10 500 MHz

1 535-1 660 MHz

1 540-1 660 MHz

1 660-1 670 MHz

1 690-1 700 MHz

1 690-1 700 MHz

1 670-1 690 MHz

1 670-1 690 MHz

1 690-1 700 MHz

2 655-2 690 MHz

3 500-3 700 MHz

Frequencies

: 4 202 MHz

6 727 MHz

Frequency bands

6 625-7 125 MHz

8 025-8 400 MHz 8 025-8 400 MHz



Document No. 386-E Page 2

1. Resolution No. Spa 2 relating to Space Vehicles in Distress and Emergency

Committee 5 decided that Resolution No. Spa 2 should be abrogated.

2. Frequency band 10 000-10 500 MHz

Foot-note ADD 402A presented by Working Group 5D for adoption in Document No. 240 was found to be outside the competence of the Conference. The delegations of France and Greece did not press their proposal. The proposed foot-note read:

"In France and Greece the band 10 000-10 500 MHz is also allocated to the aeronautical radionavigation service."

3. Frequency band 25 600-26 100 kHz

- 3.1 The Committee <u>adopted</u> the agreement reached in Working Group 5E (Document No. 281, para. 1), that there would be no allocation in this band to the Broadcasting-Satellite Service and, consequently, <u>adopted</u> the status quo between 25 600 kHz and 26 100 kHz.
- 3.2 The Delegation of the United Kingdom withdrew its proposal in deference to the views of a majority of delegations, stressing that they do not withdraw on technical grounds since the technical arguments advanced against making allocations to the Broadcasting-Satellite Service in this band, were not accepted.
- 3.3 The Delegations of New Zealand and Sweden concurred with the majority view reluctantly.

4. Frequency band 148.25 MHz + 15 kHz

In view of the decision to amend foot-note 285A, the Delegation of the F.R. of Germany reserved the right to revert, if necessary, to this question in Plenary.

5. Frequency band 420-450 MHz

5.1 With respect to the use of space techniques by the Amateur Service, by 31 against, 26 for with 9 abstentions, the Committee was against such use. The proposal to add a new foot-note ADD 320A, which is reproduced hereunder, therefore was not retained.

"ADD 320A In the band 435-438 MHz the amateur-satellite-service may be authorized on condition that harmful interference shall not be caused to other services operating in accordance with the Table of Frequency Allocations. Administrations authorizing such use shall ensure that any harmful interference caused by emissions from amateur satellites is immediately eliminated."

In view of this decision, Document No. 315, containing fuller justification for the proposal, was left for consideration in Plenary should the Delegation of the United Kingdom so request.

5.2 The Delegation of the U.S.A. reserved the right to revert to this question if necessary in Plenary.

6. Frequency band 460-470 MHz

In view of the decision to add a foot-note ADD 324C in favour of the Earth Exploration-Satellite Service (Space-to-Earth) the following delegations were unable to accept this foot-note and reserved the right to revert to the question if necessary in Plenary; Cuba, Chile, Malaysia, Kenya, Pakistan, Syria, Tanzania and Uganda.

7. Frequency band 611-613 MHz

Proposals G-S/293/2 and 3 seeking an allocation in the band 611-613 MHz on a secondary basis to the Maritime Mobile-Satellite Service (Earth-to-Space) to be inserted in the framed part of the table for the three regions, together with a foot-note ADD 322A were examined and rejected by 17 for 40 against with 3 abstentions.

8. Frequency band 790-960 MHz

- 8.1 After detailed examination of proposals seeking allocations to the Broadcasting-Satellite Service in this band, the Committee decided that there would be no allocation to the Broadcasting-Satellite Service on a world-wide basis.
- 8.2 The Delegations of Syria, Uganda, Kenya and Tanzania reserved the right to revert to this question if necessary in Plenary.

9. Frequency band 845-890 MHz

The Brazilian Delegation proposed the inclusion of a foot-note as follows:

"In Brazil the band 845-890 MHz is also allocated to the fixed service. Time did not permit of its examination and the Chairman suggested that the text be passed to Plenary for consideration."

- 10. Frequency bands 1 215-1 300 MHz, 2 300-2 450 MHz, 3 300-3 500 MHz, 5 650-5 925 MHz, 10 000-10 500 MHz
 - 10.1. The Committee adopted the conclusions of Working Group 5C against the use of space techniques by the Amateur Service in these frequency bands.
 - 10.2 The Delegations of New Zealand, the U.S.A., Israel and Italy reserved the right to revert to this subject in Plenary if they still so desired.
- 11. Frequency band 1 535-1 660 MHz

The Delegation of the U.S.S.R. was strongly in favour of the status quo for this band and reserved the right to reopen this question in Plenary if it still so desires.

12. Frequency band 1 540-1 660 MHz

The Committee decided to make no change to foot-note 352D.

13. Frequency bands 1 660-1 670 MHz and 1 690-1 700 MHz - Foot-note 354A

The Delegation of Austria requested to be inserted in foot-note 354A. The Committee considered that it would appear that the question of competence of the Conference was involved. The Delegation reserved the right to revert to this question in Plenary if still so desired.

14. Frequency bands 1 690-1 700 MHz, 1,670-1 690 MHz

The Delegation of India reserved the right to revert to this question in Planary if it still so desired.

15. Frequency band 1 690-1 700 MHz

The foot-note proposed by the Delegation of the United Kingdom in Document No. 291 was presented. In view of the lack of support for its proposal the Delegation of the United Kingdom reserved its right to revert to the matter if necessary in the Plenary.

16. Frequency bands 1 670-1 690 MHz, 1 690-1 700 MHz

Upon adoption by the Committee of foot-notes 356AB, 356ABA and 356AC, the Delegation of India reserved its right to revert to the matter if necessary in the Plenary.

17. Frequency band 2 655-2 690 MHz

With respect to the allocation adopted for the Fixed-Satellite Service in this band for Region 3 for use in the upward direction, the Delegation of India reserved its right to revert to the matter if necessary in the Plenary in connection with the direction of the transmission.

18. Frequency band 3 500-3 700 MHz

Regarding the revision of foot-note 377 with respect to changing the category of the service from alternative allocations to additional services (Nos. 145 and 142 of the Radio Regulations refers), the Committee had no difficulty in adopting this change by changing the term "allocated" to "also allocated" for the two countries appearing in the foot-note, e.g. China and Japan; however, the Committee was unable to adopt the recommendation of Working Group 5A with respect to adding the name of Korea to the foot-note. The Delegation of Korea recognized the difficulty and reluctantly decided not to press his request.

19. Frequencies 4 202 MHz and 6 727 MHz

Foot-note ADD 379A was adopted by 22 in favour 9 against and 3 abstentions. The Delegations of the United Kingdom and the United States reserved the right to revert to this question in the Plenary if still so desired.

20. Frequency band 6 625-7 125 MHz

Foot-note 392AA was adopted. The Delegation of Cuba reserved the right to revert to the matter if necessary in the Plenary.

21. Frequency band 8 025-8 400 MHz

The Delegation of Australia advised that it wished to have its name removed from foot-note 394 and invited attention to the consequential change in the framed part of the Table.

22. Frequency band 8 025-8 400 MHz

Upon the adoption of the allocation to the Earth Exploration-Satellite Service in Region 3 as a primary service, the Delegation of New Zealand reserved the right to revert to the matter if necessary in the Plenary. In connection with the Region 2 allocation to this service, the Delegation of Cuba reserved the right to revert to the matter if necessary in the Plenary.

(To be continued)

INTERNATIONAL TELECOMMUNICATION UNION

Ε

SPACE CONFERENCE

Geneva, 1971

Document No. 387-E 5 July 1971

PLENARY MEETING (SECOND READING)

R. 1

The Editorial Committee, having examined the following texts, submits them to the Plenary Meeting for a second reading.

Subject	Origin
Preamble Art. 9A Final Protocol Res. A Rec. AA Rec. BB	B2 B6 B2 B2 B2 B2 B4

François JoB
Chairman of the Editorial
Committee

Annex: Pages R1/-01-36



PARTIAL REVISION OF THE RADIO REGULATIONS¹

In its Recommendation No. Spa 9, the Extraordinary Administrative Radio Conference to allocate frequency bands for space radiocommunication purposes, held in Geneva in 1963, recommended that the Administrative Council of the Union should review annually the progress in space radiocommunications made by Administrations and the available reports and recommendations of the permanent organs of the Union with respect thereto. The Conference also recommended that the Administrative Council should, in the light of its annual review and at a date which it would determine, recommend to Administrations the convening of an administrative conference to work out further agreements for the international regulation of the use of radio frequency bands allocated for space radiocommunications by the 1963 Conference.

At its 23rd Session in 1968, the Administrative Council, in its Resolution No. 632, recommended that a World Administrative Radio Conference should be convened during the latter part of 1970 or early 1971 and invited Administrations to send to the Secretary-General their proposals for the agenda thereof.

In accordance with Nos. 56 and 64 of the International Telecommunication Convention (Montreux, 1965), the Administrative Council, at its 1969 Session, with the concurrence of a majority of the Members of the Union, determined in its Resolution No. 653 the agenda of the World

¹ Namely the Radio Regulations, Geneva, 1959, as partially revised by the Extraordinary Administrative Radio Conference to allocate frequency bands for Space Radio-communication purposes, Geneva, 1963, by the Extraordinary Administrative Radio Conference for the preparation of a revised allotment plan for the Aeronautical Mobile (R) Service, Geneva, 1966 and by the World Administrative Radio Conference to deal with matters relating to the Maritime Mobile Service, Geneva, 1967.

Administrative Radio Conference for Space Telecommunications and decided that it would meet in Geneva on 7 June 1971 for a duration of six weeks, provision being made for one additional week if necessary.

However, in 1970, the Administrative Council, taking into account the provisions of Resolution No. 40 of the XIIth Plenary Assembly of the C.C.I.R. relative to the convening, prior to the Conference, of a Special Joint Meeting of C.C.I.R. Study Groups, decided in its Resolution No. 665 that the duration of the Conference would be six weeks.

* *

The World Administrative Radio Conference for Space Telecommunications, accordingly convened on the appointed date, considered and revised, in conformity with its agenda, the relevant parts of the Radio Regulations. Particulars of the revisions of the Radio Regulations are given in Annexes 1 to $\frac{1}{12}$ hereto.

The revised provisions of the Radio Regulations shall form an integral part of the Radio Regulations which are annexed to the International Telecommunication Convention. They shall come into force on 1 January 1973, on which date the provisions of the Radio Regulations which are cancelled or modified by these revisions shall be abrogated.

* *

The delegates signing this revision of the Radio Regulations hereby declare that, should an Administration make reservations concerning the application of one or more of the revised provisions of the Radio Regulations no other Administration shall be obliged to observe that provision or those provisions in its relations with that particular Administration.

* *

Members and Associate Members of the Union shall inform the Secretary-General of their approval of the revision of the Radio Regulations by the World Administrative Radio Conference for Space Telecommuni-

cations, Geneva, 1971. The Secretary-General will inform Members and Associate Members of the Union regarding receipt of such notifications of approval as they are received.

In witness whereof the delegates of the Members of the Union represented at the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, have signed in the names of their respective countries this revision of the Radio Regulations in a single copy which will remain in the archives of the International Telecommunication Union and of which a certified copy will be delivered to each Member and Associate Member of the Union.

Done at Geneva, July, 1971.

ANNEX 💹

Revision of Article 9A of the Radio Regulations

The entire Article 9A is replaced by the following new text:

MOD

ARTICLE 9A

Co-ordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments ¹ to Radio Astronomy and Space Radiocommunication Stations [except Stations in the Broadcasting Satellite Service]

Section I. Procedure for the Advance Publication of Information on Planned Satellite Systems

- 639AA §1. (1) An administration (or one acting on behalf of a group of named administrations) which intends to establish a satellite system shall, prior to the co-ordination procedure in accordance with No. 639AJ where applicable, send to the International Frequency Registration Board not earlier than five years before the date of bringing into service each satellite network of the planned system, the information listed in Appendix [1B].
- 639AB (2) Any amendments to the information sent concerning a planned satellite system in accordance with No. 639AA shall also be sent to the Board as soon as they become available.

¹ The expression *frequency assignment*, wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called *Master Register*).

- 639AC (3) The Board shall publish the information sent under Nos. 639AA and 639AB in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.
- No. 639AC, any administration is of the opinion that interference, which may be unacceptable, may be caused to its existing or planned space radiocommunication services, it shall within ninety days after the date of the weekly circular publishing the information listed in Appendix [1B], send its comments to the administration concerned. A copy of these comments shall also be sent to the Board. If no such comments are received from an administration within the period mentioned above, it may be assumed that that administration has no basic objections to the planned satellite network(s) of that system on which details have been published.
- 639AE (5) An administration receiving comments sent in accordance with No. 639AD shall endeavour to resolve any difficulties that may arise.
- 639AF (6) In case of difficulties arising when any planned satellite network of a system is intended to use the geostationary orbit:
 - a) The administration responsible for the planned system shall first explore all possible means of meeting its requirements, taking into account the characteristics of the geostationary satellite networks of other systems, and without considering the possibility of adjustment to systems of other administrations. If no such means can be found, the administration concerned is then free

to apply to other administrations concerned to solve these difficulties;

- b) An administration receiving a request under a) above shall, in consultation with the requesting administration, explore all possible means of meeting the requirements of the requesting administration, for example, by relocating one or more of its own geostationary space stations involved, or by changing the emissions, frequency usage (including changes in frequency bands) or other technical or operational characteristics;
- c) If after following the procedure outlined in a) and b) above there are unresolved difficulties, the administrations concerned shall together make every possible effort to resolve these difficulties by means of mutually acceptable adjustments, for example, to geostationary space station locations and to other characteristics of the systems involved in order to provide for the normal operation of both the planned and existing systems.
- 639AG (7) In their attempts to resolve the difficulties mentioned above administrations may seek the assistance of the Board.
- 639AH (8) In complying with the provisions of Nos. 639AE to 639AG, an administration responsible for a planned satellite system shall if necessary defer its commencement of the co-ordination procedure, or where this is not applicable, the sending of its notices to the Board, until one hundred and fifty days after the date of the weekly circular containing the information listed in Appendix [1B] on the relevant satellite network. However, in respect of those administrations with whom difficulties have been resolved or who have responded favourably, the co-ordination procedure, where applicable, may be commenced prior to the expiry of the one hundred and fifty days mentioned above.

639AI (9) An administration on behalf of which details of planned satellite networks in its system have been published, in accordance with the provisions of Nos. 639AA to 639AC, shall periodically inform the Board whether or not comments have been received and of the progress made, with other administrations, in resolving any difficulties. The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so inform all administrations by circular telegram.

Section II. Co-ordination Procedures to be Applied in Appropriate Cases

639AJ § 2. (1) Before an administration notifies to the Board or brings into use any frequency assignment to a space station on a geostationary satellite or to an earth station that is to communicate with a space station on a geostationary satellite, it shall effect co-ordination of the assignment with any other administration whose assignment in the same band for a space station on a geostationary satellite or for an earth station that communicates with a space station on a geostationary satellite is recorded in the Master Register, or has been co-ordinated or is being co-ordinated under the provisions of this paragraph. For this purpose, the administration requesting co-ordination shall send to any other such administration the information listed in Appendix [1A].

639AK (2) No coordination under No. 639AJ is required:

a) when the use of a new frequency assignment will cause, to any service of another administration, an increase in the noise temperature ¹ of any space station receiver or earth station receiver, or an increase in the equivalent satellite link noise temperature, as appropriate, not exceeding the predetermined increase of noise

⁶³⁹AK.1 ¹ If only the up path is involved, the increase in the equivalent noise temperature is determined at the space station receiver.

- temperature calculated in accordance with the method given in Appendix [29] 1 or;
- b) when an administration proposes to change the characteristics of an existing assignment in such a way as will, in respect of any service of another administration, meet the requirements of sub-paragraph a) above, or, where this assignment has previously been coordinated, will cause an increase in noise temperature not exceeding the value agreed during coordination.
- 639AL (3) An administration initiating the co-ordination procedure referred to in No. 639AJ shall at the same time send to the Board a copy of the request for co-ordination, with the information listed in Appendix [1A] and the name(s) of the administration(s) with which co-ordination is sought. The Board shall publish this information in a special section of its weekly circular, together with a reference to the weekly circular in which details of the satellite system were published in accordance with Section I of this Article. When the weekly circular contains such information, the Board shall so inform all administrations by circular telegram.
- 639AM (4) An administration believing that it should have been included in the co-ordination procedure under No. 639AJ shall have the right to request that it be brought into the co-ordination procedure.
- 639AN§ 3. (1) Before an administration notifies to the Board or brings into use any frequency assignment to an earth station, whether for transmitting or receiving, in a particular band allocated with equal

⁶³⁹AK.2 [I For a broadcasting satellite space station, the technical data used to effect co-ordination should be [based upon the most recent, Recommendations of the C.C.I.R., as accepted by the administrations concerned under Resolution No. Spa...]. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used to effect co-ordination shall be agreed between the administrations concerned.]

rights to space and terrestrial ¹ radiocommunication services in the frequency spectrum above one Gc/s, it shall effect co-ordination of the assignment with any other administration whose territory lies wholly or partly within the co-ordination area ² of the planned earth station. For this purpose it shall send to any other such administration a copy of a diagram drawn to an appropriate scale indicating the location of the earth station and showing the co-ordination areas ² of the earth station for the cases of transmission and reception by the earth station and the data on which they are based, including all pertinent details of the proposed frequency assignment, as listed in Appendix [1A], and an indication of the approximate date on which it is planned to begin operations.

639AO (2) An administration with which co-ordination is sought under No. 639AJ shall acknowledge receipt of the co-ordination data immediately by telegram. If no acknowledgement is received within thirty days after the date of the weekly circular publishing the information under No. 639AL, the administration seeking co-ordination shall dispatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of thirty days. Upon receipt of the co-ordination data, an administration shall, having regard to the proposed date of bringing into use of the assignment for which co-ordination was requested,

⁶³⁹AN.1 ¹ Appendix [28] contains criteria relating only to co-ordination between earth stations and stations in the fixed or mobile service. Until the C.C.I.R., in accordance with Recommendation [*], provides criteria relating to other terrestrial radiocommunications, the criteria to be employed in effecting co-ordination between earth stations and terrestrial radiocommunica ion stations, other than those of the fixed or mobile service, shall be agreed between the administrations concerned.

⁶³⁹AN.2 ² Calculated, in relation to the fixed or mobile service, in accordance with the procedures described in Appendix [28].

promptly examine the matter with regard to interference ¹ which would be caused to the service rendered by its stations in respect of which co-ordination is sought under No. 639AJ; and shall, within ninety days from the date of the relevant weekly circular, notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree, it shall, within the same period, send to the administration seeking co-ordination the technical details upon which its disagreement is based, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem. A copy of these comments shall also be sent to the Board.

- 639AP (3) An administration with which co-ordination is sought under No. 639AN shall acknowledge receipt of the co-ordination data immediately by telegram. If no acknowledgement is received within fifteen days of dispatch of the co-ordination data the administration seeking co-ordination shall dispatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of fifteen days. Upon receipt of the co-ordination data an administration shall, having regard to the proposed date of bringing into use the assignment for which co-ordination was requested, promptly examine the matter both with regard to:
 - a) interference ² which would be caused to the service rendered by its terrestrial radiocommunication stations operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer, and

⁶³⁹AO.1 ¹ The criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

⁶³⁹AP.1 ² The criteria to be employed in evaluating interference level shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

b) interference 1 which would be caused to reception at the earth station by the service rendered by its terrestrial radiocommunication stations operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing the earth station assignment into service, or within the next three years, whichever is the longer.

The administration with which co-ordination is sought shall then, within sixty days from despatch of the co-ordination data, notify the administration requesting co-ordination of its agreement. If the administration with which co-ordination is sought does not agree it shall, within the same period, send to the administration seeking co-ordination a copy of a diagram drawn to an appropriate scale showing the location of its terrestrial radiocommunication stations which are or will be within the co-ordination area of the earth transmitting or receiving station, as appropriate, together with all other relevant basic characteristics, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

- 639AQ (4) When the administration with which co-ordination is sought sends to the administration seeking co-ordination the information mentioned in No. 639AP, a copy thereof shall also be sent to the Board. The Board shall consider as notifications in accordance with Section I of Article 9, only that information relating to existing terrestrial radiocommunication stations or to those to be brought into use within the next three years.
- 639AR (5) No co-ordination under No. 639AN is required when an administration proposes:

⁶³⁹AP.1 ¹ The criteria to be employed in evaluating interference levels shall be based upon relevant C.C.I.R. Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

- a) to bring into use an earth station, the co-ordination area of which does not include any of the territory of any other country;
- to change the characteristics of an existing assignment in such a way as not to exceed the permissible level of interference to or from the terrestrial radiocommunication stations of other administrations;
- to operate a mobile earth station. However, if the co-ordination area associated with the operation of such a mobile earth station, in a frequency band referred to in No. 639AN, includes any of the territory of another country, it shall be subject to prior agreement between the administrations concerned in order to avoid harmful interference to existing terrestrial radiocommunication stations of that country. This agreement shall apply to the characteristics of the mobile earth station(s), or to the characteristics of a typica mobile earth station, and shall apply to a specified service area; unless otherwise stipulated in the agreement, it shall apply to any mobile earth stations in the specified service area provided that the probability of harmful interference caused by them shall not be greater than that caused by the typical earth station.
- 639AS § 4. (1) An administration seeking co-ordination may request the Board to endeavour to effect co-ordination in those cases where:
 - a) an administration with which co-ordination is sought under No. 639AJ fails to acknowledge receipt, under

No. 639AO, within sixty days after the date of the weekly circular publishing the information relating to the request for co-ordination;

- b) an administration with which co-ordination is sought under No. 639AN fails to acknowledge receipt, under No. 639AP, within thirty days of dispatch of the co-ordination data;
- c) an administration has acknowledged receipt under No. 639AO, but fails to give a decision within ninety days from the date of the relevant weekly circular;
- d) an administration has acknowledged receipt under No. 639AP, but fails to give a decision within sixty days from dispatch of the co-ordination data;
- e) there is disagreement between the administration seeking co-ordination and an administration with which coordination is sought as to the acceptable level of interference:
- f) co-ordination between administrations is not possible for any other reason.

In so doing, it shall furnish the Board with the necessary information to enable it to endeavour to effect such co-ordination.

639AT (2) Either the administration seeking co-ordination or an administration with which co-ordination is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.

- 639AU (3) Where the Board receives a request under 639AS a) or b), it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.
- 639AV (4) Where the Board receives an acknowledgement following its action under No. 639AU, or where the Board receives a request under No. 639AS c) or d), it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.
- 639AW (5) Where the Board receives a request under No. 639AS f), it shall endeavour to effect co-ordination in accordance with the provisions of Nos. 639AJ and 639AN, as appropriate. The Board shall also, where appropriate, act in accordance with No. 639AL. Where the Board receives no acknowledgement to its request for co-ordination within the periods specified in No. 639AO or 639AP, as appropriate, it shall act in accordance with No. 639AU.
- 639AX (6) Where an administration fails to reply within thirty days of dispatch of the Board's telegram requesting an acknowledgement sent under No. 639AU, or fails to give a decision in the matter within thirty days of dispatch of the Board's telegram of request under No. 639AV, it shall be deemed that the administration with which coordination was sought has undertaken:
 - a) that no complaint will be made in respect of any harmful interference which may be caused to the services rendered by its space or terrestrial radiocommunication stations by the use of the assignment for which coordination was requested;
 - b) that its space or terrestrial radiocommunication stations will not cause harmful interference to the use

of the assignment for which co-ordination was requested.

- 639AY (7) Where necessary, as part of the procedure under No. 639AS, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.
- 639AZ § 5. In the event of continuing disagreement between one administration seeking to effect co-ordination and one with which co-ordination has been sought, provided that the assistance of the Board has been requested, the administration seeking co-ordination may, after one hundred and fifty days from the date of the request for co-ordination, taking into consideration the provisions of No. 639BF, send its notice concerning the proposed assignment to the Board.

Section III. Notification of Frequency Assignments

- 639BA § 6. (1) Any frequency assignment to an earth or space station shall be notified to the Board:
 - a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration; or
 - b) if the frequency is to be used for international radiocommunications; or
 - c) if it is desired to obtain international recognition of the use of the frequency.
- 639BB (2) Similar notice shall be given for any frequency to be used for the reception of transmissions from earth or space stations by a particular space or earth station in each case where one or more of the conditions specified in No. 639BA are applicable.

- 639BC (3) Similar notice may be given for any frequency or frequency band to be used for reception by a particular radio astronomy station, if it is desired that such data should be included in the Master Register.
- 639BD (4) A notice submitted in accordance with No. 639BA or 639BB and relating to a frequency assignment to mobile earth stations in a satellite system shall include the technical characteristics either of each mobile earth station, or of a typical mobile earth station, and an indication of the service area within which these stations are to be operated.
- 639BE § 7. For any notification under No. 639BA, 639BB, 639BC, or 639BD, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix [1A], the various Sections of which specify the basic characteristics to be furnished according to the case. It is recommended that the notifying administration should also supply the additional data called for in Section A of that Appendix, together with such further data as it may consider appropriate.
- 639BF § 8. (1) For a frequency assignment to an earth or space station, each notice must reach the Board not earlier than three years before the date on which the assignment is to be brought into use. The notice must reach the Board in any case not later than ninety days 1 before this date, except in the case of assignments in the space research service in bands allocated exclusively to this service or in shared bands in which this service is the sole primary service. In the case of such an assignment in the space research service the notice should, whenever practicable, reach the Board before the date on which the assignment is brought into use, but it must in any case reach the Board not later than thirty days after the date it is actually brought into use.

⁶³⁹BF.1 ¹ The notifying administration shall take this limit into account when deciding, where appropriate, to initiate the co-ordination procedure(s).

639BG (2) Any frequency assignment to an earth or space station, the notice of which reaches the Board after the applicable period specified in No. 639BF, shall, where it is to be recorded, bear a mark in the Master Register to indicate that it is not in conformity with No. 639BF.

Section IV. Procedure for the Examination of Notices and the Recording of Frequency Assignments in the Master Register

- 639BH § 9. Any notice which does not contain at least those basic characteristics specified in Appendix [1A] shall be returned by the Board immediately, by airmail, to the notifying administration with the reasons therefor.
- 639BI § 10. Upon receipt of a complete notice, the Board shall include the particulars thereof, with the date of receipt, in the weekly circular referred to in No. 497, which shall contain the particulars of all such notices received since the publication of the previous circular.
- 639BJ §11. The circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.
- 639BK § 12. Complete notices shall be considered by the Board in the order of their receipt. The Board shall not postpone the formulation of a finding unless it lacks sufficient data to render a decision in connection therewith; moreover, the Board shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Board, until it has reached a finding with respect to such earlier notice.
- 639BL § 13. The Board shall examine each notice:
- 639BM a) with respect to its conformity with the Convention, the Table of Frequency Allocations and the other pro-

visions of the Radio Regulations (with the exception of those relating to the co-ordination procedures and the probability of harmful interference);

639BN

b) where appropriate, with respect to its conformity with the provisions of No. 639AJ, relating to the coordination of the use of the frequency assignment with the other administrations concerned vis-a-vis space radiocommunication stations;

639BO

c) where appropriate, with respect to its conformity with the provisions of No. 639AN relating to the co-ordination of the use of the frequency assignment with the other administrations concerned vis-a-vis terrestrial radiocommunication stations;

639BP

d) where appropriate, with respect to the probability of harmful interference to the service rendered by a space radiocommunication station for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 639BM if this frequency assignment has not in fact caused harmful interference to any frequency assignment in conformity with No. 639BM previously recorded in the Master Register;

639BQ

e) where appropriate, with respect to the probability of harmful interference to the service rendered by a terrestrial radiocommunication station for which a frequency assignment already recorded in the Master Register is in conformity with the provisions of No. 501 or [570AB], as appropriate, if this frequency assignment has not, in fact, caused harmful interference to any frequency assignment in conformity with No. 639BM previously recorded in the Master Register;

639BR

f) where appropriate, with respect to the probability of harmful interference caused to the receiving earth station by a terrestrial radiocommunication station for which a frequency assignment already recorded in the Master Register is in conformity with No. 501 or [570AB], as appropriate.

639BS When, following an examination of a notice with respect to No. 639BP, the Board reaches an unfavourable finding based upon the probability of harmful interference to a recorded assignment for a space station which the Board has reason to believe may not be in regular use, the Board shall forthwith consult the administration responsible for the registered assignment. If it is established, after such consultation and on the basis of the information available, that the recorded assignment has not been in use for two years, it shall not be taken into account for the purposes of the examination in progress or any other further examination under No. 639BP conducted before the date on which the assignment is brought back into use. Before the assignment is brought back into use, it shall be subject to further co-ordination in accordance with the provisions of No. 639AJ or further examination by the Board with respect to No. 639BP as appropriate. The date on which the assignment is brought back into use shall then be entered in the Master Register.

- 639BT § 14. Depending upon the findings of the Board subsequent to the examination prescribed in Nos. 639BM, 639BN, 639BO, 639BP, 639BQ and 639BR, as appropriate, further action shall be as follows:
- 639BU § 15. (1) Finding favourable with respect to No. 639BM in cases where the provisions of Nos. 639BN and 639BO are not applicable.
- 639BV (2) The assignment shall be recorded in the Master Register.

 The date of receipt by the Board of the notice shall be entered in Column 2d.

639BW § 16. (1) Finding unfavourable with respect to No. 639BM;

- 639BX (2) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, and the finding is favourable with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.
- 639BY (3) Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 and the finding is unfavourable with respect to Nos. 639BN, 639BO, 639BP, 639BQ or 639BR, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. Should the administration insist upon reconsideration of the notice, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column.
- 639BZ (4) The period of one hundred and twenty days mentioned in Nos. 639BY and 639CP shall count:
 - from the date when the assignment to the space radiocommunication station which received an unfavourable finding is brought into use, if the assignment to the station which was the basis for the unfavourable finding is then in use;
 - otherwise, from the date when the assignment to the station which was the basis for the unfavourable finding is brought into use.

But if the assignment to the station which was the basis for the unfavourable finding has not been brought into use by the notified date, the period of one hundred and twenty days shall be counted from this date. Allowance shall, if necessary, be made for the additional period mentioned in No. 639CY.

- 639CA (5) Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.
- 639CB (6) If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of No. 639CA. If it is resubmitted with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115, it shall be treated in accordance with the provisions of No. 639BX or 639BY, as appropriate. If it is resubmitted with modifications which, after re-examination, result in a favourable finding by the Board with respect to No. 639BM, it shall be treated as a new notice.
- 639CC § 17. (1) Finding favourable with respect to No. 639BM in cases where the provisions of No. 639BN or 639BO are applicable.
- 639CD (2) Where the Board finds that the co-ordination procedures mentioned in Nos. 639BN or 639BO have been successfully completed with all administrations whose space or terrestrial radio-communication stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

- 639CE (3) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has not been applied, and the notifying administration requests the Board to effect the required co-ordination, the Board shall take appropriate action and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with No. 639CD. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of Nos. 639BP, 639BQ and 639BR, as appropriate.
- 639CF (4) Where the Board finds that either of the co-ordination procedures mentioned in Nos. 639BN and 639BO has not been applied, and the notifying administration does not request the Board to effect the required co-ordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.
- 639CG (5) Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedures mentioned in Nos. 639BN and 639BO have been successfully completed with all administrations whose space or terrestrial radiocommunication stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.
- 639CH (6) Where the notifying administration resubmits the notice with a request that the Board effect the required co-ordination under No. 639AJ or 639AN, it shall be treated in accordance with the provisions of No. 639CE. However, in any subsequent recording

of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

- 639CI (7) Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the co-ordination, the Board shall inform the administrations concerned thereof. The notice shall be examined by the Board with respect to the provisions of Nos. 639BP, 639BQ and 639BR, as appropriate. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.
- 639CJ § 18. (1) Finding favourable with respect to Nos. 639BM, 639BP, 639BQ and 639BR, as appropriate.
- 639CK (2) The assignment shall be recorded in the Master Register.

 The date of receipt by the Board of the notice shall be entered in Column 2d.
- 639CL (3) However, should the examination show that the level of the interference noise and the percentage of time during which it is likely to occur have values slightly greater than those used for assessing the probability of harmful interference (extreme propagation conditions, abnormal atmospheric humidity, etc.), a remark shall be included in the Master Register to show that there may be a slight risk of harmful interference and hence additional precautions must be taken in the use of the assignment to avoid harmful interference to assignments already recorded in the Master Register.
- 639CM § 19. (1) Finding favourable with respect to No. 639BM but unfavourable with respect to Nos. 639BP, 639BQ or 639BR, as appropriate
- 639CN (2) The notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this

finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

- 639CO (3) Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the the Board with respect to Nos. 639BP, 639BQ and 639BR, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.
- (4) Should the notifying administration resubmit the notice, 639CP either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of No. 639CO to be applied, and should that administration insist upon reconsideration of the notice, but should the Board's finding remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the advice that no complaint of harmful interference has been received shall be indicated in the Remarks Column. The period of one hundred and twenty days shall count from the date indicated in No. 639BZ.

639CQ § 20. (1) Notices relating to radio astronomy stations.

639CR (2) A notice relating to a radio astronomy station shall not be examined by the Board with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR. Whatever the finding, the assignment

shall be recorded in the Master Register with a date in Column 2c. The date of receipt by the Board of the notice shall be recorded in the Remarks Column.

- 639CS § 21. (1) Change in the basic characteristics of assignments already recorded in the Master Register.
- 639CT (2) A notice of a change in the basic characteristics of an assignment already recorded, as specified in Appendix [1A] (except the name of the station or the name of the locality in which it is situated) shall be examined by the Board according to No. 639BM, and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, and the provisions of Nos. 639BU to 639CR inclusive shall apply. Where the change should be recorded, the assignment shall be amended according to the notice.
- 639CU (3) However, in the case of a change in the characteristics of an assignment which is in conformity with No. 639BM, should the Board reach a favourable finding with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, where appropriate, or find that the changes do not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. The date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.
- 639CV § 22. In applying the provisions of the whole of this Section, any resubmitted notice which is received by the Board more than two years after the date of its return by the Board, shall be considered as a new notice.
- 639CW § 23. (1) Recording of Frequency Assignments notified before being brought into use.

- 639CX (2) If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to No. 639BM and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.
- 639CY (3) If, within thirty days after the projected date of bringing into use, the Board receives confirmation from the notifying administration of the date of putting unto use, the special symbol shall be deleted from the Remarks Column. In the case where the Board, in the light of a request from the notifying administration received before the end of the thirty-day period, finds that exceptional circumstances warrant an extension of this period, the extension shall in no case exceed one hundred and fifty days.
- 639CZ (4) In the circumstances described in Nos. 639BY and 639CP, and as long as an assignment which received an unfavourable finding cannot be resubmitted as a consequence of the provisions of No. 639BZ, the notifying administration may ask the Board to enter the assignment provisionally in the Master Register, in which event a special symbol to denote the provisional nature of the entry shall be entered in the Remarks Column. The Board shall delete this symbol when it receives from the notifying administration, at the end of the period specified in No. 639BY or 639CP, as appropriate, the information relating to the absence of complaint of harmful interference.
- 639DA (5) If the Board does not receive this confirmation within the period referred to in No. 639CY or at the end of the period referred to in Nos. 639BY or 639CP, as appropriate, the entry concerned shall be cancelled. The Board shall advise the administration concerned before taking such action.

Section V. Recording of Findings in the Master Register

639DB § 24. In any case where a frequency assignment is recorded in the Master Register, the finding reached by the Board shall be indicated

by a symbol in Column 13a. In addition, a remark indicating the reasons for any unfavourable finding shall be inserted in the Remarks Column.

Section VI. Categories of Frequency Assignments

- 639DC § 25. (1) The date in Column 2c shall be the date of putting into use notified by the administration concerned. It is given for information only.
- 639DD (2) If harmful interference is actually caused to the reception of any space radiocommunication station whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to Nos. 639BM, 639BN, 639BO, 639BP, 639BQ and 639BR, as appropriate, by the use of a frequency assignment to a space radiocommunication station subsequently recorded in the Master Register in accordance with the provisions of No. 639CP, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.
- 639DE (3) If harmful interference to the reception of any station whose assignment is in accordance with No. 501, [570AB] or 639BM, as appropriate, is actually caused by the use of a frequency assignment which is not in conformity with No. 639BM, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

Section VII. Review of Findings

639DF § 26. (1) The review of a finding by the Board may be undertaken:

— at the request of the notifying administration,

- at the request of any other administration interested in the question, but only on the grounds of actual harmful interference,
- on the initiative of the Board itself when it considers this is justified.
- 639DG (2) The Board, in the light of all the data at its disposal shall review the matter, taking into account No. 639BM and, where appropriate, Nos. 639BN, 639BO, 639BP, 639BQ and 639BR and shall render an appropriate finding, informing the notifying administration prior either to the promulgation of its finding or to any recording action.
- 639DH § 27. (1) After actual use for a reasonable period of an assignment which has been entered in the Master Register on the insistence of the notifying administration, following an unfavourable finding with respect to Nos. 639BP, 639BQ or 639BR, this administration may request the Board to review the finding. Thereupon the Board shall review the matter, having first consulted the administrations concerned.
- 639DI (2) If the finding of the Board is then favourable it shall enter in the Master Register the changes that are required so that the entry shall appear in the future as if the original finding had been favourable.
- 639DJ (3) If the finding with regard to the probability of harmful interference remains unfavourable, no change shall be made in the original entry.

Section VIII. Modification, Cancellation and Review of Entries in the Master Register

639DK § 28. (1) Where the use of a recorded assignment to a space station is suspended for a period of eighteen months, the notifying administration shall, within this eighteen-month period, inform the Board

of the date on which such use was suspended and of the date on which the assignment is to be brought back into regular use.

- 639DL (2) Whenever it appears to the Board, whether or not as a result of action under No. 639DK, that a recorded assignment to a space station has not been in regular use for more than eighteen months, the Board shall inquire of the notifying administration as to when the assignment is to be brought back into regular use.
- 639DM (3) If no reply is received within six months of action by the Board under No. 639DL, or if the reply does not confirm that the assignment to a space station is to be brought back into regular use within this six month limit, a mark shall be applied against the entry in the Master Register. Thereafter, the assignment shall be treated in accordance with No. 639BS as one which has been established as having been out of regular use for two years.
- 639DN § 29. In case of permanent discontinuance of the use of any recorded frequency assignment, the notifying administration shall inform the Board within ninety days of such discontinuance, whereupon the entry shall be removed from the Master Register.
- 639DO § 30. Whenever it appears to the Board from the information available that a recorded assignment has not been brought into regular operation in accordance with the notified basic characteristics, or is not being used in accordance with those basic characteristics the Board shall consult the notifying administration and, subject to its agreement, shall either cancel or suitably modify the entry.
- 639DP § 31. If, in connection with an enquiry by the Board under No. 639DO, the notifying administration has failed to supply the

Board within forty-five days with the necessary or pertinent information, the Board shall make suitable entries in the Remarks Column of the Master Register to indicate the situation.

Section IX. Studies and Recommendations

- 639DQ § 32. (1) If it is requested by any administration, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall conduct a study of cases of alleged contravention or non-observance of these Regulations, or of harmful interference.
- 639DR (2) The Board shall thereupon prepare and forward to the administration concerned a report containing its finding and recommendations for the solution of the problem.
- 639DS § 33. In a case where, as a result of a study, the Board submits to one or more administrations suggestions or recommendations for the solution of a problem, and where no answer has been received from one or more of these administrations within a period of ninety days, the Board shall consider that the suggestions or recommendations concerned are unacceptable to the administrations which did not answer. If it was the requesting administration which failed to answer within this period, the Board shall close the study.

Section X. Miscellaneous Provisions

- 639DT § 34. (1) If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:
 - a) computation of the increases in noise temperatures in accordance with No. 639AK;

- b) preparation of diagrams showing the co-ordination areas in No. 639AN;
- c) any other assistance of a technical nature for completion of the procedures in this Article.
- 639DU (2) In making a request to the Board under No. 639DT, the administration shall furnish the Board with the necessary information.
- 639DV § 35. The technical standards of the Board shall be based upon the relevant provisions of these Regulations and the Appendices thereto, the decisions of Administrative Conferences of the Union as appropriate, the Recommendations of the C.C.I.R., the state of the radio art and the development of new transmission techniques.
- 639DW § 36. The Board shall promulgate to administrations its findings and reasons therefor, together with all changes made to the Master Register, through the weekly circular referred to in No. 497.
- 639DX § 37. In case a Member or Associate Member of the Union avails itself of the provisions of Article 28 of the Convention, the Board shall, upon request, make its records available for such proceedings as are prescribed in the Convention for the settlement of international disputes.

FINAL PROTOCOL

At the time of signing the Final Acts of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, the undersigned delegates take note of the following statements made by signatory delegations:

RESOLUTION No. Spa A

Relating to the Experimental Use of Radio Waves by Ionospheric Research Satellites

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that research into the earth's ionosphere is very important in the study of the relationship between the Sun and the Earth and also for the effective use of radio-wave transmission via the ionosphere;
- b) that successful research has been conducted with satellites such as Alouette 1 and 2 and ISIS 1 and 2 in which top-side sounding equipment is installed;
- c) that similar ionospheric research satellites will be used for further research into the ionosphere and beyond;
- d) that top-side sounding equipment is operated mostly in a frequency-sweeping pulse mode;
- e) that this type of satellite is usually operated intermittently during a limited period each day according to the orbital characteristics;
- f) that operation of the sounder can be accurately commanded at will by the earth station concerned;

resolves

that administrations may continue to permit the transmission of radio waves from ionospheric research satellites in orbit above the ionosphere in the MF and HF bands provided that suitable means are available for controlling the transmission from these satellites as required by No. 470V of the Radio Regulations to prevent harmful interference to other services.

RECOMMENDATION No. Spa AA

Relating to the Co-ordination of Earth Stations

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that under the terms of Article 9A of the Radio Regulations, frequency assignments to earth stations in certain bands shared with equal rights between terrestrial radiocommunication services and space radiocommunication services must be co-ordinated with a view to preventing mutual harmful interference;
- b) that the calculation method described in Appendix 28 applies solely to frequencies in the 1-40 G[c/s] range;
- c) that Tables I, [Ia] and II of Appendix 28 do not show numerical values for all the necessary parameters of certain space radiocommunication services and terrestrial radiocommunication services sharing frequency bands with equal rights;

invites the C.C.I.R.

to continue as a matter of urgency its study:

- of data not included in Tables I, [Ia] and II of Appendix 28, relating to the space radiocommunication services and terrestrial radiocommunication services sharing frequency bands with equal rights,
- of the formulation of calculation methods for determining the co-ordination area of earth stations at frequencies below 1 G[c/s] and above 40 G[c/s];

R1-34

recommends to administrations

that until the next competent Administrative Conference they should use:

- any C.C.I.R. Recommendation, if applicable, for the values missing from Tables I, [Ia] and II of Appendix 28;
- the methods of determining the co-ordination area for frequencies below 1 G[c/s] and above 40 G[c/s], which may be the subject of a C.C.I.R. Recommendation.

RECOMMENDATION No. Spa BB

Relating to Carrier Energy Dispersal in Systems in the Fixed Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that use of carrier energy dispersal techniques in systems in the fixed satellite service can result in a substantial reduction of interference to stations of a terrestrial service operating in the same frequency bands;
- b) that the use of such techniques can result in a substantial reduction in the level of interference between systems in the fixed satellite service operating in the same frequency bands;
- c) that such techniques are being regularly and successfully employed in systems in the fixed satellite service without noticeable deterioration of the quality of operation;

recommends

- 1. that systems in the fixed satellite service employing angle modulation by analogue signals should use carrier energy dispersal techniques as far as is practicable with a view to spreading energy at all times and in a manner consistent with the satisfactory operation of the systems;
- 2. that systems in the fixed satellite service employing digital modulation should use carrier energy dispersal techniques when this becomes technically feasible and is practical.

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 388-E

14 July 1971

PLENARY MEETING (SECOND READING)

R. 2

The Editorial Committee, having examined the following texts, submits them to the Plenary Meeting for a second reading.

Subject	Origin
Rec. CC Appendix 29	B7 B8
Res. B, Rec. EE, FF, GG, HH, II, JJ, KK Rec. No. 3	B9 B10

François Job Chairman of the Editorial Committee

Annex: Pages R.2/01-32



RECOMMENDATION No. Spa CC

Relating to the Use of Space Radiocommunication Systems in the Event of Natural Disasters, Epidemics, Famines and Similar Emergencies

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that in the case of natural disasters, epidemics, famines and similar emergencies lives can be saved by prompt and effective relief;
- b) that rapid and reliable telecommunications are essential for relief operations;
- c) that, through damage or from other causes, the normal telecommunications facilities in disaster areas are often inadequate for relief operations and cannot be restored or supplemented quickly through local resources;
- d) that use of space radiocommunication systems is one of the means by which rapid and reliable telecommunications could be provided for relief operations;

noting

- a) that known planning of space radiocommunication systems makes no provision for specific frequencies or channels for emergency communications;
- b) that in the absence of such planning it is not feasible to proceed with specifications for rapidly transportable, universally operable earth stations;

recommends

1. that administrations, individually or in collaboration, provide for the needs of eventual relief operations in planning their space radiocommunication systems and identify for this purpose preferred radio-frequency channels and facilities which could quickly be made available for relief operations;

2. that administrations concerned waive the coordination procedures provided for in the Radio Regulations in the case of transportable earth stations used for relief operations;

requests

the Secretary-General to bring this Recommendation to the attention of the United Nations, the specialized agencies, and other international organizations concerned, in order to ensure full cooperation in the implementation of this Recommendation;

invites

the C.C.I.R. to study standard specifications and preferred frequencies for transportable earth stations and for compatible mobile and transportable fixed radiocommunications equipment for relief operations.

ADD

APPENDIX 29

Method of calculation to evaluate the degree of interference between geostationary satellite networks sharing the same frequency bands

1. Introduction

The method of calculating interference is based on the concept that the noise temperature of the system receiving interference increases as the level of the interference increases. It can, therefore, be applied irrespective of the modulation characteristics of these satellite networks, and of the precise frequencies used.

In this method, the apparent increase in the equivalent satellitelink noise temperature ¹ [of an earth station receiver] resulting from interference caused by a given system is calculated and this value is compared with a predetermined increase in the noise temperature (see section 3 below).

2. Calculation of the Increase in Noise Temperature of the Satellite Link receiving² Interference.

Let A and A' be the satellite links of the two satellite networks considered. Primes indicate the parameters of satellite link A'; the notation without primes is used for the parameters of satellite link A.

The parameters are defined as follows (for satellite link A):

- ΔT_s: increase in the receiving noise temperature of the satellite S caused by interference in the receiver of this satellite (K);
- ΔT_e : increase in the receiving noise temperature of the earth station e_R caused by interference in the receiver of this station (K);

¹ See No. 103A.

² See No. 84ALB.

- p_s: maximum power density per Hz delivered to the antenna of satellite
 : S (averaged over the worst 4 kHz band for a carrier frequency below
 15 GHz or over the worst 1 MHz band above 15 GHz) (W/kHz);
- $g_3(\eta_{e'})$: transmitting antenna gain of satellite S in the direction of the receiving earth station e'_R of satellite link A' (numerical power ratio);

Note: the product $p_sg_3(\eta_{e'})$ is the maximum equivalent isotropic radiated power per Hz of satellite S in the direction of the receiving earth station e'_R of satellite link A'.

- p_e: maximum power density per Hz delivered to the antenna of the transmitting earth station e_T (averaged over the worst 4 kHz band) (W/Hz);
- $g_2(\delta_{e'})$: receiving antenna gain of satellite S in the direction of the transmitting earth station e'_T of satellite link A' (numerical power ratio);
- $g_1(\theta)$: transmitting antenna gain of the earth station e_T in the direction of satellite S' (numerical power ratio);
- $g_4(\theta)$: receiving antenna gain of the earth station e_R in the direction of satellite S' (numerical power ratio);
- k : Boltzmann's constant (J/K);
- l_d*) : free-space transmission loss on the down-path (numerical power ratio):
- $l_{\mathbf{u}}^*$): free-space transmission loss on the up-path (numerical power ratio);

^{*)} To simplify the calculation it was assumed that:

basic transmission loss on the down-path is the same regardless of the satellite and earth station considered;

basic transmission loss on the up-path is the same regardless of the earth station and satellite considered;

[—] the topocentric angular separation between the two satellites as seen from any earth station is identical to the geocentric angular separation between the two satellites.

- γ : transmission gain of the satellite link evaluated from the output of the receiving antenna of the space station S to the output of the receiving antenna of the earth station e_R (numerical power ratio, usually less than 1);
- $\theta^*)$: geocentric angular separation between two satellites (degrees). The parameter ΔT_s and ΔT_e are given by the following equations:

$$\Delta T_{s} = \frac{p'_{e} g'_{1}(\theta) g_{2}(\delta_{e'})}{k l_{u}}$$
 (1)

$$\Delta T_{e} = \frac{p'_{s} g'_{3} (\eta_{e}) g_{4} (\theta)}{k I_{d}}$$
 (2)

The symbol ΔT will be used to denote the apparent increase in the equivalent noise temperature for the entire satellite link at the receiver input of the receiving station e_R due to interference from link A'.

This increase is the result of interference entering at both the satellite and earth station receiver of link A and can accordingly be expressed as:

$$\Delta T = \gamma \Delta T_s + \Delta T_e \tag{3}$$

Hence,
$$\Delta T = \frac{\gamma p'_{e} g'_{1}(\theta) g_{2}(\delta_{e'})}{k l_{u}} + \frac{p'_{s} g'_{3}(\delta_{e}) g_{4}(\theta)}{k l_{d}}$$
 (4)

Equation (4) combines both the up-path and the down-path interference. If there is a change of modulation in the satellite or if the translation frequencies of the wanted and interfering satellites are different then it may be necessary to treat up and down paths separately using equations (1) and (2).

In the foregoing equations, the gains $g'_1(\theta)$ and $g_4(\theta)$ are those of the earth stations concerned. Unless more precise actual data are available, an appropriate reference radiation pattern may be used to express the gain $g'_1(\theta)$ and $g_4(\theta)$ in a direction forming an angle θ with the direction of maximum radiation. In the event that precise numerical data are not avail-

able, the reference radiation pattern $32-25 \log_{10}(\theta)$ shall be used for earth station antennae for which the ratio of effective diameter to wavelength exceeds 100.

In the same way, the increase $\Delta T'$ in the equivalent noise temperature for the entire satellite link at the receiver input of the receiving earth station e'_R under the effect of the interference caused by satellite link A is given by the following equations:

$$\Delta T'_{s'} = \frac{p_e g_1(\theta) g'_2(\delta_e)}{kl_u}$$
 (5)

$$\Delta T'_{e'} = \frac{p_s g_3(\eta_{e'}) g'_4(\theta)}{k l_d}$$
 (6)

$$\Delta T' = \gamma' \frac{p_e g_1(\theta) g'_2(\delta_e)}{k l_u} + \frac{p_s g_3(\eta_{e'}) g'_4(\theta)}{k l_d}$$
(7)

For two multiple-access satellites, this calculation must be made for each of the satellite links established via one satellite in relation to each of the satellite links established via the other satellite.

3. Comparison between Calculated and Predetermined Percentage Increase in Equivalent Satellite Link Noise Temperature

The calculated values of ΔT and $\Delta T'$ shall be compared with the corresponding predetermined values. These predetermined values are taken as 2% of the appropriate equivalent satellite link noise temperatures:

- if the calculated value of ΔT is less than the predetermined one, the interference level from satellite link A' to satellite link A is acceptably small irrespective of the modulation characteristics of the two satellite links and of the precise frequencies used;
- if the calculated value of ΔT is more than the predetermined one, a detailed calculation shall be carried out following the methods and techniques set out in the relevant C.C.I.R. Reports and Recommendations.

The comparison of $\Delta T'$ with the predetermined value shall be carried out in a similar manner.

As an example, it can be seen that in the case of a satellite link operating in accordance with current C.C.I.R. Recommendations, using FM telephony and having a total noise in a telephone channel of 10 000 pW0p including 1 000 pW0p interference noise from terrestrial radio-relay systems and 1 000 pW0p interference noise from other satellite links, a 2% increase in equivalent noise temperature would correspond to 160 pW0p of interference noise.

The list of basic characteristics to be furnished for each network is given in Appendix 1B. A detailed illustration of the interference calculation in the case of two geostationary satellite links is given in the Annex to this Appendix.

4. Determination of the Satellite Links to be Considered in Calculating the Increase in Equivalent Satellite Link Noise Temperature from the Data Furnished for the Advance Publication of a Satellite Network

The greatest increase in equivalent satellite link noise temperature caused to any link of another satellite network, existing or planned, by interference produced by the proposed satellite network must be determined.

The most unfavourably sited transmitting earth station of the interfering satellite network should be determined for each satellite receiving antenna of the network suffering interference by superimposing the Earth-to-space service areas of the interfering network on the space station receiving antenna gain contours plotted on a map of the earth's surface. The most unfavourably sited transmitting earth station is the one in the direction of which the satellite receiving antenna gain of the network interfered with is the greatest.

The most unfavourably sited receiving earth station of the network suffering interference should be determined in an analogous manner for each space-to-Earth service area of that network. The most unfavourably sited receiving earth station is the one in the direction of which the satellite transmitting antenna gain of the interfering network is the greatest.

When the satellite of the network suffering interference is equipped with simple frequency-translating transponders the above determinations are made in pairs, one for the receiving antenna of a specific transponder and one for the space-to-Earth service area associated with the transmitting antenna of this transponder.

The calculation procedure described above may be used to determine the greatest increase in equivalent noise temperature caused to any satellite link in a proposed satellite network by interference produced by any other satellite network.

ANNEX

Example of an Interference Calculation Between Two Geostationary Satellite Links Sharing the Same Frequency Band

A. General

In this example, for simplicity, two identical satellite networks are assumed with $\theta = 6^{\circ}$ geocentric angular spacing between the satellites. For this angular separation the reference radiation pattern of the earth station antenna $(32-25\log_{10}\theta)$ gives a gain of 12.5 dB in the direction of the satellite of the other network.

The calculations have been performed in dB, which means that numerical multiplications thus become dB additions and numerical divisions become dB subtractions. In each step, the contributing factors have been introduced in a sequence corresponding to the propagation direction. The first three steps define the system parameters for each link. Steps 4, 5 and 6 perform the actual interference calculations.

To determine the equivalent link noise temperature it is necessary to know the ratio between the total internal link noise and the thermal noise of the down-path. The noise budget for this example is assumed as follows:

Noise budget

Internal noise 8 000 pW0p	Thermal noise (down path) Thermal noise (up path) Intermodulation noise	5 000 pW0p 1 000 pW0p 2 000 pW0p
External noise 2 000 pW0p	Interference noise from links using other satellites Interference noise from	1 000 pW0p
	terrestrial systems	1 000 pW0p
	Total noise	10 000 pW0p

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It may be noted that since both satellites use global beams, essentially no antenna discrimination between wanted and unwanted signals is obtained at the satellite and that this constitutes a worst case.

B. System parameters

		Symbol	Link A or A'	Unit
Step 1)	Up-path at 6 175 MHz Maximum power density per Hz delivered to the antenna of the transmitting earth station in any 4 kHz band Earth station antenna gain Free space loss 38 500 km at 6 175 MHz Satellite antenna gain (using global beam) Receiver input at satellite $(p_e + g_1 - l_n + g_2)$	Pe g ₁ I _u g ₂	-37 62·5 200 15·5 -159	dBW/Hz dB dB dB dB
Step 2)	Down-path at 3 950 MHz Maximum power density per Hz delivered to the satellite antenna Satellite transmitting antenna gain Free space loss for 38 500 km at 3 950 MHz Earth station antenna gain Receiver input at earth station $(p_s + g_3 - l_d + g_4)$	p _s g ₃ l _d g ₄	-57 15·5 196 58·5 -179	dBW/Hz dB dB dB dBW/Hz
Step 3)	Link calculations Transmission gain from satellite receiver input to earth station receiver input 159 dB-179 dB Earth station noise temperature (giving G/T = 40.7 dB) Thermal noise down-path (see noise budget)	Υ	20 60 5 000	dB K pW0p

* ,	Symbol	Link A or A'	Unit
Total internal link noise (see noise budget) Equivalent link noise temperature		8 000	pW0p
$\frac{8\ 000}{5\ 000} \times 60^{\circ}$	Т	96	K

C. Interference calculation

				ī
Step 4)	Up-path interference			
	Interfering earth station power density (as in Step 1)	$p_e{'}$	-37	dBW/Hz
	Interfering earth station antenna gain towards interfered satellite		!	
	(6° off beam)	$g_1'(\theta)$	+12.5	dB
	Free space loss for 38 500 km at 6 175 MHz (see Step 1)	$l_{\mathbf{u}}$	200	dB
	Satellite antenna gain in the direc- tion of the interfering earth sta-			
	tion	$g_2(\delta_{e'})$	15.5	dB
	Boltzmann's constant 1.38 × 10 ⁻²³ J/K	k	-228.6	dBW/K
	Increase in receiver noise temper-			,
	ature of the satellite $p_{e'} + g_{1'}(\theta) - l_{u} + g_{2}(\delta_{e'}) - k$		19.6	dB K
	(in logarithmic units)			
	Increase in receiver noise temper- ature of the satellite	Δ T _s	91	К
Step 5)	* *			
	Interfering satellite transmitter power density (as in Step 2)	p _{s′}	-57	dBW/Hz
	Interfering satellite antenna gain towards interfered earth station	g ₃ ' (η _e)	15.5	dB
	Free space loss for 38 500 km at 3 950 MHz (see Step 2)	$l_{\mathbf{d}}$	196	dВ
	Earth station antenna gain in the direction of the interfering sa-	-		
	tellite (6° off beam)	g ₄ (θ)	12.5	dB

		Symbol	Link A or A'	Unit
	Boltzmann's constant 1·38 × 10 ⁻²³ J/K	k	-228⋅6	dBW/K
	Increase in receiver noise temperature of the earth station $p_{s'} + g'_{3} (\eta_{e}) - l_{d} + g_{4} (\theta) - k$ (in logarithmic units)		+3.5	dB K
	Increase in receiver noise temper- ature of the earth station	$\Delta \mathrm{T_e}$	2.24	К
Step 6)	Total link interference			-
	Increase in satellite noise tempera- ture (from Step 4)	$\Delta \mathrm{T_s}$	91	K
	Numerical value for γ		·01	numerical
	(from Step 3) Increase in earth station noise	Υ	-01	numericai
	temperature (from Step 5) Increase in equivalent link noise	ΔT_{e}	2.24	K
	temperature $\gamma \Delta T_s + \Delta T_e = (.01 \times 91) + 2.24$ Percentage increase	ΔΤ	3-15	K
	$\frac{3.15}{96} \times 100\%$	(ΔT/T) × 100%	3.29	%
	Increase in link noise due to inter-			
	ference $(3.29/100 \times 8000 \text{ pW0p})$		263	pW0p
		14		

D. Conclusions

In the example shown, the increase in equivalent satellite link noise temperature is 3.29%. Since it exceeds the predetermined value of 2%, the amount of noise introduced can no longer be considered negligible and therefore co-ordination between the two networks is required. More precise calculations should now be made using, in particular, the actual antenna patterns of the earth stations, the topocentric angular separation of the satellites, and the precise basic transmission losses. There may be addi-

tional factors such as polarization discrimination, frequency interleaving, spectral distribution of the interference which all reduce the calculated interference.

It can be shown that for this example a larger satellite spacing of 7.5° would have caused only 2% increase in equivalent link noise temperature and thus obviated the need for any co-ordination.

RESOLUTION No. Spa B

Relating to the Use of the Band 156-174 MHz by the Maritime Mobile Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that there is a need to develop the use of space radiocommunication techniques to meet the future requirements of the maritime mobile service;
- b) that, of the bands used at present by the maritime mobile service, there may be advantages in using for the maritime mobile satellite service narrow channels between 156-174 MHz for safety and distress;

recognizing

- a) that the maritime mobile bands between 156-174 MHz are also used for other services;
- b) that the power flux densities laid down by maritime satellites in this band may cause harmful interference to terrestrial receivers and that the satellite receiver may suffer harmful interference from terrestrial radio-communication transmissions;
- c) that the terrestrial maritime mobile service makes extensive use of the channels given in Appendix 18 of the Radio Regulations;

is of the opinion

that it is important for the maritime mobile satellite service to be able to use some narrow channels, on an exclusive basis, for safety and distress as soon as practicable;

having provided for

the possible use of narrow channels for safety and distress by the maritime mobile satellite service in bands 157·3125-157·4125 MHz and 161·9125-162·0125 MHz not earlier than 1 January 1976 (see No. 287A of the Radio Regulations);

resolves

that the World Administrative Maritime Radio Conference to be held in 1974 be invited to consider this matter further and to decide if and to what extent the maritime mobile satellite service should be introduced in the above bands on an exclusive basis and to make any consequential changes in the Radio Regulations and in the provisions governing the use of the channels in Appendix 18;

requests the Secretary-General

to transmit this Resolution to Members and Associate Members and to the Administrative Council for inclusion in the draft agenda for the 1974 Maritime Conference.

RECOMMENDATION No. Spa. EE

Relating to a Revised Presentation of the Sections of Article 1 of the Radio Regulations

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that, as a result of the amendments made to the Article 1 of the Radio Regulations, the terms specified in that Article are no longer arranged in logical order;
- b) that it would therefore be desirable to rearrange Article 1 of the Radio Regulations in a more appropriate form;

recognizing

that this Conference was unable to perform this task;

recommends

that the next world administrative conference which is competent to revise Article 1 of the Radio Regulations should consider the rearrangement of Article 1 in a more logical manner, for example, on the lines of the Annex to this Recommendation, and further amendments to this Article, as necessary.

ANNEX TO RECOMMENDATION No. Spa EE

ARTICLE 1

Section I. General Terms

Section II. Radio Systems

Section III. Radio Services and Stations

Sub-Section IIIA. Terrestrial Radiocommunication

Sub-Section IIIB. Space Radiocommunication

Sub-Section IIIC. Radio Astronomy

Section IV. Technical Characteristics

RECOMMENDATION No. Spa FF

Relating to the Future Use of Bands Allocated to the Inter-Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that the bands 54·25-58·2 GHz, 59-64 GHz, 105-130 GHz, 170-182 GHz and 185-190 GHz have been allocated to the inter-satellite service;
- b) that all the foregoing bands are located in parts of the radiofrequency spectrum close to peaks of atmospheric absorption;

and recognizing

that the inter-satellite and terrestrial radiocommunication services are protected from mutual interference by the attenuation due to atmospheric absorption;

recommends

that a future world administrative radio conference should consider allocating these bands also to terrestrial radiocommunication (except the aeronautical mobile) services.

RECOMMENDATION No. Spa GG

Relating to the Future Use of Certain Frequency Bands between 40 and 275 GHz

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

that the 43-48 GHz, 66-71 GHz, 95-101 GHz, 142-150 GHz, 190-200 GHz and 250-265 GHz bands have been allocated to the following services:

- Aeronautical mobile satellite
- Maritime mobile satellite
- Aeronautical radionavigation-satellite
- Maritime radionavigation-satellite;

recognizing

that it is not desirable for compatibility considerations that at a later date these bands should be shared with terrestrial radiocommunication services other than those of interest to the aeronautical and maritime mobile services and/or the aeronautical and maritime radionavigation services;

recommends

that a future competent world administrative conference should consider allocating, in addition, the 43-48 GHz, 66-71 GHz, 95-101 GHz, 142-150 GHz, 190-200 GHz and 250-265 GHz bands to the following services:

- Aeronautical mobile
- Maritime mobile
- Aeronautical radionavigation
- Maritime radionavigation

in an appropriate manner.

RECOMMENDATION No. Spa HH

Relating to the Future Use of the 41-43 GHz Band by the Fixed and Mobile Services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

that the 41-43 GHz band has been allocated to the broadcasting-satellite service;

recognizing

that it is possible, by appropriate co-ordination, for a frequency band to be shared by the broadcasting-satellite service, on the one hand, and the fixed and mobile services, on the other;

recommends

that a future competent world administrative conference should consider allocating, in addition, the 41-43 GHz band to the fixed and mobile services.

RECOMMENDATION No. Spa II

Relating to Future Frequency Allocation Requirements for the Maritime Mobile Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

having noted

that the Inter-Governmental Maritime Consultative Organization (I.M.C.O.) has stated a requirement for frequencies of the order of 400 MHz, believing that small vessels in particular may be unable to use satellite radiocommunications if such frequencies are not made available;

further noting

that the C.C.I.R. Special Joint Meeting, Geneva, 1971, concluded that the present Conference should be invited to examine the possibility of providing exclusive channels for the maritime mobile satellite service at about 400 MHz and that provision of such channels is desirable;

considering

- a) that ship stations and survival craft stations are completely dependent upon the use of radio for communication;
- b) that the use of space techniques will provide the maritime mobile service with a reliable and more efficient method of communication;
- c) that reliable maritime mobile satellite service communications will greatly assist in the saving of lives and property;
- d) that although the Conference has made certain provisions for the maritime mobile satellite service, there is some uncertainty with respect to the adequacy and usefulness of these provisions, particularly insofar as small ships and survival craft are concerned;

- e) that general participation of small ships in a service using space techniques would not only benefit the efficient and safe operation of these ships but would also improve the safety service for larger ships and survival craft;
- f) that future conferences might find it necessary to make additional allocations for such uses nearer to the optimum portions of the spectrum;
- g) that for some communications functions, such as certain broadcasting and fixed applications, other means than radio could be used, thereby making portions of the spectrum available for services which are dependent on radio;

recommends

- 1. that administrations and appropriate international organizations continue to review the requirements for the maritime mobile satellite service and the suitability of current frequency allocations in meeting those requirements;
- 2. that the C.C.I.R. should continue its studies to determine the optimum portions of the frequency spectrum and related sharing conditions to accommodate maritime mobile satellite service requirements, taking into consideration advances in space radiocommunication technology;
- 3. that a competent administrative radio conference should review the requirements of the maritime mobile satellite and safety services, and if necessary, provide the frequency allocation to satisfy these requirements.

RECOMMENDATION No. Spa JJ

Relating to the Protection of Radio Astronomy Observations on the Shielded Area of the Moon

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that radio astronomy observations at frequencies below the ionospheric critical frequencies and above 100 GHz are hampered or prevented by absorption in the Earth's atmosphere;
- b) that successful radio astronomy observations require complete freedom from harmful interference;
- c) that the shielded area of the Moon offers unique opportunities for observations which are not affected by such absorption;
- d) that the shielded area of the Moon appears to be the potentially most useful area accessible to man which is completely free from interference from terrestrial transmissions;
- e) that the shielded area of the Moon refers to the area of the Moon which is more than 23.2° beyond the mean limb of the Moon as seen from the centre of the Earth;
- f) that the transmissions by radio of data from observation stations to collection points will be in the bands allocated for this purpose;

noting

the desirability of maintaining the shielded area of the Moon as an area of maximum value for observations by the radio astronomy service and by passive space research and consequently as free as possible from transmissions;

recommends

- 1. that the C.C.I.R. study the frequency bands most suitable for radio astronomy observations on the shielded area of the Moon and work out recommendations concerning these bands as well as criteria for their application and protection;
- 2. that in the meantime, administrations, in accordance with the intent of this Recommendation, take all practicable steps to ensure that there will be no interference to radio astronomy observations on the shielded area of the Moon; and
- 3. that administrations apply such Recommendations as may be provided on this matter by the C.C.I.R. pending the convening of the next World Administrative Radio Conference.

RECOMMENDATION No. Spa KK

Relating to the Future Provision of a Band near 10 MHz for the Radio Astronomy Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) the requirements of the radio astronomy service, as expressed by the Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science (IUCAF), for a frequency allocation near 10 MHz;
- b) that the use of the standard frequency guard bands has not satisfied the needs of the radio astronomy service at a frequency near 10 MHz;
- c) that propagation conditions at a frequency near 10 MHz are such that a transmitter operating anywhere on the Earth might cause interference to the radio astronomy service and as a consequence an exclusive world-wide allocation is necessary for long term observations;
- d) that successful radio astronomical measurements have, at times, been made at frequencies near 10 MHz;
- e) that IUCAF is co-ordinating the needs of radio astronomers for frequency allocations;

recommends

- 1. that administrations keep under review the possibility of releasing a band of frequencies 50 kHz wide for the use of the radio astronomy service between 10 MHz and 15 MHz;
- 2. that administrations give close attention to any future recommendation of the IUCAF concerning the specific frequency band between 10 MHz and 15 MHz required by the radio astronomy service;
- 3. that a future world administrative radio conference consider granting to the radio astronomy service an exclusive allocation in this region of the spectrum.

MOD

RECOMMENDATION No. Spa 3

To the C.C.I.R. and to Administrations Relating to Frequency Bands Shared between Space Radiocommunications Services and between Space and Terrestrial Radiocommunications Services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

recognizing

- a) the value to the Conference of the material contained in Document No. 64 (results of C.C.I.R. studies relating to space telecommunications concluded at its Special Joint Meeting, Geneva, 1971);
- b) that further studies on a wide range of problems dealing with space radiocommunications form the subject of C.C.I.R. Questions and Study Programmes approved by the XIIth Plenary Assembly;

considering however

a) that certain C.C.I.R. Recommendations, listed below, call for further work and study:

Recommendation 355-1	"Frequency	SHARING	BETWEEN	ACTIVE	COM
	3 ** ** ** O 1 #* O 3 * O		av ramma ea		

MUNICATION-SATELLITE SYSTEMS AND TERRESTRIAL RADIO SERVICES IN THE SAME FREQUENCY

BANDS"

Recommendation 465 "GENERALIZED EARTH-STATION ANTENNA RA-

diation pattern for use in interference calculations, including coordination procedures, in the frequency range $2\text{-}10~\mathrm{GHz}^{\circ}$

Recommendation 466 "Communication-satellite systems for te-

LEPHONY USING FREQUENCY-DIVISION MULTIPLEX

--- Maximum allowable values of interference in

R2-26

a telephone channel of a geostationary communication-satellite system employing frequency modulation, caused by other geostationary communication-satellite systems"

b) that as a result of the deliberations of this Conference, particularly in relation to the provisions of Article 7, Sections VII, VIII and IX, and to other relevant Articles of the Radio Regulations, further information is required to reply to the following current Questions and Study Programmes of the C.C.I.R.:

Question 1-1/4

"ANTENNAE FOR SPACE SYSTEMS"

under Decides 2

the state of development in antenna design

and fabrication:

under Decides 3

the state of development of antennae with

improved side- and back-lobe characteristics;

under Decides 4

the polarization characteristics of antennae,

particularly in the side-lobe regions and in planes other than the principal planes;

Question 2-1/4

"TECHNICAL CHARACTERISTICS OF COMMUNICA-

TION-SATELLITE SYSTEMS FOR FIXED AND MOBILE, EXCLUDING AERONAUTICAL AND MARITIME MO-

BILE, SERVICES"

under Decides 3

under what conditions and to what extent

would it be feasible for communicationsatellites, operating in the same system or operating in different systems, to share pre-

ferred frequency bands;

under Decides 4

under what conditions and to what extent

would it be feasible for communicationsatellite systems to share preferred frequency

bands with terrestrial services;

Study Programme 2-1A-1/4 "Feasibility of frequency sharing between

COMMUNICATION-SATELLITE SYSTEMS AND TER-

RESTRIAL SERVICES"

under Decides 2 the determination of the preferred technical

characteristics of transmitting and receiving antennae for earth stations at fixed locations, from the standpoint of spectrum sharing with

other radio services;

Study Programme 2-1C/4 "COMMUNICATION-SATELLITE SYSTEMS—Feasibil-

ity of frequency sharing among communica-

tion-satellite systems"

under Decides 1 the criteria which affect interference among

communication-satellites in a given system and between communication-satellite systems, taking into account the two directions of trans-

mission;

under Decides 2 the preferred technical characteristics of trans-

mitting and receiving antennae for earth stations, from the standpoint of frequency sharing within the same system and with other com-

munication-satellite systems;

Study Programme 2-1J/4 "COMMUNICATION-SATELLITE SYSTEMS—Techni-

cal factors influencing the efficiency of use of the geostationary satellite orbit by communication-satellites sharing the same frequency

bands"

under Decides 1 the technical characteristics of communication-

satellite systems which affect the utilization of the geostationary satellite orbit, and the inter-

relationships between them;

under Decides 3 • the extent to which it may be feasible and

desirable to adopt preferred technical char-

acteristics for different geostationary communication-satellites and earth stations;

under note 1:

Some of the factors which should be taken into account in carrying out these studies:

- the tolerable levels of interference noise in different communication-satellite systems;
- the radiation patterns of the earth station and satellite antennae;
- factors affecting the multiple use of the same frequencies within a single communication satellite;
- polarization discrimination;
- c) that the method of determining the co-ordination area of an earth station as described in Appendix 28 is probably open to improvement and simplification;
- d) that frequency bands have been allocated to the broadcasting satellite service and that the use of satellite transmissions for reception by the general public of sound and television broadcasts may be possible in the future;
- e) that the C.C.I.R. is studying the conditions under which sharing between the broadcasting satellite service and other services may be possible;
- f) that it would be useful to have a clear definition of the term "system noise temperature";
- g) that it would be useful to have clear definitions of the terms "acceptable (or unacceptable) interference" and "harmful interference" for the space radiocommunication, radio astronomy, and terrestrial radiocommunication services;
- h) that it would be useful to have specific numerical values of power flux density from space stations of the broadcasting-satellite service which

would permit differentiation between "individual reception" and "community reception" in the broadcasting-satellite service;

i) that frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) has been adopted in the frequency band 14·0 to 14·3 GHz, and between the radionavigation-satellite service and the fixed-satellite service (Earth-to-space) in the frequency band 14·3 to 14·4 GHz;

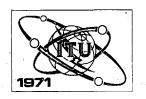
recommends

- 1. that administrations, recognized private operating agencies, and other participants in the work of the C.C.I.R., consider as a matter of priority, the submission of contributions on these subjects, so that draft Recommendations on them can be prepared at the Meetings of the relevant Study Groups for consideration by the Plenary Assembly of the C.C.I.R.;
- 2. that the C.C.I.R. should study or, as appropriate, continue to study:
 - 2.1 the reference antenna patterns for earth station antennae, which may be appropriate for setting minimum standards of performance with a view to recommending specific patterns for this purpose, in order to improve utilization of the bands shared between the fixed-satellite service and terrestrial radiocommunication services, and of the bands shared by space radiocommunication services, and to improve the utilization of the geostationary satellite orbit;
 - 2.2 the reference antenna patterns for satellite antennae, which may be appropriate for setting minimum standards of performance, particularly outside the main beam, in order to improve the utilization of the geostationary satellite orbit and to increase the possibilities for frequency re-use;
 - 2.3 the reference cross-polarization antenna patterns which may be appropriate for setting minimum standards of performance and, in this connection, further study:

- 2.3.1 the portions of the spectrum within which linear-orthogonal or circular-orthogonal polarizations might be most appropriate;
- 2.3.2 the relative desirability, taking into account technical and orbit utilization factors, of using orthogonal polarizations within a single satellite as against with two satellites;
- 2.4 the necessary limitation of spurious emissions and the frequency tolerances to be observed in both the terrestrial and space radio-communication services insofar as they may affect sharing of frequency bands;
- 2.5 the criteria of acceptable interference for the various space radiocommunication services and terrestrial radiocommunication services sharing the frequency bands allocated by the present Conference, in order to permit the determination of;
 - 2.5.1 the co-ordination distance and the probability of interference between stations within that distance;
 - 2.5.2 the necessary limits of power flux density set up at the Earth's surface by space stations;
- 2.6 the maximum acceptable level of interference into a geostationary satellite link from any other single interfering geostationary satellite network and from the aggregate of all other geostationary satellite networks, particularly in the case of:
 - 2.6.1 frequency-modulated telephony signals;
 - 2.6.2 frequency-modulated television signals;
 - 2.6.3 digitally-modulated signals;

and the most appropriate manner in which acceptable interference should be specified in these and other cases;

- 2.7 the interference criteria applicable to frequency sharing between non-geostationary satellite networks and geostationary satellite networks;
- 2.8 the possibility of establishing a technical criterion for expressing the efficiency of use of the geostationary satellite orbit;
- 2.9 the possibility of improving and simplifying the method of determining the co-ordination area as described in Appendix 28.;
- 2.10 the conditions for frequency sharing in those bands allocated to the broadcasting-satellite service by the present Conference with a view to making appropriate recommendations as soon as possible so that administrations and the International Frequency Registration Board shall have the necessary technical data required to carry out examination procedures, in particular regarding Articles 9 and 9A of the Radio Regulations;
- 2.11 the term "system noise temperature" with a view to formulating a clear definition of this term applicable to space radiocommunication systems;
- 2.12 the terms "acceptable (or unacceptable) interference" and "harmful interference" with a view to formulating clear definitions appropriate to the radio astronomy service and to the various space radiocommunication and terrestrial radiocommunication services;
- 2.13 the power flux densities required for individual and community reception in the broadcasting-satellite service, with a view to specifying numerical values which will differentiate between these types of reception;
- 2.14 the criteria for frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) in the frequency band 14·0 to 14·3 GHz and between the radionavigation-satellite service and the fixed-satellite service (Earth-to-space) in the frequency band 14·3 to 14·4 GHz.



Document No. 389-E 14 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

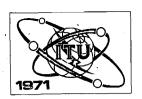
ELEVENTH REPORT OF COMMITTEE 4

New Appendix 28 relating to the procedure for the determination of the co-ordination area around an earth station in frequency bands between 1 and 40 GHz shared between services of space and terrestrial radiocommunication has been approved by Committee 4 and forwarded to the Drafting Committee.

In view of the limited time and the size of the document, Appendix 28 will be reproduced only as a Blue Document.

E.F. SANDBACH Chairman Committee 4





Document No. 390-E

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

TWELFTH AND FINAL REPORT OF

COMMITTEE 4

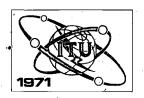
The Committee 4 (Technical) held eight meetings at which it considered the various proposals and items arising cut of its terms of reference. The Committee's deliberations have been submitted in Reports for consideration of Plenary Meeting as well as to Committee 7 (Drafting Committee).

The last remaining items which have to be referred for deliberation of the Plenary Meeting are :

- With reference to Proposal No. USA/28/266, Committee 4 agreed to recommend to Plenary Meeting to suppress Resolution No. Spa 3.
- In view of the new text to replace existing
 Recommendation No. Spa 3 broadly covering the outstanding
 problems related to frequency sharing between space
 services and terrestrial services, I would like to
 invite the Plenary Meeting to consider the suppression
 of Recommendation No. Spa 2.

E. SANDBACH Chairman Committee 4





Document No. 391-E 14 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

SUMMARY RECORD

OF THE

FOURTH MEETING OF COMMITTEE 6

Monday, 12 July 1971, at 0955 hrs

Chairman: Mr. M.K. BASU (India)

Subjects discussed	Document No.	
1. Summary record of the third meeting	353	
2. Article 9	346	
3. Appendix 1B	329 , 3 25	
4. Appendices 1 and 1A	355	
5. Final Report from Working Group 6A	359	



1. Summary record of the third meeting (Document No. 353)

Approved.

2. Article 9 (Document No. 346)

The <u>Chairman of Working Group 6A</u> said that the Group at its last meeting had succeeded in solving the problems left pending by Sub-Group 6A-3 and had unanimously adopted the text of Article 9 which was before the Committee.

The <u>Chairman</u> observed that a few terms had been left in square brackets throughout the text because certain definitions had not been forthcoming from Committees 4 and 5, and proposed that the small drafting group appointed to remove the square brackets from the document on Article 9A would be requested to perform the same function in respect of Article 9.

In view of the unanimity that had been reached on the Article in Working Group 6A, the Committee might agree to approve Document No. 346 as a whole.

The <u>Delegate of France</u> pointed out that not all the terms in square brackets related only to definitions. In particular, the question of the terrestrial services which should be co-ordinated with space radiocommunication services had not yet been settled. He asked whether that question should be left to the Plenary Meeting.

The <u>Chairman</u> considered that the problem should be solved in Committee 6 and said that the document should be considered page by page.

Pages 3 and 4

Approved.

Page 5

The <u>Delegate of Nigeria</u> said that the foot-note reference after sub-paragraph c) should be 3, not 4.

The <u>Delegate of New Zealand</u> said that the last part of the penultimate line of foot-note MOD 486.4 should read "... with space radiocommunications in ...".

He proposed that the words "fixed or mobile" in square brackets in that foot-note should be replaced by "terrestrial".

The Delegate of the United States of America pointed out that co-ordination distance was calculated on the basis of Appendix 28, which showed that calculation methods were not applicable to all terrestrial services except the fixed or mobile service.

The Delegate of the United Kingdom said that the Article in fact referred to the fixed or mobile service.

The Delegate of India considered that at that stage the Committee had no other choice but to remove the square brackets round the words "fixed or mobile service" throughout the document.

The <u>Delegate of France</u> thought it would be unwise to take a hasty decision on such an important subject. Surely a decision could be arrived at after examination of the texts of Articles 9 and 9A, Appendix 28 and the draft Recommendation inviting the C.C.I.R. to conduct further studies of co-ordination distance calculations.

The <u>Chairman</u> said that a decision on the matter would be deferred until a solution could be found, if possible during the current meeting.

On that understanding, page 5, as amended, was approved.

Pages 6 to 9

Approved.

Page 10

The Delegate of Pakistan, supported by the Delegate of Cuba, said that the period of sixty days mentioned in the sixteenth line of MOD 492B was too short to allow small countries to carry out the necessary technical examination and co-ordination procedures, and proposed that the period should be increased to ninety days, in accordance with sub-paragraph b) of MOD 492D on page 12.

The Chairman of the I.F.R.B. pointed out that the sixty-day period was not a time-limit for effecting the co-ordination procedure, but merely served to enable the administration seeking co-ordination to find out whether or not the other administration wished to enter into the discussion. Under MOD 492D, however, the latter administration was given ninety days in which to indicate that it did not wish to reply. Accordingly, the two periods could not be the same, and there was no question of aligning MOD 492B with MOD 492D.

Page 4

The Delegate of the United States of America observed that the existing No. 492B also provided for a sixty-day period, which should give ample time to decide whether or not a co-ordination problem existed.

The Delegate of Mexico pointed out that the period had originally been the same for the two clauses, but had been changed to ninety days in the case of MOD 492D. He could, however, agree that the sixty-day period should be retained in MOD 492B.

The Delegates of Pakistan and Cuba agreed not to press their proposal, although they still considered that a wider margin should be allowed.

Page 10 was approved.

Pages 11 to 17

Approved.

Page 18

The Delegate of Canada said that "NOC 570AD" should be changed to "MOD 570AD", as the original reference in the penultimate line had been to No. 639AS, not to No. 639BM.

Approved, as amended.

Pages 19 to 32

Approved.

The Chairman of Working Group 6A reminded the Committee that during the discussion of Article 9A, the Netherlands Delegation had proposed that the term "fixed or mobile service" should be replaced by "terrestrial radiocommunications", but that that proposal had been rejected on the grounds that Appendix 28 related only to co-ordination criteria for sharing between earth stations and stations in the fixed or mobile service. An excellent solution had now been found on the basis of the Netherlands proposal, by adding a foot-note stating that the provisions would apply only to the fixed or mobile service, until such time as the C.C.I.R. had established criteria for other terrestrial radiocommunications.

The Delegate of the United Kingdom said that the proposed change would be inserted on page 9, where the third line would be altered to read "terrestrial radiocommunication stations1) for" and the new foot-note1) would read:

"Appendix 28 contains criteria relating only to co-ordination between stations in the fixed or mobile service and earth stations. Until the C.C.I.R., in accordance with Recommendation No. X, provides criteria relating to other terrestrial radiocommunications, the criteria to be employed in effecting co-ordination between terrestrial radiocommunication stations other than those of the fixed or mobile service, and earth stations, shall be agreed between the administrations concerned."

The existing foot-note MOD 492A.1 would be renumbered MOD 492A.2 and would be altered to read "2) Calculated, in relation to the fixed or mobile service, in accordance with the procedures described in Appendix [28]".

If that amendment was acceptable, the small drafting group could be authorized to go through the remainder of the text, removing the square brackets and making appropriate changes. Corresponding changes would also be required in Article 9A, where the order in which the services were mentioned would of course be reversed.

The Delegate of India said he was not sure of the effects that the amendment would have on the co-ordination procedure as a whole, and reserved the right to return to the question in the Plenary Meeting.

The <u>Chairman</u> suggested that the drafting group should be entrusted with the task outlined by the <u>United Kingdom Delegate</u> and that he, as Chairman of the Committee, should introduce the proposed changes in Article 9A in the Plenary Meeting.

It was so decided.

3. Appendix 1B (Document No. 329, Document No. 325)

The Chairman of Working Group 6A introduced Document No. 329 containing a draft of Appendix 1B, incorporating amendments proposed by Working Group 4E in Document No. 311, which was to be considered in conjunction with the proposed French amendments in Document No. 325. The square brackets enclosing the words "Indicate also ..." on page 4 to "of the earth" on page 5 were a typographical error, and should be removed.

The Delegate of France pointed out that the words "in accordance with Resolution No. Space C" on page 4 should be deleted because that Resolution had been withdrawn by its sponsor. The words "satellite network" and "satellite system" had been incorporated in the text after a decision on those terms had been taken; they were therefore correct wherever they appeared and the Drafting Group had only to remove the square brackets from them.

After some discussion of the desirability of deleting the phrase "[and the number of satellites having the same characteristics used in the satellite network]" on page 5 (sub-paragraph (b!)), it was agreed that the square brackets should be removed, the words "in the satellite network" deleted, and the remainder of the phrase referred to the Drafting Group so that its wording might be improved.

Pages 3, 4 and 5 of Document No. 329 were approved as amended.

The <u>Delegate of France</u> introduced the proposed modifications in Document No. 325.

Pages 6, 7, 8 and 9 of Document No. 329 were <u>approved</u> with the relevant modifications from Document No. 325.

The proposed modification to page 10 of Document No. 329 (Document No. 325, Annex, paragraph 2) was <u>approved</u> with the following minor modifications to the English text:

- 1) Replace "foreseen" by "projected" in the 1st and 7th lines.
- 2) Replace "smaller" by "lowest" in the 3rd line, and delete "highest" in the 4th line.
- 3) Replace "link gain" by "transmission gain" (English text only) in the 5th line.

Pages 10 and 11 of Document No. 329 as thus amended were approved.

4. Appendices 1 and 1A (Document No. 355)

The Chairman of Working Group 6A introduced Document No. 355 containing the provisionally approved texts of Appendices 1 and 1A, and pointed out that on page 18, Item 5, sub-paragraph (a) (1) and (2) should read "the arc of the geostationary satellite orbit ...", and on page 21, in the Note at the bottom of the right-hand corner of the page "profile" should be replaced by "elevation angle diagram". The square brackets on page 5 would be removed by the Drafting Group.

In reply to a request for clarification by the <u>Delegate of Pakistan</u>, it was <u>agreed</u> that the foot-note reading "This <u>information</u> need only be supplied in the notice when such information has been used as a basis to effect co-ordination with another administration" should be inserted on pages 21 and 23 as footnote **).

The Delegate of India queried whether that implied that some notices would not give information regarding the carrier frequency involved, because he believed Working Group 6A had decided that co-ordination would not be carried out for the whole frequency band but only for carrier frequencies. There was some discussion of the subject, in which it was explained that notification was to be made on the basis of assigned frequencies and assigned frequency bands in kc/s, and that because of material difficulties with certain new transmission and modulation techniques, it had been decided that it was only necessary to give the carrier frequency when it had been used for co-ordination purposes. The assigned frequency band was not the same thing as the allocated frequency band, and within the assigned frequency band administrations were quite free to co-ordinate carrier frequency by frequency if they so desired.

Document No. 355 was approved as amended.

5. Final Report from Working Group 6A (Document No. 359)

The Chairman of Working Group 6A introduced Document No. 359.

The Representative of the I.F.R.B. drew attention to a typographical error whereby "noise temperature", which was dealt with in IIB, also appeared in IIA.

The Delegate of the U.S.S.R. pointed out that certain terms listed in IIA as considered unnecessary to be included in the Radio Regulations, in fact appeared in the draft resolution and recommendations annexed to Document No. 359.

After some discussion of the point, it was agreed to state that in some cases terms had not been defined, either because they were not used in Appendices 1, 1A and 1B, or because they were quite clear in themselves and needed no explanation.

Document No. 391-E Page 8

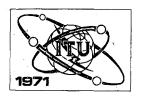
It was agreed that IIE and MOD 89 should remain pending until the following meeting, so as to give the Delegate of India an opportunity to revert to the point he had raised in connection with Document No. 325.

Annexes 1, 2 and 3 of Document No. 359 were approved.

The meeting rose at 1330 hrs.

The Secretary: W. GARCIA-RIOS

The Chairman: M.K. BASU



Document No. 392-E 14 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

SUMMARY RECORD

OF THE

FIFTH MEETING OF COMMITTEE 6

Monday, 12 July 1971, at 2115 hrs

Chairman : Mr. M.K. BASU (India)

Subjects discussed		Document No.		
1.	Draft Resolution NoJ	188(Rev.)		
2.	Draft new Resolution _A_7	**286 /		
3.	Appendix 10	356		
4.	Report of Sub-Working Group 6A-2	358		



1. Draft Resolution No. /J/ (Document No. 188(Rev.))

The Delegate of France introduced the document, pointing out that it had been prepared by his delegation in pursuance of discussions on co-ordination distances in Working Group 4C and of certain comments in Document No. 61 submitted by the I.F.R.B. The Draft Resolution had been studied by Committee 4, which had approved it with the two small changes given in Document No. 269. The purpose of the text was to provide for a case not covered in the Radio Regulations : co-ordination distances were determined on the basis of arbitrarily fixed values of the e.i.r.p. of transmitting terrestrial stations, as those values were not limited anywhere in the Regulations. The French Delegation had thought that, rather than imposing such limits in the Regulations themselves, it would be more convenient to ask administrations to indicate the characteristics of the stations which exceeded those values; as there were very few such stations, they could easily be enumerated in a list which administrations could consult. He stressed that the question was not one of protecting space stations vis-à-vis terrestrial stations or vice versa, since that point was covered in Article 7, but one of preventing interference between earth and terrestrial stations in cases where the values determining the co-ordination area were exceeded. If it was deemed necessary for purposes of clarification, he would be prepared to add a note to the effect that the Resolution related only to the frequency bands where the co-ordination distance was applicable, i.e. between 1 and 40 Gc/s.

The Delegate of the U.S.S.R., supported by the Delegates of the United Kingdom, the United States of America, the Netherlands and Japan, said that, although his delegation had studied the document carefully, it could see no need for the new provision. The co-ordination procedure in question was fully covered by No. 492A, and it was quite unnecessary to impose further work on administrations and to lengthen the Radio Regulations. Moreover, the French Delegate had admitted that further clarification might be required. In the interests of advancing the work of the Conference, he appealed to the French Delegation to withdraw its proposal.

In reply to a question by the <u>Delegate of Pakistan</u>, the <u>Chairman of the I.F.R.B</u>. said that the Draft Resolution was intended to elicit information additional to that already required under No. 490. Interference could indeed be caused by terrestrial or earth stations with a very high e.i.r.p. beyond the co-ordination area, and the new information could be very useful to administrations. The role of the I.F.R.B. would be merely that of publishing the information.

The Delegate of France pointed out that the problem had been very clearly stated in paragraph 3.6.4 on page 26 of Document No. 61 submitted by the I.F.R.B. An earth station obviously might not be protected against interference from certain terrestrial stations which nevertheless operated in accordance with the Radio Regulations. As the number of such stations was small, the best solution was to enumerate them in a list which could be consulted with a view to choosing sites for earth stations. Similarly, interference might be caused by an earth station to a terrestrial station with a sensitivity higher than the e.i.r.p. value from which the co-ordination distance was calculated, although that station also operated in accordance with the Regulations. Accordingly, the situation in question was not covered by No. 492A, and was permitted by the existing Regulations.

In view of the favourable reception of the Draft Resolution in Committee 4, he wished to know the technical grounds for the opposition that had been expressed in Committee 6.

In reply to the Delegate of Austria, the Representative of the I.F.R.B. said that the Board believed the Draft Resolution to be well justified. There seemed to be some misunderstanding about the scope of that text. It should be borne in mind that, in the bands allocated to earth receiving stations sharing frequencies with fixed services, the co-ordination distance was calculated with respect to the hypothetical e.i.r.p. of the fixed service. The Master Register contained entries for over 300 fixed stations where that e.i.r.p. was exceeded. Since Article 7 set no limit for e.i.r.p. in those bands, receiving stations of a country operating within the hypothetical e.i.r.p. of 55 dBW were open to interference from sending stations of a neighbouring country operating in excess of that value. The co-ordination distance of sending earth stations was calculated on hypothetical e.i.r.p. values of terrestrial stations, and the same situation was liable to arise. Thus, the purpose of the Draft Resolution was to compile a list of the few cases in which those hypothetical values were exceeded, so that they could be taken into account in choosing sites for receiving and sending earth stations.

The Delegates of Argentina, Spain, Mexico, Brazil and Mauritania said that they had been convinced by those arguments and could support the Draft Resolution.

In reply to the <u>Delegate of Syria</u>, the <u>Chairman of the I.F.R.B.</u> said that the problem was whether No. 490 indeed sufficed to enable an administration to determine whether or not a station in another country

was liable to cause it harmful interference under No. 486. The statements of the French Delegate and the Representative of the I.F.R.B. showed that No. 490 was inadequate for that purpose in the cases at issue. Adoption of the Draft Resolution would allow for the technical examination of the terrestrial stations concerned, and that in turn might lead to unfavourable findings by the Board.

The Delegate of the United States of America said he doubted whether the problem would be solved by listing high-sensitivity receiving stations in the Master Register. Moreover, No. 486, sub-paragraph a) covered the case of terrestrial stations with a high e.i.r.p., and it should also be borne in mind that, if administrations wanted to obtain international recognition of the use of the frequency, in accordance with sub-paragraph c) of that provision, it would not be in their interests to use a very high e.i.r.p.

The <u>Delegate</u> of the U.S.S.R. agreed that the situation was not entirely covered by the Radio Regulations, but pointed out that the provisions of the Regulations were fundamental and were not intended to cover all the activities of individual administrations. When choosing sites for earth stations, administrations made searching investigations and took very careful precautions. The French Delegation and the I.F.R.B. might be complicating an issue which was not really so difficult to settle in practice: there were certainly other means of avoiding the dangers feared by some delegations.

The Delegate of the United Kingdom, supported by the Delegate of Australia, considered that the Draft Resolution was redundant, for if an administration complied with No. 490 and the Board made the necessary entry in the Master Register, the essential provisions of the Draft Resolution would in fact be implemented.

The <u>Delegate</u> of France pointed out that the U.S.S.R. Delegate had not explained what other means there were of protecting earth and terrestrial stations. Nor could he agree with the United Kingdom Delegate that the necessary provisions were contained in No. 490: for instance the azimuths in which the e.i.r.p. was exceeded were unknown. In any case, Committee 4 had found considerable technical value in the document, and he appealed to Committee 6 to ponder its decision.

The Chairman observed that opinion on the question was divided and invited the Committee to vote on the Draft Resolution.

The Draft Resolution was rejected by 15 votes to 7, with 5 abstentions.

The Delegate of France reserved the right to raise the matter again in the Plenary Meeting.

2. Draft new Resolution / A / (Document No. 286)

The Chairman pointed out that the Draft Resolution had been examined by Committee 4, which had considered that it was not competent to deal with the administrative and legal aspects of the text.

The Delegate of New Zealand said that considerable amendments to the draft were in the course of preparation.

The <u>Delegate of Syria</u> drew attention to paragraphs 4 and 5 of the document and pointed out that the competence of the Space Conference to revise Regulations affecting services other than space services had been questioned. Perhaps the Committee should settle that issue before proceeding with the debate.

The <u>Delegate of India</u>, supported by the <u>Delegates of the United States of America</u>, the <u>United Kingdom</u> and <u>Brazil</u>, proposed that a small group should be set up to prepare a unified draft of the document, bearing in mind the point raised by the Syrian Delegate.

It was decided that the group would be convened by the Delegate of New Zealand and would consist of the Delegates of the United Kingdom, the United States, India, Syria and Brazil, assisted by the Representative of the I.F.R.B.

3. Appendix 10 (Document No. 356)

The Chairman of Working Group 6A said that the amendments to Appendix 10 which appeared in the document were based on the Argentine proposal in Document No. 183 and drew attention to No. 831 of the Radio Regulations, which authorized the Secretary-General to select additional symbols where necessary.

In reply to the <u>Delegate of Venezuela</u>, the <u>Delegate of Argentina</u> explained that the designation "space" was used to describe space-to-earth and earth-to-space links, whereas the word "satellite" was used for services, in accordance with definitions approved during the Conference.

In reply to the <u>Delegate of Syria</u>, the <u>Representative of the I.F.R.B.</u> said that the symbols in Appendix 10 were intended for use in service documents, not in connection with the Frequency Allocation Table. In the existing Appendix 10, there were different symbols for television, sound channel, and for television, vision channel, so that it had been considered advisable also to distinguish between sound broadcasting and television for space stations in the Broadcasting-Satellite Service.

Document No. 356 was approved.

4. Report of Sub-Working Group 6A-2 (Document No. 358)

The Convenor of Sub-Working Group 6A-2 said that the draft provision to be added to Article 7, contained in Annex 1 to the document, could be considered separately from the Draft Resolutions and Recommendation in Annexes 2, 3 and 4.

At the proposal of the <u>Delegate of Brazil</u>, it was <u>agreed</u> to replace the word "neighbouring" in the fourth line of Annex 1 by "other".

The Delegate of Argentina proposed that the word "possible" in the third line should be replaced by "necessary" and that the phrase "so as to avoid affecting their existing or planned services" should be inserted after "other countries" in the fourth line.

The Delegates of Syria, Brazil, Pakistan, the United States of America and Mexico supported that proposal.

The Delegate of Italy, supported by the Delegates of Sweden, India, Japan and the Netherlands, proposed that the existing text, as amended by Brazil, should be retained.

The Delegate of Spain pointed out that the text might in any case have to be aligned with the draft Resolution in Annex 2.

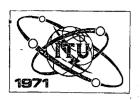
The meeting rose at 2320 hours.

The Secretary:

W. GARCIA-RIOS

The Chairman:

M.K. BASU



<u>Document No. 393-E</u> 9 July 1971

Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

I have received a letter from the Head of the Delegation of the Republic of Viet-Nam, the text of which is attached hereto.

Gunnar PEDERSEN Chairman of the Conference

Annex: 1



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ANNEX

PERMANENT MISSION OF THE
REPUBLIC OF VIET-NAM
TO INTERNATIONAL ORGANIZATIONS

Geneva, 9 July 1971

Mr. Gunnar PEDERSEN Chairman of the World Administrative Radio Conference for Space Telecommunications

Geneva

Dear Sir,

I am sending you herewith the text of a statement made by the Delegation of the Republic of Viet-Nam regarding Document No. 290 and should be grateful if you would issue it as a Conference document.

Yours faithfully, For the Head on the Delegation

Vuong Quang Nghia

Annex: 1

Annex

Geneva, 9 July 1971

Statement by the Delegation of the Republic of Viet-Nam

The Delegation of the Republic of Viet-Nam strongly protests against the allegations made by the representative of the Castro régime in Document No. 290 and declares them null and void.

Our Delegation would again stress that any polemics in this Assembly directed towards political ends and using insulting language are out of place and quite unacceptable at an international conference.

Our Delegation would recall that the terms of reference of the Credentials Committee are to verify the credentials of delegates in conformity with Chapter 5 of the General Regulations and not to serve as a forum for discussing invitations to certain countries to participate in the Conference.

INTERNATIONAL
TELECOMMUNICATION
UNION

SPACE CONFERENCE

Geneva, 1971

Document No. 394-E 15 July 1971

PLENARY MEETING (FIRST READING)

B.15

The Editorial Committee, having examined the following documents, submits the attached texts to the Plenary Meeting for a first reading.

Com.	Doc. No.	Pages	Subject	Comments
4	335	Annex 1-3	Additions to Art, 7	
6	<i>3</i> 97		Art. 7, No. 428A Res. F, G	
6	398	er i	Art. 1, No. 89 Res. D Rec. IL, MM	
6	399		App. 9 Res. C App. 10	
6	400		Res. E	

Francis JOB Chairman of the Editorial Committee

Annex: Pages B.15/01-24



[ARTICLE 7]

ADD Section IA Broadcasting-Satellite Service

ADD 428A § 2A. In devising the characteristics of a broadcasting space station, all technical means available shall be used to reduce to the maximum extent the radiation over the territory of other countries unless an agreement has been previously reached with such countries.

RESOLUTION No. Spa F

relating to the Establishment of Agreements and Associated Plans for the Broadcasting-Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that it is important to make the best possible use of the geostationary-satellite orbit and of the frequency bands allocated to the Broadcasting-Satellite Service;
- b) that the great number of receiving installations using such directional antennae as could be set up for a Broadcasting-Satellite Service may be an obstacle to changing the location of broadcasting space stations on the geostationary-satellite orbit, from the date of their bringing into use;
- c) that satellite broadcasts may create harmful interference over a large area of the earth's surface;
- \underline{d}) that the other services with allocations in the same band need to use the band before the Broadcasting-Satellite Service is set up;

resolves

- that stations in the Broadcasting-Satellite Service shall be established and operated in accordance with agreements and associated plans adopted by world or regional administrative conferences, as the case may be, in which all the administrations concerned and the administrations whose services are liable to be affected may participate;
- 2. that the Administrative Council be requested to examine as soon as possible the question of a world administrative conference, and/or regional administrative conferences as required, with a view to fixing suitable dates, places and agenda;
- 3. that during the period before the entry into force of such agreements and associated plans the administrations and the I.F.R.B. shall apply the procedure contained in Resolution No. Spa G.

DRAFT RESOLUTION No. Spa G

relating to the Bringing into use of Broadcasting Space Stations, prior to the entry into force of Agreements and Associated
Plans for the Broadcasting-Satellite Service

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that while Resolution No. Spa F has been adopted by this Conference, envisaging plans for the Broadcasting-Satellite Service, some administrations might nevertheless feel the need to bring broadcasting space stations into service prior to such plans being established;
- b) that administrations should, as far as possible, avoid proliferation of broadcasting space stations before such plans have been established;
- c) that a broadcasting space station may cause harmful interference to terrestrial stations operating in the same frequency band, even if the latter are outside the service area of the space station;
- d) that the procedure specified in Article 9A of the Radio Regulations contains no provisions for co-ordination between broadcasting space stations and terrestrial stations and between broadcasting space stations and space systems of other administrations;

resolves

- 1. that the following procedure shall be applied until agreements and associated plans pursuant to Resolution No. Spa F enter into force:
 - Section A: Co-ordination procedure between broadcasting space stations and terrestrial stations;
- 2.1 Before an administration notifies to the Board or brings into use any frequency assignment to a broadcasting space station in a frequency band where this frequency band is allocated, with equal rights,

to the Broadcasting-Satellite Service and to a Terrestrial Radiocommunication Service, either in the same Region or sub-Region or in different Regions or sub-Regions, it shall co-ordinate the use of this assignment with any other administration whose Terrestrial Radiocommunication Services may be affected. For this purpose, it shall inform the Board of all the technical characteristics of the station, as listed in the relevant sections of Appendix 1A, which are necessary to assess the risk of interference to a Terrestrial Radiocommunication Service¹;

- 2.2 The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram;
- Any administration which considers that its Terrestrial Radiocommunication Services may be affected shall forward its comments to the administration seeking co-ordination and, in any case, to the Board. These comments must be forwarded within one hundred and twenty days from the date of the relevant I.F.R.B. weekly circular. It shall be deemed that any administration which has not forwarded comments within that period considers that its Terrestrial Radiocommunication Services are unlikely to be affected;
- 2.4 Any administration which has forwarded comments on the projected station shall either give its agreement or, if this is not possible, send to the administration seeking co-ordination all the data on which its comments are based as well as any such suggestions as it may be able to offer with a view to a satisfactory solution of the problem;
- 2.5 The administration which plans to bring into use a broadcasting space station as well as any other administration which believes that its Terrestrial Radiocommunication Services are likely to be affected by the station in question may request the assistance of the Board at any time during the co-ordination procedure;
- 2.6 If the assistance of the Board has been sought and there is a continuing disagreement between the administration seeking co-ordination and the administration which has forwarded its comments, the administration seeking co-ordination may, after a total period of one hundred and eighty days, send to the Board its notice concerning the frequency assignment in question.

The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations as accepted by the administrations concerned under the terms of Resolution No. Spa E. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

- Section B : Co-ordination procedure between broadcasting space stations and space systems of other administrations
- 3. An administration intending to bring into use a broadcasting space station shall, for the purpose of co-ordination with space systems of other administrations, apply the following provisions of Article 9A of the Radio Regulations:
- 3.1 Nos. 639AA to 639AI inclusive.
 - 3.2.1 No. 639AJ 1.
 - 3.2.2 No co-ordination under paragraph 3.2.1 is required when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the probability of harmful interference to stations in the Space Radiocommunication Service of other administrations.
 - 3.2.3 Nos. 639AL, 639AM, 639AO, 639AS(a), (c), (e), (f), 639AT, 639AU, 639AV, 639AW, 639AX, 639AY, 639AZ.
 - Section C : Notification, examination and recording in the Master Register of assignments to broadcasting space stations, dealt with under this Resolution.
- 4.1 Any frequency assignment ² to a broadcasting space station shall be notified to the Board. The notifying administration shall apply for this purpose the provisions of Nos. 639BE, 639BF and 639BG of the Radio Regulations.
- 4.2 Notices made under paragraph 4.1 shall initially be treated in accordance with No. 639BH of the Radio Regulations.

¹ The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations as accepted by the administrations concerned under the terms of Resolution No. Spa E. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

² The expression frequency assignment, wherever it appears, in this Resolution shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called Master Register).

- 5.1 The Board shall examine each notice with respect to:
- 5.2 <u>a)</u> its conformity with the Convention, the Table of Frequency Allocations and the other provisions of the Radio Regulations (with the exception of those relating to the co-ordination procedures and to the probability of harmful interference);
- 5.3 b) its conformity, where applicable, with the provisions of paragraph 2.1 and Section A above, relating to co-ordination of the use of the frequency assignment with the other administrations concerned;
- 5.4 c) its conformity, where applicable, with the provisions of paragraph 3.2.1 of Section B above, relating to co-ordination of the use of the frequency assignment with the other administrations concerned:
- where appropriate, the probability of harmful interference to the service rendered by a station in a Space or Terrestrial Radiocommunication Service for which a frequency assignment has already been recorded in the Master Register in conformity with the provisions of No. 501 or 639BM as appropriate, if that assignment has not, in fact, caused harmful interference to the service rendered by a station for which an assignment has been previously recorded in the Master Register and which itself is in conformity with No. 501 or 639BM as appropriate.
- 5.6 Depending upon the findings of the Board subsequent to the examination prescribed in paragraphs 5.2, 5.3, 5.4 and 5.5, further action shall be as follows:
- 5.7 Where the Board reaches an unfavourable finding with respect to paragraph 5.2 the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.8 Where the Board reaches a favourable finding with respect to paragraph 5.2, or where it reaches the same finding after resubmission of the notice, it shall examine the notice with respect to the provisions of paragraphs 5.3 and 5.4.
- 5.9 Where the Board finds that the co-ordination procedures mentioned in paragraphs 5.3 and 5.4 have been successfully completed with all administrations whose services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in the column 2d of the Master Register with entry in the Remarks Column indicating that such recording does not prejudge in any way the decisions to be included in the agreements and associated plans referred to in Resolution No. Spa F.

- 5.10 Where the Board finds that the co-ordination procedures mentioned in paragraph 5.3 or 5.4 have not, as appropriate, been applied or have been unsuccessfully applied, the notice shall be returned immediately by airmail to the notifying administration with the reason for its return and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.11 Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedures have been successfully completed with all administrations whose services may be affected, the assignment shall be treated as indicated in paragraph 5.9.
- 5.12 Where the notifying administration resubmits the notice and states that it has been unsuccessful in endeavouring to effect the co-ordination, the notice shall be examined by the Board with respect to paragraph 5.5.
- 5.13 Where the Board reaches a favourable finding with respect to paragraph 5.5, the assignment shall be recorded in the Master Register. The appropriate symbol indicating the finding by the Board shall indicate that the co-ordination procedures, as appropriate, referred to in paragraph 2.1 were not successfully completed. The date of receipt by the Board of the notice shall be entered in the column 2d of the Master Register, with the remark mentioned in paragraph 5.9.
- 5.14 Where the Board reaches an unfavourable finding with respect to paragraph 5.5, the notice shall be returned immediately by airmail to the notifying administration with the reasons for the Board's finding and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.15 If the administration resubmits the notice unchanged with the insistence that it be reconsidered, but should the Board's unfavourable finding under paragraph 5.5 remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in column 2d of the Master Register, with the remark mentioned in paragraph 5.9. An appropriate remark shall be placed in column 13 to indicate that the assignment is not in conformity with the provisions of paragraphs 5.2, 5.3, 5.4 or 5.5, as appropriate. In the event that the administration concerned receives no complaint of harmful interference concerning the operation of the station in question for a period of one year from the commencement of operation, the Board shall review its finding.

- of any station in the Broadcasting-Satellite Service whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to paragraphs 5.2, 5.3, 5.4 and 5.5 of this Resolution, as appropriate, by the use of a frequency assignment to a station of the Broadcasting-Satellite Service which has been subsequently recorded in the Master Register in accordance with the provisions of paragraph 5.15 of this Resolution or of No. 639CP of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.
- 5.17 If harmful interference to the reception of any station whose assignment is in accordance with paragraph 5.2 of this Resolution, is actually caused by the use of a frequency assignment which is not in conformity with paragraph 5.2 of this Resolution, or with Nos. 501, 570AB or 639BM of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

RESOLUTION No. Spa E

Relating to the Technical Criteria recommended by the C.C.I.R. for sharing frequency bands between Space Radiocommunication and Terrestrial Radiocommunication Services or between Space Radiocommunication Services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971

considering

- a) that, in frequency bands shared with equal rights by Space Radiocommunication and Terrestrial Radiocommunication Services, it is necessary to impose certain technical limitations and co-ordination procedures on each of the sharing services in the interest of controlling mutual interference;
- b) that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose co-ordination procedures in the interest of controlling mutual interference;
- c) that the technical criteria and co-ordination procedures referred to in <u>a</u>) and <u>b</u>) above, and as set out in the Radio Regulations, are mainly based upon Recommendations of the C.C.I.R.;
- d) that, in recognition of the successful sharing of frequency bands by Space Radiocommunication and Terrestrial Radiocommunication Services, and the continuing improvements in space technology, each Plenary Assembly of the C.C.I.R. subsequent to the Xth Plenary Assembly, Geneva, 1963, has improved upon some of the technical criteria recommended by the preceding Plenary Assembly;
- e) that Plenary Assemblies of the C.C.I.R. are held triennally whereas Administrative Radio Conferences, which are empowered to modify the Radio Regulations making substantial use of the Recommendations of the C.C.I.R., are in practice held less frequently and with much less regularity;
- that the International Telecommunication Convention of Montreux, 1965, recognizes the right of Members and associated Members of the Union to make special agreements on telecommunication matters; however, such agreements shall not be in conflict with the terms of the Convention or of the Regulations annexed thereto, so far as concerns the harmful interference to the radio services of other countries;

is of the opinion

that subsequent Plenary Assemblies of the C.C.I.R. are likely to make further changes in the recommended technical criteria; and

that administrations should be afforded the opportunity to take advantage of the current C.C.I.R. Recommendations on sharing criteria when planning systems for use in frequency bands shared with equal rights by Space Radiocommunication and Terrestrial Radiocommunication Services, or between space systems,

therefore resolves that

- each Plenary Assembly of the C.C.I.R. should arrange for the Secretary-General of the I.T.U. to be informed of those Recommendations of the C.C.I.R. affecting the technical criteria relating to sharing between Space Radiocommunication and Terrestrial Radiocommunication Services or between Space Radiocommunication Services;
- c.C.I.R. texts, the Secretary-General shall write to administrations asking them to indicate within one hundred and twenty days, to which of the C.C.I.R. Recommendations or to which specific technical criteria defined in the Recommendations referred to in 1. above they agree for use in the application of the pertinent provisions of the Radio Regulations;
- the administrations which do not respond to the Secretary-General's enquiry within one hundred and twenty days shall be deemed to wish the specific technical criteria referred to in the existing Regulations to be applied for the time being;
- 4. in those cases where an administration, in its reply to the Secretary-General's enquiry, indicates that a specific C.C.I.R. Recommendation or a specific technical criterion defined in those Recommendations is not acceptable to it, or where an administration has not replied to the Secretary-General's enquiry as in paragraph 3. above, the relevant technical criteria defined in the Radio Regulations shall continue to apply with respect to cases involving that administration;
- the Secretary-General shall publish, for the information of all administrations, a consolidated list prepared by the I.F.R.B. on the basis of the replies to the enquiry, of the C.C.I.R. Recommendations or of the specific relevant technical criteria defined in those Recommendations, and to which administrations each of those Recommendations or specific relevant technical criteria are acceptable or are not acceptable. This list shall also include those administrations mentioned in paragraph 3. above;
- 6. the I.F.R.B. be directed to take into account:
 - a) the applicability of the C.C.I.R. technical criteria in accordance with the list referred to in 5. above, when making technical examinations with respect to cases involving only administrations to which such criteria are acceptable;

- b) the applicability of the technical criteria defined in the Radio Regulations in accordance with the list referred to in 5. above, when making technical examinations with respect to cases involving an administration which does not accept the relevant C.C.I.R. technical criteria.
- 7. If, at a later date, questions arise concerning the application of the relevant technical criterion or criteria to a case involving administrations described in paragraph 3. above, the I.F.R.B. shall enquire of the administrations concerned whether or not they would agree to the application of the technical criterion or criteria defined in the relevant C.C.I.R. Recommendations referred to in paragraph 1. above. The list published pursuant to paragraph 5. above shall be updated on the basis of the reply of the administration or of the absence of reply.

RESOLUTION No. Spa D

Relating to the Use by All Countries, with Equal Rights, of Frequency Bands for Space Radiocommunication Services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

that all countries have equal rights in the use of both the radio frequencies allocated to various space radiocommunication services and the geostationary satellite orbit for these services,

taking into account

that the radio frequency spectrum and the geostationary satellite orbit are limited natural resources and should be most effectively and economically used,

having in mind

that the use of the allocated frequency bands and fixed positions in the geostationary satellite orbit by individual countries or groups of countries can start at various dates depending on requirements and readiness of technical facilities of countries,

resolves

1) that the registration with the I.T.U. of frequency assignments for space radiocommunication services and their use should not provide any permanent priority for any individual country or groups of countries and should not create an obstacle to the establishment of space systems by other countries,

2) that, accordingly, a country or a group of countries having registered with the I.T.U. frequencies for their space radiocommunication services, should take all practicable measures to realize the possibility of the use of new space systems by other countries or groups of countries so desiring,

and

3) that the provisions contained in operative paragraphs 1 and 2 of this Resolution should be taken into account by the Administrations and the permanent organs of the Union.

RECOMMENDATION No. Spa LL

Relating to the Examination by Administrative
Radio Conferences of the Situation with
regard to Occupation of the Frequency Spectrum
in Space Radiocommunications

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- <u>a)</u> that the frequency bands available for space applications are limited in number and size;
- b) that the possible positions for satellites whose main purpose is to establish telecommunication links are limited in number and that certain positions are more favourable than others for certain links:
- <u>c</u>) that all administrations should be enabled to establish the space links which they deem necessary;
- d) that the scale and cost of space networks or systems are such that their operation and development must be hindered as little as possible:
- e) that technology is steadily and rapidly evolving and that the best possible use should be made of resources in space radiocommunications:
- <u>f</u>) that administrations should ensure that frequency assignments for space applications are utilized in the most efficient manner possible consistent with developing technology and that such assignments are relinquished when no longer in use:
- g) that despite the provisions of Article 9A and the principles adopted by this Conference, which provide for full consultation and co-ordination between administrations with a view to the optimum accommodation of all space systems, it is possible that as the use of frequencies and orbital

positions increases, administrations may encounter undue difficulty in one or more frequency bands in meeting their requirements for space radiocommunication;

recommends

that the next appropriate Administrative Radio Conference be empowered to deal with this situation, if it arises;

invites

the Administrative Council, in the event of such a situation arising, to include in the agenda for the next appropriate Administrative Radio Conference specific provisions enabling it to examine all aspects of the use of the frequency band(s) concerned including, inter alia, the relevant frequency assignments recorded in the Master International Frequency Register and to find a solution to the problem.

RECOMMENDATION Spa MM

Relating to Technical Standards for the Assessment of Harmful Interference in the Frequency Bands above 28 MHz

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- <u>a</u>) that the definition of harmful interference (No. 93 of the Radio Regulations), being of a qualitative nature, leads to a purely subjective estimation of the nuisance;
- b) that, for the accomplishment of its regulatory tasks, the I.F.R.B. has adopted in its technical standards, for the frequency bands below 28 MHz, values for the ratio between the wanted signal and the interfering signal, below which harmful interference may be expected:
- c) that "harmful interference" implies a considerable degree, or probability, of interference;
- d) that, as a consequence, it is desirable to determine the level of interference by which any emission, radiation or induction affects a radiocommunication service beyond specific limits established to ensure the quality and reliability of performance required by the nature of the service;
- e) that the assessment of interference levels is related to various factors such as the nature of the services concerned, number of interference sources, percentages of time during which the interfering signal affects the wanted signal:

and noting

- a) that the T.F.R.B. has been considering the maximum allowable values of interference given in the pertinent C.C.I.R. Recommendations to be values which ensure a satisfactory service;
- \underline{b}) that, however, the I.F.R.B. does not possess data on the extent to which these recommended values and the associated percentages of time may be exceeded without affecting a service beyond the specific limits established to ensure the quality and reliability of performance required by the nature of the service;

invites the C.C.I.R.

to study this subject and to recommend the technical performance criteria for the frequency bands above 28 MHz, allocated to space radiocommunication, radio astronomy, and the terrestrial radiocommunication services concerned, in order to enable the I.F.R.B. and administrations to apply such criteria for these bands:

and invites the I.F.R.B.

to publish, for the information of administrations, its technical standards based upon the relevant provisions of the Radio Regulations and Appendices thereto, decisions of Administrative Conferences of the Union as appropriate and the Recommendations of the C.C.I.R., the state of the radio art and the development of transmission techniques.

__ARTICLE 1_7

MOD 89 Assigned Frequency Band: The frequency band (the centre of which coincides with the frequency assigned to the station and) the width of which equals the necessary bandwidth plus twice the absolute value of the frequency tolerance.

Modifications to Appendix 9 to the Radio Regulations

NOC	Service Documents	
MOD	(see Articles 8, 9, 9A, 10 and 20)	
NOC	List I. International Frequency List	
NOC	Foot-notes 3 and 5	
SUP	Reference in Foot-notes 1, 2, 4 to "Geneva 1959".	
MOD	Foot-note 6, read : See Article 9, Section II and Article 9A Section II of the Radio Regulations.	
MOD	Foot-note 7, read: See Nos. 516, 517, 621, 622, 639BS, 639DM, 639DO and 639DP of the Radio Regulations.	
M Q D	Foot-note 8, read: Including dates referred to in Section II of Article 9 and Section IV of Article 9A of the Radio Regulations.	
NOC	Lists II to VIII	
MOD	List VIII A. List of Space Radiocommunication Stations and Radio Astronomy Stations	
MOD	1 - Earth stations in the fixed-satellite service	
SUP	Column 3, Call sign	
(MOD)	Renumber the columns	
MOD		
	Foot Note 1, read: For the cases where these data must be supplied, see Nos. 639BA, 639BB and 639BC.	

MOD	2 - Space stations in the fixed-satellite service	
SUP	Column 2, Call sign	
(MOD)	Renumber the columns	
MOD	New column 7, read: Service area or areas on the Earth or the name of the locality and country in which the associated earth station(s) is(are) located.	
(MOD)	New column 9 : Remarks	
MOD	e) number of satellites used, if appropriate	
ADD	f) In the case of geostationary satellite:	
	 nominal geographical longitude on the geostationary satellite orbit 	
	 arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas. 	
MOD	3 - Earth stations in the Earth exploration-satellite service	
SUP	Column 3, Call sign	
(MOD)	Renumber the columns	
MOD	New column 6, read : Reception of earth exploration information	
MOD	New column 7, read: Identity of the associated space station(s) with which communication is to be established.	
MOD	4 - Space stations in the Earth exploration-satellite	
	<u>service</u>	
SUP	2, Call sign	
(MOD)	Renumber the columns	
MOD	New column 3, read: Transmission of earth exploration information	
MOD	New column 5, read: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is(are)	

located.

(MOD)	New column 7 : Remarks
MOD	e) number of satellites used, if appropriate
ADD	f) In the case of geostationary satellite:
	 nominal geographical longitude on the geostationary satellite orbit
	 arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas
MOD	5 - Earth stations in the radiodetermination-satellite service
SUP	Column 3, Call sign
(MOD)	Renumber the columns
MOD	Replace by "radiodetermination" all references to "radionavigation"
MOD	New column 7, read: Identity of the associated space station(s) with which communication is to be established
MOD	6 - Space stations in the radiodetermination-satellite service
SUP	2, Call sign
(MOD)	Renumber the columns
MOD	Replace by "radiodetermination" all references to "radionavigation"
MOD	New column 6, read: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is(are) located
(MOD)	New column 8, read : Remarks
MOD	e) number of satellites used, if appropriate
.ADD	f) In the case of geostationary satellite:
	- nominal geographical longitude on the geostationary satellite orbit.
	- arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas

to its associated earth stations or service areas

MOD 7 - Earth stations in the space research service SUP Column 3, Call sign (MOD) Renumber the columns MOD New column 7, read : Identity of the associated space station(s) with which communication is to be established MOD 8 - Space stations in the space research service SUP Column 2 , Call sign (MOD) Renumber the columns MOD New column 6 : Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is(are) located (MOD) New column 8, Remarks MOD e) number of satellites used, if appropriate ADD f) In the case of geostationary satellite: - nominal geographical longitude on the geostationary satellite orbit - arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas MOD _ 9 - Stations in the radio astronomy service
_ 7

NOC

Present text

[APPENDIX 10]

ADD	EA	Space station in the amateur-satellite service
ADD	EB	Space station in the broadcasting-satellite service
		(sound broadcasting)
ADD	EV	Space station in the broadcasting-satellite service
		(television)
ADD	TA	Space operation earth station in the amateur-satellite
		(service)
ADD	TE	Transmitting earth station
ADD	TF	Fixed earth station in the radiodetermination-satellite
		service
ADD	TL	Mobile earth station in the radiodetermination-satellite
		service
ADD	TP	Receiving earth station
ADD	TT	Earth station in the space operation service
SUP	FE	Earth station (Earth-Space service)
MOD	EC	Space station in the fixed-satellite service
MOD	TC	Earth station in the fixed-satellite service
MOD	TH	Earth station in the space research service
MOD	TM	Earth station in the meteorological-satellite service
MOD	IN	Earth station in the radionavigation-satellite service

RESOLUTION No. Spa C

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that it has modified the definitions which appeared in the Radio Regulations and has adopted a series of new definitions for the services and the various categories of earth and space stations;
- b) that, within the framework of these modifications, it has changed, in Appendix 9 to Radio Regulations, the headings and the contents of the existing nine Sections of List VIIIA (List of Space Radiocommunication Stations and Radio Astronomy Stations);
- c) that however, in List VIIIA so modified, it is not possible to include all the categories of earth and space stations notified to the I.F.R.B. for inclusion in the Master International Frequency Register;
- d) that the Conference has not had the time to make the required modifications:

decides

to invite the Secretary-General, in collaboration with the I.F.R.B., to take the necessary steps, on the basis of the existing Sections of List VIIIA, to have additional Sections added to this List, so that the particulars of all the earth and space stations notified to the I.F.R.B. under Article 9A of the Radio Regulations, for recording in the Master International Frequency Register, be included.

INTERNATIONAL TELECOMMUNICATION UNION

E

SPACE CONFERENCE

Geneva, 1971

Document No. 395-E (Rev.)

16 July 1971

PLENARY MEETING (SECOND READING)

R. 3 (Revised)

The Editorial Committee, having examined the following texts, submits them to the Plenary Meeting for a second reading.

Subject	Origin	
Art. 1 " 2 " 5 (No. 125) " 6 " 7 " 8 " 14 " 15 " 27 Rec. DD	B1-B10	

François Job Chairman of the Editorial Committee

Annex: Pages R3/01-42



ANNEX 1

Revision of Article 1 of the Radio Regulations

Article 1 of the Radio Regulations shall be amended as follows:

Section II is amended as follows:

Section II. Radio Systems, Services and Stations NOC **NOC** 21 ADD 21A Space Station A station located on an object which is beyond, is intended (MOD 84AE) to go beyond, or has been beyond, the major portion of the earth's atmosphere. Earth Station ADD 21B A station located either on the earth's surface or within (MOD 84AD) the major portion of the earth's atmosphere intended for communica-

- with one or more space stations; or
- with one or more stations of the same kind by means of one or more passive satellites or other objects in space.
- ADD 21C Space Radiocommunication
- (MOD 84AC) Any radiocommunication involving the use of one or more space stations or the use of one or more passive satellites or other objects in space.
- ADD 21D Terrestrial Radiocommunication 1
- (MOD 84AA) Any radiocommunication other than space radiocommunication or radio astronomy.
- ADD 21D.1 ¹ In these Regulations, unless otherwise stated, any radiocommunication service relates to terrestrial radiocommunication.

ADD 21E Terrestrial Station 1

(MOD 84AB) A station effecting terrestrial radiocommunication.

NOC 22-68

MOD 69 Safety Service

A radiocommunication service used permanently or temporarily for the safeguarding of human life and property on the earth's surface, in the air or in space.

(MOD 70-73 SUP (Spa 1)

NOC 74-84

SUP 84AA Replaced by ADD 21D

SUP 84AB Replaced by ADD 21E

Section IIA is replaced by the following new text:

NOC Section IIA. Space Systems, Services and Stations

SUP 84AC (See 84ATE and 84ATF)

SUP 84AD Replaced by ADD 21B

SUP 84AE Replaced by ADD 21A

MOD 84AF Space System

Any group of co-operating earth and/or space stations employing space radiocommunication for specific purposes.

ADD 84AFA Satellite System

(MOD 84AL) A space system using one or more artificial earth satellites.

ADD 21E.1 In these Regulations, unless otherwise stated, any station is a terrestrial station.

ADD 84AFB Satellite Network

A satellite system or a part of a satellite system, consisting of only one satellite and the co-operating earth stations.

ADD **84AFC** Satellite Link

A radio link between a transmitting earth station and a receiving earth station through one satellite.

A satellite link comprises one up path and one down path.

ADD 84AFD Multi-Satellite Link

A radio link between a transmitting earth station and a receiving earth station through two or more satellites, without any intermediate earth station.

A multi-satellite link comprises one up path, one or more satellite-to-satellite paths and one down path.

MOD 84AG Fixed-Satellite Service

A radiocommunication service:

- between earth stations at specified fixed points when one or more satellites are used; in some cases this service includes satellite to satellite links, which may also be effected in the inter-satellite service;
- for connection between one or more earth stations at specified fixed points and satellites used for a service other than the fixed-satellite service (for example, the mobile-satellite service, broadcasting-satellite service, etc.).

ADD 84AGA Mobile-Satellite Service

A radiocommunication service:

- between mobile earth stations and one or more space stations; or between space stations used by this service;
- or between mobile earth stations by means of one or more space stations;
- and if the system so requires, for connection between these space stations and one or more earth stations at specified fixed points.

ADD 84AGB Aeronautical Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on board aircraft. Survival craft stations and emergency position indicating radiobeacon stations may also participate in this service.

ADD 84AGC Maritime Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on board ships. Survival craft stations and emergency position indicating radiobeacon stations may also participate in this service.

ADD 84AGD Land Mobile-Satellite Service

. A mobile-satellite service in which mobile earth stations are located on land.

SUP	84AH	
SUP	84AI	
SUP	84AJ	Replaced by ADD 84BAC
SUP	84AK	Replaced by ADD 84BAD
SUP	84AL	Replaced by ADD 84AFA
SUP	84AM	Replaced by ADD 84ATD
SUP	84AN	
SUP	84AO	

MOD 84AP Broadcasting-Satellite Service

A radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception 1 by the general public.

ADD 84APA Individual reception (in the broadcasting-satellite service)

The reception of emissions from a broadcasting-satellite space station by simple domestic installations and in particular those possessing small antennae.

ADD 84APB Community reception (in the broadcasting-satellite service)

The reception of emissions from a broadcasting-satellite space station by receiving equipment, which in some cases may be complex and have antennae larger than those used for individual reception, and intended for use:

- by a group of the general public at one location, or
- through a distribution system covering a limited area.

ADD 84APC Radiodetermination-Satellite Service

A radiocommunication service involving the use of radiodetermination and the use of one or more space stations.

MOD 84AO Radionavigation-Satellite Service

A radiodetermination-satellite service used for the same purposes as the radionavigation service; in certain cases this service

ADD 84AP.1 ¹ In the broadcasting-satellite service, the term "direct reception" shall encompass both individual reception and community reception.

includes transmission or retransmission of supplementary information necessary for the operation of the radionavigation systems.

ADD 84AQA Aeronautical Radionavigation-Satellite Service

A radionavigation-satellite service in which mobile earth stations are located on board aircraft.

ADD **84AQB** Maritime Radionavigation-Satellite Service

A radionavigation-satellite service in which mobile earth stations are located on board ships.

SUP 84AR

SUP 84AS

ADD 84ASA Earth Exploration-Satellite Service

A radiocommunication service between earth stations and one or more space stations in which:

- information relating to the characteristics of the Earth and its natural phenomena is obtained from instruments on earth satellites;
- similar information is collected from air-borne or earthbased platforms;
- such information may be distributed to earth stations within the system concerned;
- platform interrogation may be included.

MOD 84AT Meteorological-Satellite Service

An earth exploration-satellite service for meteorological purposes.

ADD 84ATA Amateur-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur service.

ADD 84ATB Standard Frequency-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the standard frequency service.

ADD 84ATC Time Signal-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the time signal service.

ADD 84ATD Space Research Service

(MOD 84AM) A radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes.

ADD 84ATE Space Operation Service

A radiocommunication service concerned exclusively with the operation of spacecraft, in particular tracking, telemetry and telecommand.

These functions will normally be provided within the service in which the space station is operating.

ADD 84ATF Inter-Satellite Service

A radiocommunication service providing links between artificial earth satellites.

SUP 84AU

SUP 84AV

NOC 84AW

NOC 84AX

NOC 84AY

NOC 84AZ

Section IIB is replaced by the following new text:

NOC Section IIB. Space, Orbits and Types of Objects in Space

MOD 84BA Deep Space

Space at distances from the Earth approximately equal to, or greater than, the distance between the Earth and the Moon.

ADD 84BAA Spacecraft

(MOD 84BH) A man-made vehicle which is intended to go beyond the major portion of the earth's atmosphere.

ADD 84BAB Satellite

A body¹ which revolves around another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of that other body.

ADD 84BAC Active Satellite

(formerly 84AJ) An earth satellite carrying a station intended to transmit or retransmit radiocommunication signals.

ADD 84BAD Passive Satellite

(formerly 84AK) An earth satellite intended to transmit radiocommunication signals by reflection.

ADD 84BAB.1 A body so defined which revolves around the Sun is called a planet or planetoid.

MOD 84BB

Orbit

- 1. The path, relative to a specified frame of reference, described by the centre of mass of a satellite or other object in space, subjected solely to natural forces, mainly the force of gravity.
- 2. By extension, the path described by the centre of mass of an object in space subjected to natural forces and occasional lowenergy corrective forces exerted by a propulsive device in order to achieve and maintain a desired path.

MOD 84BC

Inclination of an Orbit (of an Earth Satellite)

The angle determined by the plane containing an orbit and the plane of the earth's equator.

MOD 84BD

Period (of a Satellite)

The time elapsing between two consecutive passages of a satellite or planet through a characteristic point on its orbit.

MOD 84BE

Altitude of the Apogee (Perigee)

The altitude of the apogee (perigee) above a specified reference surface serving to represent the surface of the Earth.

SUP 84BF

ADD 84BFA

Geosynchronous Satellite

An earth satellite whose period of revolution is equal to the period of rotation of the Earth about its axis.

MOD 84BG

Geostationary Satellite

A satellite, the circular orbit of which lies in the plane of the earth's equator and which turns about the polar axis of the

R3-09

Earth in the same direction and with the same period as those of the Earth's rotation.

The orbit on which a satellite should be placed to be a geostationary satellite is called the "geostationary satellite orbit".

SUP 84BH Replaced by ADD 84BAA

Section III is amended as follows:

NOC Section III. Technical Characteristics

NOC 85-98

ADD 98A Equivalent Isotropically Radiated Power (e.i.r.p.)

The product of the power of an emission as supplied to an antenna and the antenna gain in a given direction relative to an isotropic antenna.

NOC 99-103

ADD 103A

Equivalent Satellite-Link Noise Temperature

The noise temperature at the input of the earth station receiver corresponding to the radio-frequency noise power which produces the total observed noise at the output of the satellite link excluding noise due to interference coming from satellite links using other satellites and from terrestrial systems.

ADD 103B

Co-ordination Distance

Distance from an earth station in a given azimuth within which a terrestrial station sharing the same frequency band may cause or be subject to more than a permissible level of interference.

ADD 103C

Co-ordination Contour

The line joining the points which are on all azimuths around this earth station at a distance from this station equal to the co-ordination distance corresponding to each azimuth.

ADD 103D

Co-ordination Area

Area around an earth station enclosed by the co-ordination contour.

Revision of Article 2 of the Radio Regulations

Article 2 of the Radio Regulations shall be amended as follows:

Replace Section III by the following new text:

- MOD Section III. Nomenclature of the Frequency and Wavelength Bands Used in Radiocommunication
- MOD 112 § 7. The radio spectrum shall be subdivided into nine frequency bands, which shall be designated by progressive whole numbers in accordance with the following Table. Frequencies shall be expressed:
 - in kilohertz (kHz) up to and including 3000 kHz
 - in megahertz (MHz) thereafter up to and including 3000 MHz
 - in gigahertz (GHz) thereafter up to and including 3000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made.

Band Number	Frequency Range (lower limit exclusive, upper limit inclusive)	Corresponding Metric Subdivision
4	3 to 30 kHz	Myriametric waves
5	30 to 300 kHz	Kilometric waves
6	300 to 3000 kHz	Hectometric waves
7	3 to 30 MHz	Decametric waves
8	30 to 300 MHz	Metric waves
9	300 to 3000 MHz	Decimetric waves
10	3 to 30 GHz	Centimetric waves
11	30 to 300 GHz	Millimetric waves
12	300 to 3000 GH z or	Decimillimetric waves
7	3 THz	

Note 1: "Band Number N" extends from 0.3×10^N to 3×10^N Hz.

Note 2: Symbols and prefixes:

Hz = hertz

 $k = kilo (10^3), M = mega (10^6), G = giga (10^9), T = tera (10^{12}).$

Note 3: Abbreviations for adjectival band designations:

 Band 4 = VLF
 Band 8 = VHF

 Band 5 = LF
 Band 9 = UHF

 Band 6 = MF
 Band 10 = SHF

 Band 7 = HF
 Band 11 = EHF

Revision of Article 5 of the Radio Regulations

Article 5 of the Radio Regulations shall be amended as follows:

Frequency Allocations ¹ 10 kHz to 275 GHz

Section I. Regions and Areas

(MOD) 125 § 1. For the allocation of frequencies the world has been subdivided into three Regions 2 (see Appendix 24).

ADD

¹ See Resolution No. 6.

⁽MOD) 125.1

² It should be noted that where the words "regions" or "regional" are without a capital "R" in these Regulations, they do not relate to the three Regions here defined for purposes of frequency allocation.

Revision of Article 6 of the Radio Regulations

Article 6 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 415 by the following new text:

- MOD 415 § 2. (1) When special circumstances make it indispensable to do so, an administration may, as an exception to the normal methods of working authorized by these Regulations, have recourse to the special methods of working enumerated below, on the sole condition that the characteristics of the stations still conform to those inserted in the Master International Frequency Register:
 - a) a fixed station in the terrestrial radiocommunication service or an earth station in the fixed satellite service may, on a secondary basis, transmit to mobile stations on its normal frequencies;
 - b) a land station may communicate, on a secondary basis, with fixed stations in the terrestrial radiocommunication service or earth stations in the fixed satellite service or other land stations of the same category.

Replace Regulation No. 417 by the following new text:

MOD 417 § 3. Any administration may assign a frequency in a band allocated to the fixed service or allocated to the fixed satellite service to a station authorized to transmit, unilaterally, from one specified fixed point to one or more specified fixed points provided that such transmissions are not intended to be received directly by the general public.

Add the following new text after Regulation No. 419:

ADD 419A § 5A. Earth stations on board aircraft are authorized to use frequencies in the bands allocated to the maritime mobile-satellite service for the purpose of communicating, via the stations of that service, with the public telegraph and telephone networks.

Revision of Article 7 of the Radio Regulations

Article 7 of the Radio Regulations shall be amended as follows:

Add the following new text after Regulation Section I:

ADD

Section IA. Broadcasting-Satellite Service

ADD 428A § 2A. In devising the characteristics of a broadcasting space station, all technical means available shall be used to reduce, to the maximum extent practicable, the radiation over the territory of other countries unless an agreement has been previously reached with such countries.

Replace Section VII by the following new text:

MOD Section VII. Terrestrial Radiocommunication Services sharing frequency bands with Space Radiocommunication Services above 1 GHz

Choice of Sites and Frequencies

- (MOD) 470A § 18. Sites and frequencies for terrestrial stations, operating in frequency bands shared with equal rights between terrestrial radio-communication and space radiocommunication services shall be selected having regard to the relevant Recommendations of the C.C.I.R. with respect to geographical separation from earth stations.
- ADD 470AA § 18bis. (1) As far as practicable, sites for transmitting ¹ stations, in the fixed or mobile service, employing maximum values of equi-
- ADD 470A.1 ¹ For their own protection receiving stations in the fixed or mobile services operating in bands shared with space radiocommunication services (space-to Earth) should also avoid directing their antennae towards the geostationary satellite orbit if their sensitivity is sufficiently high that interference from space station transmissions may be significant.

valent isotropically radiated power exceeding 35 dBW in the frequency bands between 1 and 10 GHz, should be selected so that the direction of maximum radiation of any antenna will be at least 2° away from the geostationary satellite orbit, taking into account the effect of atmospheric refraction.¹

- ADD 470AB (2) As far as practicable, sites for transmitting ² stations, in the fixed or mobile service, employing maximum values of equivalent isotropically radiated power exceeding 45 dBW in the frequency bands between 10 and 15 GHz, should be selected so that the direction of maximum radiation of any antenna will be at least 1.5° away from the geostationary satellite orbit, taking into account the effect of atmospheric refraction.³
- ADD 470AC (3) In the frequency bands above 15 GHz there shall be no restriction as to the direction of maximum radiation for stations in the fixed or mobile service.

Power Limits

- MOD 470B § 19. (1) The maximum equivalent isotropically radiated power of a station in the fixed or mobile service shall not exceed +55 dBW.
- ADD 470BA (1bis) Where compliance with No. 470AA is impracticable the maximum equivalent isotropically radiated power of a station in the fixed or mobile service shall not exceed:

+47 dBW in any direction within 0.5° of the geostationary satellite orbit; or

ADD 470AA.2 ¹ Information on this subject is given in the most recent version of C.C.I.R. Report No. 393.

ADD 470AB.1 ² See No. 470AA.1.

ADD 470AB.2 ³ See No. 470AA.2.

+47 dBW to +55 dBW, on a linear decibel scale (8 dB per degree), in any direction between 0.5° and 1.5° of the geostationary satellite orbit, taking into account the effect of atmospheric refraction.¹

- MOD 470C (2) The power delivered by a transmitter to the antenna of a station in the fixed or mobile service in frequency bands between 1 and 10 GHz, shall not exceed +13 dBW.
- ADD 470CA (2bis) The power delivered by a transmitter to the antenna of a station in the fixed or mobile service in frequency bands above 10 GHz shall not exceed +10 dBW.
- MOD 470D (3) The limits given in Nos. 470AA, 470B, 470BA and 470C apply in the following frequency bands allocated to the fixed satellite service and the meteorological satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

2655 - 2690 MHz for Regions 2 and 3.

5 800 - 5 850 MHz (for the countries mentioned in No. 390).

5 850 - 5 925 MHz for Regions 1 and 3.

5 925 - 6 425 MHz

7 900 - 7 975 MHz

7 975 - 8 025 MHz (for the countries mentioned in No. 392H).

8 025 - 8 400 MHz

ADD 470BA.1 1 See No. 470AA.2.

ADD 470DA (4) The limits given in Nos. 470AB, 470B and 470CA apply in the following frequency bands allocated to the fixed-satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

10.95 - 11.2 GHz (Region 1)
12.5 - 12.75 GHz (Regions 1 and 2)
14.175 - 14.3 GHz (for the countries mentioned in No.
407)
14.4 - 14.5 GHz

ADD 470DB (5) The limits given in Nos. 470B and 470CA apply in the following frequency bands allocated to the fixed-satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

27.5 - 29.5 GHz 29.5 - 31 GHz (for the countries mentioned in No. **409E**).

Replace Section VIII by the following new text:

MOD Section VIII. Space Radiocommunication Services sharing Frequency Band with Terrestrial Radiocommunication Services above 1 GHz

Choice of Sites and Frequencies

(MOD) 470E § 20. Sites and frequencies for earth stations, operating in frequency bands shared with equal rights between terrestrial and space radiocommunication services, shall be selected having regard to the relevant Recommendations of the C.C.I.R. with respect to geographical separation from terrestrial stations.

Power Limits

MOD 470F § 21. (1) Earth stations.

MOD 470G (2) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands between 1 and 15 GHz, shall not exceed the following limits except as provided in Nos. 470H or 470GC:

```
+40 dBW in any 4 kHz band for \delta\leqslant 0^\circ +40 + 3 \delta dBW in any 4 kHz band for 0^\circ<\delta\leqslant 5^\circ
```

where δ is the angle of elevation of the horizon viewed from the centre of radiation of the antenna of the earth station and measured as positive above the horizontal plane and negative below it.

ADD 470GA (2A) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands above 15 GHz shall not exceed the following limits except as provided in Nos. 470H or 470GD:

```
+64 dBW in any 1 MHz band for \delta \le 0^\circ
+64+3 \delta dBW in any 1 MHz band for 0^\circ < \delta \le 5^\circ
```

where δ is as defined in No. 470G.

- ADD 470GB (2B) For angles of elevation of the horizon greater than 5° there shall be no restriction as to the equivalent isotropically radiated power transmitted by an earth station towards the horizon.
- ADD 470GC (2C) As an exception to the limits given in No. 470G, the equivalent isotropically radiated power towards the horizon for an earth station in the space research (deep-space) shall not exceed +55 dBW in any 4 kHz band.
- ADD 470GD (2D) As an exception to the limits given in No. 470GA, the equivalent isotropically radiated power towards the horizon for space research earth station (deep-space) shall not exceed +79 dBW in any 1 MHz band.

MOD 470H (3) The limits given in No. 470G, No. 470GA, No. 470GC and No. 470GD, as applicable, may be exceeded by not more than 10 dB. However, when the resulting co-ordination area extends into the territory of another administration, such increase shall be subject to agreement by that administration.

SUP 470I

MOD 470J (3B) The limits given in No. 470G apply in the following frequency bands allocated to the fixed-satellite service and earth exploration-satellite service, including the meteorological-satellite service for transmission by earth stations where these bands are shared with equal rights with the fixed or mobile service:

2655 - 2690 MHz (Regions 2 and 3) 4 400 - 4 700 MHz 5800 - 5850 MHz (for the countries mentioned in No. 390) 5 850 - 5 925 MHz (Regions 1 and 3) 5 925 - 6 425 MHz 7 900 - 7 975 MHz 7 975 - 8 025 MHz (for the countries mentioned in No. 392H) 8 025 - 8 400 MHz 10.95 - 11.2 GHz (Region 1) 12.50 - 12.75 GHz (Regions 2 and for the countries mentioned in No. 405BA) 14-175 - 14-300 GHz (for the countries mentioned in No. 407) 14.4 - 14.5 GHz

ADD 470JA (3B) The limits given in No. 470GA apply in the following frequency band allocated to transmission by earth stations in the fixed satellite service, where this is shared with equal rights with the fixed

or mobile service:

27.5 - 29.5 GHz

Minimum Angle of Elevation

MOD 470K § 22. (1) Earth stations.

MOD 470L (2) Earth station antennae shall not be employed for transmission at elevation angles of less than 3 degrees measured from the horizontal plane to the direction of maximum radiation, except when agreed to by administrations concerned or those whose services may be affected. In case of reception by an earth station, the above value shall be used for co-ordination purposes if the operating angle of elevation is less than that value.

ADD 470LA (2A) As an exception to No. 470L, earth station antennae in the space research service (near-earth) shall not be employed for transmission at elevation angles of less than 5 degrees, and earth station antennae in the space research service (deep-space) shall not be employed for transmission at elevation angles of less than 10 degrees, both angles being those measured from the horizontal plane to the direction of maximum radiation. In case of reception by an earth station, the above values shall beused for co-ordination purposes if the operating angle of elevation is less than those values.

SUP 470M ·

SUP

Power Flux Density Limits

ADD

Limits of Power Flux Density from Space Stations

MOD 470N § 23. (1) Power flux density limits between 1 690 MHz and 1 700 MHz.

ADD 470NA

a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed -133 dBW/m² in any 1.5-MHz band. This limit relates to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NB

b) The limit given in No. 470NA applies in frequency band listed in No. 470NC which is allocated to transmission by space stations in the earth exploration-satellite service and in particular the meteorological-satellite service where this band is shared with equal rights with the meteorological aids service.

ADD 470NC

1 690 - 1 700 MHz.

ADD 470ND

(2) Power flux density limits between 1 670 MHz and 2 535 MHz.

ADD 470NE

- a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 154 dBW/m² in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-154 + \frac{\delta - 5}{2} dBW/m^2$$
 in any 4 kHz band for

angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

— 144 dBW/m² in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NF

- b) The limits given in No. 470NE apply in the frequency bands listed in No. 470NG which are allocated to transmission by space stations in the following space radiocommunication services:
 - Earth exploration-satellite service and in particular meteorological-satellite service (space-to-Earth)
 - Space research service (space-to-Earth)
 - Fixed-satellite service (space-to-Earth)

where these bands are shared with equal rights with the fixed or mobile services. ADD 470NG

1670 - 1690 MHz

1690 - 1700 MHz (for the countries mentioned in No.

354A)

1 700 - 1 710 MHz

1770 - 1790 MHz (for the countries mentioned in No.

356AA)

2 200 - 2 290 MHz

2 290 - 2 300 MHz

2 500 - 2 535 MHz

ADD 470NGA

c) The power flux density values given in No. 470NE are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the bands listed in No. 470NG and where there is insufficient frequency separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed —168 dBW in any 4 kHz band.

ADD 470NH

(3) Power flux density limits between 2 500 - 2 690 MHz.

ADD 470NI

a) The power flux density at the earth's surface produced by emissions from a space station in the broadcastingsatellite service for all conditions and for all methods of modulation shall not exceed the following values:

 $-152 \, \mathrm{dBW/m^2}$ in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-152 + \frac{3(\delta-5)}{4}$$
 dBW/m² in any 4-kHz band for

angles of arrival (8) between 5 and 25 degrees above the orizontal plane;

- 137 dBW/m² in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NJ

b) The limits given in No. 470NI apply in the frequency band:

2 500 - 2 690 MHz

which is shared by the broadcasting-satellite service with the fixed or mobile service.

ADD 470NK

c) The power flux density values given in No. 470NI are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the band mentioned in No. 470NJ and where there is insufficient frequency separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed -168 dBW in any 4 kHz band.

ADD 470NL

(4) Power flux density limits between 3 400 MHz and 7 750 MHz.

ADD 470NM

a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a

passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

 -152 dBW/m^2 in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-152 + \frac{(\delta-5)}{2}$$
 dBW/m² in any 4 kHz band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

— 142 dBW/m² in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NN

- b) The limits given in No. 470NM apply in the frequency bands listed in No. 470NO which are allocated to transmission by space stations in the following space radiocommunication services:
 - fixed-satellite service (space to Earth)
 - meteorological-satellite service (space to Earth)

where these bands are shared with equal rights with the fixed or mobile services:

ADD 470NO

3 400 - 4 200 MHz

7 250 - 7 300 MHz (for the countries mentioned in No. 392G)

7 300 - 7 750 MHz

ADD 470NP

(5) Power flux density limits between 8 025 MHz and 11.7 GHz.

ADD 470NQ

- a) The power flux density at the earth's surface, produced by emissions from a space station, or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 150 dBW/m² in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane:

$$-150 + \frac{(\delta - 5)}{2} \text{ dBW/m}^2 \text{ in any 4 kHz band for}$$

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

- 140 dBW/m² in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NR

- b) The limits given in No. 470NQ apply in the frequency bands listed in No. 470NS which are allocated to transmission by space stations in the following space radiocommunication services:
- Earth exploration satellite service (space to Earth)
- space research service (space to Earth)
- fixed-satellite service (space to Earth)

where these bands are shared with equal rights with the fixed or mobile services:

ADD 470NS

8 025 - 8 400 MHz 8 400 - 8 500 MHz 10.95 - 11.2 GHz 11.45 - 11.7 GHz

ADD 470NT

(6) Power flux density limits between 11.7 and 12.75 GHz.

ADD 470NU

- a) The power flux density at the earth's surface, produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 148 dBW/m² in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;
 - $148 + \frac{(\delta 5)}{2}$ dBW/m² in any 4 kHz band for angles of arrival (8) between 5 and 25 degrees above the horizontal plane;
 - 138 dBW/m² in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NV

b) The limits given in No. 470NU apply in the frequency band indicated in No. 470NW which is allocated to the fixed-satellite service for transmission by space stations where this band is shared with equal rights with the fixed or mobile service.

ADD 470NW

12.5 - 12.75 GHz (Region 3 and for countries mentioned in No. 405BA)

ADD 470NX

(7) Power flux density limits between 17-7 GHz and 22 GHz.

ADD 470NY

- a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 115 dBW/m² in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;
 - $-115 + \frac{(\delta 5)}{2}$ dBW/m² in any 1 MHz band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

 $-105~\mathrm{dBW/m^2}$ in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NZ

- b) The limits given in No. 470NY apply in the frequency bands listed in No. 470NZA which are allocated to transmission by space stations in the following space radiocommunication services:
 - fixed-satellite service (space to Earth)
 - Earth exploration satellite service (space to Earth)

where these bands are shared with equal rights with the fixed or mobile services: ADD 470NZA

17.7 - 19.7 GHz

21.2 - 22 GHz

ADD 470NZB

(8) The limits given in 470NA, 470NE, 470NI, 470NM, 470NQ, 470NU and 470NY may be exceeded on the territory of any administration which has so agreed.

SUP 470O to 470U

Replace Section IX by the following new text:

MOD

Section IX. Space Radiocommunication Services

Cessation of Emissions

MOD 470V § 24. Space stations shall be fitted with devices to ensure immediate cessation of their radio emissions by telecommand, whenever such cessation is required under the provisions of these Regulations.

SUP Note 1

ADD Control of Interference between Geostationary-Satellite
Systems and Non-Synchronous Inclined Orbit-Satellite
Systems

ADD 470VA § 25. Non-geostationary space stations in the fixed satellite services shall cease or reduce to a negligible level radio emissions, and their associated earth stations shall not transmit to them whenever there is insufficient angular separation between the non-geostationary satellite and geostationary satellites and unacceptable interference to geostationary satellite space systems operating in accordance with these Regulations.

ADD Station Keeping of Space Stations 2

ADD 470VB § 26. Space stations on geostationary satellites:

ADD 470VC — shall have the capability of maintaining their positions within +1 degree of the longitude of their nominal positions, but efforts should be made to achieve a capability of maintaining their positions at least within ± 0.5 degrees of the longitude of their nominal positions,

ADD 470VA.1 ¹ The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

² In the case of space stations on geosynchronous satellites with orbits having an angle of inclination greater than 5 degrees the positional tolerance shall relate to the nodal point.

ADD 470VD

— shall maintain their positions within ± 1 degree of longitude of their nominal positions irrespective of the cause of variation, but

ADD 470VE

— need not comply with No. **470VD** as long as the satellite network to which the space station belongs does not produce an unacceptable level interference ¹ into any other satellite network whose space station complies with the limits given in No.**470VD**.

ADD

Pointing Accuracy of Antennae on Geostationary Satellites

ADD 470VF § 27. The pointing direction of maximum radiation of any earthward beam of antennae on geostationary satellites shall be capable of being maintained within:

10% of the half power beamwidth relative to the nominal pointing direction; or

0.5 degrees relative to the nominal pointing direction.

whichever is greater. This provision applies only when these beams are intended for less than global coverage.

In the event that the beam is not rotationally symmetrical about the axis of maximum radiation, the tolerance in any plane containing this axis shall be related to the half power beamwidth in that plane.

This accuracy shall be maintained only if it is required to avoid unacceptable interference 2 to other systems.

ADD 470VE.1 ¹ The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

ADD 470VF.1 ² The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

Power Flux Density at the geostationary Satellite Orbit

ADD 470VG

ADD

In the frequency band 8 025 to 8 400 MHz, which the Earth exploration-satellite service using non-geostationary satellites shares with the fixed-satellite service (Earth-to-space or the meteorological satellite service (Earth-to-space), the maximum power flux density produced at the geostationary satellite orbit by any Earth exploration-satellite service space station shall not exceed $-174~\mathrm{dBW/m^2}$ in any 4 kHz band.

R3--35

Revision of Article 8 of the Radio Regulations

Article 8 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 477 by the following new text:

MOD 477

e) the study, on a long-term basis, of the usage of the radio spectrum, with a view to making recommendations for its more effective use;

Revision of Article 14 of the Radio Regulations

Article 14 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 695 by the following new text:

MOD 695 § 3. In order to avoid interference:

- locations of transmitting stations and, where the nature of the service permits, locations of receiving stations shall be selected with particular care;
- radiation in and reception from unnecessary directions shall be minimized, where the nature of the service permits, by taking the maximum practical advantage of the properties of directional antennae;
- the choice and use of transmitters and receivers shall be in accordance with the provisions of Article 12;
- the conditions specified under No. 470V shall be fulfilled.

Revision of Article 15 of the Radio Regulations

Article 15 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 717 by the following new text:

MOD 717

(2) In such a case, the administration concerned may also request the Board to act in accordance with the provisions of Sections VII and VIII of Article 9 and Sections IX and X of Article 9A; but it shall then supply the Board with the full facts of the case, including all the technical and operational details and copies of the correspondence.

Revision of Article 27 of the Radio Regulations

Article 27 of the Radio Regulations shall be amended as follows:

Replace Nos. 951 and 952 by the following new texts:

- MOD 951 § 3. (1) Stations on board aircraft may communicate with stations of the maritime mobile or maritime mobile satellite services. They shall conform to those provisions of these Regulations which relate to these service.
- MOD 952 (2) For this purpose stations on board aircraft should use the frequencies allocated to the maritime mobile or maritime mobile satellite services. However, having regard to interference which may be caused by aircraft stations at high altitudes, maritime mobile frequencies in the bands above 30 MHz shall not be used by aircraft stations in any specific area without the prior agreement of all the administrations of the area in which interference is likely to be caused. In particular, aircraft stations operating in Region I should not use frequencies in the bands above 30 MHz allocated to the maritime mobile service by virtue of any agreement between administrations in that Region.

RECOMMENDATION No. Spa DD

Relating to the Criteria to be Applied for Sharing between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the Band 620-790 MHz

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that, within, the band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service;
- b) that it is necessary to have a power flux density limit which will provide adequate protection to the terrestrial broadcasting service:

taking into account

a) that the conclusions of the Special Joint Meeting of the C.C.I.R. Geneva, 1971, indicated that the following power flux density limits are necessary to protect the terrestrial broadcasting service:

$$\begin{array}{llll} -121 \ dBW/m^2 & \delta < 20^\circ \\ -121 \ + \ 0.4 \ (\delta - 20) \ dBW/m^2 & 20^\circ < \delta < 60^\circ \\ -105 \ dBW/m^2 & 60^\circ < \delta < 90^\circ \end{array}$$

where δ is the angle of arrival above the horizontal plane;

b) that additional tests carried out by one administration after the Special Joint Meeting of the C.C.I.R., indicated that the following more conservative power flux density limits may be necessary:

$$\begin{array}{lll} -130 \; dBW/m^2 & \delta < 20^\circ \\ -130 \, + \, 0.4 \; (\delta - 20) \; dBW/m^2 & 20^\circ < \delta < 60^\circ \\ -114 \; dBW/m^2 & 60^\circ < \delta \leqslant 90^\circ \end{array}$$

where δ is the angle of arrival above the horizontal plane;

- c) that additional information is required on the protection ratio for interference from an FM television signal into a VSB television signal for both the 625- and 525-line systems;
- d) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in C.C.I.R. Recommendation 417-2;
- e) that account may have to be taken of ground reflections;
- f) that energy dispersal techniques may reduce the required protection ratio and should be used if shown to be effective;

recommends

1. that in view of the absence of sufficient information on tests under operational conditions and in order to provide sharing criteria, on a provisional basis, the maximum power flux density produced at the surface of the earth within the service area of a terrestrial broadcasting station (see C.C.I.R. Recommendation 417-2), by a space station in the broadcasting-satellite service in the band 620-790 MHz should not exceed:

$$\begin{array}{lll} -129 \; dBW/m^2 & \delta < 20^\circ \\ -129 \; + \; 0.4 \; (\delta - 20) \; dBW/m^2 & 20^\circ < \delta < 60^\circ \\ -113 \; dBW/m^2 & 60^\circ < \delta < 90^\circ \end{array}$$

where δ is the angle of arrival above the horizontal plane;

- 2. that these limits be not exceeded on the territory of an administration except with the latter's agreement;
- 3. that the transmission of unmodulated carriers should be avoided.
- 4. that the C.C.I.R. urgently study the sharing criteria to be applied to frequency sharing between the broadcasting-satellite service and the terrestrial broadcasting service in the band 620-790 MHz and prepare a Recommendation on power flux densities to be used in lieu of the above provisional limits;

- 5. that in its studies the C.C.I.R. consider in particular the following aspects:
 - 5.1 the required protection ratio for both 525- and 625-line systems for interference from an FM television signal into a VSB television signal;
 - 5.2 the minimum field strength to be protected for the terrestrial television service taking into account the current state of the art;
 - 5.3 the effect of ground reflections;
 - 5.4 the number of broadcasting satellites that may be visible from a terrestrial broadcasting receiver;
 - 5.5 the effect of polarization discrimination;
 - 5.6 the effect of antenna directivity;
- 6. that in its studies the C.C.I.R. should consider the advantages of energy dispersal techniques in the broadcasting-satellite service (television).

INTERNATIONAL TELECOMMUNICATION UNION

Ε

SPACE CONFERENCE

Geneva, 1971

Document No. 395-E 15 July 1971

PLENARY MEETING (SECOND READING)

R. 3

The Editorial Committee, having examined the following texts, submits them to the Plenary Meeting for a second reading.

Subject	Origin
Art. 1 '' 2 '' 5 (No. 125) '' 6 '' 7 '' 8 '' 14 '' 15 '' 27 Rec. DD	B1-B10

François Job Chairman of the Editorial Committee

Annex: Pages R3/01-42



Revision of Article 1 of the Radio Regulations

Article 1 of the Radio Regulations shall be amended as follows:

Section II is replaced by the following new text:

NOC Section II. Radio Systems, Services and Stations NOC 21

ADD 21A Space Station

(MOD 84AE) A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the earth's atmosphere.

ADD 21B Earth Station

(MOD 84AD) A station located either on the earth's surface or within the major portion of the earth's atmosphere intended for communication:

- with one or more space stations; or
- with one or more stations of the same kind by means of one or more passive satellites or other objects in space.
- ADD 21C Space Radiocommunication
- (MOD 84AC) Any radiocommunication involving the use of one or more space stations or the use of one or more passive satellites or other objects in space.
- ADD 21D Terrestrial Radiocommunication 1
- (MOD 84AA) Any radiocommunication other than space radiocommunication or radio astronomy.
- ADD 21D.1 ¹ In these Regulations, unless otherwise stated, any radiocommunication service relates to terrestrial radiocommunication.

ADD 21E Terrestrial Station ¹

(MOD 84AB) A station effecting terrestrial radiocommunication.

NOC 22-68

SUP

84AB

MOD 69 Safety Service

A radiocommunication service used permanently or temporarily for the safeguarding of human life and property on the earth's surface, in the air or in space.

(MOD 70-73 SUP (Spa 1)

NOC 74-84

SUP 84AA Replaced by ADD 21D

Section IIA is replaced by the following new text:

NOC Section IIA. Space Systems, Services and Stations

Replaced by ADD 21E

SUP 84AC (See 84ATE and 84ATF)
SUP 84AD Replaced by ADD 21B

SUP 84AE Replaced by ADD 21A

MOD 84AF Space System

Any group of co-operating earth and/or space stations employing space radiocommunication for specific purposes.

ADD 84AFA Satellite System

(MOD 84AL) A space system using one or more artificial earth satellites.

ADD 21E.1 ¹ In these Regulations, unless otherwise stated, any station is a terrestrial station.

ADD 84AFB Satellite Network

A satellite system or a part of a satellite system, consisting of only one satellite and the co-operating earth stations.

ADD 84AFC Satellite Link

A radio link between a transmitting earth station and a receiving earth station through one satellite.

A satellite link comprises one up path and one down path.

ADD 84AFD Multi-Satellite Link

A radio link between a transmitting earth station and a receiving earth station through two or more satellites, without any intermediate earth station.

A multi-satellite link comprises one up path, one or more satellite-to-satellite paths and one down path.

MOD 84AG Fixed-Satellite Service

A radiocommunication service:

- between earth stations at specified fixed points when one or more satellites are used; in some cases this service includes satellite to satellite links, which may also be effected in the inter-satellite service;
- for connection between one or more earth stations at specified fixed points and satellites used for a service other than the fixed-satellite service (for example, the mobile-satellite service, broadcasting-satellite service, etc.).

ADD 84AGA Mobile-Satellite Service

A'radiocommunication service:

- between mobile earth stations and one or more space stations; or between space stations used by this service;
- or between mobile earth stations by means of one or more space stations;
- and if the system so requires, for connection between these space stations and one or more specified fixed points on the earth.

ADD 84AGB

Aeronautical Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on board aircraft. Survival craft stations and emergency position indicating radiobeacon stations may also participate in this service.

ADD 84AGC

Maritime Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on board ships. Survival craft stations and emergency position indicating radiobeacon stations may also participate in this service.

ADD 84AGD

Land Mobile-Satellite Service

A mobile-satellite service in which mobile earth stations are located on land.

SUP	84AH	
SUP	84AI	
SUP	84AJ	Replaced by ADD 84BAC
SUP	84AK	Replaced by ADD 84BAD
SUP	84AL	Replaced by ADD 84AFA
SUP	84AM	Replaced by ADD 84ATD
SUP	84AN	
SUP	84AO	

MOD 84AP

Broadcasting-Satellite Service

A radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception 1 by the general public.

ADD 84APA

Individual reception (in the broadcasting-satellite service)

The reception of emissions from a broadcasting-satellite space station by simple domestic installations and in particular those possessing small antennae.

ADD 84APB

Community reception (in the broadcasting-satellite service)

The reception of emissions from a broadcasting-satellite space station by receiving equipment, which in some cases may be complex and have antennae larger than those used for individual reception, and intended for use:

- by a group of the general public at one location, or
- through a distribution system covering a limited area.

ADD 84APC

Radiodetermination-Satellite Service

A radiocommunication service involving the use of radiodetermination and the use of one or more space stations.

MOD 84AQ

Radionavigation-Satellite Service

A radiodetermination-satellite service used for the same purposes as the radionavigation service; in certain cases this service

ADD 84AP.1

4AP.1 ¹ In the broadcasting-satellite service, the term "direct reception" shall encompass both individual reception and community reception.

includes transmission or retransmission of supplementary information necessary for the operation of the radionavigation systems.

ADD 84AQA Aeronautical Radionavigation-Satellite Service

A radionavigation-satellite service in which mobile earth stations are located on board aircraft.

ADD 84AQB Maritime Radionavigation-Satellite Service

A radionavigation-satellite service in which mobile earth stations are located on board ships.

SUP 84AR

SUP 84AS

ADD 84ASA Earth Exploration-Satellite Service

A radiocommunication service between earth stations and one or more space stations in which:

- information relating to the characteristics of the Earth and its natural phenomena is obtained from instruments on earth satellites;
- similar information is collected from air-borne or earthbased platforms;
- such information may be distributed to earth stations within the system concerned;
- platform interrogation may be included.

MOD 84AT Meteorological-Satellite Service

An earth exploration-satellite service for meteorological purposes.

R3--06

ADD 84ATA Amateur-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur service.

ADD 84ATB Standard Frequency-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the standard frequency service.

ADD 84ATC Time Signal-Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the time signal service.

ADD 84ATD Space Research Service

(MOD 84AM) A radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes.

ADD **84ATE** Space Operation Service

A radiocommunication service concerned exclusively with the operation of spacecraft, in particular tracking, telemetry and telecommand.

These functions will normally be provided within the service in which the space station is operating.

ADD 84ATF Inter-Satellite Service

A radiocommunication service providing links between artificial earth satellites.

SUP 84AU

SUP 84AV

NOC 84AW

NOC 84AX

NOC 84AY

NOC 84AZ

Section IIB is replaced by the following new text:

NOC Section IIB. Space, Orbits and Types of Objects in Space

MOD 84BA Deep Space

Space at distances from the Earth approximately equal to, or greater than, the distance between the Earth and the Moon.

ADD 84BAA Spacecraft

(MOD 84BH) A man-made vehicle which is intended to go beyond the major portion of the earth's atmosphere.

ADD **84BAB** Satellite

A body¹ which revolves around another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of that other body.

ADD 84BAC Active Satellite

(formerly 84AJ) An earth satellite carrying a station intended to transmit or retransmit radiocommunication signals.

ADD 84BAD Passive Satellite

(formerly 84AK) An earth satellite intended to transmit radiocommunication signals by reflection.

ADD 84BAB.1 A body so defined which revolves around the Sun is called a planet or planetoid.

R3--08

MOD 84BB

Orbit

- 1. The path, relative to a specified frame of reference, described by the centre of mass of a satellite or other object in space, subjected solely to natural forces, mainly the force of gravity.
- 2. By extension, the path described by the centre of mass of an object in space subjected to natural forces and occasional lowenergy corrective forces exerted by a propulsive device in order to achieve and maintain a desired path.

MOD 84BC

Inclination of an Orbit (of an Earth Satellite)

The angle determined by the plane containing an orbit and the plane of the earth's equator.

MOD 84BD

Period (of a Satellite)

The time elapsing between two consecutive passages of a satellite or planet through a characteristic point on its orbit.

MOD 84BE

Altitude of the Apogee (Perigee)

The altitude of the apogee (perigee) above a specified reference surface serving to represent the surface of the Earth.

SUP 84BF

ADD 84BFA

Geosynchronous Satellite

An earth satellite whose period of revolution is equal to the period of rotation of the Earth about its axis.

MOD 84BG

Geostationary Satellite

A satellite, the circular orbit of which lies in the plane of the earth's equator and which turns about the polar axis of the Earth in the same direction and with the same period as those of the Earth's rotation.

The orbit on which a satellite should be placed to be a geostationary satellite is called the "geostationary satellite orbit".

SUP 84BH Replaced by ADD 84BAA

Section III is amended as follows:

NOC Section III. Technical Characteristics

NOC 85-98

ADD 98A Equivalent Isotropically Radiated Power (e.i.r.p.)

The product of the power of an emission as supplied to an antenna and the antenna gain in a given direction relative to an isotropic antenna.

NOC 99-103

ADD 103A

Equivalent Satellite-Link Noise Temperature

The noise temperature at the input of the earth station receiver corresponding to the radio-frequency noise power which produces the total observed noise at the output of the satellite link excluding noise due to interference coming from satellite links using other satellites and from terrestrial systems.

ADD 103B

Co-ordination Distance

Distance from an earth station in a given azimuth within which a terrestrial station sharing the same frequency band may cause or be subject to more than a permissible level of interference.

ADD 103C

Co-ordination Contour

The line joining the points which are on all azimuths around this earth station at a distance from this station equal to the co-ordination distance corresponding to each azimuth.

ADD 103D

Co-ordination Area

Area around an earth station enclosed by the co-ordination contour.

ANNEX

Revision of Article 2 of the Radio Regulations

Article 2 of the Radio Regulations shall be amended as follows:

Replace Section III by the following new text:

- MOD Section III. Nomenclature of the Frequency and Wavelength Bands Used in Radiocommunication
- MOD 112 § 7. The radio spectrum shall be subdivided into nine frequency bands, which shall be designated by progressive whole numbers in accordance with the following Table. Frequencies shall be expressed:
 - in kilohertz (kHz) up to and including 3000 kHz
 - in megahertz (MHz) thereafter up to and including 3000 MHz
 - in gigahertz (GHz) thereafter up to and including 3000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made.

Band Number	Frequency Range (lower limit exclusive, upper limit inclusive)		Corresponding Metric Subdivision	
4	3 to 30 l	kHz	Myriametric waves	
5	30 to 300 i	kHz	Kilometric waves	
6	300 to 3000 i	kHz	Hectometric waves	
7	3 to 30	MHz	Decametric waves	
8	30 to 300 i	MHz	Metric waves	
9	300 to 3000	MHz	Decimetric waves	
10	3 to 30	GHz	Centimetric waves	
11	30 to 300	GHz	Millimetric waves	
12	300 to 3000 (GHz or THz	Decimillimetric waves	

Note 1: "Band Number N" extends from 0.3×10^N to 3×10^N Hz.

Note 2: Symbols and prefixes:

Hz = hertz

 $k = kilo (10^3), M = mega (10^6), G = giga (10^6), T = tera (10^{12}).$

Note 3: Abbreviations for adjectival band designations:

ANNEX 3

Revision of Article 5 of the Radio Regulations .

Article 5 of the Radio Regulations shall be amended as follows:

Frequency Allocations ¹ 10 kHz to 275 GHz

Section I. Regions and Areas

(MOD) 125 § 1. For the allocation of frequencies the world has been subdivided into three Regions 2 (see Appendix 24).

ADD

¹ See Resolution No. 6.

⁽MOD) 125.1

² It should be noted that where the words "regions" or "regional" are without a capital "R" in these Regulations, they do not relate to the three Regions here defined for purposes of frequency allocation.

ANNEX 4

Revision of Article 6 of the Radio Regulations

Article 6 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 415 by the following new text;

- MOD 415 § 2. (1) When special circumstances make it indispensable to do so, an administration may, as an exception to the normal methods of working authorized by these Regulations, have recourse to the special methods of working enumerated below, on the sole condition that the characteristics of the stations still conform to those inserted in the Master International Frequency Register:
 - a) a fixed station in the terrestrial radiocommunication service or an earth station in the fixed satellite service may, on a secondary basis, transmit to mobile stations on its normal frequencies;
 - b) a land station may communicate, on a secondary basis, with fixed stations in the terrestrial radiocommunication service or earth stations in the fixed satellite service or other land stations of the same category.

Replace Regulation No. 417 by the following new text:

MOD 417 § 3. Any administration may assign a frequency in a band allocated to the fixed service or allocated to the fixed satellite service to a station authorized to transmit, unilaterally, from one specified fixed point to one or more specified fixed points provided that such transmissions are not intended to be received directly by the general public.

Add the following new text after Regulation No. 419:

ADD 419A § 5A. Earth stations on board aircraft are authorized to use frequencies in the bands allocated to the maritime mobile-satellite service for the purpose of communicating, via the stations of that service, with the public telegraph and telephone networks.

ANNEX

Revision of Article 7 of the Radio Regulations

Article 7 of the Radio Regulations shall be amended as follows:

Add the following new text after Regulation Section I:

ADD

Section IA. Broadcasting-Satellite Service

ADD 428A § 2A. In devising the characteristics of a broadcasting space station, all technical means available shall be used to reduce, to the maximum extent, the radiation over the territory of other countries unless an agreement has been previously reached with such countries.

Replace Section VII by the following new text:

MOD Section VII. Terrestrial Radiocommunication Services sharing frequency bands with Space Radiocommunication Services above 1 GHz

Choice of Sites and Frequencies

- (MOD) 470A § 18. Sites and frequencies for terrestrial stations, operating in frequency bands shared with equal rights between terrestrial radio-communication and space radiocommunication services shall be selected having regard to the relevant Recommendations of the C.C.I.R. with respect to geographical separation from earth stations.
- ADD 470AA § 18bis. (1) As far as practicable, sites for transmitting ¹ stations, in the fixed or mobile service, employing maximum values of equi-
- ADD 470AA.1 ¹ For their own protection receiving stations in the fixed or mobile services operating in bands shared with space radiocommunication services (satellite-to earth) should also avoid directing their antennae towards the geostationary satellite orbit if their sensitivity is sufficiently high that interference from space station transmissions may be significant.

valent isotropically radiated power exceeding 35 dBW in the frequency bands between 1 and 10 GHz, should be selected so that the direction of maximum radiation of any antenna will be at least 2° away from the geostationary satellite orbit, taking into account the effect of atmospheric refraction.¹

- ADD 470AB (2) As far as practicable, sites for transmitting ² stations, in the fixed or mobile service, employing maximum values of equivalent isotropically radiated power exceeding 45 dBW in the frequency bands between 10 and 15 GHz, should be selected so that the direction of maximum radiation of any antenna will be at least 1.5° away from the geostationary satellite orbit, taking into account the effect of atmospheric refraction.³
- ADD 470AC (3) In the frequency bands above 15 GHz there shall be no restriction as to the direction of maximum radiation for stations in the fixed or mobile service.

Power Limits

- MOD 470B § 19. (1) The maximum equivalent isotropically radiated power of a station in the fixed or mobile service shall not exceed +55 dBW.
- ADD 470BA (1bis) Where compliance with No. 470AA is impracticable the maximum equivalent isotropically radiated power of a station in the fixed or mobile service shall not exceed:

+47 dBW in any direction within 0.5° of the geostationary satellite orbit; or

ADD 470AA.2 ¹ Information on this subject is given in the most recent version of C.C.I.R. Report No. 393.

ADD 470AB.1 ² See No. 470AA.1.

ADD 470AB.2 ³ See No. 470AA.2.

+47 dBW to +55 dBW, on a linear decibel scale (8 dB per degree), in any direction between 0.5° and 1.5° of the geostationary satellite orbit, taking into account the effect of atmospheric refraction.¹

- MOD 470C (2) The power delivered by a transmitter to the antenna of a station in the fixed or mobile service in frequency bands between 1 and 10 GHz, shall not exceed +13 dBW.
- ADD 470CA (2bis) The power delivered by a transmitter to the antenna of a station in the fixed or mobile service in frequency bands above 10 GHz shall not exceed +10 dBW.
- MOD 470D (3) The limits given in Nos. 470AA, 470B, 470BA and 470C apply in the following frequency bands allocated to the fixed satellite service and the meteorological satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

2655 - 2690 MHz for Regions 2 and 3.

5 800 - 5 850 MHz (for the countries mentioned in No. 390).

5 850 - 5 925 MHz for Regions 1 and 3.

5 925 - 6 425 MHz

7 900 - 7 975 MHz

7 975 - 8 025 MHz (for the countries mentioned in No. 392H).

8 025 - 8 400 MHz

ADD 470DA (4) The limits given in Nos. 470AB, 470B and 470CA apply in the following frequency bands allocated to the fixed-satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

10.95 - 11.2 GHz (Region 1)
12.5 - 12.75 GHz (Regions 1 and 2)
14.175 - 14.3 GHz (for the countries mentioned in No.
407)
14.4 - 14.5 GHz

ADD 470DB (5) The limits given in Nos. 470AC, 470B and 470CA apply in the following frequency bands allocated to the fixed-satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

27.5 - 29.5 GHz 29.5 - 31 GHz (for the countries mentioned in No. **409E**).

Replace Section VIII by the following new text:

MOD Section VIII. Space Radiocommunication Services sharing Frequency Band with Terrestrial Radiocommunication Services above 1 GHz

Choice of Sites and Frequencies

(MOD) 470E § 20. Sites and frequencies for earth stations, operating in frequency bands shared with equal rights between terrestrial and space radiocommunication services, shall be selected having regard to the relevant Recommendations of the C.C.I.R. with respect to geographical separation from terrestrial stations.

Power Limits

MOD 470F § 21. (1) Earth stations.

MOD 470G (2) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands between 1 and 15 GHz, shall not exceed the following limits except as provided in Nos. 470H or 470HA:

```
+40 dBW in any 4-kHz band for \delta\leqslant 0^\circ +40 + 3 \delta dBW in any 4-kHz band for 0^\circ<\delta\leqslant 5^\circ
```

where δ is the angle of elevation of the horizon viewed from the centre of radiation of the antenna of the earth station and measured as positive above the horizontal plane and negative below it.

ADD 470GA (2A) The equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands above 15 GHz shall not exceed the following limits except as provided in Nos. 470H or 470HB:

```
+64 dBW in any 1-MHz band for \delta{\leqslant}0^\circ +64+3 \delta dBW in any 1-MHz band for 0^\circ{<}\delta{\leqslant}5^\circ
```

where 8 is as defined in No. 470G.

- ADD 470GB (2B) For angles of elevation of the horizon greater than 5° there shall be no restriction as to the equivalent isotropically radiated power transmitted by an earth station towards the horizon.
- MOD 470H (3). The limits given in No. 470G, No. 470GA, No. 470HA and No. 470HB, as applicable, may be exceeded by not more than 10 dB. However, when the resulting co-ordination area extends into the territory of another administration, such increase shall be subject to agreement by that administration.

- ADD 470HA (3A) As an exception to the limits given in No. 470G, the equivalent isotropically radiated power towards the horizon for an earth station in the space research (deep-space) shall not exceed +55 dBW in any 4-kHz band.
- ADD 470HB (3B) As an exception to the limits given in No. 470GA, the equivalent isotropically radiated power towards the horizon for space research earth station (deep-space) shall not exceed +79 dBW in any 1-MHz band.

SUP 470I

MOD 470J (3C) The limits given in No. 470G apply in the following frequency bands allocated to the fixed-satellite service and meteorological-satellite service for transmission by earth stations where these bands are shared with equal rights with the fixed or mobile service:

2655 - 2690 MHz 4 400 - 4 700 MHz 5 800 - 5 850 MHz (for the countries mentioned in No. 390) 5 850 - 5 925 MHz (Regions 1 and 3) 5 925 - 6 425 MHz 7 900 - 7 975 MHz 7 975 - 8 025 MHz (for the countries mentioned in No. 392H) 8 025 - 8 400 MHz 10.95 - 11.2 GHz (Region 1) 12.50 - 12.75 GHz (Regions 2 and 3) 14-175 - 14-300 GHz (for the countries mentioned in No. 407) 14.4 - 14.5 GHz

ADD 470JA (3D) The limits given in No. 470GA apply in the following frequency band allocated to transmission by earth stations in the fixed satellite service, where this is shared with equal rights with the fixed

or mobile service:

27.5 - 29.5 GHz

Minimum Angle of Elevation

MOD 470K § 22. (1) Earth stations.

- MOD 470L (2) Earth station antennae shall not be employed for transmission at elevation angles of less than 3° measured from the horizontal plane to the direction of maximum radiation, except when agreed to by administrations concerned or those whose services may be affected. In case of reception by an earth station, the above value shall be used for co-ordination purposes if the operating angle of elevation is less than that value.
- ADD 470LA (2A) As an exception to No. 470L, earth station antennae in the space research service (near-earth) shall not be employed for transmission at elevation angles of less than 5°, and earth station antennae in the space research service (deep-space) shall not be employed for transmission at elevation angles of less than 10°, both angles being those measured from the horizontal plane to the direction of maximum radiation. In case of reception by an earth station, the above values shall be used for coordination purposes if the operating angle of elevation is less than those values.
- MOD 470M (2B) The limit given in No. 470L applies in the following frequency bands allocated to the fixed-satellite service and to the meteorological-satellite service for transmission by earth stations where these bands are shared with equal rights with the fixed or mobile services:

2655 - 2690 MHz

4 400 - 4 700 MHz

5 800 - 5 850 MHz (for the countries mentioned in No. 390)

```
5 850 - 5 925 MHz (for Regions 1 and 3)
 5 925 - 6 425 MHz
 7900 - 7975 MHz
7 975 - 8 025 MHz (for the countries mentioned in No.
                    392H)
8 025 - 8 400 MHz
10.95 - 11.2 GHz (for Region 1)
12.5 - 12.75 GHz (for Regions 2 and 3)
14.175 - 14.3
             MHz (for the countries mentioned in No.
                    407)
14.4
      - 14.5
              GHz
             GHz
27.5
     - 29.5
```

SUP

Power Flux Density Limits

ADD

Limits of Power Flux Density from Space Stations

MOD 470N § 23. (1) Power flux density limits between 1 690 MHz and 1 700 MHz.

ADD 470NA

- a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed —133 dBW/m² in any 1.5-MHz band. This limit relates to the power flux density which would be obtained under assumed freespace propagation conditions.
- ADD 470NB
- b) The limit given in No. 470NA applies in frequency band listed in No. 470NC which is allocated to transmission by space stations in the earth exploration-satellite service and in particular the meteorological-satellite service where this band is shared with equal rights with the meteorological aids service.

ADD 470NC

c) 1690 - 1700 MHz.

ADD 470ND

(2) Power flux density limits between 1 670 MHz and 2 535 MHz.

ADD 470NE

- a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 154 dBW/m² in any 4-kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-$$
 154 + $\frac{\delta$ $-$ 5 $}{2}$ dBW/m² in any 4-kHz band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

— 144 dBW/m² in any 4-kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane. These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NF

- b) The limits given in No. 470NE apply in the frequency bands listed in No. 470NG which are allocated to transmission by space stations in the following space radiocommunication services:
 - Earth exploration-satellite service and in particular meteorological-satellite service (space to Earth)
 - Space research service (space to Earth)
 - Fixed-satellite service (space to Earth) where these bands are shared with equal rights with the fixed or mobile services:

ADD 470NG

1 670 - 1 690 MHz

1 690 - 1 700 MHz (for the countries mentioned in No.

354A)

1 700 - 1 710 MHz

1770 - 1790 MHz (for the countries mentioned in No.

356AA)

2 290 - 2 300 MHz

2 500 - 2 535 MHz

ADD 470NGA

c) The power flux density values given in No. 470NE are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the bands listed in No. 470NG and where there is insufficient frequency separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed —168 dBW in any 4-kHz band.

ADD 470NH

(3) Power flux density limits between 2 500 - 2 690 MHz.

ADD 470NI

a) The power flux density at the earth's surface produced by emissions from a space station in the broadcastingsatellite service for all conditions and for all methods of modulation shall not exceed the following values:

 $-152 \, \mathrm{dBW/m^2}$ in any 4-kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-$$
 152 $+$ $\frac{3(8-5)}{4}$ dBW/m² in any 4-kHz band for

angles of arrival (8) between 5 and 25 degrees above the orizontal plane;

— 137 dBW/m² in any 4-kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NJ

b) The limits given in No. **470NI** apply in the frequency

2 500 - 2 690 MHz

which is shared by the broadcasting-satellite service with the fixed or mobile service.

ADD 470NK

c) The power flux density values given in No. 470NI are derived on the basis of protecting the fixed service using line-of-sight techniques. Where a fixed service using tropospheric scatter operates in the band mentioned in No. 470NJ and where there is insufficient frequency separation, there must be sufficient angular separation between the direction to the space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed — 168 dBW in any 4-kHz band.

ADD 470NL

(4) Power flux density limits between 3 400 MHz and 7 750 MHz.

ADD 470NM

a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a

passive satellite for all conditions and for all methods of modulation shall not exceed the following values:

-152 dBW/m² in any 4-kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-152 + \frac{(\delta-5)}{2} dBW/m^2$$
 in any 4-kHz band for

angles of arrival (8) between 5 and 25 degrees above the horizontal plane;

— 142 dBW/m² in any 4—kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NN

- b) The limits given in No. 470NM apply in the frequency bands listed in No. 470NO which are allocated to transmission by space stations in the following space radiocommunication services:
 - fixed-satellite service (space to Earth)
 - meteorological-satellite service (space to Earth)

where these bands are shared with equal rights with the fixed or mobile services:

ADD 470NO

3 400 - 4 200 MHz

6 625 - 7 125 MHz for Region 2 (see No. 392AA for Regions 1 and 3)

7 250 - 7 300 MHz (for the countries mentioned in No. 392G)

7 300 - 7 750 MHz

ADD 470NP

(5) Power flux density limits between 8 025 MHz and 11.7 GHz.

ADD 470NQ

- a) The power flux density at the earth's surface, produced by emissions from a space station, or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 150 dBW/m² in any 4-kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-150 + \frac{(\delta-5)}{2} \text{ dBW/m}^2 \text{ in any } 4-\text{kHz band for}$$

angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

— 140 dBW/m² in any 4—kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NR

- b) The limits given in No. 470NQ apply in the frequency bands listed in No. 470NS which are allocated to transmission by space stations in the following space radiocommunication services:
- -- Earth exploration satellite service (space to Earth)
- space research service (space to Earth)
- fixed-satellite service (space to Earth)

where these bands are shared with equal rights with the fixed or mobile services:

ADD 470NS

8 025 - 8 400 MHz

8 400 - 8 500 MHz

10.95 - 11.2 GHz

11·45 - 11·7 GHz

ADD 470NT

(6) Power flux density limits between 11.7 and 12.75 GHz.

ADD 470NU

- a) The power flux density at the earth's surface, produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 148 dBW/m² in any 4-kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;
 - $-148 + \frac{(8-5)}{2}$ dBW/m² in any 4-kHz band for

angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

— 138 dBW/m² in any 4-kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NV

- b) The limits given in No. 470NU apply in the frequency bands listed in No. 470NW which are allocated to transmission by space stations in the following space radiocommunication services:
 - fixed-satellite service

where these bands are shared with equal rights with the fixed or mobile services: ADD 470NW

11.7 - 12.2 GHz (Region 2 only)

12.5 - 12.75 GHz (Regions 2 and 3 only)

ADD 470NX

(7) Power flux density limits between 17-7 GHz and 23 GHz.

ADD 470NY

- a) The power flux density at the earth's surface produced by emissions from a space station or reflected from a passive satellite for all conditions and for all methods of modulation shall not exceed the following values:
 - 115 dBW/m² in any 1-MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$$-115 + \frac{(\delta - 5)}{2} \text{ dBW/m}^2 \text{ in any 1-MHz band for}$$

angles of arrival (δ) between 5 and 25 degrees above the horizontal plane;

 -105 dBW/m^2 in any 1-MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux density which would be obtained under assumed free-space propagation conditions.

ADD 470NZ

- b) The limits given in No. 470NY apply in the frequency bands listed in No. 470NZA which are allocated to transmission by space stations in the following space radiocommunication services:
 - fixed-satellite service (space to Earth)
 - Earth exploration satellite service (space to Earth)

where these bands are shared with equal rights with the fixed or mobile services: ADD **470NZA** 17.7 - 19.7 GHz 21.2 - 22 GHz

ADD 470NZB

(8) The limits given in 470NA, 470NE, 470NI, 470NM, 470NQ, 470NU and 470NY may be exceeded on the territory of any administration which has so agreed.

SUP 4700 to 470U

Add the following new text at the end of Section VIII .

ADD Section VIII. Space Radiocommunication Services sharing Frequency Band with Terrestrial Radiocommunication Services below 1 GHz

ADD 470MA § 23. (1) Power flux density limits below 1 GHz.

ADD 470MB In the portions of the band 620-790 MHz shared with equal rights by the broadcasting-satellite service and the fixed service using tropospheric scatter, where there is insufficient frequency separation there must be sufficient angular separation between the direction to the broadcasting-satellite space station and the direction of maximum radiation of the antenna of the receiving station of the fixed service using tropospheric scatter to ensure that the interference power at the receiver input of the station of the fixed service does not exceed —168 dBW in any 4-kHz band.

Replace Section IX by the following new text:

MOD Section IX. Space Radiocommunication Services

R3-32

Cessation of Emissions

MOD 470V § 24. Space stations shall be fitted with devices to ensure immediate cessation of their radio emissions by telecommand, whenever such cessation is required under the provisions of these Regulations.

SUP Note 1

ADD Control of Interference between Geostationary-Satellite Systems and Non-Synchronous Inclined Orbit-Satellite Systems

ADD 470VA § 25. Non-geostationary space stations in the fixed satellite services shall cease or reduce to a negligible level radio emissions, and their associated earth stations shall not transmit to them whenever there is insufficient angular separation between the non-geostationary satellite and geostationary satellites and unacceptable interference to geostationary satellite space systems operating in accordance with these Regulations.

ADD Station Keeping of Space Stations²

ADD 470VB § 26. Space stations on geostationary satellites:

ADD 470VC — shall have the capability of maintaining their positions within \pm 1° of the longitude of their nominal positions, but efforts should be made to achieve a capability of maintaining their positions at least within \pm 0.5° of the longitude of their nominal positions,

ADD 470VA.1 ¹ The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

² In the case of space stations on geosynchronous satellites with orbits having an angle of inclination greater than 5° the positional tolerance shall relate to the nodal point.

ADD 470VD

— shall maintain their positions within \pm 1° of longitude of their nominal positions irrespective of the cause of variation, but

ADD 470VE

— need not comply with [b] as long as the satellite network to which the space station belongs does not produce an unacceptable level of interference ¹ into any other satellite network whose space station complies with the limits given in [b].

ADD

Pointing Accuracy of Antennae on Geostationary Satellites

ADD 470VF § 27. The pointing direction of maximum radiation of any earthward beam of antennae on geostationary satellites shall be capable of being maintained within:

10% of the half power beamwidth relative to the nominal pointing direction; or

0.5° relative to the nominal pointing direction,

whichever is greater. This provision applies only when these beams are intended for less than global coverage.

In the event that the beam is not rotationally symmetrical about the axis of maximum radiation, the tolerance in any plane containing this axis shall be related to the half power beamwidth in that plane.

This accuracy shall be maintained only if it is required to avoid unacceptable interference ² to other systems.

ADD 470VE.1 ¹ The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

ADD 470VF.1 ² The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant C.C.I.R. Recommendations as a guide.

ADD Power Flux Density at the geostationary Satellite Orbit

ADD 470VG In the frequency band 8 025 to 8 400 MHz which the Earth Exploration-Satellite Service using non-geostationary satellites shares with the Fixed-Satellite Service (Earth-to-space) the maximum power flux density produced at the geostationary satellite orbit by any Earth Exploration-Satellite Service space station shall not exceed -174

dBW/m² in any 4-kHz band.

ANNEX ...

Revision of Article 8 of the Radio Regulations

Article 8 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 477 by the following new text:

MOD 477

e) the study, on a long-term basis, of the usage of the radio spectrum, with a view to making recommendations for its more effective use;

ANNEX 💻

Revision of Article 14 of the Radio Regulations

Article 14 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 695 by the following new text:

MOD 695 § 3. In order to avoid interference:

- locations of transmitting stations and, where the nature of the service permits, locations of receiving stations shall be selected with particular care;
- radiation in and reception from unnecessary directions shall be minimized, where the nature of the service permits, by taking the maximum practical advantage of the properties of directional antennae;
- the choice and use of transmitters and receivers shall be in accordance with the provisions of Article 12;
- the conditions specified under No. 470V shall be fulfilled.

ANNEX 💹

Revision of Article 15 of the Radio Regulations

Article 15 of the Radio Regulations shall be amended as follows:

Replace Regulation No. 717 by the following new text:

MOD 717

(2) In such a case, the administration concerned may also request the Board to act in accordance with the provisions of Section VII of Article 9 and Section VII of Article 9A; but it shall then supply the Board with the full facts of the case, including all the technical and operational details and copies of the correspondence.

ANNEX ...

Revision of Article 27 of the Radio Regulations

Article 27 of the Radio Regulations shall be amended as follows:

Replace Nos. 951 and 952 by the following new texts:

- MOD 951 § 3. (1) Aircraft stations may communicate with stations of the maritime mobile or maritime mobile satellite services. They shall then conform to those provisions of these Regulations which relate to these services.
- MOD 952 (2) For this purpose aircraft stations should use the frequencies allocated to the maritime mobile or maritime mobile satellite services. However, having regard to interference which may be caused by aircraft stations at high altitudes, maritime mobile frequencies in the bands above 30 MHz shall not be used by aircraft stations in any specific area without the prior agreement of all the administrations of the area in which interference is likely to be caused. In particular, aircraft stations operating in Region 1 should not use frequencies in the bands above 30 MHz allocated to the maritime mobile service by virtue of any agreement between administrations in that Region.

RECOMMENDATION No. Spa DD

Relating to the Criteria to be Applied for Sharing between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the Band 620-790 MHz

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that the band 620-790 MHz has been allocated to the broadcasting-satellite service;
- b) that it is necessary to have a power flux-density limit which will provide adequate protection to the terrestrial broadcasting service;

taking into account

a) that the conclusions of the Special Joint Meeting of the C.C.I.R. Geneva, 1971, indicated that the following power flux-density limits are necessary to protect the terrestrial broadcasting service:

$$\begin{array}{lll} -121 \ dBW/m^2 & \delta < 20^\circ \\ -121 \ + \ 0.4 \ (\delta - 20) \ dBW/m^2 & 20^\circ < \delta < 60^\circ \\ -105 \ dBW/m^2 & 60^\circ < \delta < 90^\circ \end{array}$$

where δ is the angle of arrival above the horizontal plane;

b) that additional tests carried out by one administration after the Special Joint Meeting of the C.C.I.R., indicated that the following more conservative power flux-density limits may be necessary:

$$\begin{array}{lll} -130 \text{ dBW/m}^2 & \delta < 20^\circ \\ -130 + 0.4 \ (\delta - 20) \text{ dBW/m}^2 & 20^\circ < \delta < 60^\circ \\ -114 \ \text{dBW/m}^2 & 60^\circ < \delta \leqslant 90^\circ \end{array}$$

where 8 is the angle of arrival above the horizontal plane;

- c) that additional information is required on the protection ratio for interference from an FM television signal into a VSB television signal for both the 625- and 525-line systems;
- d) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in C.C.I.R. Recommendation 417-2;
- e) that account may have to be taken of ground reflections;
- f) that energy dispersal techniques may reduce the required protection ratio and should be used if shown to be effective;

recommends

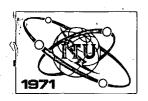
1. that in view of the absence of sufficient information on tests under operational conditions and in order to provide sharing criteria, on a provisional basis, the maximum power flux-density produced at the surface of the earth within the service area of a terrestrial broadcasting station (see C.C.I.R. Recommendation 417-2), by a space station in the broadcasting-satellite service in the band 620-790 MHz should not exceed:

-129 dBW/m^2	$\delta < 20^\circ$
$-129 + 0.4 (\delta - 20) dBW/m^2$	$20^{\circ} < \delta < 60^{\circ}$
-113 dBW/m^2	$60^{\circ} < \delta < 90^{\circ}$

where δ is the angle of arrival above the horizontal plane;

- 2. that these limits be not exceeded on the territory of an administration except with the latter's agreement;
- 3. that the transmission of unmodulated carriers should be avoided.
- 4. that the C.C.I.R. urgently study the sharing criteria to be applied to frequency sharing between the broadcasting-satellite service and the terrestrial broadcasting service in the band 620-790 MHz and prepare a Recommendation on power flux densities to be used in lieu of the above provisional limits;

- 5. that in its studies the C.C.I.R. consider in particular the following aspects:
 - 5.1 the required protection ratio for both 525- and 625-line systems for interference from an FM television signal into a VSB television signal;
 - 5.2 the minimum field strength to be protected for the terrestrial television service taking into account the current state of the art:
 - 5.3 the effect of ground reflections;
 - 5.4 the number of broadcasting satellites that may be visible from a terrestrial broadcasting receiver;
 - 5.5 the effect of polarization discrimination;
 - 5.6 the effect of antenna directivity;
- 6. that in its studies the C.C.I.R. should consider the advantages of energy dispersal techniques in the broadcasting-satellite service (television).



SPACE CONFERENCE

Document No. 396-E 14 July 1971 Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 3

SUMMARY RECORD

OF THE

THIRD AND LAST MEETING OF COMMITTEE 3 (BUDGET CONTROL)

Monday, 12 July 1971, at 0930 hrs

Chairman: Mr. L. CONSTANTINESCU
(Socialist Republic of Roumania)

Sub	jects discussed	Document No.
1.	Approval of the Summary Record of the Second Meeting of Committee 3	261
² 2.	Draft Final Report of the Budget Control Committee to the Plenary Assembly	DT/101
3.	Completion of the work of the Committee	



1. Approval of the Summary Record of the Second Meeting of Committee 3 (Document No. 261)

The Summary Record was approved, subject to the replacement of the words "the delegate of the United States" by "the delegate of the Territories of the United States of America" throughout the text. The amendment applied also to the Summary Record of the First Meeting of Committee 3 (Document No. 212).

2. Draft Final Report of the Budget Control Committee (Document No. DT/101)

During the discussion the <u>delegate of Italy</u> urged the Budget Control Committee to present the Plenary Meeting with the precise facts reflecting the true situation, i.e. that the preparations for the Conference had been carried out by the Special Joint Meeting of the C.C.I.R. Study Groups, without whose work the duration of the Conference itself would have been longer.

That point of view was confirmed by the Director of the C.C.I.R.

The <u>delegate of the U.S.S.R.</u> was not opposed to the idea as far as the substance was concerned; nevertheless he thought that, properly speaking, the Administrative Council should have considered the matter at its last Session. If that procedure has been followed, it could have made the necessary budgetary arrangements to meet the situation. It was not customary to sanction additional expenditure at such a late stage merely by including it in the expenses of the Conference.

The <u>delegate of the Territories of the United States of America</u> thought that the Committee might recommend the Administrative Council to post the excess expenditure, accepted as inevitable, to the 1971 account for additional credits.

At the end of a discussion in which the delegates of Canada, the U.S.S.R., Italy, Federal Republic of Germany, the United Kingdom, Territories of the United States of America, the Chairman, the Vice-Chairman and the Secretary of the Conference took part, it was decided to replace the last two paragraphs on page 3 and the first paragraph on page 4 by the following text:

"After a lengthy study of this situation, the Budget Control Committee concluded that Conference expenditure should be kept within the limits of the budget approved by the Administrative Council.

Under No. 675 of the Convention, the Budget Control Committee therefore drew the Plenary Meeting's attention to the situation.

The Budget Control Committee nevertheless recognizes that the excess expenditure mentioned above could not be cut without jeopardizing the smooth running of the Conference and was therefore justified.

Under these conditions the Committee recommends the approval of this report for transmission to the Secretary-General for submission to the Administrative Council at its next annual session, in accordance with No. 677 of the Convention."

Page 10

The Secretary of the Committee said that the following operating agencies and international organizations attending the Conference had chosen the half-unit class of contribution.

Marconi International Marine Co. Ltd.

Radio-Austria AG

International Chamber of Shipping (I.C.S.)

International Press Telecommunications Committee (I.P.T.C.)

International Transport Federation (I.T.F.)

The <u>Secretary of the Conference</u> pointed out that, since some of the organizations which had asked to take part in the Conference had not sent representatives, they would not have to make a contribution.

Replying to a question by the <u>delegate of Italy</u>, he said the established rule was that organizations which had not sent representatives to a conference did not receive any of the conference documents.

There being no further comments, the <u>Chairman</u> said that the draft Report of the Committee (Document No. DT/101) which had just been approved would be published as amended and submitted to the Plenary Meeting of the Conference, where he hoped it would be well received.

3. Completion of the work of Committee 3

The <u>delegate of the U.S.S.R.</u> congratulated the Chairman for the excellent way in which he had guided the work of the Committee. His work was all the more praiseworthy in that it was the first time that he had been asked to preside over the discussions of a committee.

The <u>Chairman</u> then thanked the members of the Committee for the spirit of co-operation they had shown during the meetings and declared that the work of Committee 3 was finished.

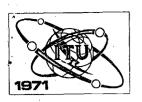
The meeting rose at 1145 hrs.

The Secretary:

The Chairman:

R. PRELAZ

L. CONSTANTINESCU



SPACE CONFERENCE

Document No. 397-E 14 July 1971

Original : English

French

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SEVENTH REPORT OF COMMITTEE 6 (REGULATIONS)

SATELLITE-BROADCASTING

The following texts appearing in the annexes to the present Report, concerning:

- the addition of a provision to Article 7 (Annex 1);
- Resolution No. /E/ (Annex 2)

were adopted by Committee 6.

Resolution No. /D / also appearing in the Annex to the present Report (Annex 3) was adopted by Committee 6. With respect to paragraph 2 of the said Resolution, 24 delegations were in favour of its retention, 14 against, and 5 abstained. Some delegations of countries in Region 1 stated that they reserved the right to come back to this question when discussing the matter at the Plenary Meeting.

M.K. BASU Chairman

Annexes: 3



ARTICLE 7

Satellite Broadcasting

ADD 428A

§ 2A. In devising the characteristics of a broadcasting space station, all technical means available shall be used to reduce to the maximum extent the radiation over the territory of other countries unless an agreement has been previously reached with such countries.

RESOLUTION /D/

on the establishment of agreements and associated plans for satellite broadcasting

The World Administrative Radio Conference for Space Telecommunications, Geneva 1971,

considering

- a) that it is important to make the best possible use of the geostationary satellite orbit and of the frequency bands allocated to the Broadcasting-Satellite Service:
- b) that the great number of receiving installations using such directional antennae as could be set up for a Broadcasting-Satellite Service may be an obstacle to changing the location of broadcasting space stations on the geostationary satellite orbit, from the date of their bringing into use:
- c) that satellite broadcasts may create harmful interference over a large area of the earth's surface;
- d) that the other services with allocations in the same band need to use the band before the Broadcasting-Satellite Service is set up;

resolves

- that satellite broadcasting stations shall be established and operated in accordance with agreements and associated plans adopted by World or Regional Administrative Conferences, as the case may be, in which all the administrations concerned and the administrations whose services are liable to be affected may participate;
- 2. that the Administrative Council be requested to examine as soon as possible the question of a World Administrative Conference, and/or Regional Administrative Conferences as required with a view to fixing suitable dates, places and their agenda.
- 3. that during the period before the entry into force of such agreements and associated plans the administrations and the I.F.R.B. shall apply the procedure contained in Resolution \sqrt{E} .

DRAFT RESOLUTION No./E/

on the bringing into service of broadcasting space stations, prior to the entry into force of agreements and associated plans for satellite broadcasting

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that while Resolution No. / D / has been adopted by this Conference envisaging plans for satellite broadcasting, some administrations might nevertheless feel the need to bring such stations into service prior to such plans being established;
- b) that administrations should, as far as possible, avoid proliferation of broadcasting space stations before such plans have been established;
- c)) that a broadcasting space station may cause harmful interference to terrestrial stations operating in the same frequency band, even if the latter are outside the service area of the space station,
- d) that the procedure specified in Article 9A of the Radio Regulations contains no provisions for the co-ordination between broadcasting space stations and terrestrial stations and between broadcasting space stations and space systems of other administrations.

resolves

that the following procedure shall be applied until agreements and associated plans pursuant to Resolution No. D enter into force:

Section Λ : Co-ordination procedure between broadcasting space stations and terrestrial stations

2.1 Before an administration notifies to the Board or brings into service any frequency assignment to a broadcasting space station in a frequency band where this frequency band is allocated, with equal rights,

to the Broadcasting-Satellite Service and to a Terrestrial Radiocommunication Service, either in the same Region or sub-Region or in different Regions or sub-Regions, it shall co-ordinate the use of this assignment with any other administration whose Terrestrial Radiocommunication Services may be affected. For this purpose, it shall inform the Board of all the technical characteristics of the station, as listed in the relevant section of Appendix 1A, which are necessary to assess the risk of interference to a Terrestrial Radiocommunication Service¹⁾.

- 2.2 The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.
- 2.5 Any administration which considers that its Terrestrial Radiocommunication Services may be affected shall forward its comments to the administration seeking co-ordination and, in any case, to the Board. These comments must be forwarded within one hundred and twenty days from the date of the relevant I.F.R.B. weekly circular. It shall be deemed that any administration which has not forwarded comments within that period does not consider that its Terrestrial Radiocommunication Services are likely to be affected.
- Any administration which has forwarded comments on the projected station shall either give its agreement to the co-ordination, or, if this is not possible, send to the administration seeking co-ordination all the data on which its comments are based as well as any such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.
- 2.5 The administration which plans to bring into use a space station as well as any other administration which believes that its Terrestrial Radiocommunication Services are likely to be affected by the station in question may request the assistance of the Board at any time during the co-ordination procedure.
- 2.6 If the assistance of the Board has been sought and there is a continuing disagreement between the administration seeking co-ordination and the administration which has forwarded its comments, the administration seeking co-ordination may, after a total period of one hundred and eighty days, send to the Board its notice concerning the frequency assignment in question.

¹⁾ The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations as accepted by the administrations concerned under the terms of Resolution No. ... In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

- Section B: Co-ordination procedure between broadcasting space stations and space systems of other administrations
- 3. An administration intending to establish a service of broadcasting by satellite shall, for the purpose of co-ordination with space systems of other administrations, apply the following provisions of Article 9A of the Radio Regulations:
- 3.1 Numbers 639AA to 639AI inclusive.
 - 3.2.1 Number 639AJ 1)
 - 3.2.2 No co-ordination under paragraph 3.2.1 is required when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the probability of harmful interference to stations in the Space Radiocommunication Service of other administrations.
 - 3.2.3 Numbers 639AL, 639AM, 639AO, 639AS(a), (c), (e), (f), 639AT, 639AU, 639AV, 639AW, 639AX, 639AY. 639AZ.
 - Section C: Notification, examination and recording in the Master Register of assignments to broadcasting space stations, treated under this Resolution.
- 4.1 Any frequency assignment ²⁾ to a broadcasting space station shall be notified to the Board. The notifying administration shall apply (for this purpose) the provisions of Numbers 639BE, 639BF and 639BG of the Radio Regulations.
- 4.2 Notices made under paragraph 4.1 shall initially be treated in accordance with Number 639BH.

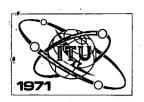
¹⁾ The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations / as accepted by the administrations concerned under the terms of Resolution No. ... /. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

²⁾ The expression frequency assignment, wherever it appears in this Resolution, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called Master Register).

- 5.1 The Board shall examine each notice with respect to:
- 5.2 a) its conformity with the Convention, the Table of Frequency
 Allocations and the other provisions of the Radio Regulations
 (with the exception of those relating to the co-ordination
 procedures and to the probability of harmful interference);
- 5.3 b) its conformity, where applicable, with the provisions of paragraph 2.1 and Section A above relating to co-ordination of the use of the frequency assignment with the other administrations concerned;
- 5.4 c) its conformity, where applicable, with the provisions of paragraph 3.2.1 of Section B above relating to co-ordination of the use of the frequency assignment with the other administrations concerned;
- 5.5 d) where appropriate, the probability of harmful interference to the service rendered by a station in a Space or Terrestrial Radiocommunication Service for which a frequency assignment has already been recorded in the Master Register in conformity with the provisions of Number 501 or 639BM as appropriate, if that assignment has not, in fact, caused harmful interference to the service rendered by a station for which an assignment has been previously recorded in the Master Register and which itself is in conformity with Number 501 or Number 639BM as appropriate.
- 5.6 Depending upon the findings of the Board subsequent to the examination prescribed in paragraphs 5.2, 5.3, 5.4 and 5.5, further action shall be as follows:
- 5.7 Where the Board reaches an unfavourable finding with respect to paragraph 5.2 the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.8 Where the Board reaches a favourable finding with respect to paragraph 5.2, or where it reaches the same finding after resubmission of the notice, it shall examine the notice with respect to the provisions of paragraphs 5.3 and 5.4 above.
- 5.9 Where the Board finds that the co-ordination procedures mentioned in paragraphs 5.3 and 5.4 have been successfully completed with all administrations whose services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in the column 2d of the Master Register with entry in the Remarks column indicating that such recording does not prejudge in any way the decisions to be included in the agreements and associated plans referred to in Resolution No. \sqrt{D} .

- 5.10 Where the Board finds that the co-ordination procedures mentioned in paragraphs 5.3 or 5.4 have not, as appropriate, been applied or have been unsuccessfully applied, the notice shall be returned immediately by airmail to the notifying administration with the reason for its return and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
 - 5.11 Where the notifying administration resubmits the notice and the Board finds that the co-ordination procedures, as appropriate, have been successfully completed with all administrations whose services may be affected, the assignment shall be treated as indicated in paragraph 5.9.
 - 5.12 Where the notifying administration resubmits the notice and states that it has been unsuccessful in endeavouring to effect the co-ordination, the notice shall be examined by the Board with respect to paragraph 5.5.
 - 5.13 Where the Board reaches a favourable finding with respect to paragraph 5.5, the assignment shall be recorded in the Master Register. The appropriate symbol indicating the finding by the Board shall indicate that the co-ordination procedures, as appropriate, referred to in paragraph 2.1 were not successfully completed. The date of receipt by the Board of the notice shall be entered in the column 2d of the Master Register, with the remark mentioned in paragraph 5.9.
 - 5.14 Where the Board reaches an unfavourable finding with respect to paragraph 5.5, the notice shall be returned immediately by airmail to the notifying administration with the reasons for the Board's finding and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.
- 5.15 If the administration resubmits the notice unchanged with the insistence that it be reconsidered, but should the Board's unfavourable finding under paragraph 5.5 remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in column 2d of the Master Register, with the remark mentioned in paragraph 5.9. An appropriate remark shall be placed in column 13 to indicate that the assignment is not in conformity with the provisions of paragraphs 5.2, 5.3, 5.4 or 5.5, as appropriate. In the event that the administration concerned receives no complaint of harmful interference concerning the operation of the station in question for a period of one year from the commencement of operation, the Board shall review its finding.

- 5.16 If harmful interference is actually caused to the reception of any station in the Broadcasting-Satellite Service whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to paragraphs 5.2, 5.3, 5.4 and 5.5 of this Resolution, as appropriate, by the use of a frequency assignment to a station of the Broadcasting-Satellite Service which has been subsequently recorded in the Master Register in accordance with the provisions of paragraph 5.14 of this Resolution or of No. 639CP of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.
- 5.17 If harmful interference to the reception of any station whose assignment is in accordance with paragraph 5.2 of this Resolution, is actually caused by the use of a frequency assignment which is not in conformity with paragraph 5.2 of this Resolution, or with Numbers 501, 570AB or 639BM of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.



SPACE CONFERENCE

Document No. 398-E 14 July 1971

Original: English

French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

EIGHTH REPORT OF COMMITTEE 6

(REGULATIONS)

The texts appearing in the Annexes to the present report, concerning

- Resolution No. Spa / F / (Annex 1)
- Recommendations Nos. \overline{B} and \overline{D} (Annexes 2 and 3)
- modifications to No. 89 of the Radio Regulations (Annex 4) were adopted by Committee 6.

M.K. BASU Chairman

Annexes: 4



RESOLUTION No. Spa / F /

on the use by all countries with equal rights of frequency bands for Space Radiocommunication Services

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

that all countries have equal rights in the use of both the radio frequencies, allocated to various Space Radiocommunication Services, and the geostationary satellite orbit for these services,

taking into account

that radio frequency spectrum and the geostationary satellite orbit are limited natural resources and should be most effectively and economically used;

having in mind

that the use of the allocated frequency bands and definite fixed satellite positions in the geostationary orbit by individual countries or groups of countries can start at various dates depending on requirements and readiness of technical facilities of countries.

decides

1) that the registration in the I.T.U. of frequency assignments for Space Radiocommunication Services and their use should not provide any permanent priority for any individual country or groups of countries and should not create an obstacle to the establishment of space systems by other countries;

Annex 1 to Document No. 398-E Page 4

- 2) that, in this connection, a country or a group of countries, having registered in the I.T.U. frequencies for their Space Radiocommunication Services, should take all practicable measures in order to realize the possibility of the use of new space systems by other countries or groups of countries so desiring;
 - 5) that the provisions contained in items 1 and 2 of this Resolution should be taken into account by the Administrations and the permanent organs of the Union.

RECOMMENDATION No. /B 7

concerning the examination by the Administrative Radio Conferences of the situation with regard to occupation of the frequency spectrum in space communications

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that the frequency bands available for space applications are limited in number and size;
- b) that the possible positions for satellites whose main purpose is to establish telecommunication links are limited in number and that certain positions are more favourable than others for certain links;
- c) that all administrations should be enabled to establish the space links which they deem necessary;
- d) that the scale and cost of space networks or systems are such that their operation and development must be hindered as little as possible:
- e) that technology is steadily and rapidly evolving and that the best possible use should be made of resources in space radiocommunications:
- f) that administrations should ensure that frequency assignments for space applications are utilized in the most efficient practicable manner consistent with developing technology and that such assignments are relinquished when no longer in use:
- g) that despite the provisions of Article 9A of the Radio Regulations and the principles adopted by this Conference, which provide for full consultation between administrations with a view to the maximum accommodation of all space systems, it is possible that as the use of frequencies and orbital

locations increases administrations may encounter undue difficulties in one or more frequency bands in meeting their requirements for space radiocommunication;

recommends

that, if this situation arises, it will need to be examined by the next Administrative Radio Conference, which should be empowered; to deal with the situation:

invites

the Administrative Council, in the event of such a situation arising, to include in the agenda for the next appropriate Administrative Radio Conference specific provisions enabling it to examine all aspects of the use of the frequency band(s) concerned including, for example, the relevant frequency assignments recorded in the Master International Frequency Register, and to find a solution to the problem.

RECOMMENDATION \angle No. H \nearrow

relating to technical standards for the assessment of harmful interference in the frequency bands above 28 Mc/s

The World Administrative Radio Conference for Space Telecommunications, Geneva 1971;

considering

- a) that the definition of harmful interference (No. 93 of the Radio Regulations), of a qualitative nature, leads to a purely subjective estimation of the nuisance;
- b) that, for the accomplishment of its regulatory tasks, the I.F.R.B. has adopted in its technical standards, for the frequency bands below 28 Me/s, values for the ratio between the wanted signal and the interfering signal, below which harmful interference may be expected:
- c) that "harmful interference" implies a degree of interference or a probability of interference which is considerable;
- d) that, as a consequence, it is desirable to determine the level of interference by which any emission, radiation or induction affects a Radio-communication Service beyond specific limits established for its performance with regard to the quality and reliability required by the nature of the service;
- e) that the assessment of interference values is related to various factors such as: nature of the services concerned, number of interference sources, percentages of time during which the interfering signal affects the wanted signal, etc.

and noting

- a) that the I.F.R.B. has been considering the maximum allowable values of interference given in the pertinent C.C.I.R. Recommendations, as values which ensure a satisfactory service:
- b) that, however, the I.F.R.B. does not possess data on the increases of these recommended values and on the associated percentages of time affecting a service beyond the specific limits established for its performance with regard to the quality and reliability required by the nature of the service:

invites the C.C.I.R.

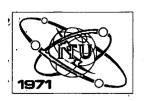
to study this subject and to recommend the technical performance criteria for the frequency bands above 28 Mc/s, allocated to Space, Radio Astronomy, and the concerned terrestrial radiocommunications services, in order to enable the I.F.R.B. and administrations to apply such criteria for these bands;

and invites the I.F.R.B.

to publish its technical standards, for the information of administrations, based upon the relevant provisions of the Radio Regulations and the Appendices thereto, the decisions of Administrative Conferences of the Union as appropriate, the Recommendations of the C.C.I.R., the state of the radio art, and the development of new transmission techniques.

MOD 89

Assigned Frequency Band: The frequency band (the centre of which coincides with the frequency assigned to the station) the width of which equals the necessary bandwidth plus twice the absolute value of the frequency tolerance.



SPACE CONFERENCE

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French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

NINTH REPORT OF COMMITTEE 6 (REGULATIONS)

The texts appearing in the Annexes to the present report, concerning:

- the modifications to Appendix 9 (Annex 1)
- the modifications to Appendix 10 (Annex 3)
- Resolution No. Spa / / (Annex 2)

were adopted by Committee 6.

M.K. BASU Chairman

Annexes: 3



Modifications to Appendix 9 to the Radio Regulations

NOC		(Heading) Se	rvice Documents
MOD	•	(see Article	s 8, 9, 9A, 10 and 20)
NOC		LIST I - Int	ernational Frequency List and Foot-notes 3 and 5
SUP		Reference in	Foot-notes 1, 2, 4 to "Geneva 1959".
MOD		Foot-note 6,	read: See Article 9, Section II and Article 9A Section II of the Radio Regulations.
MOD		Foot-note 7,	read: See Nos. 516, 517, 621, 622, 639BS, 639DM, 639DO and 639DP of the Radio Regulations.
MOD		Foot-note 8,	read: Including dates referred to in Section II of Article 9 and Section IV of Article 9A of the Radio Regulations.
NOC		LISTS II to	VIII
MOD		LIST VIIIA -	List of Space Radiocommunication Stations and Radio Astronomy Stations
			THE THE MAN AND THE REAL PROPERTY AND THE PROPERTY AND TH
MOD		Section 1:	Earth stations in the Fixed-Satellite Service
SUP		Item 3, Call Renumber the	
MOD	. •	Foot-note 1,	read: For the cases where these data must be supplied, see Nos. 639BA, 639BB and 639BC.
MOD		Item 8, read	: Identity of the associated space station(s) with which communication is to be established.

MOD		Section 2:	Space stations in the Fixed-Satellite Service
SUP		Item 2, Call Renumber the	
MOD	÷	•	: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is(are) located
NOC	•	Item 10 : Ren	marks
ADD		e) number of	f satellites used, if appropriate
MOD		f) In the ca	ase of geostationary satellite:
			l geographical longitude on the geostationary ite orbit
		the spa	the geostationary satellite orbit within which ace station could provide the required service associated earth stations or service areas
			MARTINE DE LE PROPERTO DE LE PROPERTO DE LE PROPERTO DE LA PROPERTO DEL PROPERTO DE LA PROPERTO DE LA PROPERTO DEL PROPERTO DE LA PROPERTO DEL PROPERTO DE LA PROPERTO DE LA PROPERTO DE LA PROPERTO DE LA PROPERTO DEL PROPERTO DE LA PROPERTO DEL PROPERTO DE LA PROPERTO DE LA PROPERTO DE LA PROPERTO DE LA PROPERTO DEL PROPERTO DE LA PROPERTO DE LA PROPERTO DE LA PROP
MOD		CONTRACTOR AND AND AND AND AND AND AND AND AND AND	Earth stations in the Earth Exploration- Satellite Service
SUP		Item 3, Call Renumber the	
MOD		Item 6, read	: Reception of earth exploration information
MOD		Item 7, read	: Identity of the associated space station(s) with which communication is to be established
			Windows And Committee of the Committee o
MOD		AND DESCRIPTION OF THE PROPERTY.	Space stations in the Earth Exploration- Satellite Service
SUP		Item 2, Call Renumber the	
MOD	•	Item 4, read	: Transmission of earth exploration information
MOD		Item 6, read	: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located

NOC	Item 8 : Remarks
ADD	e) number of satellites used, if appropriate
MOD	f) In the case of geostationary satellite:
	- nominal geographical longitude on the geostationary satellite orbit
	- are of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas
MOD	Section 5: Earth stations in the Radiodetermination- Satellite Service
SUP	Item 2, Call sign
MOD	Replace by "radiodetermination" all references to "radionavigation"
MOD	<pre>item 8, read : Identity of the associated space station(s)</pre>
MOD	Section 6: Space stations in the Radiodetermination- Satellite Service
SUP	Item 2. Call sign
MOD	Replace by "radiodetermination" all references to "radionavigation"
MOD	Item 7, read: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located
NOC	Item 8 : Remarks
ADD	e) number of satellites used, if appropriate
MOD	f) In the case of geostationary satellite:
	- nominal geographical longitude on the geostationary satellite orbit
	 arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas

Annex 1 to Document No. 399-E. Page 6

MOD	•	Section 7: Earth stations in the Space Research Service
SUP		Item 3, Call sign Renumber the columns
MOD		Item 7, read : Identity of the associated space station(s) with which communication is to be established
*.		you had have been been made of the development for the delay in
MOD		Section 8: Space stations in the Space Research Service
SUP		Item 2, Call sign Renumber the columns
MOD		Item 6: Service area or areas on the earth or the name of the locality and country in which the associated earth station(s) is (are) located
NOC		Item 8, Remarks
ADD		e) number of satellites used, if appropriate
MOD		f) In the case of geostationary satellite:
		- nominal geographical longitude on the geostationary satellite orbit
		- arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas
D#OD		
MOD		Section 9: Stations in the Radio Astronomy Service
NOC		Present text

RESOLUTION N . Spø / _/

The World Administrative Radic Conference for Space Telecommunications, Geneva, 1971,

considering

- a) that it has modified the definitions which appeared in the . Radio Regulations and has adopted a series of new definitions for the services and the various categories of earth and space stations;
- b) that, within the framework of these modifications, it has changed the headings and the contents of the existing nine Sections of List VIIIA (List of Stations in the Space Service and in the Radio Astronomy Service);
- c) that however, in List VIIIA so modified, it is not possible to include all the categories of earth and space stations notified to the I.F.R.B. for inclusion in the Master International Frequency Register;
- d) that the Conference has not had the time to make the required modifications:

decides

to invite the Secretary-General, in collaboration with the I.F.R.B. to take the necessary measures, on the basis of the existing Sections of List VIIIA, to have additional Sections added to this List, so that the particulars of all the earth and space stations notified to the I.F.R.B. under Article 9A of the Radio Regulations, for recording in the Master International Frequency Register, be included.

APPENDIX 10

1. New symbols

EA: Space station in the Amateur Satellite Service

TA: Space operation earth station in the Amateur Satellite Service

EB: Space station in the Broadcasting-Satellite Service (sound broadcasting)

EV: Space station in the Broadcasting-Satellite Service (television)

TF: Fixed earth station in the Radiodetermination Satellite Service

TL: Mobile earth station in the Radiodetermination Satellite Service

TT: Earth station in the Space Operation Service

TP : Receiving earth station

2. Amendments to existing symbols

Replace:

FE : Earth station (Earth-Space Service)

bу

TE: Transmitting earth station

Annex 3 to Document No. 399-E

Page 10

3. The Drafting Committee will have to amend the following symbols to adapt them to the new definitions for the services:

Replace:

EC: Communication-satellite space station

by

Space station in the Fixed Satellite Service

TC: Communication-satellite earth station

by

Earth station in the Fixed Satellite Service

TH: Space research earth station

bу

Earth station in the Space Research Service

TM : Meteorological-satellite earth station

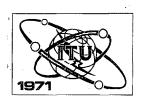
by

Earth station in the Meteorological-Satellite Service

TN : Radionavigation-satellite earth station

by

Earth station in the Radionavigation-Satellite Service



Document No. 400-E

14 July 1971

Original : English

French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

SIXTH REPORT OF COMMITTEE 6

The draft Resolution text appearing in the Annex to the present Report was <u>adopted</u> by Committee 6.

The text relates to the technical criteria recommended by the C.C.I.R. for sharing frequency bands between Space and Terrestrial Radiocommunication Services or between Space Radiocommunication Services.

M.K. BASU Chairman

Annex: 1



RESOLUTION /A 7

relating to the technical criteria recommended by the C.C.I.R. for sharing frequency bands between / space and terrestrial services / or between / space services 7

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971

considering

- a) that, in frequency bands shared with equal rights by \(\sum_{\text{Space}} \) and Terrestrial Services \(\sum_{\text{,}} \) it is necessary to impose certain technical limitations and co-ordination procedures on each of the sharing services in the interest of controlling mutual interference;
- b) that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose co-ordination procedures in the interest of controlling mutual interference;
- c) that the technical criteria and co-ordination procedures referred to in a) and b) above, and as set forth in the Radio Regulations, are mainly based upon Recommendations of the C.C.I.R.;
- d) that, in recognition of the successful sharing of frequency bands by /Space and Terrestrial Services /, and the continuing improvements in space technology, each Flenary Assembly of the C.C.I.R. subsequent to the Xth Plenary Assembly, Geneva, 1963, has improved upon some of the technical criteria recommended by the preceding Plenary Assembly;
- e) that Plenary Assemblies of the C.C.I.R. are held triennally whereas Administrative Radio Conferences, which are empowered to modify the Radio Regulations making substantial use of the Recommendations of the C.C.I.R. are in practice held less frequently and with much less regularity;
- that the International Telecommunication Convention of Montreux, 1965, recognizes the right of Members and associated Members of the Union to make special agreements on telecommunication matters; however, such agreements shall not be in conflict with the terms of the Convention or of the Regulations annexed thereto, so far as concerns the harmful interference to the radio services of other countries;

is of the opinion

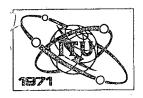
that subsequent Plenary Assemblies of the C.C.I.R. are likely to make further changes in the recommended technical criteria; and

that administrations should be afforded the opportunity to take advantage of the current C.C.I.R. Recommendations on sharing criteria when planning systems for use in frequency bands shared with equal rights by / Space and Terrestrial Services / , or between / space systems / ,

therefore resolves that

- each Plenary Assembly of the C.C.I.R. should arrange for the Secretary-General of the I.T.U. to be informed of those Recommendations of the C.C.I.R. affecting the technical criteria relating to sharing between Space and Terrestrial Services or between Space Services;
- 2. following the distribution to administrations of the relevant C.C.I.R. texts, the Secretary-General shall write to administrations asking them to indicate within one hundred and twenty days, to which of the C.C.I.R. Recommendations or to which specific technical criteria defined in the Recommendations referred to in 1. above they agree for use in the application of the pertinent provisions of the Radio Regulations:
- 5. the administrations which do not respond to the Secretary-General's enquiry within one hundred and twenty days shall be deemed to wish the application for the time being of the specific technical criteria referred to in the existing Regulations;
- 4. in those cases where an administration, in its reply to the Secretary-General's enquiry, indicates that a specific C.C.I.R. Recommendation or a specific technical criterion defined in those Recommendations is not acceptable to it, or where an administration has not replied to the Secretary-General's enquiry as in paragraph 3. above, the relevant technical criteria defined in the Radio Regulations shall continue to apply with respect to cases involving that administration;
- 5. The Secretary-General shall publish, for the information of all administrations, a consolidated list prepared by the I.F.R.B. on the basis of the replies to the enquiry, of the C.C.I.R. Recommendations or of the specific relevant technical criteria defined in those Recommendations, and to which administrations each of those Recommendations or specific relevant technical criteria are acceptable or are not acceptable. This list shall also include those administrations mentioned in paragraph 3. above;

- 6. the I.F.R.B. be directed to take into account:
 - a) the applicability of the C.C.I.R. technical criteria consonant with the list referred to in 5. above, when making technical examinations with respect to cases involving only administrations to which such criteria are acceptable;
 - b) the applicability of the technical criteria defined in the Radio Regulations consonant with the list referred to in 5. above, when making technical examinations with respect to cases involving an administration which does not accept the relevant C.C.I.R. technical criteria.
- 7. If, at a later date, questions arise concerning the application of the relevant technical criterion or criteria to a case involving administrations described in paragraph 3. above, the I.F.R.B. shall enquire of the administrations concerned whether or not they would agree to the application of the technical criterion or criteria defined in the relevant C.C.I.R. Recommendations referred to in paragraph 1. above. The list published pursuant to paragraph 5. above shall be updated on the basis of the reply of the administration or of the absence of reply.



Document No. 401-E 14 July 1971

Original: French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

I have received a letter from the Head of the Delegation of the Socialist Republic of Roumania, the text of which is attached hereto.

Gunnar PEDERSEN
Chairman of the Conference

Annex: 1



Mr. Gunnar PEDERSEN Chairman of the World Administrative Radio Conference for Space Telecommunications

Dear Sir,

I should be grateful if you would kindly issue as a document of the World Administrative Radio Conference for Space Telecommunications, 1971, the attached statement by the Delegation of the Socialist Republic of Roumania concerning the presence of certain delegations at the Conference.

Yours faithfully,

Gh. Airinei Head of the Delegation of the Socialist Republic of Roumania

Geneva, 14 July 1971

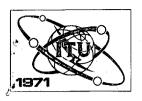
Annex: 1

Annex

The Delegation of the Socialist Republic of Roumania states on behalf of its Government that only the Government of the People's Republic of China, and not the puppet régime of Taiwan, is entitled to represent that country.

The Roumanian Delegation also considers that the only lawful representative of South Viet-Nam is the Provisional Revolutionary Government of the Republic of South Viet-Nam.

Finally, the Roumanian Delegation questions the right of the Seoul authorities to represent Korea as a whole since that régime cannot represent the Korean people.



Addendum No. 5 to Document No. 402-E 16 July 1971

Original: French

Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE SECRETARIAT

FINAL PROTOCOL

Please add the attached annexes to Document No. 402.

Annexes: 2



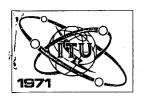
A N N E X 1

REPUBLIC OF CHILE

The Chilean Delegation reserves the right for the Republic of Chile to take, in cooperation with the International Telecommunication Union, such action as it may consider legitimate to safeguard its sovereignty and interests should any Member or Associate Member fail to comply with any or all of the provisions of the revised Radio Regulations, Geneva, 1971, and the Montreux Conventión, 1965, or should reservations made by other countries affect directly or indirectly the interests and/or telecommunication systems of the Republic of Chile.

CENTRAL AFRICAN REPUBLIC

The Delegation of the Central African Republic to the World Administrative Radio Conference for Space Telecommunications (Geneva, 1971) signs the Final Acts of the present Conference but reserves for the Government of the Central African Republic the right to take such action as it may consider necessary to safeguard its interests should certain Members or Associate Members fail in any way to comply with the decisions of the present Conference or should action resulting from the reservations made by other countries jeopardize the efficient operation of its telecommunication services.



Addendum No. 4 to
Document No. 402-E
16 July 1971
Original; English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE SECRETARIAT

FINAL PROTOCOL

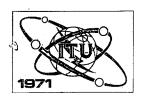
The attached annex should be added to Document No. 402.

Annex: 1



JAMAŢCA

The Delegation of Jamaica reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should any Member fail in any way to comply with the decisions of the World Administrative Radio Conference (Geneva, 1971) and in so doing jeopardize the telecommunication services of Jamaica.



Addendum No. 3(Rev.) to
Document No. 402-E
26 July 1971
Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE SECRETARIAT

FINAL PROTOCOL *)

The attached Annex should be added to Document No. 402.

Annex : 1



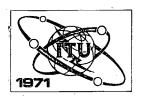
^{*)} As modified during the 13th Plenary Meeting

GENERAL

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, decided that the following Statement by India should be included in the Final Protocol forming part of the Final Acts of the Conference:

"In India, the band 845-935 MHz is also used in the experimentation of satellite broadcasting of television with frequency modulation including energy dispersal, subject to agreement with the administrations having services operating in accordance with the Table which may be affected.

For the protection of Terrestrial Television Services the power flux-density limit given in Radio Regulation 332A will apply; and for the protection of Fixed and Mobile Services operating in this band, the power flux-density limit given in Radio Regulation 470 NI and the power flux-density limit in Radio Regulation 470 NK will apply."



Addendum No. 3 to Document No. 402-E 15 July 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE SECRETARIAT

FINAL PROTOCOL

The attached Annex should be added to Document No. 402.

Annex: 1

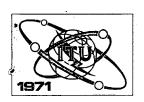


GENER AL

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, decided that the following be included in the Final Protocol forming part of the Final Acts of the Conference:

In India, the band 845-935 MHz is also used in the experimentation of satellite broadcasting of television with frequency modulation including energy dispersal, subject to agreement with the Administrations having services operating in accordance with the Table which may be affected.

For the protection of Terrestrial Television Services the power flux-density limit given in foot-note 332A will apply; and for the protection of Fixed and Mobile Services operating in this band, the power flux-density limits in Article 7, 470NI and 470MB will apply.



Addendum No. 2 to
Document No. 402-E

15 July 1971 Original: English

> French Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS — GENEVA — 1971

PLENARY MEETING

MEMORANDUM BY THE SECRETARIAT

FINAL PROTOCOL

The attached annexes should be added to Document No. 402.

Annexes: 3



REPUBLIC OF VENEZUELA

The Delegation of the Republic of Venezuela to the World Administrative Radio Conference for Space Telecommunications, Geneva (1971), declares that, in signing the Final Acts of the Conference, it expressly reserves the right for its Government to adopt or not to adopt the conclusions of the Conference and to take any steps that it may deem fit to safeguard its interests and to protect its telecommunication networks should any Member or Associate Member fail to comply with the provisions of the Radio Regulations as amended or supplemented at the date mentioned above.

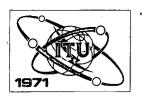
REPUBLIC OF THE NIGER

The Delegation of the Republic of the Niger reserves for its Government the right to take any steps it may deem fit and adequate to safeguard its interests should any country fail in any way to comply with the provisions contained in the Final Acts of this Conference or should reservations made by any country jeopardize the efficient operation of its telecommunications.

PAKI STAN

In signing the Final Acts of the World Administrative Radio Conference for Space Telecommunications, Geneva 1971, the Delegation of Pakistan reserves the right of its Government to adhere to all or to some of the provisions of the revised Radio Regulations (Geneva, 1959).

The Delegation of Pakistan further declares that it reserves the right of its Government in accepting implications that may arise through the non-adherence by any other country Member of the Union to the provisions of these Revised Radio Regulations.



Addendum No. 1 to
Document No. 402-E
15 July 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE SECRETARIAT

FINAL PROTOCOL

Please add the attached annexes to Document No. 402.

Annexes: 4



DEMOCRATIC REPUBLIC OF THE CONGO

The Delegation of the Democratic Republic of the Congo to the World Administrative Radio Conference for Space Telecommunications (Geneva, 1971) reserves for its Government the right, in co-operation with the International Telecommunication Union, to take such action as it may consider necessary to safeguard its interests should any Members or Associate Members fail to comply with the provisions of the revised Radio Regulations, or should reservations made by other countries jeopardize the efficient operation of its telecommunication services.

ISLAMIC REPUBLIC OF MAURITANIA

The Delegation of the Islamic Republic of Mauritania to the World Administrative Radio Conference for Space Telecommunications (Geneva, 1971), in signing the Final Acts of this Conference, reserves for its Government the right, in co-operation with the International Telecommunication Union, to take such action as it may consider necessary to:

- safeguard its interests, or
- protect, in all the frequency bands concerned, its existing, projected or future telecommunication network, should certain Members or Associate Members fail in any way to comply with the revised and supplemented provisions of the Radio Regulations, or should reservations made by other countries jeopardize the normal operation of its telecommunication services.

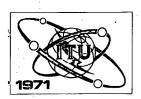
REPUBLIC OF RWANDA

The Delegation of the Republic of Rwanda, in signing the Final Acts of the World Administrative Radio Conference for Space Telecommunications (Geneva 1971), reserves for its Government the right to take such action as it may consider necessary to safeguard its interests, should any Members or Associate Members fail in any way to comply with the provisions of the Radio Regulations (Geneva 1959) as revised by this Conference or should reservations made by other countries jeopardize the efficient operation of its telecommunication services.

REPUBLIC OF THE SENEGAL

The Delegation of the Republic of the Senegal to the World Administrative Radio Conference for Space Telecommunications (Geneva 1971), in signing the Final Acts of this Conference, reserves for its Government the right to take such action as it may consider useful or necessary:

- to safeguard its interests in the use of the frequency bands above 40 Gc/s;
- or should certain Members fail in any way to comply with the decisions of this Conference or should acts deriving from reservations made by other Members jeopardize the efficient operation of its telecommunication services.



SPACE CONFERENCE

Document No. 402-E 14 July 1971

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

Memorandum by the Secretariat

FINAL PROTOCOL

On 14 July, at 1800 hours, the following texts had been received for publication in the Final Protocol:

- - Federal Republic of Cameroon
 - Ceylon
 - Republic of the Ivory Coast
 - Republic of Indonesia
 - Iran
 - Republic of Singapore

Annexes: 6



FEDERAL REPUBLIC OF CAMEROON

The Delegation of the Federal Republic of Cameroon to the World Administrative Radio Conference for Space Telecommunications (Geneva, 1971), unable at the present state of its development to make pertinent comments on the proposed allocation of frequencies between 40 and 275 Gc/s, yet earnestly wishing to encourage technological progress,

signs the Final Acts of the present Conference but reserves for its Government the right to take such action as it may consider necessary to safeguard its interests, and to protect its telecommunication network should certain Members or Associate Members fail to comply with the provisions of the Radio Regulations thus revised and amplified.

V M M E X S

CEYLON

The Delegation of Ceylon reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should certain Members fail in any way to comply with the decisions of the World Administrative Radio Conference (Geneva, 1971), or should reservations by other countries jeopardize its telecommunication services.

REPUBLIC OF THE IVORY COAST

The Delegation of the Ivory Coast wishes to declare that, by virtue of the powers conferred on it, it reserves for its Government the right to take such action as it may consider necessary, in co-operation with the International Telecommunication Union, to safeguard its interests should any Members or Associate Members fail in any way whatever to comply with the provisions in the revised version of the Radio Regulations, Geneva (1959), prepared by the World Administrative Radio Conference for Space Telecommunications, Geneva (1971), or should reservations made by other countries jeopardize the efficient operation of its telecommunication services.

REPUBLIC OF INDONESIA

The Indonesian Delegation is of the firm belief that only through close international co-operation on as broad a basis as possible could the tremendous potential of the satellite communications be realized.

Indonesia being an archipelago with a vast land and sea area looks forward with great hope to the expansion of the satellite communication as to help solving our tremendous communication problems.

The great importance of the satellite communications in helping to diffuse education, information, and other public services to the people in places far away from the capitals is being fully recognized by the developing countries.

There is, however, great need for the developing countries to fully participate in the discussions and in important decisions concerning the future of the satellite systems. They need to be continuously informed with regard to its further progress and development.

Furthermore, the developing countries should not be left with a feeling as being dependent on the goodwill of a small group in order to enjoy the progress of this technology. The use of the satellite system should not be limited to a few rich; assistance measures have therefore to be devised so as to allow even the poorest among the developing countries to take advantage of the progress in the satellite communication systems.

If the progress of this technology is to benefit mankind as a whole and if it is to become a substantial contribution towards the success of the Second Development Decade, then it is necessary that more attention be given to the interest of the developing countries.

Indonesia is grateful to the I.T.U. and the U.N.D.P. for the assistance given so far in the improvement of our communication system. There are, however, projects which are still to be completed such as: the regional telecommunication network in South East Asia, educational projects, telecommunication projects in West Irian in the framework of the Funds for Development for West Irian and others for which further assistance is being required. It is further our sincere hope that Indonesia could be given technical assistance in developing its own national satellite communication system.

IRAN

The Imperial Government of Iran reserves the right to take such action as it may consider necessary to protect and use its services as operated at present or to be brought into operation in the future should they be affected by the services of other countries.

It also reserves the right not to accept the I.F.R.B. procedures for registering the frequencies now used or to be used in the future in respect of its equipment and on its territory.

The Delegation of Iran therefore reserves for its country the right to take such action as may be necessary to meet its requirements in telecommunications and to protect its existing and future services without restriction of any sort as to the equipment used or to be used in the future in all frequency bands.

REPUBLIC OF SINGAPORE

In signing the Final Acts of the World Administrative Radio Conference for Space Telecommunications (Geneva, 1971), the Delegation of the Republic of Singapore reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should any country fail in any way to comply with the requirements of the Final Acts of this Conference or should reservations made by any country jeopardize the Telecommunications Services of the Republic of Singapore.



SPACE CONFERENCE

Document No. 403-E 15 July 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

I have received a letter from the Head of the Delegation of the United States of America, the text of which is attached hereto.

Gunnar PEDERSEN
Chairman of the Conference

Annex: 1



A N N E X

UNITED STATES MISSION TO INTERNATIONAL ORGANIZATIONS

GENEVA, SWITZERLAND

15 July 1971

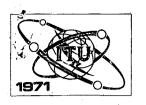
Chairman of the World Administrative Radio Conference for Space Telecommunications

Dear Sir,

The Delegation of the United States of America to the World Administrative Radio Conference for Space Telecommunications regrets the circulation of Document No. 290-E which is not only frivolous and irrelevant to the problems of WARC-ST, but ignores the fact that the Republic of China, the Republic of Korea and the Republic of Viet Nam are members in good standing of the International Telecommunication Union.

Sincerely yours,

Robert C. TYSON
Chairman
Delegation of the United States



SPACE CONFERENCE

Document No. 404-E 15 July 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

FOURTH PLENARY MEETING

Monday, 12 July 1971, at 1500 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Subjects discussed	Document No.
1. Draft recommendation relating to the use	349
of satellite communication systems in the event of natural disasters, epidemics, famines and similar emergency situations	360 (Series B7, pp. 03, 04)
2. First reading of texts submitted by the Editorial Committee	
a) Series B4	326
b) Series B5	343
c) Series B6	352
d) Series B7 (pages Ol, O2)	360



The <u>Chairman of Committee 2</u> said that the credentials of the Delegation of Tunisia had that morning been studied and found in order.

1. <u>Draft Recommendation relating to the use of satellite communication systems in the event of natural disasters, epidemics, famines and similar emergencies</u> (Document Nos. 349, 360 (Series B7, pages 03, 04)

It was <u>agreed</u>, since Document No. 349 had been through the Editorial Committee before coming to the Plenary, to discuss the draft Recommendation as it appeared in Series B7, pages 03 and 04 (Document No. 360).

Introducing the draft Recommendation, the <u>Delegate of the Philippines</u> said the changes, other than those of a minor editorial nature, made to the original proposal (Document No. 224) were as follows: the title had been brought into line with United Nations terminology; and, in accordance with suggestions made at the third Plenary meeting, a paragraph 2 had been added to the section under "recommends" (where the original section had been combined into the present paragraph 1) and the paragraphs under "requests" and "invites" had been altered.

After some discussion on whether the word "provide" in paragraph 1 under "recommends", page 03, was too strong, it was <u>agreed</u> to leave the text as it stood. In the same paragraph, it was agreed to <u>delete</u> the word "/ international /" as the paragraph would also apply to national systems.

In reply to a query from the <u>Observer from the World Meteorological Organization</u>, the <u>Secretary-General</u> confirmed that the final text would be in the form of a Recommendation, not a Resolution. Such a procedure was in line with I.T.U. practice, in spite of the inclusion of sections headed "requests" and "invites".

The <u>Director of the C.C.I.R.</u> mentioned that, in view of the interest shown by radio amateurs throughout the world in co-operating with relief operations, delegates might wish on return to their countries to look into the possibilities of using the amateur service in this respect.

The draft Recommendation (pages B7 - 03 to 04), as amended, was adopted.

2. First reading of texts submitted by the Editorial Committee

a) Series B4 (Document No. 326)

In reply to queries from the <u>Delegates of Argentina and Poland</u>, the <u>Chairman</u> said that the parts of the texts of the blue documents that were enclosed in square brackets represented information that was not yet in its final form. That information was being prepared by a small ad hoc drafting group convened by the Chairmen of Committees 4 and 5, after which it would be sent direct to the Editorial Committee for incorporation into the pink documents and would be examined by the Plenary at that stage. The

task of the present meeting would therefore be to examine only the parts of the document not in square brackets.

Replying to a suggestion from the <u>Delegate of Israel</u> that it would be helpful for delegates to have a summary table by frequency range and service for reference when considering any particular provision, the <u>Chairman of Committee 4</u> said that although the drafting group had considered such a suggestion useful it had not yet had time to complete the drafting of such a table. The <u>Vice-Chairman of the I.F.R.B.</u> said that in any case a similar document was always prepared for the assistance of administrations after each administrative conference.

Page B4 - 01

Following the point raised by the <u>Delegate of Kenya</u> that the frequency sub-divisions listed in MOD 112 did not appear to be followed in parts of the Table of Frequency Allocations (Article 5), or in parts of Articles 9 and 10, a general discussion took place on whether the second and perhaps also the third sentence of the provision should be deleted. However, as the text of MOD 112 referred to the table in that provision only, as departures from the table elsewhere in the Radio Regulations were covered by the third sentence and as no difficulty had been caused in the past by the provision (the only change to the existing RR 112 being the substitution of "hertz" for "cycles per second"), it was <u>agreed</u> to leave the text as it stood.

The Delegate of Argentina pointed out the following corrections to the Spanish text only: the word "gigahertzios" should be inserted in the first line of the third indented sub-paragraph after "en"; and the expression "0,3 x 10N a 3 x 10N Hz" in Note 1 should read "0,3 x 10^N a 3 x 10^N Hz".

The proposal of the <u>Delegate of Argentina</u>, supported by the <u>Director of the C.C.I.R</u>. and other speakers, that it would be more correct if the word "Abbreviations" in Note 2 were replaced by "Symbols and prefixes" was <u>approved</u> after a short discussion.

Page Ol, as amended, was approved.

Pages B4 - 02 to 03

The <u>Chairman of Committee 7</u> pointed out the following correction to be made to the text of ADD 470NB: the words ", in particular," to be inserted on the second line of page B4 - 03 after "and". The <u>Delegates of the United States of America</u> and of <u>Australia</u> queried the need to have the earth-exploration satellite service mentioned in that and other provisions and it was <u>agreed</u> that Committee 7 should look into the point.

Document No. 404-E Page 4

The Chairman of the I.F.R.B. pointed out that the words "where this / these / band / s / service." appearing on the second and third lines of page B4 - 03 were missing from the Spanish text, which should be amended accordingly.

Pages 02 to 03, as amended, were approved.

Pages B.4 - 04 to 09

Approved.

Pages B4 - 10

In reply to a query from the <u>Delegate of Austria</u>, the <u>Chairman</u> explained that the provisions given in square brackets in ADD 470NZB had been included for the guidance of Committee 7 in making the final draft. No question of substance was involved.

Page 10 was approved.

Page B4 - 11

The <u>Delegate of Canada</u> pointed out that the word "spatiale" was missing after "station" on the fifth line of the French text for ADD 470 / .../.

The <u>Delegate of the United States of America</u> proposed the insertion of the words "or Meteorological-Satellite Service" after the "Fixed Satellite Service" on the third line of ADD 470 / .../.

Page 11, as amended, was approved.

Page B4 - 12

Approved.

b) Series B.5 (Document No. 343)

Pages B5 - 01

The Delegate of France said that "space system" should be replaced by "satellite network" in ADD 470 \sqrt{c} .

Page B5 - 02

Following a suggestion by the <u>Delegate of France</u> that the final part of the first paragraph should be split into two sentences, it was <u>agreed</u> to leave the redrafting of that paragraph to the Editorial Committee.

Page B5 - 03

Approved.

c) Series B.6 (Document No. 352)

The <u>Chairman of the Editorial Committee</u> said that certain discrepancies had been found between the different language versions and in view of the importance of Article 9A it was proposed to set up a separate small drafting group including members of Committee 6 to align the three texts.

The <u>Delegates of Canada</u>, the <u>United States of America</u>, the <u>United Kingdom</u>, <u>France</u> and <u>Mexico</u> supported that proposal and said they would participate in the work of the group, the chairmanship to be confirmed later as the Chairman of Committee 6 was not present at the meeting at that moment.

The <u>Chairman</u> therefore requested that all drafting matters be dealt with by the group just set up and that the Committee deal with matters of substance only.

Page B6 - 01

In reply to the <u>Delegate of Syria</u>, the <u>Chairman of Committee 6</u> said that the square brackets had been left around the reference to stations in the broadcasting satellite service pending a constructive proposal for a separate resolution from Committee 6.

Page 01 was approved, subject to a drafting change noted by the Delegate of Finland.

Pages B6 - 02 and 03

Approved.

Page B6 - 04

Approved, subject to the examination of 639AK \sqrt{a} by the drafting group referred to above.

Page B6 - 05

The <u>Delegate of Pakistan</u> having asked for clarification on the foot-note, the <u>Chairman of the I.F.R.B.</u> explained that no technical data on co-ordination between broadcasting satellite space stations appeared in the Radio Regulations.

Page 05 was approved.

Page B6 - 06

The Chairman of the I.F.R.B. said that Article 9A should be brought into line with Article 9 in the light of the decision taken in Committee 6 to replace fixed or mobile services by terrestrial radiocommunications with an appropriate foot-note.

Approved, subject to that amendment.

Page B6 - 07

Approved.

Page B6 - 08

Approved, subject to a correction pointed out by the <u>Delegate of Canada</u>.

Page B6 - 09

The <u>Delegate of Grechoslovakia</u> asked for the foot-note 639AR.1 to mention Region 1 as well as Region 3 and that proposal was supported by the <u>Delegates of Poland</u>, the <u>U.S.S.R.</u>, <u>Bielorussia</u>, <u>Bulgaria</u>, <u>Ethiopia</u> and <u>Syria</u> as the countries in question used the bands extensively for other services and co-ordination was essential.

The <u>Delegates of the United Kingdom</u>, <u>Federal Republic of Germany</u>, <u>France</u> and <u>Spain</u> were opposed to the inclusion of Region 1 in the foot-note.

The <u>Delegate of New Lealand</u> proposed that "Region 3" in the foot-note be replaced by "that area of Region 3 north of latitude 15°N". The <u>Delegate of India</u> was prepared to accept the revised foot-note provided that it modified to "north of latitude 10°N"; the <u>Delegate of Indonesia</u> said he could not agree with the proposal and the <u>Delegate of Australia</u> said he shared the New Zealand position and could not accept 10°N.

The <u>Delegate of Pakistan</u> preferred the foot-note to be retained as it stood.

In reply to queries from the <u>Delegates of Kenya</u> and <u>Sweden</u> on the origin of the note, the <u>Delegate of the Netherlands</u> said he had on several occasions explained its existence in the Radio Regulations. Region 3 had been excluded from the application of paragraph c) as a result of a special agreement between some administrations participating in the 1963 Space Conference.

The Delegate of the Democratic Republic of the Congo wondered to what extent such an agreement was binding on an administrative conference.

The <u>Chairman</u> thought a reasonable solution would be to list countries rather than refer to regions. The <u>Delegates of Syria</u> and <u>India</u> did not think that satisfactory as the countries concerned were in fact seeking co-ordination with other countries.

The <u>Delegates of Senegal</u> and <u>Ethiopia</u> agreed with a suggestion by the <u>Delegate of Kenya</u> to include Region 1 in the foot-note, with a note excluding those countries which were prepared to forego co-ordination procedures.

The <u>Delegate of Mexico</u>, supported by the <u>Delegates of Cuba</u>, <u>Argentina</u>, <u>Kuwait and Chile</u>, thought the whole of paragraph c) should be deleted and proposed that a vote be taken on that point.

The <u>Delegate of France</u>, supported by the <u>Delegate of the U.S.S.R.</u>, thought a vote was premature and that it should be deferred to the following meeting.

It was so agreed.

Pages B6 - 10 to 19

Approved.

Page B6 - 20

Approved, subject to the correction of the reference in 639CI to numbers 639BP, 639BQ and 639BR.

Pages B6 - 21 to 23

Approved.

Page B6 - 24

Approved, subject to revision of the wording of 639DD by the drafting group.

Pages B6 - 25 to 28

Approved.

The <u>Delegate of Svria</u> reserved the right to revert to the subject if the Broadcasting-Satellite Service were included in Article 9A.

Document No. 404-E Page 8

d) Series B.7 (Document No. 360)

Page B7 - 01

Further to proposals made by the <u>Delegates of France</u>, <u>Greece</u> and <u>Brazil</u>, it was <u>agreed</u> that the definition of satellite network should begin "A satellite system, or part of a satellite system, consisting of ..."

The <u>Delegate of the Netherlands</u> asked what the relation was between the definition of satellite system in B.3 - 02 and the one just adopted. The <u>Chairman of Committee 4</u> agreed that the definitions would have to be brought into line by the drafting group.

Page Ol approved, subject to amendment.

Page B7 - 02

There was considerable discussion on the necessity for retaining the reference to a geographical map in ADD 103C (Co-ordination contour). The Delegates of the Democratic Republic of the Congo, Poland and Ethiopia were in favour of deleting it, and the Representative of the I.F.R.B. and the Director of the C.C.I.R. also felt it could be removed. The Chairman thought that deletion of the word "geographical" might be a satisfactory solution, whereas the Delegate of Brazil preferred deletion of the whole phrase "on a geographical map on which an earth station location is represented".

The <u>Delegate of the United Kingdom</u> thought that contour had no real meaning without a map and was opposed to deletion of the phrase, but nevertheless agreed to withdra his opposition.

It was <u>decided</u> that the definition would begin "The line joining the points ...".

Page 02 approved, as amended.

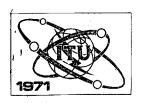
The meeting rose at 1915 hours.

The Secretary:

C. STEAD

The Chairman:

Gunnar PEDERSEN



SPACE CONFERENCE

Document No. 405-E 15 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

I have received a letter from the Head of the Delegation of the Republic of Korea, the text of which is attached hereto.

Gunnar PEDERSEN
Chairman of the Conference

Annex: 1





CONFERENCIA ESPACIAL

Corrigendum No. 1 to
Document No. 406-F/E/S
16 July 1971

Original : English

CONFERENCIA ADMINISTRATIVA MUNDIAL DE TELECOMUNICACIONES ESPACIALES - GINEBRA - 1971

PLENARY MEETING

In the Annex, 2^{nd} and 3^{rd} lines, read :

.... by the Delegations of Cuba, Poland and Roumania respectively...

En el Anexo, 2.ª línea, léase:

... las Delegaciones de Cuba, de Polonia y de Rumania...

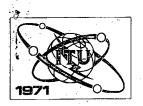
Ne concerne pas le texte Grançais.

STATEMENT

The Delegation of the Republic of Korea regrets that the technical forum of the present Conference is again misused for cheap political propaganda by a certain delegation.

The remarks contained in the statement annexed to Document No. 290-E do not correspond with the purpose of the present Conference and are in total violation of its terms of reference, namely Article 7 of 1965 Montreux Convention on International Telecommunication.

The annexed statement of Document No. 290-E, obviously politically motivated and unrelated to the substance of the present Conference, should therefore be completely disregarded.



SPACE CONFERENCE

Document No. 406-E 15 July 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

I have received a letter from the Head of the Delegation of the Republic of China, the text of which is attached hereto.

Gunnar PEDERSEN Chairman of the Conference

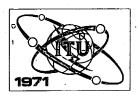
Annex : 1



A N N E X

With reference to Documents Nos. 290, Annex, 379, Annex and 401, Annex, which have been circulated by the Delegations of Cuba and Poland respectively, the Delegation of the Republic of China wishes to repeat what it expressed at the Second Meeting of Committee 2 on 17 June 1971 and contained in the Summary Record in Document No. 167, Annex.7. In accordance with the provisions of paragraph 12 of Article 2 of the I.T.U. Convention, the Delegation of the Republic of China has every right to attend this Conference as the only legal representative of China.

This statement will equally apply to any other derogatory remarks or statements on the representation of China in this Conference.



Document No. 407-E 15 July 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

ALGERIA
AUSTRALIA
CANADA
CHILE
NEW ZEALAND
SYRIA

RECOMMENDATION No.

relating to the preferred frequency bands for tropospheric scatter systems

The World Administrative Radio Conference for Space Telecommunications, Geneva 1971,

considering

the technical and operational difficulties pointed out by the C.C.I.R., particularly in the Report of the Special Joint Meeting, Geneva, 1971, in bands shared by tropospheric scatter systems and space systems;

recognizing, however,

that Administrations will wish to continue to use tropospheric systems in order to satisfy certain telecommunications requirements;

noting

that the proliferation of such systems in all frequency bands, particularly those shared with space systems, will only serve to aggravate an already difficult situation;

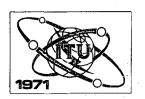
requests

that the C.C.I.R. urgently study the radio-frequency requirements for tropospheric scatter systems and recommend the preferred radio frequencies for such systems;

invites

the Administrative Council to arrange that a future Administrative Conference allocate specific frequency bands, unshared with space services, for use by new tropospheric scatter systems.





<u>Document No. 408-E</u> 16 July 1971

Original: French

English Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

EDITORIAL COMMITTEE.

relating to the Abrogation of Obsolete Resolutions and Recommendations of the Extraordinary Administrative Radio Conference to Allocate Frequency Bands for Radiocommunication Purposes, Geneva, 1963

The World Administrative Radio Conference for Space Telecommunications, Geneva, 1971

considering

a) that all necessary action has been taken on the following Resolutions and Recommendations of the Extraordinary Administrative Radio Conference, Geneva, 1963:

__Resolution No. Spa 2 Relating to Space Vehicles in Distress and Emergency_/;

__Resolution No. Spa 3 Relating to the Category of the Fixed and Mobile Services in the Band 1 525-1 540 Mc/s_/;

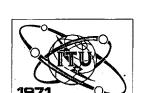
b) that the undermentioned Recommendation of the Extraordinary Administrative Radio Conference, Geneva, 1963, is obsolete:



Document No. 408-E Page 2

resolves

that the said Resolutions and Recommendations are abrogated.



Document No. 409-E 16 July 1971 Original: Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

I have received a letter from the Head of the Delegation of Chile, the text of which is attached hereto.

Gunnar PEDERSEN
Chairman of the Conference

Annex: 1



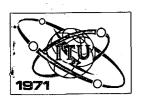
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ANNEX

STATEMENT BY THE DELEGATION OF CHILE

The Chilean Delegation considers that the place reserved for China at this Conference should be occupied by a representative of the Government of the People's Republic of China, which is the lawful representative of the Chinese people.



Document No. 410-E 16 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

SIXTH PLENARY MEETING

Wednesday, 14 July 1971, at 1100 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Subjects discussed 1. First reading of texts submitted by the Editorial Committee - Series B.ll 2. Organization of work Document No.



1. First reading of texts submitted by the Editorial Committee - Series B.11 (Document No. 381)

The Delegate of the United Kingdom, speaking on behalf of the small drafting group appointed by Committee 6 to deal with changes in Articles 9 and 9A, said that a few small editorial and typing errors had been noted and would be corrected, and he would only draw the attention of the Plenary Meeting to four substantive changes suggested by the group. On page B.11 - 03, at the end of MOD 490, a comma should be placed after "broadcasting stations" in the third line, the word "or" should be deleted, a comma should be inserted after the last word and the following phrase should be added : "or to stations of the fixed or mobile service which operate in frequency bands listed in Table II of Appendix 28 with e.i.r.p. exceeding the corresponding values listed in that Table"; on page B.11 - 04, foot-note MOD 492A.3 could be deleted, since "co-ordination area" was now a defined term; on page B.11 - 05, in the second line of sub-paragraph b) of MOD 492C, the word "exceed" should be replaced by "increase" and the word "acceptable" should be deleted; and on page B.11 - 15, in sub-paragraph a) of ADD 635A, the word "preparation" should be replaced by "verification" and "No. 492A" by "No. 639AN", to bring the text into line with the corresponding provision of Article 9A. Finally, a change which was not really substantive, although it might seem so, should be made in the title of Sub-Section I on page B.11 - 08, where the square brackets round "terrestrial" should be removed and the words "in the fixed or mobile service" should be deleted.

The <u>Chairman</u> invited delegates who wished to make drafting changes to submit them in writing to the Editorial Committee.

Page B.11 - 01

Approved.

Page B.11 - 02

The <u>Delegate of Canada</u> pointed out that in the French text of NOC 487 the adjective "terrestre", corresponding to "land", had been omitted.

Approved.

Page B.11 - 03

The <u>Delegate of France</u> said he was very glad to be able to announce that if the drafting group's amendment to MOD 490 was accepted, his delegation would not be obliged to raise again in the Plenary Meeting the

question which had been discussed at length in Committee 6 in connection with Document No. 188(Rev.). The amendment offered all administrations protection for their earth stations vis-à-vis terrestrial stations beyond the co-ordination area, a point with which the French Administration was greatly concerned.

Approved, as amended by the drafting group.

Page B.11 - 04

Approved, as amended by the drafting group.

Page B.11 ~ 05

The <u>Delegate of Pakistan</u> said he found it difficult to accept the drafting group's amendment to MOD 492C, sub-paragraph b), because the omission of the word "acceptable" left the term "level of interference" unduly vague. The question of the words to be used to qualify interference levels had been discussed at length in Committée 6, which had used the word "permissible" in the version of the sub-paragraph appearing in Document No. 377. He would therefore suggest either that the clause should be left unchanged or that the phrase should read "... not to increase the acceptable level...".

The <u>Delegate of the United States of America</u> agreed that care should be taken to use the correct adjective to qualify the level of interference, but pointed out that in the case at issue there was no need for such a word, as the situation was one where the assignment, having been approved, operated in a stable environment so far as interference to and from the earth stations of other administrations was concerned.

The <u>Delegate of Pakistan</u> said he could accept the amendment on the understanding that the level of interference was not to be increased in relation to the level accepted earlier.

The <u>Director of the C.C.I.R.</u> observed that under the original text increases of the interference level were permitted, but only to the extent that the final level did not exceed the acceptable level. As the clause was now worded, if the interference level was increased slightly but still remained below the acceptable level, co-ordination under No. 492A would be required.

Document No. 410-E Page 4

The <u>Delegate of the United Kingdom</u> pointed out that the purpose of the provision was indeed to require co-ordination whenever the risk of interference was increased in any way.

The <u>Chairman of the I.F.R.B.</u> said that the phrase "acceptable level of interference" at the end of MOD 492D, sub-paragraph c), was correct in the English text and that the French and Spanish should be aligned with it.

Approved, as amended.

Pages B.11 - 06 to 09

Approved.

Page B.11 - 10

In reply to the <u>Delegate of Cuba</u>, the <u>representatives of the I.F.R.B</u>. said that the "notified date" referred to in the last paragraph of ADD 570AGC was, according to No. 639CC of the Radio Regulations, the date of putting into use notified by the administration concerned. That date was entered in Column 2c of the Master Register. Moreover, the term "this date" clearly referred to the preceding sub-paragraph, where reference was made to the date when the assignment was brought into use.

Approved.

Pages B.11 - 11 to 14

Approved.

Page B.11 - 15

The <u>Delegate of India</u> suggested that a sentence reading "The Board shall advise the administration concerned before taking such action" should be added at the end of NOC 570BH, to bring it into line with No. 639DA, the corresponding provision of Article 9A.

Approved, as amended

2. Organization of work

At the invitation of the <u>Chairman</u>, the <u>Secretary of the Conference</u> announced that the agenda for the Seventh Plenary Meeting would consist of the first reading of the texts in Series B.12 and the second reading of the

texts in Series B.11 and B.12, the latter on the basis of the amended "blue" documents, since there would be no time to print "pink" versions for texts after Series B.10. At the second reading of "blue" texts, the Secretariat would read out all the substantive changes made during the first reading. Further changes approved would be carefully noted and passed to Committee 7 for incorporation in the final "white" document.

That procedure was approved.

The Secretary of the Conference said that Document Nos. 338, 362, 374 + Add., 375 + Add. and 385 + Add., which concerned the Frequency Allocation Table in Article 5, had been distributed and that another document was being prepared indicating requests made by delegations in Committee 5 for the right to revert to certain decisions, if necessary, when the relevant texts were examined in the Plenary Meeting. The requests would be arranged in order of frequencies. The revised Table would appear in Series B.13, to be considered during the Eighth Plenary Meeting. It was to be hoped that delegations would study the preliminary documents and would seek any necessary clarifications from the Chairman or Secretariat of Committee 5, so as to reduce discussion in the Plenary Meeting as far as possible.

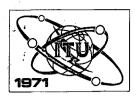
The meeting rose at 1210 hrs.

Secretary:

Clifford STEAD

Chairman:

Gunnar PEDERSEN



Document No. 411-E

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

ANNEX 11bis

REVISION OF ARTICLE 41 OF THE RADIO REGULATIONS

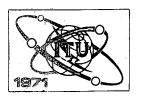
Article 41 of the Radio Regulations shall be amended as follows:

Add the following new text at the end of number 1567

ADD 1567A

§ 6. Space stations in the Amateur Service operating in bands shared with other services shall be fitted with appropriate devices for controlling emissions in the event that harmful interference is reported in accordance with the procedure laid down in Article 15. Administrations authorizing such space stations shall inform the I.F.R.B., and shall insure that sufficient ground command stations are established before launch to guarantee that any harmful interference that might be reported can be terminated by the authorizing Administration. (See No. 470V.)





Document No. 412-E 16 July 1971

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

RECOMMENDATION No. Spa NN

Relating to the Preferred Frequency
Bands for Tropospheric Scatter Systems

The World Administrative Radio Conference for Space Telecommunications, Geneva 1971,

considering

the technical and operational difficulties pointed out by the C.C.I.R., particularly in the Report of the Special Joint Meeting, Geneva, 1971, in bands shared by tropospheric scatter systems and space systems;

recognizing, however,

that administrations will wish to continue to use tropospheric systems in order to satisfy certain telecommunications requirements;

noting

that the proliferation of such systems in all frequency bands, particularly those shared with space systems, will only serve to aggravate an already difficult situation;

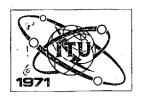
requests

'that the C.C.I.R. urgently study the radio-frequency requirements for tropospheric scatter systems and recommend the preferred radio frequencies for such systems;

invites the Administrative Council

to arrange that a future world administrative radio conference consider which frequency bands of the fixed service shall be preferably used by new tropospheric scatter systems, taking into account the allocations to the space radiocommunication services.





ocument No. 41

16 July 1971

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

NOTE BY THE SECRETARIAT

FINAL ACTS

The Final Acts of the Space Conference consist of the following:

1. Basic volume

- Partial revision of the Radio Regulations
- Annex 7: Article 9
- Annex 8 : Article 9A
- Annex 12 : Appendix 1
- Annex 13: Appendix 9
- Annex 14: Appendix 10
- Annex 15 : Appendix 28
- Annex 16: Appendix 29
- Final Protocol (see also Document No. 402 and Addenda)
- Resolution No. Spa A relating to the Experimental Use of Radio Waves by Ionospheric Research Satellites
- Resolution No. Spa B relating to the Use of the Band 156-174 MHz by the Maritime Mobile Satellite Service
- Resolution No. Spa C relating to the inclusion of additional Section in List VIIIA (Article 20, Appendix 9)
- Resolution No. Spa D relating to the Use by All Countries, with Equal Rights, of Frequency Bands for Space Radiocommunication Services

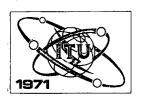


- Resolution No. Spa E relating to the Technical Criteria recommended by the C.C.I.R. for sharing frequency bands between Space Radiocommunication and Terrestrial Radiocommunication Services or between Space Radiocommunication Services
- Resolution No. Spa F relating to the Establishment of Agreements and Associated Plans for the Broadcasting-Satellite Service
- Resolution No. Spa G relating to the Bringing into use of Broadcasting Space Stations, prior to the entry into force of Agreements and Associated Plans for the Broadcasting-Satellite Service
- Recommendation No. Spa 3 to the C.C.I.R. and to Administrations Relating to Frequency Bands Shared between Space Radiocommunications Services and between Space and Terrestrial Radiocommunications Services
- Recommendation No. Spa AA relating to the Co-ordination of Earth Stations
- Recommendation No. Spa BB relating to Carrier Energy Dispersal in Systems in the Fixed Satellite Service
- Recommendation No. Spa CC relating to the Use of Space Radiocommunication Systems in the Event of Natural Disasters, Epidemics, Famines and Similar Emergencies
- Recommendation No. Spa EE relating to a Revised Presentation of the Sections of Article 1 of the Radio Regulations
- Recommendation No. Spa FF relating to the Future Use of Bands Allocated to the Inter-Satellite Service
- Recommendation No. Spa GG relating to the Future Use of Certain Frequency Bands between 40 and 275 GHz
- Recommendation No. Spa HH relating to the Future Use of the 41-43 GHz Band by the Fixed and Mobile Services
- Recommendation No. Spa II relating to Future Frequency Allocation Requirements for the Maritime Mobile Satellite Service
 - Recommendation No. Spa JJ relating to the Protection of Radio Astronomy Observations on the Shielded Area of the Moon

- Recommendation No. Spa KK relating to the Future Provision of a Band near 10 MHz for the Radio Astronomy Service
- Recommendation No. Spa LL relating to the Examination by World Administrative Radio Conference of the Situation with regard to Occupation of the Frequency Spectrum in Space Radiocommunications
- Recommendation No. Spa MM relating to Technical Standards for the Assessment of Harmful Interference in the Frequency Bands above 28 MHz

2. Document No. 395(Rev.), R.3(Rev.)

- Annex 1 : Article 1
- Annex 2 : Article 2
- Annex 3: Article 5
- Annex 4 : Article 6
- Annex 5 : Article 7
- Annex 6 : Article 8
- Annex 9 : Article 14
- Annex 10 : Article 15
- Annex 11 : Article 27
- Recommendation No. Spa DD relating to the Criteria to be Applied for Sharing between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the Band 620-790 MHz
- 3. Table of Frequency Allocations (see also above, under 2, Annex 3)
- 4. Resolution No. Spa H Relating to the Abrogation of Obsolete Resolution and Recommendations of the Extraordinary Administrative Radio Conference to Allocate Frequency Bands for Radiocommunications Purposes, Geneva 1963 (see Document No. 408)
- 5. Annex Ilbis : Article 41 (see Document No. 411)
- 6. Recommendation No. Spa NN relating to the Preferred Frequency Bands for Tropospheric Scatter Systems (see Document No. 412)



Document No. 414-E

Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

COMMITTEE 6

SUMMARY RECORD

OF THE

SIXTH MEETING OF COMMITTEE 6

Tuesday, 13 July 1971, at 0940 hrs

Acting Chairman: Mr. M.K. BASU (India)

	Document No.
Subjects discussed	
1. Report of Sub-Working Group 6A-2	358
2. Appendix 9	370
3. Draft new Resolution	376



1. Report of Sub-Working Group 6A-2 (Document No. 358)

Annex 1

The <u>Delegate of Canada</u> said that after reconsideration of the discussion at the Committee's previous meeting, he had come to the conclusion that the original draft text in Annex 1, with the amendment to change "neighbouring countries" to "other countries" was the best form of wording.

The <u>Delegates of the United States of America</u> and <u>Brazil</u> endorsed the wording, as did the <u>Delegate of Argentina</u> with the proposal that "as much as possible" should be replaced by "to the maximum possible extent".

Annex 1, as thus amended, was approved.

Annexes 2, 3 and 4

The Convener of Working Group 6A-2 introduced Annexes 2, 3 and 4 of Document No. 358, Annex 2, with the exception of operative paragraph 2, and Annex 3 had been unanimously approved by the Sub-Working Group, but there had been a difference of opinion regarding operative paragraph 2 of Annex 2 and Annex 4. After lengthy discussion it had appeared that the alternatives were: 1) to retain operative paragraph 2 of Annex 2 and delete Annex 4, or, 2) to delete operative paragraph 2 and retain Annex 4.

The <u>Delegate of the Urited Kingdom</u> said that a third possibility was to maintain both operative paragraph 2 of Annex 2 and Annex 4, there being in his Administration's opinion no conflict between the two texts. Annex 2 was a draft Resolution on the establishment of agreements and associated plans for satellite broadcasting, whereas Annex 4 was a draft Recommendation dealing with one particular frequency band for one particular area. The preambular paragraphs of the draft Recommendation set out a special problem of the European Broadcasting Area: in order to develop terrestrial services in the European Area it was necessary to know as soon as possible which channels would be available to them, and it would be wasteful of the frequency spectrum not to begin such development at an early date.

The Delegate of the U.S.S.R. did not agree that operative paragraph 2 of Annex 2 and Annex 4 were not incompatible. Although his country belonged to Region 1, it bordered on many other Broadcasting Regions. The draft Recommendation in Annex 4 involved a band allocation on a world-wide basis, and its handling by a regional conference would give rise to all sorts of difficulties.

Hence, a World Administrative Conference must precede any Regional Administrative Conferences.

A lengthy discussion ensued in which the <u>Delegates of the Netherlands</u>, <u>Denmark</u>, <u>Italy</u>, <u>Austria</u> and <u>Spain</u> supported the view that both operative paragraph 2 of Annex 2 and Annex 4 should be maintained, while the <u>Delegates of New Zealand</u>, <u>Pakistan</u>, <u>Nigeria</u>, <u>Brazil</u>, <u>Argentina</u> and <u>Poland</u> were in favour of operative paragraph 2 of Annex 2, but wished to delete Annex 4. It was pointed out that under Article 4, No. 118 of the Radio Regulations there was nothing to prevent the European countries from concluding a special agreement among themselves.

The <u>Delegate of Canada</u>, supported by the <u>Delegate of Italy</u>, said that the main opposition to Annex 4 appeared to come from countries outside the European Region, who feared that a prior European Regional Conference would adversely affect the outcome of a World Conference, and suggested that some wording to allay that fear should be added to operative paragraph 3 of Annex 4.

The <u>Delegate of Syria</u>, supporting the retention of operative paragraph 2 of Annex 2, proposed that the word "and/" should be inserted before "or Regional" in the second line of the paragraph and it was so <u>agreed</u>.

The <u>Delegate of Nigeria said</u> that if it was so vital to submit a recommendation such as that in Annex 4 to the Administrative Council, his Delegation might find it necessary to submit draft recommendations for Regional Administrative Conferences on the 620-790 MHz band and the 2.5 GHz band, to safeguard the interests of the African countries.

The <u>Secretary-General</u> explained that an equally satisfactory procedure would be for a request for the convening of a Regional Administrative Conference to be submitted by a quarter of the total number of Members and Associate Members of the Region, as set out in 654, Chapter 7 of the Montreux Convention.

Finally, the <u>Chairman</u> put to the vote the proposal that operative paragraph 2 of Annex 2, as amended by the Delegate of Syria, be maintained and Annex 4 be deleted.

The proposal was adopted by 24 votes to 14, with 5 abstentions.

The <u>Delegates of the United Kingdom</u> and the <u>Netherlands</u> reserved the right to raise the subject again in a Plenary meeting.

Annex 2, as amended, was approved.

Discussing Annex 3, the Delegate of Argentina, supported by the Delegates of Brazil and Pakistan, said that the ninety day period mentioned in operative paragraph 2.3 was not sufficient, particularly for countries distant from Geneva and for those with extensive territories in which there were many broadcasting systems to be considered. He proposed that the period be extended to one hundred and twenty days. It was so agreed and as a consequential change the one hundred and fifty days in operative paragraph 2.6 was changed to one hundred and eighty.

At the proposal of the <u>Delegate of France</u>, it was <u>agreed</u> to delete "as listed in Appendix 1A, Sections / A and D /" in operative paragraph 2.1 and replace it by "as listed in the appropriate paragraphs in Appendix 1A".

Arising from a question by the <u>Delegate of Denmark</u>, it was <u>agreed</u> that the following wording suggested by the <u>Delegate of Canada</u>, and slightly amended by the <u>representative of the I.F.R.B.</u>, should replace operative paragraph 4.1: "Any frequency assignment to a broadcasting space station shall be notified to the Board. The notifying administration shall apply for the purpose the provisions of Numbers 639 BE, 639 BF and 639 BG of the Radio Regulations.".

The representative of the I.F.R.B. pointed out that "paragraph 2.1" in operative paragraph 3.2.2 should be "paragraph 3.2.1".

After discussion of operative paragraph 5.3 (b), it was <u>agreed</u> that for the sake of clarity, it should be replaced by two sub-paragraphs, whose wording would be the same as the existing paragraph except for the words: "... the provisions of paragraph 2.1 of Section A relating..." in one, and the words: "... the provisions of paragraph 3.2.1 of Section B relating..." in the other.

It was <u>agreed</u> that in operative paragraph 5.15, in the fifth and sixth lines, the text should read: "... frequency assignment to a station in the Broadcasting Satellite Service which has been subsequently recorded..." and that the last three lines of that paragraph should be aligned with Article 9A by the drafting group.

Annex 3, as thus amended, was approved.

2. Appendix 9 (Document No. 370)

The Chairman of Working Group 6A introduced Document No. 370 and explained that because of the difficulties of setting out amendments to Appendix 9 in tabular form, the Working Group had considered the draft Resolution in Annex 2 the best way of dealing with the subject.

Pages 3 to 6 of Document No. 370 were approved.

The draft Resolution in Annex 2 was approved.

3. Draft new Resolution / A / (Document No. 376)

The Delegate of New Zealand, who had convened the Ad Hoc Group set up the previous night to re-word the draft Resolution in the Annex to Document No. 286, said that the group, consisting of the Delegates of India, Syria, Brazil, United Kingdom and the United States of America, had produced the draft new Resolution set out in Document No. 376. Preambular paragraph f) in Document No. 376, dealt with a point which had been in dispute, and was intended to indicate that the Conference was entitled to adopt a resolution on the use of the latest C.C.I.R. recommendations about the sharing of frequency bands. The time limit mentioned in operative paragraph 2 had been extended to 120 days, and operative paragraph 3 covered the situation when administrations did not respond to the Secretary-General's inquiry. Changes had been made in operative paragraph 7. The Ad Hoc Group had decided to withdraw operative paragraph 8, which it appeared might protect administrations running services which were not entirely in accordance with the Radio Regulations.

The Delegate of the United States of America explained that the purpose of operative paragraph 8 had been to reassure administrations which continued to apply the existing technical criteria of the Radio Regulations that they would suffer no harmful interference as a result of the application by other administrations of later criteria. The wording of operative paragraph 8 was now felt to be unsatisfactory, and the point was adequately covered by operative paragraph 4.

The Delegate of Cuba said that in Committee 4 his Delegation had questioned the Conference's legal capacity to adopt such a recommendation, which it appeared would modify the Montreux Convention and the Radio Regulations. After receiving assurances from the representative of the Secretary-General and the Delegate of the United States of America that the provisions of Article 44

Document No. 414-E
Page 6

of the Convention were broad enough to cover the type of situation contemplated in the draft Resolution, and in view of the general support for the draft Resolution, he accepted it in principle.

The Delegate of Italy said that provided due stress was laid on the word "only" in operative paragraph 6(a), the draft Resolution was fully in conformity with the Convention.

The Delegates of Canada, U.S.S.R., India, Syria and the United Kingdom supported the deletion of operative paragraph 8. It was so agreed.

The <u>Delegate of India</u>, supported by the <u>Delegates of Syria</u> and the <u>United Kingdom</u> proposed the addition in operative paragraph 4, fourth line, after "... acceptable to it," of the words "or has not replied to the Secretary-General's inquiry in 3 above," so as to cover the case of administrations which by not replying implied that they wished the <u>status</u> quo to continue.

That amendment was adopted.

The <u>Delegate of France</u> proposed two amendments to operative paragraph 7 and after some discussion the principle of those amendments was approved, and it was <u>agreed</u> that the words "criterion or" should be inserted before "criteria" in the second line of operative paragraph 7, and similarly in the fourth line of operative paragraph 4, and that the last sentence of operative paragraph 7 should read: "The list published pursuant to paragraph 5 above shall be updated on the basis of replies received from administrations.".

The draft new Resolution in Document No. 376, as amended, was approved.

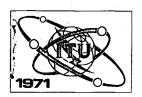
The meeting rose at 1320 hrs.

The Secretary:

The Chairman:

W. GARCIA-RIOS

M.K. BASU



Document No. 415-E

20 July 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

SEVENTH PLENARY MEETING

Wednesday, 14 July 1971, at 1600 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Sul	jects discussed	Document No.
1.	First reading of texts submitted by the Editorial Committeé	
	- Series B. 12	382
2.	Second reading of texts submitted by the Editorial Committee	
	- Series B.11*)	381
	- Series B.12*)	382



^{*)} As modified at the first reading.

Document No. 415-E Page 2

1. First reading of texts submitted by the Editorial Committee Series B.12 (Document No. 382)

The Chairman invited delegates to submit directly to the Editorial Committee changes which were purely of a drafting nature, or which appeared necessary because the text in one language was not correctly aligned with the approved version.

Pages B.12 - 01 to 04

Approved.

Page B.12 - 05

The Vice-Chairman of the I.F.R.B. pointed out that in Item 7 the words "in accordance with Article 2 and Appendix 5" applied to all three sub-paragraphs and not merely to sub-paragraph c), and should therefore be placed before sub-paragraph a).

After some discussion of Item 8 b), it was <u>agreed</u> that the English and Spanish texts should be brought into line with the French text, particularly as regarded the translation of the word "worst".

Approved, as amended.

Pages B.12 - 06 to 12

Approved.

Page B.12 - 13

The Vice-Chairman of the I.F.R.B. said that in order to align the text of 3) Note exactly with the text of Item 5 a) on page 12, it should read: "The arcs specified in 1) and 2) will be indicated by the geographical longitude of the extremes of these arcs on the geostationary satellite orbit."

Approved, as amended.

Pages B.12 - 14 to 18

Approved.

Page B.12 - 19

The Vice-Chairman of the I.F.R.B. said that the word "capability" should be deleted from Item 9 d), and after a brief discussion that was agreed, after confirmation by the Chairman of the Editorial Committee that the majority of texts submitted to the Editorial Committee after approval in the other Committees had not contained the word "capability".

Approved, as amended.

Page B.12 - 20

The <u>Vice-Chairman of the I.F.R.B.</u> drew attention to a mistake in the English text of Item 13, where "conducted" should be replaced by "effected".

Approved.

Page B. 12 - 21

The <u>Vice-Chairman of the I.F.R.B.</u> indicated that the words "in kHz" should be added to Item 4, and the reference to Item 1 was incorrect and should read Item 4, in both Item 6 and Item 8.

Approved.

Pages B.12 - 22 to 24

Approved.

Page B.12 - 25

The Chairman of Committee 6 said that the words "(see Article 9A)" should be inserted after the title of the Appendix.

Approved, as amended.

Pages B.12 - 26 to 50

Approved.

Document No. 415-E Page 4

2. Second reading of texts submitted by the Editorial Committee
Series B.11 (Document No. 381, as modified at the first reading)

Page B.11 - 01 to 02

Approved.

Page B.11 - 03

The Chairman of Committee 6 queried the inclusion of the amendment on page 3, which was a matter of substance that had not been approved when the text was discussed in Committee 6.

The delegate of the United Kingdom explained that the point at issue had still been outstanding after Committee 6 had held its last meeting. A small drafting group had produced a form of words for the Plenary to consider, and that had been approved without argument at the preceding Plenary meeting.

Approved.

Page B.11 - 04

Approved.

Page B.11 - 05

The <u>delegate of New Zealand</u> said that in MOD 492D the word "data" should be added at the end of paragraph 4) b).

Approved, as amended.

Page B.11 - 06 to 09

Approved.

Page B.11 - 10

After some discussion of the words "this date" in the last paragraph of ADD 570AGC, it was agreed that it should read "that date" in the English and Spanish texts, and the French text should remain unchanged.

Approved, as amended.

Page B.11 - 11 to 15

Approved.

Series B.12 (Document No. 382, as modified at the first reading)

Pages B.12 - 01 to 04

Approved.

Page B.12 - 05

After some discussion on the use of the word "worst" in the third and fourth lines in Item 8 b), English text only, it was agreed to leave the word as it stood in this paragraph and wherever else it occurred in the document.

Approved.

Pages B.12 - 06 to 13

Approved.

Page B.12 - 14

Item 10 c), last line (French text only): it was agreed to replace the word "lobe" by "faisceau". This correction also applied to page B.12 - 19, Item 9 c), fourth line.

Approved, as amended.

Pages B.12 - 15 to 22

Approved.

Page B.12 - 23

The delegate of France proposed a drafting amendment to the French text of the note at the bottom right hand corner of the page.

Approved, as amended.

Document No. 415-E Page 6

Page B.12 - 24

The delegate of France proposed several drafting amendments.

Approved, as amended.

Pages B.12 - 25 to 26

Approved.

Page B.12 - 27

Item 3, second line : it was agreed to insert the word "within" after "range".

Approved, as amended.

Pages B.12 - 28 to 30

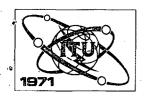
Approved.

The meeting rose at 1835 hrs.

The Secretary:

The Chairman:

Clifford STEAD Gunnar PEDERSEN



Document No. 416-E 25 August 1971 Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

FIFTH PLENARY MEETING

Tuesday, 13 July 1971, at 1515 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Subjects discussed 1. Credentials of the Republic of Upper Volta 2. First reading of texts submitted by the Editorial Committee: Series B6, page 09, paragraph c) Series B7, pages 07 to 12 Series B8 361 Series B9 364 Series B10 369

3. Publication of the Final Acts



Document No. 416-E Page 2

1. Credentials of the Republic of Upper Volta

The Chairman of Committee 2 announced that he had received that morning the credentials of the Republic of Upper Volta which had been checked and found in order.

2. First reading of the texts submitted by the Editorial Committee Series B6 (Document No. 352)

Page B6-09, paragraph c)

The Chairman, after briefly recalling that paragraph c) on page B6-09 had already been discussed at length, asked participants if they agreed that the paragraph should be deleted.

It was so decided by 55 votes to none, with 5 abstentions.

The series B6, as amended, was approved.

Series B7 (Document No. 360)

Page B7-06

The <u>delegate of the United States</u> said that Committee 4 had decided to make the following amendment to No. MOD 470H: the word "or" after "No. 470G" should be replaced by a comma and the words "No. 470HA and No. 470HB" should be inserted after "No. 470GA,".

Page B7-06, as amended, was adopted.

Page B7-07

The <u>delegate of Canada</u> indicated that in the English text of MOD 470L after the words "concerned or" in the fourth line, the words, "those whose services may be" should be added.

The same addition would be made to the Spanish text.

Subject to the above, page B7-07 was approved.

Page B7-09

Replying to a question by the <u>delegate of Argentina</u>, the <u>Chairman of Committee 5</u> said that in sub-paragraph a) under "taking into account" it was understood that community reception was referred to, although that was not specified.

The delegates of the U.S.S.R., Denmark, Poland, the United Kingdom and Israel took part in a discussion on whether the type of reception should be specified. Since most speakers considered that that was unnecessary, it was decided to leave the text unchanged.

Following a discussion on the wording of sub-paragraph a) under "considering", in which the delegates of the Netherlands, Italy, India and Israel took part, it was decided to use the same text as that of foot-note 332A, adopted by Committee 5, concerning the frequency bands in question.

Page B7-09, as amended, was approved.

Page B7-10

A remark by the Chairman of the I.F.R.B. on what was meant, at the present stage, by the words "a preliminary co-ordination procedure" gave rise to comments by the Chairman of Committee 4 and the delegates of Poland, U.S.S.R. and the United Kingdom.

The delegate of Canada said that the co-ordination procedure for Satellite Broadcasting had been examined by Committee 6 and that the document now being considered dealt with the technical criteria for frequency sharing between Broadcasting-Satellite and Terrestrial Broadcasting Services. To solve the problem raised by the Chairman of the I.F.R.B., he proposed that the second and third lines of paragraph 1 under "recommend" should read:

"... provide for preliminary sharing criteria, on a provisional basis ...".

The Chairman of the I.F.R.B. accepted that proposal.

The delegate of France said that in a paragraph which was essentially technical it was unnecessary to refer to a co-ordination procedure which would be dealt with in the foot-note in the Table of Frequency Allocations.

The Canadian proposal was approved.

Page B7-10, as amended, was approved.

Series B7, as amended was approved.

Document No. 416-E Page 4

Series B8 (Document No. 361)

The Chairman of Committee 4 said that he would provide the Editorial Committee with a copy of the document in which all the mathematical symbols were correct.

Page B8-01

The Chairman of the I.F.R.B. said that, following the discussions in Committee 6, the square brackets around the title could be removed.

The <u>Vice-Chairman of Committee 6</u> said that the square brackets within the title could also be removed.

It was so decided.

The delegate of France pointed out that the word "_systèmes 7" should be replaced by "réseaux" throughout the French text except at certain points which he would indicate as they arose. He also suggested that it would be better to say "degree of the interference" rather than "level of the interference".

It was <u>decided</u> that the <u>Editorial</u> Committee would amend the title in the light of the above remarks.

The Chairman of the Editorial Committee proposed that the square brackets around the words "of an earth station receiver" should be deleted. The sub-paragraph in square brackets at the beginning of paragraph 2 should also be deleted and replaced by a foot-note 2 referring to a definition.

It was so decided.

Page B8-01, as amended, was approved.

Page B8-02

The Chairman of Committee $\frac{1}{4}$ said that the passages in parentheses opposite "P " and "P " should read "(averaged over the worst 4 kHz band for carriers below 15 GHz or over the worst 1 MHz band for carriers above 15 GHz)".

Page B8-02, as amended, was approved.

Page B8-03

The delegate of France said that the definition of gamma at the top of the page should read:

"transmission gain of the link estimated from the receiving antenna output of the space station S to the receiving antenna output of the earth station E_n (numerical power ratio, usually less than 1)".

In his view the word "/ system /" which occurred three times on the page should be replaced by "link".

In the French text of the paragraph beginning: "Cet accroissement...", the words "... et ceux des stations terriennes ..." should be replaced by "... et celui de la station terrienne ...".

It was $\underline{\text{decided}}$ that the French delegate would submit the above amendments in writing to the Editorial Committee.

Subject to the above, page B8-03 was approved.

Page B8-04

The <u>delegate of the U.S.S.R.</u> asked for it to be recorded that, in his view, the values for the increase in equivalent noise temperature had not been sufficiently studied and justified.

Page B8-04 was approved.

Page B8-05

The Chairman of the Editorial Committee said that, in the French text, the square brackets around the words "/ contours de gain /" in the 9th line from the bottom of the page should be deleted and the word "/ d'émission /" in the same line should be replaced by the words "de réception". Similar amendments should be made to the Spanish text.

The <u>delegate</u> of <u>France</u> requested that the sentence beginning "L'emplacement le plus défavorable ..." should be translated into English literally and that the present English text should be amended accordingly.

Subject to the above, page B8-05 was approved.

Page B8-06

The <u>delegate of the United States</u> proposed that the words "the transponder" in the 3rd line of the first paragraph should be replaced by the words "a particular transponder".

It was so decided.

Page B8-06, as amended, was approved.

Page B8-07

It was <u>decided</u> to replace the word "systems" in the 4th line from the bottom by the word "links",

Page B8-07, as amended, was approved.

Page B8-08

The Chairman of Committee 4 said that "c/s" should be replaced by "Hz" in the English text and that the third term in the formula for Receiver input under Step 1 should be "l₁₁" instead of "e".

Page B8-08, as amended, was approved.

Pages B8-09 and B8-10

Pages B8-09 and B8-10 were approved.

Series B8, as amended, was approved.

Series B9 (Document No. 364)

Page B9-02

In view of the explanations given by the Chairman of Committee 5 and the Chairman of the I.F.R.B., it was decided to use the expression "à titre secondaire" rather than "accessoirement" in the French text of No. MOD 415, sub-paragraphs 2(1) a) and b) and "secundario" rather than "accesorio" in the Spanish text. In the English text, the square brackets around "on a secondary basis" should be deleted.

Page B9-02, as amended, was approved.

Page B9-03

Page B9-03 was approved, the square brackets in No. MOD 952 being deleted.

Pages B9-11 and B9-12

Pages B9-11 and 12 were approved, the square brackets being deleted.

Series B9, as amended, was approved.

The Observer for the Intergovernmental Consultative Maritime Organization (I.M.C.O.), referring to the two recommendations on pages B9-11 and 12, made a statement, the text of which is reproduced in Annex 1.

The Observer for the International Radio Maritime Committee (C.I.R.M.) made a statement the text of which is reproduced in Annex 2.

Series Blo (Document No. 369)

Pages Bl0-01

Subject to minor drafting amendments and the insertion of the words "Geneva, 1971", after the words "Special Joint Meeting" in sub-paragraph a) under "recognizing", page BlO-Ol was approved.

Page B10-04

It was decided that sub-paragraph c) would be redrafted by the Editorial Committee which would delete the square brackets around the words "fixed and mobile services" and delete the words "/ terrestrial radiocommunication services /".

Page B10-04, as amended, was approved.

Pages B10-05 and B10-08

Following a long discussion it was $\frac{\text{decided}}{\text{page B10-05}}$ and sub-paragraph 2.16 on page B10-08.

The figure "XIIIth" in the 5th line of paragraph 1 under "recommends" was deleted.

Document No. 416-E

Page 8

The <u>delegate of Denmark</u> said that the word "proposed" in the 2nd line of sub-paragraph m) should be replaced by the word "adopted".

It was so decided.

Page B10-05, as amended, was approved.

Page B10-06

The Editorial Committee was instructed to bring the French and English texts of paragraphs 2.5 and 2.14 (on page BlO-08) into line.

With this reservation, page BIO-06 was approved.

Page B10-07

At the proposal of the Chairman of the Editorial Committee, it was decided to adopt the word "networks" rather than "systems" in paragraphs 2.6 and 2.7.

Page Blo-07, as amended, was approved.

Page B10-08

As indicated above, it was <u>decided</u> that the Editorial Committee should reconsider the words "acceptable" and "unacceptable".

With that reservation, page Blo-08 was approved.

The <u>French delegate</u> said that, in view of previous decisions some parts of the pages of Series BlO which had already been approved ought to have been deleted, namely: sub-paragraphs c), d) and e) on page BlO-O4; paragraphs 2.9 and 2.11 on page BlO-O7 and the whole of paragraph 3 on page BlO-O8.

It was so decided.

Series BlO, as amended, was approved.

3. Publication of Final Acts

Replying to a question by the <u>delegate of Poland</u> concerning the reprinting of the Radio Regulations which had been amended, the <u>Secretary of</u>

the Conference said that the amended Regulations would be published shortly before the date when the Final Acts of the Conference entered into force.

As in the case of other I.T.U. publications, their price would depend on the number of subscribers replying to the appeal sent out by the General Secretariat.

The meeting rose at 1825 hours.

The Secretary:

The Chairman:

Clifford STEAD

Gunnar PEDERSEN

Annexes: 2

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ANNEX 1

I.M.C.O. STATEMENT

As an observer of I.M.C.O., I should like to express my disappointment that this Conference has not been able to allocate suitable and sufficient frequencies to satisfy the maritime operational requirements, due mainly to the conflicting requirements of existing terrestrial services. I am particularly referring to a world-wide satellite system for distress, safety and radionavigation, suitable for all ships.

It is my personal belief that the decision of this Conference not to allocate a frequency spectrum of about 2 MHz somewhere in the bands between 200 and 600 MHz will seriously restrict the development of a maritime satellite system.

I.M.C.O. will review the requirements for the maritime mobile service in the light of the decisions taken by this Conference and I trust that a future I.T.U. Conference will be in a better position to give adequate priority to a service which is completely dependent upon the use of radio for distress, safety and operational communications.

I am very grateful to this Conference for giving a great deal of its time to the discussion of this subject and in particular for the efforts made by several delegations to find an effective solution to this problem.

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ANNEX 2

STATEMENT BY C.I.R.M.

The Conference, its Committees 4 and 5, and their Working Groups have devoted a great deal of their time to consideration of the requirements of the maritime mobile service and have shown a good understanding of the needs.

However, it has not been able to find anywhere in the 200-600 MHz area to accommodate the 1% of spectrum needed by the maritime mobile service or made any arrangement for the future, such as clearing spectrum space by some specified date.

This is a restriction on the development of a service that is one of the oldest and most deserving in the use of radio, and that, directly or indirectly, is essential to all the countries of the world, including those represented here.

To some extent, reliance is being placed on the hope that technological development at 1.5 GHz will solve the difficulties concerning smaller ships, that could, we know, be overcome to-day by using frequencies of the order of 400 MHz.

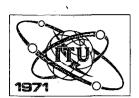
Efforts will have to be made to use the 1.5 GHz allocations to satisfy all the operational needs set out by I.M.C.O., by the S.J.M., and endorsed by many delegates to this Conference. These efforts will undoubtedly cost a great deal, and we in C.I.R.M. are certain that any 1.5 GHz system will cost many times that of a corresponding 400 MHz system. Moreover, if at the end the problems are not solved, there will be no allocations permitting all the "have not" ships who cannot fit 1.5 GHz equipment to enjoy the advantages of a reliable fade free global service and contribute to the Safety of Life at Sea. Even worse time will be lost with all that is implied in loss of efficiency, loss of property, loss of human life, and damage to the ecology.

There seems to be no doubt that the region of the spectrum between 200 and 600 MHz has advantages for use by space communications, particularly in connection with mobile applications, and more particularly for maritime mobile use.

Annex 2 to Document No. 416-E Page 14

In these circumstances, and in the light of this relatively recent knowledge, we feel that long term plans should be made to free such bands, or at least sufficient space in these bands, from other usage where the same considerations do not apply. Clearly sufficient time has to be given for present equipment to be amortized, or for aerials or crystals to be changed, but if the bands to be cleared are not too wide, the cost involved and the inconvenience suffered need only be quite small. The gains, however, would be large.

We would suggest that the administrations in conjunction with the $I_{\bullet}F_{\bullet}R_{\bullet}B_{\bullet}$ study this problem with the object of suggesting where in the 400 MHz region of the spectrum two bands, each about 2 or 3 MHz wide, can be allocated to the maritime mobile service, with the least possible inconvenience to other users.



SPACE CONFERENCE

Document No. 417-E 25 August 1971 Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

EIGHTH PLENARY MEETING

Thursday, 15 July 1971, at 1100 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Subject discussed	Document No.
Table of frequency allocations	
1. Frequency band 435-438 MHz	374 p.7 and 315
2. Frequency bands (5 650- 5 925 (1 215-1 300 (10 000-10 500	MHz 342
3. Frequency band 845-935 MHz	Addendum to Document No. 374



Document No. 417-E Page 2

Table of Frequency Allocations

1. Frequency band 435-438 MHz (Documents Nos. 374, page 7, and 315)

The <u>delegate</u> of the <u>United Kingdom</u> introduced the proposed amendments to Article 5 of the Radio Regulations contained in Document No. 315 and they were supported by a number of delegations.

The <u>delegate of France</u> recalled the French position on the principle of the amateur service, which had been explained at length at the beginning of the Conference, i.e. that the amateur satellite service should only be introduced in exclusive worldwide bands to preserve the essential services from amateur service interference. The guarantees proposed did not seem adequate to prevent amateurs from causing interference to certain services concerning the safety of human life. However, that position did not prevent France from supporting the United Kingdom proposal since in the 435-438 MHz band there would be no risk of interference with the radiolocation service.

The <u>delegate of Greece</u> supported the United Kingdom proposal but wished to protect the fixed and mobile services which also operated in that band; he therefore proposed the following addition at the end of note 320A: "in accordance with the provisions of No. 1567 bis".

The <u>delegate of the United Kingdom</u> accepted that amendment, pointing out that the amateur service "may be authorized" by the administration granting licences, which constituted an effective protective clause.

The <u>delegate of Malaysia</u> was opposed to the introduction of the amateur service in the band in question because in his country there was a risk that amateurs would interfere with the maritime radio-telephony service.

The <u>delegate of the Philippines</u>, whose view was shared by the <u>delegates of Saudi Arabia</u> and <u>Uganda</u>, warmly supported the United Kingdom proposal, since in the Philippines, as elsewhere, the amateur service had helped to set up thousands of extremely useful calls, particularly in the case of natural disasters and emergencies. The contribution of radioamateurs and the infrastructure represented by the totality of their equipment were of great value.

The United Kingdom proposal on the amateur satellite service, as amended at the request of Greece, was adopted by 63 votes to 3, with 14 abstentions.

2. Frequency bands 5 650-5 925 MHz, 1 215-1 300 MHz and 10 000-10 500 MHz (Document No. 342)

At the request of the <u>delegate of France</u>, who was opposed to the use of space techniques in the bands concerned, it was <u>decided</u> to examine the three proposals contained in the document separately.

Proposal A: frequency band 5 650-5 670 MHz

The <u>delegate of Greece</u>, supported by the <u>delegate of Australia</u>, was in favour of the proposal; he considered, however, that it would be advisable to split the 20 GHz band allocated to the amateur service into two sub-bands of 10 GHz, one for up-links and the other for down-links.

Furthermore, at the end of the note, the text of 320A just adopted should be added: "Administrations authorizing such use shall ensure that any harmful interference caused by emissions from amateur satellites is immediately eliminated in accordance with the provisions of No. 1567 bis."

The <u>delegate of the U.S.S.R.</u>, supported by the <u>delegate of Sweden</u>, while recognizing the importance of radioamateur activities, was opposed to all three proposals presented by Italy.

The <u>delegate of the United States of America</u> supported the Italian proposal amended by the delegate of Greece but thought that to allow the service more flexibility it would be preferable not to specify the bands to be used in the up and down directions.

The <u>delegate of Israel</u>, who also supported the Italian amended proposal, considered that without specifying the bands to use in each direction, a separate band should be foreseen for up- and down-links.

The two amendments proposed by the <u>delegate of Greece</u> were <u>adopted</u> by 21 votes to 20, with 21 abstentions.

The amended proposal A was rejected by 42 votes to 25, with 9 abstentions.

Proposal B: frequency band 1 215-1 230 MHz

The <u>delegate of France</u> was categorically opposed to the use of the band in question by radioamateurs in view of the risk of possible harmful interference to air safety services and referred to No. 343 of the Radio Regulations in that respect.

Proposal B was rejected by 42 votes to 12, with 13 abstentions.

Proposal C: frequency band 10 350-10 400 MHz

Following a discussion in which the <u>delegates of France</u> (who referred to paragraph 2 of Document No. 386), the <u>United States of America</u>, New <u>Zealand</u>, the <u>United Kingdom and Sweden took part</u>, the proposal was <u>rejected</u> by 36 votes to 30, with 7 abstentions.

3. Frequency band 845 - 935 MHz (Addendum to Document No. 374)

The <u>Chairman of Committee 5</u> explained that the draft of note ADD 339B had given rise to considerable discussion in Committee 5 and that the Committee had accepted the idea of inserting a text for which India had been invited to submit a new draft taking account of all the points mentioned in the discussion.

The <u>delegate of India</u> recalled that the importance of the broad-casting satellite service had been stressed on many occasions during the Conference and the experiment planned by his country would be of benefit to the entire world and in particular the developing countries. He pointed out that the experiment would involve work analogous to space research and that the text of ADD 339B had been prepared on the basis of the majority views expressed in Committee 5.

The question gave rise to a lengthy discussion in which the <u>delegates of Nigeria</u>, <u>Australia</u>, <u>Canada</u> and the <u>United States of America</u> said they were in favour of adding the foot-note because of the technical importance of the experiment for many countries.

The delegate of the United States of America asked for the words "also allocated for use" in the first and second lines of ADD 339B to be deleted.

The <u>delegate of India</u> accepted the suggestion but insisted on retention of the word "also", the text thus reading:

"In India, the band 845-935 MHz is also used in the experimentation of satellite broadcasting of television with frequency modulation including energy dispersal, subject to agreement with the administrations having services operating in accordance with the Table which may be affected.

For the protection of terrestrial television services the power flux-density limit given in foot-note 332A will apply; and for the protection of fixed and mobile services operating in this band the power flux-density limits in Article 8, Nos. 470NI and 470MB shall be applied.

The <u>delegates of Malaysia</u>, <u>Pakistan</u>, <u>Kenya</u> (speaking also for <u>Uganda and Tanzania</u>), <u>China and Cyprus</u>, on the other hand, thought that the use of the 845-935 MHz band for the Indian project might harm already existing services and particularly those using tropospheric scatter and transhorizon links, and the development of radio networks.

Several of those speakers, supported by the delegates of Greece, the United Arab Republic, the United Kingdom, France, Italy and Mexico, considered that the insertion of such a foot-note would constitute a dangerous precedent and would partially abrogate the Frequency Allocation Table. Lower bands (620 - 790 MHz, for example) had already been allocated to broadcasting satellite systems and India should keep within the possibilities thus offered. The proposed foot-note would be contrary to the spirit of the Radio Regulations and would amount to an actual allocation; the experiments planned by India could not be limited to that country's own frontiers and would cause problems for other countries, even situated at some distance.

The delegate of the United Kingdom thought that if the Indian proposal were accepted it might encourage other administrations to introduce satellite broadcasting services in the band concerned and to ask, in due course, for their name to be added to that of India, and that would weaken the results of the Conference. He thought the solution would be to have the text of ADD 339B appear in the Final Protocol, with a slight drafting amendment to the English text.

That suggestion was supported by the delegate of Greece.

The <u>delegate of India</u> explained his country's position and said that important investments had already been made for the testing of a satellite of the broadcasting satellite service for television programmes. Certain datelimits had been fixed and any delay would compromise seriously the result of the efforts that had been made. He reminded the meeting that Committee 5 had pronounced itself in favour of the principle of such a foot-note and that the plenary meeting would decide on the text.

The Chairman of Committee 5 recalled for information that the result of the voting in the Committee on the question of principle had been 35 votes in favour, 13 against and 5 abstentions.

Document No. 417-E

The <u>delegate of Sweden</u> proposed that note ADD 339B be accepted with an explanation in the minutes of the meeting that the action had been taken as an exceptional measure in view of the importance of the experiment and its repercussions on the development of technique.

The delegate of India agreed with that suggestion.

The Chairman, before putting the United Kingdom suggestion to the vote, said that the result of its adoption would be for there to be no footnote in the Table of Frequency Allocations but for the text to appear in the Final Protocol.

The delegate of Brazil said that he had asked for the insertion of the following foot-note in paragraph 9 of Document No. 386: "In Brazil, the band 845-890 MHz is also allocated to the fixed service". He considered that that proposal should be examined at the same time as the question of foot-note ADD 339B since for his country it was a case of protecting already-established systems in the bands concerned which might be affected adversely by the Indian experiment.

The <u>delegate of Italy</u> wondered whether the Conference was competent to deal with the note mentioned by the delegate of Brazil, adding that the Indian experiment could take place within the terms of No. 115 of the Radio Regulations.

The <u>delegates of Argentina</u> and <u>Chile</u> associated themselves with the views expressed by the delegate of Brazil and thought the Conference was competent to deal with the matter.

The Chairman pointed out that the delegate of Italy's comment about No. 115 did not constitute a formal suggestion.

With regard to the question of the Indian experiment, the Chairman put to the vote the solution suggested by the delegate of the United Kingdom which had been supported by the delegate of Greece and other delegations: the solution was approved by 42 votes to 18, with 10 abstentions, and the amended text of ADD 339B would therefore appear in the Final Protocol.

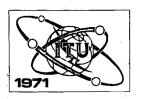
The meeting rose at 1310 hrs.

The Secretary of the Conference:

Clifford STEAD

The Chairman:

Gunnar PEDERSEN



SPACE CONFERENCE

Document No. 418-E 25 August 1971

Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

NINTH PLENARY MEETING

Thursday, 15 July 1971, at 1510 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Suk	jects discussed	Document No.
1.	Table of Frequency Allocations: (Article 5 of the Radio Regulations)	
	1.1 Frequency bands 2 500-2 690 MHz ADD 364C, ADD 364D, ADD 364F	375 page 6
	1.2 Frequency band 2 655-2 690 MHz ADD 364H	375 page 7 Corrigendum (item 5) to 375
	1.3 Frequency band 11.7-12.5 GHz ADD / A /, / D / and / E /	385 page 3
2.	Second reading of texts submitted by the Editorial Committee:	
	Series Rl	387
	Series R2	388
3.	First reading of texts submitted by the Editorial Committee:	
	Series B14	384 + Add. No. 1
4.	Second reading of texts submitted by the Editorial Committee:	
	Series Bl4*)	384 + Add. No. 1
5.	Statement by the delegate of the Syrian Arab Republic	
6.	Announcement by the Chairman of Committee 2	

^{*)} As amended at the first reading.



Document No. 418-E Page 2

The Chairman announced that the head of the Kenyan delegation, Mr. Rajab M. YUSUF, had been ill in hospital for several days, and requested the delegation to convey to him the Conference's best wishes for his speedy recovery.

The <u>delegate of Uganda</u>, speaking on behalf of the delegations of Kenya, Tanzania and Uganda, thanked the Chairman for that expression of concern on the Conference's part, and assured him that the message would be conveyed.

The <u>Chairman</u> welcomed the Deputy Director-General of the Universal Postal Union who was present at the meeting.

1. Table of Frequency Allocations

(Article 5 of the Radio Regulations)

1.1 Frequency band 2 500-2 690 MHz
ADD 364C, ADD 364D, ADD 364F (Document No. 375, page 6)

The Chairman of Committee 5 stated that in Document No. 375, page 5, in the box at the bottom of the page under Region 1, "364D" should be inserted after "FIXED 364C", and in the box under Regions 2 and 3, the square brackets round 364D should be removed.

Referring to page 6 of Document No. 375, he said that after the adoption of ADD 364C and ADD 364D by Committee 5, it had been pointed out that there was perhaps some inconsistency between those two foot-notes. Because of pressure of time, Committee 5 had agreed to leave it to the delegations concerned to seek a solution and raise the matter in Plenary.

The delegate of Canada, supported by the delegates of Italy, Federal Republic of Germany, Australia, Japan and India, proposed that the band limits in ADD 364C be changed to 2 500-2 655 MHz.

The delegate of Pakistan reserved his delegation's position regarding compliance with ADD 364D, and said that if the Canadian proposal was adopted he would like language similar to that in 364C to apply to Pakistan for the 2 655-2 690 MHz band.

The <u>delegate of the U.S.S.R.</u> said that his Administration could not possibly accept the Canadian proposal regarding 364C, nor could it accept 364D, because it had a very large and developing network in that part of the spectrum.

The <u>delegate of Nigeria</u> suggested that 364F should be considered in conjunction with 364C and 364D. It was necessary to clarify the implications of 364F which, with reference to No. 145 of the Radio Regulations, appeared to suggest that the countries listed in 364F did not recognize the allocation to the Broadcasting-Satellite Service in the band 2 500-2 690 MHz, and could thus create problems in future for co-ordination between countries having only the Fixed and Mobile Services in that band and countries attempting to establish the Broadcasting-Satellite Service. It would be better if 364F said "... is also allocated" and not "... is allocated ... only".

The delegate of the U.S.S.R. said he could see no connection between 364F and 364C and D. There had always been Fixed and Mobile Services in the band 2 500-2 690 MHz, and although the Conference had now included the Broadcasting-Satellite Service in Region 1 in that band, the countries listed in 364F intended to continue to use it for the Fixed and Mobile Services only. They were making no new allocation and therefore No. 145 of the Radio Regulations was not applicable.

After some further discussion; in the course of which alternative draftings for 364F were proposed by the <u>delegates of Brazil</u> and <u>Sweden</u>, but not retained, the <u>delegate of Nigeria</u> said he would not press his point regarding 364F.

The <u>delegate of Ethiopia</u> agreed that the point could be dropped, but stated that he understood that 364F would not impose any limitations of the power flux-density provisions contained in Article 7 of the Radio Regulations, in so far as the Broadcasting-Satellite Service was concerned.

The delegate of Uganda supported that statement.

The <u>delegate of the U.S.S.R.</u> said that the sharing criteria which appeared in Article 7 had been accepted by all delegations and were therefore valid for all. His delegation had made no reservation in that connection.

The Chairman put to the vote the proposal that ADD 364D be deleted.

The proposal was adopted by 22 votes to 17, with 15 abstentions, and ADD 364D was accordingly deleted.

The <u>delegate of Canada</u> withdrew his proposal for the amendment of ADD 364C.

In reply to a question by the <u>delegate of Sweden</u>, the <u>Chairman</u> confirmed that once the countries listed in 364F had signed the Final Acts, the provisions of 364C would apply to them.

Returning to the need for special protection for the uplink in the band 2 655-2 690 MHz, the delegate of the United States of America proposed the inclusion of a new foot-note to replace 364D reading as follows:

"Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in the band 2 655-2 690 MHz".

After a discussion as to whether or not it would be correct for the meeting to consider the United States proposal, which some delegates believed merely resurrected the provisions of the deleted 364D, the Chairman put the United States proposal to the vote.

The proposal of the United States delegate was adopted by 41 votes to 22, with 9 abstentions,

The <u>delegate of France</u>, speaking as a member of the <u>Editorial</u> Committee, asked whether a decision had been taken regarding the deletion of existing foot-note 364 of the Radio Regulations.

The Chairman of Committee 5 said that a meeting of the Joint Working Group had agreed to delete 364 on the understanding that it would be covered by 364C and 364D which had just been adopted.

The delegate of the United Kingdom did not believe that the Conference was competent to delete footmote 364, because it related entirely to co-ordination between Fixed and Mobile Services and tropospheric scatter systems, and no Space Service was involved in it. He proposed that 364 be amended to read, in the third line, "those having terrestrial radiocommunication services operating", thus retaining its original sense.

The <u>delegate of the U.S.S.R.</u> said that when 364 had been adopted, there had been only Terrestrial Services in the band concerned, but that situation had now changed.

After a discussion in which the <u>delegates of Israel</u>, <u>Syria</u>, <u>Denmark</u> and <u>India</u> took part, the <u>Chairman</u> put to the vote the proposal that footnote 364 be deleted.

The proposal was rejected by 34 votes to 23, with 10 abstentions.

The Chairman put to the vote the amendment proposed by the United Kingdom delegate to foot-note 364.

The amendment was adopted by 35 votes to 7, with 14 abstentions.

1.2 Frequency band 2 655-2 690 MHz
ADD 364H (Document No. 375, page 7, Corrigendum (item 5) to 375)

The Chairman of Committee 5 explained that many delegates had found it difficult to accept ADD 364H, particularly the figure of -277 dBW/m²/Hz, and its deletion was indicated in the Corrigendum (item 5) to Document No. 375.

The <u>delegate of the United Kingdom</u> said that his Government had made very substantial investment in radio astronomy equipment, and was concerned to ensure adequate protection of the band 2 690-2 700 MHz. He therefore proposed an alternative foot-note 364H reading: "In the design of systems in the broadcasting satellite service, administrations are urged to take all necessary steps to protect radio astronomy observations in the band 2 690-2 700 MHz".

The delegates of Greece and Jamaica supported the proposal, and the delegate of Denmark, while supporting it in principle, urged that the word "necessary" be changed to "practicable".

The delegate of the United Kingdom, supported by the delegates of New Zealand and the United States of America maintained the word "necessary" pointing out that it should be read in conjunction with the words "are urged to take", and was not strictly mandatory.

The <u>delegate of Australia</u> supported the United Kingdom proposal, and suggested it should read "to protect the radio astronomy service", and that alteration was accepted by the delegate of the United Kingdom.

The Chairman put to the vote the text proposed by the delegate of the United Kingdom for footmote 364H.

The proposal was adopted by 42 votes to 5, with 13 abstentions.

1.3 Frequency band 11.7-12.5 GHz, ADD /A /, /D / and /E / (Document No., 385, page 3)

Introducing the document, the <u>Chairman of Committee 5</u> said that the point before the Plenary for decision was the action to be taken on foot-notes $\overline{/A}$, $\overline{/D}$ and $\overline{/E}$ enclosed in square brackets at the foot of page 3. The

Document No. 418-E Page 6

foot-notes as they stood represented the best obtainable compromise, arrived at after a great deal of work and discussion, on a subject about which many delegations had strong feelings. In consideration of this, and in spite of the doubts expressed by the delegate of the Netherlands as to the legality of the implied infringement in foot-notes /A / and /D / of the concept of equal rights for all primary services, it was decided by 58 votes to 4 with 5 abstentions to delete the square brackets from the three foot-notes and insert them as they stood (with the replacement of the words "Recommendation No. / ... /" in A, seventh line, by "Resolution D") in the relevant part of the blue document concerned (B13).

As that blue document had still to be examined by the Plenary, it was <u>agreed</u> that points raised by the <u>delegates of Nigeria</u> and <u>Senegal</u>, and any other comments on the text of Document No. 385, would be dealt with during the first reading.

2. Second reading of texts submitted by the Editorial Committee

Series Rl (Document No. 387)

Pages Rl - Ol to 03

Approved.

Page Rl - 04

The Chairman of Committee 7 pointed out that in the two last lines of the title under the heading "Article 9A", the square brackets should be replaced by parentheses.

Approved, as amended.

Pages R1 - 05 to 06

Approved.

Page Rl - 07

It was agreed to delete note 639AK.1 in view of the fact that the redrafted text of provision 639AK made it redundant.

Approved, as amended.

Page Rl - 08

As proposed by the <u>delegate of the U.S.S.R.</u>, it was <u>decided</u> to <u>delete</u> note 639AK.2, since its subject-matter had been covered by a separate Resolution.

Approved, as amended.

Pages R1 - 09 - 11

Approved.

Page Rl - 12

The Representative of the I.F.R.B. pointed out that paragraph b) of 639AR required the same amendment as had been made for provision 492C, namely: on the second line the word "exceed" should be replaced by "increase" and the word "permissible" deleted.

Approved, as amended.

Pages R1 - 13 to 17

Approved.

Pages R1 - 18 and 19

In reply to queries from the <u>delegates of New Zealand</u> and <u>Syria</u>, the <u>Chairman of the I.F.R.B.</u> said that the square brackets enclosing "570AB" in provisions 639BQ on page 18 and 639BR on page 19 were to be removed, in accordance with what had been agreed at the first reading of Series Bll.

Approved, as amended.

Page Rl - 20

Approved.

Page Rl - 21

It was agreed that, in the first paragraph, fourth line of the Spanish text only, the word "this" should be replaced by "that".

Document No. 418-E Page 8

Pages R1 - 22 to 32

Approved.

Page Rl - 33

On a point raised by the <u>delegate of Nigeria</u> and in accordance with what had been agreed at the first reading of Series B2, page 6, it was agreed to replace the words "this type of satellite is" on paragraph e), first line, of the English and Spanish texts only, by "these types of satellite are".

Approved, as amended.

Pages Rl - 34 to 35

The Chairman pointed out that the mention " $\sqrt{\text{Ia}}$ " should be deleted whenever it appeared in Recommendation No. Spa AA as Table Ia no longer existed as such and had been combined into Table I.

In reply to a query from the <u>delegate of Chile</u>, the <u>Chairman said</u> that Committee 7 would make sure that the mention "/c/s/", wherever it occurred, would be replaced by "Hz" in the final text.

The Chairman of Committee 4 said that for clarity the word "World" should be inserted before "Administrative" on page Rl - 35 in view of the fact that the Convention provided for the convening of both world and regional administrative conferences.

Approved, as amended.

Series R2 (Document No. 338)

Page R2 - 01

Approved.

Page R2 - 02

To improve the presentation and following a suggestion from the <u>Secretary General</u>, it was <u>agreed</u> to place the word "invites" and the paragraph beneath it between paragraph 2 and the word "requests".

Pages R2 - 03 to 08

The Chairman of Committee 4 pointed out a number of drafting amendments to be made to these pages.

The <u>delegate of the United States of America</u> said he had a list of small typographical errors occurring in the document and would hand over to Committee 7.

Approved, as amended.

Pages R2 ~ 09 to 10

Approved.

Pages R2 - 11 to 12

The Chairman of Committee 4 pointed out a number of drafting amendments to be made to Table C.

Approved, as amended.

Pages R2 - 13 to 32

Approved.

3. First reading of texts submitted by the Editorial Committee

Series B14 (Document No. 384 + Add. No. 1)

The Chairman of Committee 7 said that due to pressure of time pages Bl.4 - 19 to 4l (Figures l - 23) had been given to the printer in the form in which Committee 4 had submitted them to Committee 7. Committee 7 had, however, a number of drafting corrections to make to these pages.

The Addendum was to be inserted between pages 45 and 46.

The Chairman of Committee 4 pointed out some drafting amendments to be made to pages 03 and 18 and said he would give a note of these together with some other small corrections to Committee 7 for processing.

Page B14 - 01

The delegate of the United Kingdom suggested that the word "of azimuth" be added after "direction" in the first paragraph of Item 1, second line, and that, in accordance with a decision of Committee 4 to refer to co-ordination area, not distance, the words "calculating co-ordination distance" in the last paragraph, first and second lines, should be replaced by "the determination of the co-ordination area".

After a short discussion on the best place for the paragraph in bold type, "It must be emphasized... Interference", it was agreed to leave the matter in the hands of Committee 7.

Approved, with the amendments being left to the consideration of Committee 7.

Page B14 - 02

The <u>Chairman of Committee 7</u> pointed out that the words "and using" should be inserted after the word "obtaining" in the second paragraph, eighth line.

Approved, as amended.

Page B14 - 03

The <u>delegate of Chile</u> pointed out a drafting amendment to Note 1), Spanish text only.

The <u>delegate of the United States of America</u> pointed out that the expression "J ≤ -8.5 dB" in Note 1), tenth line, should read "J ≥ -8.5 dB".

Approved, as amended,

Pages B14 - 04 to 07

Approved.

Page B14 - 08

The <u>delegate of Chile</u> pointed out that the title of item 3.3, in the English and Spanish texts only, should be altered to "Radio Climatic Zones".

Approved, as amended.

Page B14 - 09

Adopted.

Page B14 - 10

The <u>delegate of the United States of America</u> said that the first equation of the English text should be aligned with that given in the French text.

Approved, as amended.

Pages B14 - 11 to 15

Approved.

Page B14 - 16

The delegate of the United States of America suggested that the word "Values" in item 7, third paragraph, last line, should be replaced by "The values to be used".

Approved, as amended.

Page Bl4 - 17

Approved, subject to a drafting amendment pointed out by the delegate of the United States of America.

Page B14 - 18

Approved, subject to the amendments pointed out by the Chairman of Committee $\frac{4}{4}$,

Bl4 - Figures 1 to 16

Approved.

Bl4 - Figure 17

In response to a query from the <u>delegate of Poland</u>, it was <u>agreed</u> to replace the figures "1, 2, etc...5" at the bottom left-hand corner by "Rain Climate 1, Rain Climate 2, etc...".

Approved, as amended.

B14 - Figures 18 to 23

Approved.

Pages B14 - 42 to 44

Approved.

Page B14 - 45

The Chairman of Committee 7 pointed out that an extra frequency band, 8.025-8.400 GHz allocated to the earth exploration satellite service, was to be included in Table IV. The same amendment applied to Table II, page 18.

Approved, as amended.

Pages B14 - 46 to 47

Approved.

Addendum No. 1 to Document No. 384 (Series Bl4)

Approved.

In response to an observation from the delegate of Poland on the likelihood of errors having gone unnoticed during the review of documents due to pressure of time, the Secretary-General confirmed that it was usual I.T.U. practice after an administrative conference for the Chairman of the I.F.R.B. in co-operation with the General Secretariat to review the text for such errors before the final printing.

4. Second reading of texts submitted by the Editorial Committee

Series B14 (Document No. 384 + Add. No. 1 as amended at the first reading)

Approved.

5. Statement by the delegate of the Syrian Arab Republic

The delegate of the Syrian Arab Republic made the statement which appears at the Annex to the present document.

6. Announcement by the Chairman of Committee 2

The Chairman of Committee 2 announced that the credentials of the Republic of Mali had been received, examined and found in order. He requested that the necessary corrections be made to the documents concerned.

The meeting rose at 1920 hours.

The Secretary:

The Chairman:

Clifford STEAD

Gunnar PEDERSEN

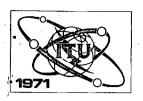
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ANNEX

STATEMENT

The Delegation of the Syrian Arab Republic would like to draw attention to the fact that wherever the name of the United Arab Republic appeared in the provisions of the 1959 World Administrative Radio Conference, it ipso facto included the Syrian Arab Republic. The I.F.R.B. is hereby requested to take the necessary steps to add the name of the Syrian Arab Republic separately to any provision of the 1959 World Administrative Radio Conference in which the name of the United Arab Republic appears.



SPACE CONFERENCE

Document No. 419-E 25 August 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES,

OF THE

TENTH PLENARY MEETING

Thursday, 15 July 1971, at 2115 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Subjects discussed

Document No.

1. First reading of texts submitted by the Editorial Committee:

Series B,15

394

2. Second reading of texts submitted by the Editorial Committee:

Series B.15 *)

394

*) As amended at first reading.



Document No. 419-E Page 2

1. First reading of texts submitted by the Editorial Committee :

Series B.15 (Document No. 394)

Page B, 15/01 .

Approved.

Page B.15/02

The Delegate of Argentina said that the Spanish text of "resolves" paragraph 2 should be aligned with the French.

Approved.

Pages B.15/03 to B.15/05

Approved.

Page B.15/06

The Chairman of the I.F.R.B. said that the word "and" in the English text of paragraph 5.3 should be replaced by "of".

Approved.

Page B.15/07

The Chairman of the I.F.R.B. said that the last part of the fourth line of paragraph 5.13 should be amended to read "referred to in paragraphs 2.1 and 3.2.1".

Approved, as amended.

Page B.15/08

The Chairman of the I.F.R.B. said that, to bring the English and French texts of paragraph 5.16 into line, the word "space" should be inserted between "any" and "station" in the second line and the sixth line should be altered to read "to a space station which has been ...".

The <u>Delegate of France</u> said that that amendment would change the meaning of the whole paragraph. The entire Resolution was concerned with the Broadcasting-Satellite Service, and if a station in that service, recorded in the Master Register according to paragraph 5.15 and No. 639CP, caused interference to another space station, it was the first assignment that should immediately cease such interference. Great caution should be exercised in changing the provision.

The Chairman of the I.F.R.B. said that the point raised by the French Delegate might be covered by referring to the case of a space broadcasting station which caused interference to the space station of another space service. The whole difficulty was due to the existence of two parallel co-ordination procedures, one of which had not been mentioned. Perhaps the problem could be solved by the drafting group which had worked on the question.

It was so agreed.

After a brief interval, the Delegate of the United Kingdom, speaking on behalf of the drafting group, suggested that paragraph 5.16 should be amended by inserting the word "space" before "station" in the second line and changing the sixth line to read "to a space broadcasting station which has" and that a new paragraph 5.17 should be inserted, reading as follows:

"5.17 If harmful interference is actually caused to the reception of any space radiocommunication station using an assignment recorded in the Master Register following a favourable finding with respect to Nos. 639EM, 63

In reply to the <u>Delegate of the U.S.S.R.</u>, the <u>Chairman of the I.F.R.B.</u> said that the new paragraph 5.17 filled the gap due to the omission of reference to the parallel procedure in cases where a broadcasting satellite station caused interference to the other space services mentioned in the six numbers of the Radio Regulations cited in the new text.

The <u>Delegate of France</u> said that the French text of the new paragraph was not quite clear and should be aligned with the English. Moreover, the Editorial Committee should clarify the last paragraph of the Resolution.

The Delegate of Cuba, supported by the Delegate of Syria and Rwanda, pointed out that no provision was made for cases of harmful interference to terrestrial stations caused by stations in the Broadcasting-Satellite Service, despite the statement in "considering" paragraph c) that a broadcasting space station might cause such interference. He therefore suggested that a new paragraph 5.18 should be inserted, identical with the new paragraph 5.17, except that the words "space radiocommunication" in the first phase should be replaced by "terrestrial" and the references to numbers of the Radio Regulations should be replaced by "No. 501".

It was so agreed.

Page B.15/08, as amended, was approved.

Page B. 15/09

Approved.

Page B.15/10

In reply to a question by the <u>Delegate of Brazil</u>, the <u>Vice-Chairman of the I.F.R.B.</u> confirmed that "resolves" paragraph 3 did not prevent an administration from agreeing to the application of new C.C.I.R. Recommendations after the limit of one hundred and twenty days had expired.

Approved.

Pages B. 15/11 and B. 15/12

Approved.

Page B. 15/13

The <u>Delegate of the U.S.S.R.</u> said that the word "operative" in the first line of the English text of paragraph 3) should be deleted.

Approved.

Page B. 15/14.

Approved.

Page B.15/15

The <u>Delegate of New Zealand</u> said that the "recommends" paragraph would be clarified by a reference to "considering" paragraph f) or g).

The <u>Delegate of Canada</u>, supported by the <u>Delegates of Brazil</u> and <u>Austria</u>, said that the word "World" should be inserted before "Administrative Radio Conference" in the title of the Recommendation and in the "recommends" and "invites" paragraphs.

Approved, as amended.

Pages B.15/16 and B.15/17

Approved.

Page B.15/18

In reply to the Delegate of Cuba, the Vice-Chairman of the I.F.R.B. explained that during the discussion of No. 89 in Committees 4 and 5, the words now in parentheses had been deemed to be redundant in the light of the provision of No. 85. The representatives of the I.F.R.B. had expressed the view that the phrase should nevertheless be retained, because it had been found useful in the past in connection with single sideband and asymmetric sideband emissions. He suggested that the text might be left as it had stood since the 1959 Conference; in that case, page B.15/18 might be deleted.

The Delegates of the United Kingdom and Cuba supported that suggestion.

Page B.15/18 was deleted.

Pages B.15/19 to B.15/24

Approved, with the deletion of the square brackets on pages B.15/22 and B.15/24.

The texts in Series B.15, as amended, were approved on first reading.

Document No. 419-E Page 6

2. Second reading of texts submitted by the Editorial Committee:

Series B.15 (Document No. 394) as amended at first reading.

Page B. 15/01

The Chairman of Committee 7 said that the word "la" should be deleted from the French text of the title of Section IA.

Page B.15/04

The Delegate of Chile suggested that the words "as from the date of the relevant Weekly Circular" should be inserted after "one hundred and eighty days" in paragraph 2.6.

It was so agreed.

Page B. 15/06

The Delegate of Syria suggested that paragraph 5.6 should be slightly amended so as to form a heading for the subsequent paragraphs.

The Chairman of the I.F.R.B. said that the paragraph could not be changed into a title or into an introduction to the subsequent paragraphs, but suggested that it might be renumbered 6.1, with consequential renumbering of the following paragraphs, so that that part of the resolution would correspond to the "recording in the Master Register" mentioned in the title of Section C.

It was so agreed.

Page B. 15/24

The <u>Delegate of Finland</u>, supported by the <u>Delegate of Italy</u>, suggested that the phrase "and the various categories of earth and space stations" should be deleted from "considering" paragraph a), since the Conference had in fact omitted nearly all the definitions given in the earlier Regulations.

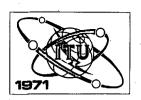
It was so agreed.

The texts in Series B.15, as amended, were approved on second reading.

The meeting rose at 2355 hours.

Secretary of the Conference : Clifford STEAD

Chairman of the Conference :
Gunnar PEDERSEN



SPACE CONFERENCE

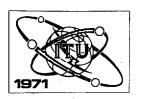
Corrigendum No. 2.to
Document No. 420-E
7 February 1972

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES OF THE ELEVENTH PLENARY MEETING

In the statement of the Delegate of the U.S.S.R. on page 13, the expression "in the band 1 535-1 542.5 MHz" should be <u>replaced</u> by "in the band 1 535-1 550 MHz".



SPACE CONFERENCE

Corrigendum to
Document No. 420-E
5 November 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

ELEVENTH PLENARY MEETING

1. Page 9 (Page B.13/06, second paragraph) should be amended as follows:

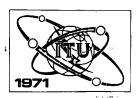
Replace - "The delegate of Uruguay"

by - "The delegate of Jamaica".

2. Page 10 (B.13/19 - ADD 308A) should be amended as follows:

The delegate of Poland said that his delegation could accept only the bands 240-300 MHz and 344-399.9 MHz for use in the Mobile-Satellite Service.





SPACE CONFERENCE

Document No. 420-E 25 August 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

ELEVENTH PLENARY MEETING

Friday, 16 July 1971, at 1000 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Subjects discussed:	Document No.
1. Second reading of texts submitted by the Editorial Committee	
- Series R. 3	395
2. First reading of texts submitted by the Editorial Committee	·
- Series B.13	383 + Add. No. 1
3. Second reading of texts submitted by the Editorial Committee	
- Series B.13*)	383 + Add. No. 1
4. Draft Resolution: Planning and administration	
of the resources of the geostationary satellite orbit	138



^{*)} As amended at first reading.

Document No. 420-E Page 2

1. Second reading of texts submitted by the Editorial Committee - Series R.3 (Document No. 395)

Pages R. 3/01 - 03

Approved.

Page R. 5/04

The Observer from I.A.T.A. proposed that the third sub-paragraph be aligned with 84AG to read: "and if the system so requires, for connection between these space stations and one or more earth stations at specific fixed points".

Approved, with that amendment.

Pages R.3/05 - 09

Approved.

Page R.3/10

The <u>Chairman of the Editorial Committee</u> said that MOD 89 was to be deleted following the decision taken at the previous meeting.

The Chairman of the I.F.R.B. pointed out that it had been decided to retain the existing definition of harmful interference and MOD 93 should therefore also be deleted, and Section III would begin NOC 85-98.

Approved, as amended.

Pages R.3/11 - 15

Approved.

Page R. 3/16

Following comment by the Observer of I.C.A.O., the <u>delegate of the United States of America</u> proposed that the definition should begin "Earth stations on board aircraft ...".

Approved, with that amendment.

Page R.3/17

The <u>delegate of New Zealand</u> said that in the English text of ADD 428A, the word "practicable" should be inserted after "to the maximum extent".

The <u>Chairman of Committee 4</u> said that the word "space" should be substituted for "satellite" in the second line of ADD 470AA.1.

Approved, as amended.

Page R.3/18

Approved.

Page R.3/19

The Chairman of Committee 4 suggested that the band 4 400-4 700 MHz should be inserted in the list of frequency bands in MOD 470D, but withdrew the suggestion following an explanation by the delegates of France and Italy.

The <u>delegate of Cuba</u> pointed out that, in view of the reference in the first line of the introductory passage of MOD 470D, services other than the Fixed-Satellite and Meteorological-Satellite Services were involved, and suggested that Committee 7 might modify the paragraph to take that fact into account.

The Chairman considered that no such far-reaching changes should be introduced at the stage of the second reading.

Approved.

Page R.3/20

The Chairman of Committee 4 said that the reference to No. 470AC should be deleted from ADD 470DB, because no limits were in fact given in it.

Approved, as amended.

Page R. 3/21

In response to a comment by the Chairman of Committee 4, it was agreed that Committee 7 would consider placing MOD 470H after ADD 470HB.

Page R.3/22

The Chairman of Committee 4 suggested that, in the light of consultations in Committee 7, a reference to the Space Research and Earth Exploration-Satellite Services should be included in the introductory part of MOD 470J; he withdrew the suggestion after the Chairman of Committee 7 had said that in all cases it would be necessary to ascertain whether or not deep-space research was involved.

The Chairman of Committee 7 said that the words "(Regions 2 and 3)" should appear against the band 2 655-2 690 MHz.

The Chairman of Committee 4 said that the entry against the band 12.50-12.75 GHz should read "(Region 2 and for the countries mentioned in No. 405BA)".

Approved, as amended.

Page R.3/23

The Chairman of Committee 7 pointed out that the limit in MOD 470M in fact concerned only the physical limit of antenna power and did not apply to MOD 470L; as there was no corresponding number to ADD 470LA, the simplest course would be to delete MOD 470M, making it clear that MOD 470L and ADD 470LA would apply in all cases cited in those provisions and consequently to the corresponding allocations in the Table in Article 5.

Approved, as amended.

Pages R. 3/24 to R. 3/27

In reply to a query by the delegate of the United States of America concerning the frequency range in MOD 470N and a suggestion by the delegate of France that the range should be 1 670-1 700 MHz because the case was one of sharing between the Meteorological-Satellite Service and the Meteorological Aids Services, the Chairman of Committee 4 and the delegate of the United Kingdom pointed out that the limit of 1 690-1 700 MHz was correct where the Fixed Service was on a secondary basis and the stricter limit of 1 670-1 690 MHz obtained where the allocation to that Service was on a primary basis. The delegate of France observed that the result of retaining the range 1 690-1 700 MHz would imply elimination of sharing criteria between the Meteorological-Satellite Service and Meteorological Aids Service.

At the proposal of the <u>delegate of the United Kingdom</u>, it was agreed not to amend MOD 470N.

The <u>delegate of Brazil</u>, referring to a suggestion that the upper limit in ADD 470ND should be increased to 2 690 MHz, said that the amendment was unnecessary because the highest limit for the services listed in ADD 470NF was 2 535 MHz.

The <u>delegate of France</u> said that unless the upper limit of 2 690 MHz was inserted in ADD 470ND and ADD 470NG, there would be contradictory provisions in the Radio Regulations.

The <u>delegate of Canada</u> pointed out that in Article 5 the band 2 655-2 690 MHz was allocated to the Fixed-Satellite Service (Earth-to-space), and that ADD 364C cited the values in No. 470NH in respect of the space-to-Earth direction. The upper limit of 2 555 MHz was therefore correct.

It was agreed not to change ADD 470ND and ADD 470NG.

The delegate of France said that the band 2 200-2 290 MHz should be added to the list in ADD 470NG. The band was allocated to the Space Research Service in Regions 2 and 5 and to the Fixed Service in all regions.

Pages R.3/24 to R.3/27 were approved, as amended.

Page R.3/28

The <u>delegate of the United States of America</u>, supported by the <u>delegate of the United Kingdom</u>, suggested that the second entry under ADD 470NO should be deleted, since in that band services were not shared with equal rights with the Fixed or Mobile Services.

Approved, amended.

Page R.3/29

Approved.

Page R. 3/30

The Chairman of Committee 7 said that, in the French text, the first figure in the second sub-paragraph of ADD 470NU should be "-148".

Page R.3/31

The <u>delegate of New Zealand</u> said that the words in brackets in the second line of ADD 470NW should read "(in Region 3 and for the countries mentioned in No. 405BA)".

The delegate of the United States of America proposed that the first line of ADD 470NW should be deleted, as the Fixed-Satellite Service in that band was subject to overall regional plans involving several services and, consequently, the sharing criteria were subject to regional agreements. Moreover, since the Broadcasting-Satellite Service normally used higher power flux-densities than the Fixed-Satellite Service, it seemed to be inadvisable automatically to impose such different limits on the two services.

The delegate of Cuba said he could not support that proposal.

The Chairman put the United States proposal to the vote.

There were 7 votes in favour, 7 against and 23 abstentions.

Consideration of the matter was postponed to a later meeting.

The Chairman of Committee 4 said that the upper limit in ADD 470NX should be 22 GHz, not 23 GHz.

Approved, as amended.

Page R. 3/52

The delegate of the United Kingdom, supported by the delegate of the U.S.S.R., proposed that Section VIIIA should be deleted, as a result of the allocations now approved in Article 5.

Approved, as amended.

Page R.3/33

Page R. 3/34

The Chairman of Committee 7 said that the term $\frac{11}{2}$ b $\frac{1}{2}$ in No. 470VE should be replaced by $\frac{1}{2}$ No. 470VD.

Approved.

Page R. 3/35

The <u>delegate</u> of the <u>United States</u> of America proposed that the words "and the <u>Meteorological-Satellite Service</u> (Earth-to-space)" should be inserted after "Fixed-Satellite Service (Earth-to-space)" in ADD 470VG, as an allocation had been made to the former service in the Table. Moreover, the two services would be occupying the geostationary orbit, whereas the Earth Exploration-Satellite Service would use a random orbitary device, so that protection for the Meteorological-Satellite Service was necessary.

Approved, as amended.

Pages R.3/36 - 37

Approved.

Page R.3/38

Approved, subject to checking of references by the Chairman of the I.F.R.B. and the Editorial Committee.

Page R. 3/59

In line with the amendment made on page 16, the two definitions would begin: "Stations on board aircraft ..." and "For this purpose stations on board aircraft ..." respectively.

Approved, as amended.

Page R.3/40

The <u>delegate of Roumania</u>, supported by the <u>delegate of Cuba</u>, suggested amending considering (a) in the light of the text of ADD 332A and suggestions were made to insert the words "per channel" after "power flux-density limits" or to clarify which channel was meant. There was a lengthy discussion in which the <u>delegates of the United States of America</u>, France,

U.S.S.R., New Zealand, Argentina, Poland, Denmark and Cuba took part on the best way of avoiding ambiguity and the delegate of the United Kingdom supported by the delegates of Cuba, Israel, U.S.S.R. and Nigeria finally proposed that the wording of ADD 322A be followed, i.e. that considering (a) read "that within the frequency band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service".

In "taking into account" (b), Spanish text, "menos rigurosos" would be replaced by "más prudentes".

Page R.3/40 was approved as amended.

Page R.3/41

Approved, subject to checking of the reference to Recommendation 427-2 by the Director of the C.C.I.R.

Page R. 3/42

Approved.

2. First reading of texts submitted by the Editorial Committee - Series B.13 (Document No. 383 + Add. No. 1)

The Chairman of Committee 5, introducing the document, stressed that reference would be to the page numbers in the bottom right-hand corner.

Page B.13/01

The <u>delegate of New Zealand</u>, supported by the <u>delegate of Italy</u> said that in ADD 201A the words "for terrestrial services" should be inserted after "in force".

Approved, with that amendment.

Pages B.15/02 - 04

Page B.13/05: Spanish text, correct 21 150 kHz to 21 450 kHz.

The <u>delegate of Uruguay</u> requested that the name of his country be inserted in foot-note ADD 222A. Agreed.

Approved as amended.

Page B.13/06

Similarly, in foot-note 255A, the words "and Uruguay" were to be inserted after "Argentina" and "Brazil" in the first and third lines.

The <u>delegate of Uruguay</u> asked for the minutes to confirm that the provisions of the foot-notes were applicable only in the countries mentioned therein.

Agreed.

Approved, with the above additions.

Page B.15/07

Approved, with the insertion of MOD before 235.

Page B.13/08

Approved.

Page B.13/09

Approved, following an explanation by the Secretary-General on a point raised by the delegate of Kenya concerning the inclusion of Rhodesia in MOD 275.

Page B.13/10

ADD 281AA: The <u>delegate of Cuba</u> asked for the name of his country to be deleted. The <u>delegates of Kenya</u>, <u>Uganda</u>, <u>Tanzania</u> and <u>Malaysia</u> requested that the names of their countries be included in the new foot-note. Agreed.

Approved, as amended.

Document No. 420-E Page 10

Page B.13/11

Approved, with the deletion of Algeria from MOD 281C.

Page B.15/12

Approved, with the inclusion of SUP 282.

Page B.15/15

The delegates of Liechtenstein and Switzerland requested that the names of their countries be included in foot-note ADD 282A. Agreed.

Approved, with these additions.

Pages B.15/14 - 18

Approved.

Page B.15/19

ADD 308A:

The <u>delegate of Poland</u> said that his delegation could accept only the bands 240-540 MHz and 344-399.9 MHz for use in the Mobile-Satellite Service.

The <u>delegate of the U.S.S.R.</u> stated that in the Soviet Union the Mobile-Satellite Service would use the band up to 390 MHz only. These comments were <u>noted</u>.

Approved.

Pages B.15/20 - 21

Approved.

Page B.15/22

ADD 317A :

The delegate of the United States of America proposed inserting the words "low power (not to exceed 5 watts)" before "emergency". Agreed.

At the request of their delegations, it was <u>agreed</u> to add the names of the following countries in ADD 317B: Kenya, Kuwait, Liechtenstein, Switzerland, Rwanda, Austria, India, Malaysia, Iran and Chile.

Approved, as amended.

Page B.13/23 + Add. No. 1

The <u>Secretary of Committee 5</u> said that as MOD 317 was identical with ADD 233AA the earlier number would be used, and as a result of a decision taken the day before, foot-note 320A would be added in the framed part of the Table for Region 1 (band 430-440 MHz) and also for Regions 2 and 3.

Approved, with the amendments indicated.

Page B.13/24

ADD 324C :

In reply to the <u>delegate of Cuba</u>, the <u>Secretary of Committee 5</u> confirmed that from his records the direction was correctly shown as space—to—Earth.

Approved, with the insertion of 320A in the framed part of the Table for the frequency bands concerned.

Page B.13/25

The Secretary of Committee 5 recalled that as a consequence of a decision of the Plenary Meeting of the previous day, foot-note / ADD 339B/was deleted from the framed part of the Table on page 25 and from page 26.

The <u>delegate of Uruguay</u> requested that the name of his country be included in ADD 325A. Agreed.

Page B.13/26

ADD 552A

The <u>delegate of the Netherlands</u> pointed out that the wording of the foot-note was unusual and asked what the status of an assignment to a station in the Broadcasting-Satellite Service would be once it was recorded, and the implications with regard to existing adopted frequency assignment plans for stations in the Terrestrial-Broadcasting Service.

The <u>Secretary of Committee 5</u> replied, that from the records of Committee 5, texts along the lines of those contained in ADD 532A had been used in each case where the Committee had decided not to make an allocation at the present time of the entire frequency band in question to an "additional" Space Radiocommunication Service with equal rights to those of the existing primary service(s) in the band; but where it had wished to make provision for the use of the band by stations of an "additional" Space Radiocommunication Service on an assignment by assignment basis and subject to the obligation of first obtaining, for each specific assignment, the agreement of all administrations having existing or future planned services (in accordance with the Table) which might be affected, Committee 5 had placed on record that only after such agreement had been reached and the assignment had been notified, together with information on the agreement, for recording in the Master Register, could the assignment be considered and recorded as being in conformity with the Table of Frequency Allocations.

The <u>Chairman</u> suggested that in the light of that explanation the foot-note be left unchanged and the <u>Chairman of Committee 5</u> supported that suggestion.

The proposal to add "for angles of arrival $< 20^{\circ}$ " after "-129 dBW/m^{2"} was adopted by 63 votes to 1, with 5 abstentions.

The <u>Chairman of the I.F.R.B.</u> mentioned that the explanation which had been given was not an interpretation of the Radio Regulations but indeed an explanation of the text supplied by Committee 5 and pointed out that the words "see Articles 9 and 9A or" should be deleted, leaving simply the reference to the Resolution.

The <u>delegate of Chile</u> noted that the Spanish text should begin "Algunas frecuencias \dots ". It was <u>agreed</u> that the three texts would be aligned.

Approved, on that understanding, with the above amendments and with the deletion of the text between square brackets \angle ADD 339B \angle .

Page B.13/27

In the band 1 525-1 535 MHz in Region 2, Spanish text, EXPLOTACION ESPACIAL, should be replaced by OPERACIONES ESPACIALES.

Approved, as amended.

Page B.13/28

The <u>delegate of the U.S.S.R.</u> said that in view of the decision that there would also be Mobile-Satellite Service communications in the band 1 555-1 542.5 MHz, his administration would not be able to guarantee absence of interference in the band concerned. That comment was noted.

Approved.

Pages B.13/29 - 30

Approved.

Page B.13/31

The <u>delegates</u> of the following countries asked for the names of their countries to be included in MOD 354A: <u>Jordan</u>, <u>Uganda</u>, <u>Tanzania</u>, <u>Kenya</u>, <u>Syrian Arab Republic</u>, <u>Israel</u> and <u>Ethicpia</u>. <u>Agreed</u>.

Approved, after the deletion of Algeria and with those additions.

Pages B.15/32 - 33

Approved.

Pages B.13/34 - 35

The <u>delegate of Switzerland</u> proposed modifying foot-note 356 in the Radio Regulations to bring it closer into line with the Table, i.e. "... service, and the band 1 770-1 790 MHz is also allocated, on a secondary basis, to the meteorological-satellite service".

The <u>delegate of Mexico</u>, supported by the <u>delegates of India</u>, <u>Cuba</u>, <u>Chile</u>, <u>Uganda</u>, <u>Israel and Venezuela</u>, suggested that the texts of Nos. 356, 356AB and 356AA be modified to the effect that the allocations concerned were on a secondary basis.

Document No. 420-E Page 14

The <u>delegate of the United States of America</u> advised against a hasty decision and the <u>delegate of the United Kingdom</u> pointed out that the inclusion of the "subject to agreement" clause implied that nothing could be done without the consent of the countries concerned.

The Chairman put to the vote the motion to retain the foot-notes as they appeared on pages 34 and 35, and it was adopted by 39 votes to 17, with 9 abstentions.

Approved.

Page B.13/36

The <u>Secretary of Committee 5</u> indicated the following changes: in the framed part of the Table for the band 2 550-2 655 MHz add foot-note 364; add the same number 364 in the band 2 655-2 690 MHz for Region 1 and delete the square brackets around foot-note 364D.

The Spanish version for the band 2 550-2 655 MHz should be aligned with the French and English versions.

Approved, with those amendments.

Page B.13/37

ADD 361B :

It was agreed to replace "(see Articles 9 and 9A or Resolution No.)" by "(see Resolutions Nos. G and F)", Resolution No. F being of a general nature and Resolution No. G an interim provision.

The <u>Secretary of Committee 5</u> said that foot-note MOD 364 should be included, the wording to be reproduced from No. 364 of the Radio Regulations with the addition of the words "terrestrial radiocommunication" before "services".

MOD 364A:

The <u>delegate of Algeria</u> asked for his country to be deleted from the foot-note, and the <u>delegates of Uganda</u>, <u>Kenya</u>, <u>Tanzania</u>, <u>Jordan</u>, <u>Syria</u>, <u>Ethiopia</u> and <u>Cuba</u> asked to be added.

The latter request gave rise to a discussion on whether the Conference was competent to take such action; the delegates of Italy and Canada were against the inclusion of new names and the delegate of the United Kingdom said that in a band where there had been no change to the Radio Astronomy Service there was no justification for increasing the allocation to the Fixed and Mobile Services. The Chairman of the I.F.R.B. said that if the Conference had kept strictly to the letter of its terms of reference in all cases, it would have had great difficulty in completing its work; however, he asked those countries requesting inclusion to do so only if they considered it absolutely essential.

The <u>delegates of Syria and Ethiopia did not insist</u> but the <u>delegates of Uganda, Kenya and Tanzania</u> pressed for inclusion in the foot-note.

The <u>Chairman of Committee 5</u> said that there had been similar discussions in the Committee and finally the countries having made such requests in similar circumstances had agreed not to press the issue.

The <u>Chairman</u> put to the vote the inclusion of additional names: the result of the vote was 13 in favour, 17 against and 21 abstentions and the list of countries was therefore left as it was, with the reinsertion of the name of Cuba which appeared in the foot-note in the existing Radio Regulations.

The Secretary of Committee $\underline{5}$ said that the agreed wording of ADD $\underline{364D}$ was :

"Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in the band 2 655-2 690 MHz".

Approved, as amended.

Page B.15/38

ADD 364E:

The <u>delegate of the United States of America</u> proposed inserting "(see Article 9A)" at the end of the sixth line, and at the end of the paragraph "... shall not exceed the value given in No. 470NE of Article 7".

There was some discussion on the advisability of quoting No. 470NI and it was finally decided to state in the minutes of the meeting that both 470NE and 470NI were applicable.

Document No. 420-E Page 16

The <u>Secretary of Committee 5</u> recalled that ADD 364H, with the wording adopted at the previous meeting, should appear in numerical order.

Approved, as amended.

Page B.13/39

Approved.

Page B.13/40

 $\underline{\text{Approved}},$ with deletion of 392A in the framed part of the Table for the band 4 400-4 700 MHz.

Pages B.13/41 - 42

Approved.

Page B.13/45

ADD 392AA :

The <u>delegate of Brazil</u>, recalling that he had reserved the right to revert to the foot-note in Plenary meeting, asked for the name of Brazil to be included. <u>Agreed</u>.

Approved, with that addition.

Page B.13/44

Approved, with the inclusion of SUP 392F.

Page B.13/45

Approved.

Page B.13/46

The <u>delegate of Australia</u>, having asked for the name of Australia to be removed from No. 394A of the Radio Regulations, it was agreed that the text thus amended would be included with the indication MOD 394A.

Approved, as amended.

Page B.13/47

Approved.

Page B.13/48

The <u>Secretary of Committee 5</u> said that the square brackets should be removed throughout the page and the texts contained in the brackets should remain. In foot-note A the words in parentheses should read "(see Resolution No. F)".

The <u>delegate of Nigeria</u> proposed that the provisions of foot-note ADD E be applied also to Region 1, with some slight modifications of the text. The <u>delegates of Ghana</u> and <u>Uganda</u> associated themselves with the Nigerian proposal, particularly the suggestion to add "or sub-region" after "domestic".

The <u>delegate of Italy</u>, supported by the <u>delegate of the U.S.S.R.</u>, thought that the provisions of foot-note E could not be applied to Region 1.

The <u>Chairman of Committee 5</u> suggested that page 48 be adopted as it stood, with the removal of the square brackets, and he was supported by the <u>delegates of Sweden</u>, <u>France</u> and <u>Spain</u>.

The <u>Chairman</u> put to the vote the proposal to apply the provisions of foot-note E to Region 1 and it was <u>rejected</u> (5 votes in favour, 41 against and 13 abstentions).

The <u>delegate of the United States of America</u> noted that the phrase "(see Article 9 and Resolution G)" should be added at the end of paragraph E.

Approved, as amended.

Page B.15/49

The <u>delegates</u> of the following countries asked for the names of their countries to be deleted or added as shown.

ADD 405BA :

Austria to be deleted and Senegal and Niger added.

ADD 405BB :

Nigeria and Senegal to be deleted, Liechtenstein, Uganda, Kenya and Tanzania added. Agreed.

Approved, with those amendments.

Page B.15/50

The delegate of the United Kingdom, supported by the delegate of Canada, said that in the bands 14-14.3 and 14.3-14.4 GHz it was recognized that some sharing criteria were necessary; the best Committee 4 had been able to do was to include a paragraph in Recommendation No. Spa 3 asking the C.C.I.R. to carry out studies. He therefore proposed the following new note:

"The use of the bands 14-14.7 GHz and 14.3-14.4 GHz by the Radio-navigation Service and the Radionavigation Satellite Service respectively shall be such as to afford adequate protection to space stations of the Fixed-Satellite Service (see Recommendation No. Spa 3, paragraph 2.14)".

The delegate of Japan said he had reserved the right to make a statement in connection with the band in question. The Japanese Administration, recognizing the fact that frequencies were important natural resources, had proposed allocating almost all frequency bands for Fixed-Satellite Services on a shared basis with terrestrial Fixed Services since sharing criteria between those services had been established technically. The 14-14.3 GHz band was proposed for the Fixed-Satellite Service sharing with the Radionavigation Service. His Administration believed that sharing between Fixed-Satellite and Radionavigation Services, including various kinds of radar, would be much more difficult because of the lack of sharing criteria. On the other hand, the band 12.75-13.25 GHz allocated to Fixed and Mobile Services could easily be shared with the Fixed-Satellite Service. For that reason, they were reluctant to accept frequency allocations for the band 14-14.3 GHz. However, if the majority were ready to support that allocation they would accept it and wait for C.C.I.R. studies and recommendations on sharing criteria.

Approved, as amended.

Page B.13/51

Page B.13/52

The Secretary of Committee 5 said that the term "SUP 410" should appear at the top of the page, a vertical line be drawn between Regions 2 and 5 in the framed part of the Table for the band 22.5-23 GHz. Also the square brackets around the reference to 410B and the foot-note itself should be deleted.

The <u>delegate of Brazil</u> pointed out that the Conference was not competent to include a reference to the Terrestrial Broadcasting Service in the framed part of the Table for the band 22.5-25 GHz and suggested that the reference to the Broadcasting-Satellite Service should also be deleted as it might be enough to refer to that service in the foot-note. If that were done, the indications in the Table and foot-note 410B could be made applicable to all Regions, and the words "in Region 5" could be deleted from the foot-note.

The Chairman of Committee 5, supported by the delegates of the United States of America, New Zealand, the United Kingdom, Cuba and Japan, suggested that the entry in the Table and the foot-note should remain unchanged, except for the deletion of the reference in the Table to the Terrestrial Broadcasting Service.

Approved, as amended.

Pages B.13/53 - 54

Approved.

Page B.13/55

The delegate of the Federal Republic of Germany suggested that the directions of the Fixed-Satellite Service in the 40-41 GHz and 50-51 GHz bands should be reversed for reasons of economy and to reduce filtering problems and interference to broadcasting receivers.

The <u>delegates of Japan</u>, the <u>United States of America</u>, the <u>U.S.S.R.</u> and <u>India</u> supported the proposal.

Approved, as amended.

Pages B.13/56 - 59

The texts in Series B.13, as amended, were approved at first reading.

The <u>delegate of Malaysia</u> said that, with regard to the application of modifications and additions to foot-notes in the course of the Conference, it should be borne in mind that the foot-notes relating to Malaysia introduced into the Radio Regulations by the 1959 and 1963 Administrative Radio Conferences had included Singapore, which had since become a separate State. Accordingly, it should be understood that the foot-notes amended or added during the current Conference in which the name of Malaysia appeared no longer included the State of Singapore, but applied only to the territory of Malaysia.

The <u>delegate of the United States of America</u> pointed out that the new foot-note 320A, giving status to the Amateur-Satellite Service in the band 435-438 MHz, contained a reference to No. 1567A, whereas no such provision appeared in the existing Radio Regulations.

The <u>delegate of the United Kingdom</u> said that the text of a proposed No. 1567A appeared in Document No. 315 and expressed the hope that it would be considered before the end of the Conference.

5. Second reading of texts submitted by the Editorial Committee Series B.13 (as amended at first reading) (Document No. 383)

The <u>Secretary of Committee 5</u> read out the amendments agreed previously page by page.

Page B.13/24

The Secretary of Committee 5 confirmed once more that the decision of Committee 5 concerning the direction to be mentioned in the Table and in foot-note ADD 324C was correctly reproduced; nevertheless, eight countries had reserved their positions on the foot-note.

Approved.

Page B.15/45

The Chairman of Committee 7 said that "392A", should be deleted from the last line.

Page B.13/49

The <u>delegate of Ethiopia</u> said that his country's name should be added to foot-note 405BB. Agreed.

Approved, with that addition.

Page B.15/50

The Chairman of Committee 7 said that the number assigned provisionally to the new foot-note in the 14-14.3 GHz and 14.5-14.4 GHz bands was 405BF.

Page B.15/52

410B :

The <u>delegates of Mexico</u> and <u>Nigeria</u> thought that there might be no need for foot-note 410B, since the allocation to the Broadcasting-Satellite Service was made on a primary basis in the Table. The <u>Chairman of the I.F.R.B.</u> pointed out that the foot-note introduced a necessary proviso and therefore created no inconsistency in the Radio Regulations.

In reply to the delegate of Syria, the Chairman of Committee 4 said that as a result of the reduction of the upper limit in No. 470NX from 25 GHz to 22 GHz, Article 7 no longer laid down a power limit for the Broadcasting-Satellite Service in the band concerned. The delegate of the United Kingdom, supported by the delegate of New Zealand, said that when the service was brought into operation a power flux-density limit would be agreed upon in the co-ordination arrangements. The delegate of Syria pointed out that the provision contained no reference to future agreements between administrations, but the delegate of the United Kingdom stressed that such an agreement would of necessity have to be reached before the service became operational.

The <u>delegates of France</u>, <u>Brazil</u> and <u>Nigeria</u>, thought the wisest course might be to delete the service from the Table and either merely refer to it in the foot-note or delete the foot-note as well.

The <u>delegate of Canada</u> suggested that the word "also" should be deleted from foot-note 410B.

Approved, with the Canadian amendment.

Page B.13/53

The Chairman of Committee 7 said that in the framed part of the Table for the band 24.05-24.25 GHz, "410" should be changed to "410C" and that "MOD 410" should be changed to "ADD 410C".

In reply to a suggestion by the <u>delegate of Norway</u> that the words "except aeronautical mobile" should be added to "mobile" wherever that service appeared in conjunction with the Fixed-Satellite Service throughout the Table, the <u>Chairman</u> said that such a change fell outside the competence of the Space Conference.

The texts in Series B.15, as amended, were approved at second reading.

The <u>delegate of Australia</u> observed that under No. 765 of the Montreux Convention, the approval of texts on second reading sufficed to bring the Final Acts into existence. There would therefore be no need to print the texts in Series B.13 in "whites" before the signature of the Final Acts.

The Chairman of Committee 5 said that on the occasion of the final approval at the second reading of the revised Table of Frequency Allocations (Article 5) he wished specially to thank the Chairman of the Conference for his wise guidance and moral support and to express his sincere gratitude to the Vice-Chairman of Committee 5, the Chairmen of the Working Groups and Sub-Working Groups, the Committee's Editorial Group, the Members of the I.F.R.B. and their staff and, in particular, the Secretary of Committee 5, who had been the real heart and brain of the Allocations Committee throughout the Conference.

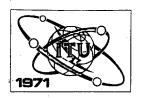
4. Draft Resolution: Planning and administration of the resources of the geostationary satellite orbit (Document No. 138)

The <u>delegate of Mexico</u> said that the preoccupations which had caused his delegation to submit the draft resolution had been completely covered by Resolutions Nos. Spa 4, F and G, Recommendation No. LL and the revised texts of Articles 9 and 9A that had been adopted on second reading. He therefore withdrew the draft resolution.

The meeting rose at 1755 hours.

Secretary of the Conference:
Clifford STEAD

Chairman of the Conference:
Gunnar PEDERSEN



SPACE CONFERENCE

Document No. 421-E 25 August 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

TWELFTH PLENARY MEETING

Friday, 16 July 1971, at 1800 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Subjects discussed	Document No
1. Second reading of texts submitted by the Editorial Committee:	
a) Series R.3	395
b) Proposed addition to Article 41 of the Radio Regulations	315
2. Draft Resolution relating to the abrogation of obsolete Resolutions and Recommendations of the Extraordinary Administrative Radio Conference to Allocate Frequency Bands for Space Radio-	a
communication Purposes, Geneva, 1963	408
3. Draft Recommendation relating to the preferred frequency bands for tropospheric scatter systems	407



1. Second reading of texts submitted by the Editorial Committee

a) Series R.3 (Document No. 395)

The delegate of Canada, referring to the proposal to delete the first line of ADD 470NW which had not been adopted at the preceding meeting, said that the bands in question in Region 2 would be the subject of planning procedures, under which the countries of the Region would be provided with appropriate channels for satellite broadcasting and yet, in between channels allocated on a geographical basis, would allow for fixed and mobile services. The power flux-density limits would be among the many factors taken into account in such planning, and the application to the broadcasting satellite service of limits which would normally apply to the communication satellite service would be prejudicial to the plan and to the countries of Region 2.

The Chairman put to the vote the proposal to delete the first line of ADD 470NW.

The proposal was adopted by 11 votes to 9.

The texts in Series R.3, as amended, were approved at second reading.

b) Proposed addition to Article 41 of the Radio Regulations (Document No. 315)

Approved at second reading.

2. Draft Resolution relating to the abrogation of obsolete resolutions and recommendations of the Extraordinary Administrative Radio Conference to Allocate Frequency Bands for Space Radiocommunication Purposes, Geneva, 1963 (Document No. 408)

The <u>Chairman of Committee 7</u> said that all the texts appearing in square brackets in the "considering" part of the draft Resolution had either been superseded by new texts or had become obsolete.

The <u>Secretary of the Conference</u> suggested that the last "considering" paragraph should be preceded by the words "c) that" and that the words "are obsolete" should be added at the end.

It was agreed to delete the square brackets from the draft Resolution.

The Chairman of Committee 7 pointed out that, owing to an oversight by the 1963 Conference, Recommendation No. 36 had been retained in the Radio Regulations, although it was a recommendation of the 1959 Conference relating to the convening of the 1963 Conference. He therefore proposed the addition of a "considering" paragraph d), reading "that Recommendation No. 36 relating to the convening of an Extraordinary Administrative Radio Conference to Allocate Frequency Bands for Space Radiocommunication Purposes is obsolete".

Approved, as amended.

3. <u>Draft Recommendation relating to the preferred frequency bands for tropospheric scatter systems (Document No. 407)</u>

The <u>delegate of Canada</u>, introducing the draft recommendation on behalf of its six sponsors, said that the text had been submitted in the belief that many difficult problems were due to proposals for sharing between tropospheric scatter and space systems and that measures could be taken with a view to achieving better spectrum management in that regard.

The word "World" should be inserted before "Administrative Conference" in the "invites" paragraph.

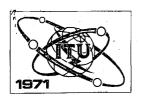
The <u>delegate of France</u>, supported by the <u>delegates of Italy</u>, <u>New Zealand and Mexico</u>, said that her delegation agreed with the substance of the proposal, but would suggest that the last paragraph should be amended to read: "<u>invites</u> the Administrative Council to arrange that a future World Administrative Radio Conference should specify, in the frequency bands allocated to the fixed services, those which are specially intended for tropospheric scatter systems". The reason for that amendment was that the existing text implied a complete revision of allocations in the bands between 800 Mc/s and 5 Gc/s, which would obviously be impossible.

Approved, as amended.

The meeting rose at 1820 hrs.

Secretary of the Conference : Clifford STEAD

Chairman of the Conference : Gunnar PEDERSEN



SPACE CONFERENCE

Document No. 422-E 25 August 1971 Original: English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE

THIRTEENTH PLENARY MEETING

Friday, 16 July 1971, at 2130 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Sub	jects discussed :	Document No.
1.	Minutes of the Third Plenary Meeting	378
2.	Minutes of the Fourth Plenary Meeting	404
3.	Final report by the Budget Control Committee	363
4.	Statements for inclusion in the Final Protocol	402 + Add. 1 - 5



1. Minutes of the Third Plenary Meeting (Document No. 378)

Approved, subject to an amendment to page 3 to be handed in by the delegate of Algeria.

2. Minutes of the Fourth Plenary Meeting (Document No. 404)

Approved.

3. Final Report by the Budget Control Committee (Document No. 363)

The <u>Chairman</u> pointed out that in accordance with the Convention the Conference was called upon to consider and approve the report and make such observations as it found necessary; the report would then be transmitted to the Secretary-General for submission to the following session of the Administrative Council.

Approval of the report was expressed by the <u>delegates</u> of Yugoslavia, <u>Spain</u>, <u>Argentina</u>, <u>Canada</u>, <u>U.S.S.R</u>. and the <u>United Kingdom</u>, the <u>delegate of the United States of America</u> adding his regret that the budget had been unrealistic and his hope that the Council would be able to rectify the situation and find some way of meeting the excess expenditure.

The <u>delegate of Yugoslavia</u> thanked all those in the Conference secretariat who had enabled the Conference to complete its work. He pointed out that Committees 4, 5 and 6 had stressed the role played by the I.F.R.B. and the Conference's Technical Secretariat, and he thought the Conference should draw the attention of the Council to the fact that the I.F.R.B. would need additional staff to implement the decisions just taken. That kind of action was normally the subject of a resolution but he suggested that the Conference might - if there was no objection - have the summary records of the meeting passed to the Administrative Council.

The <u>delegates of Spain</u>, <u>India</u>, <u>Mali</u>, <u>Argentina</u>, <u>Venezuela</u>, <u>Iran</u>, <u>Mexico</u> and <u>Japan</u>, supported the suggestion by the delegate of Yugoslavia, paying tribute to the efforts made during the Conference by the I.F.R.B. Secretariat and the necessity for the I.F.R.B. to be reinforced to assume the additional responsibilities conferred upon it by the Conference. The <u>delegates of Canada</u>, the <u>U.S.S.R.</u>, <u>Cuba</u>, the <u>United Kingdom</u> and the <u>United States of America</u>, while endorsing the expressions of appreciation to the I.F.R.B., and thanking the C.C.I.R., which had laid down the technical foundations of the Conference, and the rest of the I.T.U. Secretariat, said

that the attention of the Administrative Council would certainly be drawn to the decisions taken at the Conference and the resulting technical and administrative measures, but it was then for the Council itself to decide what action was appropriate. The delegate of Chile said that developing countries had found the exchange of opinions made possible by the Conference most valuable, and he associated himself with the expressions of gratitude to all those who had contributed in any way to its success.

The final report of the Budget Control Committee was adopted.

The <u>Chairman</u> requested the <u>Secretary-General</u> to transmit the report and the above observations to the Council.

4. Statements for inclusion in the Final Protocol (Document No. 402, Addenda 1 - 5)

Document No. 402

Annexes 1 - 6 - were agreed for inclusion in the Final Protocol.

Addendum No. 1

Annexes 1 - 4 - were agreed for inclusion in the Final Protocol.

Addendum No. 2

Annexes 1 - 3 - were agreed for inclusion in the Final Protocol.

Addendum No. 3

The <u>delegate of the United Kingdom</u> suggested that since the text under discussion was intended to be included in the Final Protocol "footnote 332A" should be replaced by "Radio Regulation 332A" to ensure that No. 332A was identified as a Radio Regulation.

Furthermore it had been decided not to include 470MB in the Radio Regulations so it should be replaced in the text of Add.3 to Document No. 402 by 470NK which contained the same power limit. The reference to 470NI remained unchanged.

The <u>delegate of India</u> said that the suggestions made by the delegate of the United Kingdom were quite acceptable to the Indian delegation.

The <u>delegate of the United States of America</u>, while agreeing with the technical correction thus made, thought the statement was out of order in the form in which it was presented.

The <u>delegate of Greece</u> suggested that the introductory paragraph be reworded to the effect that India had submitted a statement and a phrase added stating that the Conference expressed its interest in the experiment. That suggestion was supported by the delegates of Mexico and Italy.

The delegates of Pakistan, Malaysia, France, Uganda, Cuba and the United States of America said their understanding had been that the decision taken was that India could make such a statement in the Final Protocol.

The <u>delegates of Canada</u>, <u>Brazil</u> and <u>Sweden</u> thought that the text as it appeared in Addendum No. 3 correctly reflected the decision taken.

The <u>delegate of India</u> pointed out that the text was not a reservation and in that it differed from the other statements included in the Final Protocol, it was in fact an expression of the wish of the Conference and not merely an Indian statement.

The <u>Deputy Secretary-General</u> said that the Secretariat, in publishing what had been submitted to it, had thought it reasonable to include it at the end of the reservations and immediately preceding the signatures; an alternative would be to have it in the form of an Additional Protocol.

The <u>delegate of Spain</u> thought that consideration should be given to that alternative.

The <u>delegate of the United Kingdom</u> proposed that in the second line after "following", the words "statement by India" be added.

The <u>delegates of Canada and Malaysia</u> found that amendment acceptable and the <u>Deputy Secretary-General</u> felt that the amended text put the situation in the correct perspective.

The <u>Chairman</u> put the United Kingdom amendment to the vote and it was <u>adopted</u> by 61 votes to 2, with 10 abstentions.

The <u>delegate of India</u> thanked the delegates for the consideration they had shown with regard to the project; it was his firm conviction that it would open up a new vista and prove beneficial to many countries throughout the world.

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The <u>delegate of Sweden</u> said he had abstained because in his view the vote just taken was incorrect.

Addendum No. 3, as amended, was agreed for inclusion in the Final Protocol.

Addendum No. 4

Annex 1 - was agreed for inclusion in the Final Protocol.

Addendum No. 5

Annexes 1 and 2 - were agreed for inclusion in the Final Protocol.

The meeting rose at 2340 hrs.

Secretary of the Conference :

Chairman of the Conference :

Clifford STEAD

Gunnar PEDERSEN



SPACE CONFERENCE

Document No. 423-E 25 August 1971 Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

PLENARY MEETING

MINUTES

OF THE .

FOURTEENTH AND LAST PLENARY MEETING

Saturday, 17 July 1971, at 0600 hrs

Chairman: Mr. Gunnar PEDERSEN (Denmark)

Vice-Chairmen: Mr. A. BADALOV (U.S.S.R.)

Ambassador R.C. TYSON (United States of America)

Subjects discussed

- 1. Signing of Final Acts
- 2. Statement by the Chairman
- 3. Closure of the Conference



1. Signing of the Final Acts

The Chairman of the Credentials Committee said that the provisional credentials of the delegations of Jordan and Panama had not been confirmed and they were therefore not empowered to sign the Final Acts of the Conference.

The <u>Secretary-General</u> then called the roll and signatures were successively appended in respect of the following Members of the Union:

Algeria (Algerian Democratic and Popular Republic)

Saudi Arabia (Kingdom of)

Argentine Republic

Australia (Commonwealth of)

Austria

Belgium

Bielorussian Soviet Socialist Republic

Brazil

Bulgaria (People's Republic of)

Cameroon (Federal Republic of)

Canada

Central African Republic

Ceylon

Chile

China

Cyprus (Republic of)

Vatican City State

Colombia (Republic of)

Congo (Democratic Republic of the)

Congo (People's Republic of the)

Korea (Republic of)

Ivory Coast (Republic of the)

Cuba

Denmark

Group of Territories represented by the French Overseas

Post and Telecommunication Agency

Spain

United States of America

Ethiopia

Finland

France

Gabon Republic

Ghana Greece Upper Volta (Republic of) Hungarian People's Republic India (Republic of) Indonesia (Republic of) Iran Iraq (Republic of) Ireland Iceland Israel (State of) Italy Jamaica Japan Kenya Kuwait (State of) Liberia (Republic of) Libyan Arab Republic Liechtenstein (Principality of) Luxembourg Malaysia Mali (Republic of) Morocco (Kingdom of) Mauritania (Islamic Republic of) Mexico Monaco Nicaragua Niger (Republic of the) Nigeria (Federal Republic of) Norway New Zealand Uganda Pakistan Paraguay Netherlands (Kingdom of the) Peru Philippines (Republic of the) Poland (People's Republic of) Portugal Portuguese Oversea Provinces Syrian Arab Republic United Arab Republic Federal Republic of Germany

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Ukrainian Soviet Socialist Republic Roumania (Socialist Republic of) United Kingdom (United Kingdom of Great Britain and Northern Ireland, the Channel Islands and the Isle of Man) Rwanda (Republic of) Senegal (Republic of the) Singapore (Republic of) South Africa (Républic of) Sweden Switzerland (Confederation of) Tanzania (United Republic of) Czechoslovak Socialist Republic Territories of the United States of America Overseas Territories for the international relations of which the Government of the United Kingdom of Great Britain and Northern Ireland are responsible Thailand Togolese Republic Tunisia Turkey Union of Soviet Socialist Republics Uruguay (Oriental Republic of) Venezuela (Republic of) Viet-Nam (Republic of) Yugoslavia (Sccialist Federal Republic of)

2. Statement by the Chairman

The Chairman made the statement attached hereto as the Annex.

3. Closure of the Conference

The <u>delegate of Spain</u>, doyen of the meeting, congratulated the Chairman on behalf of all those present for bringing the work of the Conference to a successful conclusion. He recalled earlier Conferences at which the discussions had been very similar. In 1932 at Madrid, for example, radio broadcasting was in its infancy, but the development of terrestrial broadcasting since that date was well known. The results of the 1971 Conference would be judged by those who would use telecommunications in future with the aim of uniting peoples, encouraging the development of countries and increasing co-operation and goodwill. In conclusion, he associated himself with the tributes paid during the Conference to Mr. Yusuf and to the three Soviet cosmonauts.

The <u>delegate of Saudi Arabia</u>, representing one of the developing countries which would benefit from the Final Acts of the Conference, also expressed his admiration for the excellent manner in which the Chairman had conducted the meetings and enabled the Conference to perform its work in a traditional friendly and co-operative atmosphere. The Conference had taken a wise step in electing Mr. Pedersen Chairman and had benefited from his lengthy and valuable personal experience. He also wished to congratulate the Secretary-General, his collaborators and all the organs of the I.T.U. and last but not least thank the Swiss Administration for its hospitality.

The <u>delegate of India</u> said that it was worthwhile to look back over the six-week duration of the Conference and compare what had been expected with what had been achieved. A new era was beginning with new services created and others appearing in a new form. Finally, he thanked the Chairman and the two Vice-Chairmen, the Secretary-General and General Secretariat, the Director of the C.C.I.R., Chairman of the I.F.R.B. and the Swiss Administration.

The Chairman declared closed the World Administrative Radio Conference for Space Telecommunications.

The meeting rose at 0710 hrs.

Secretary of the Conference : Clifford STEAD

Chairman of the Conference : Gunnar PEDERSEN

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ANNEX

STATEMENT BY MR. GUNNAR PEDERSEN, CHAIRMAN

We have now concluded our work and I feel that we have been able to solve the problems that faced us in a very constructive atmosphere. We have in our work followed the good old traditions of the I.T.U., but in addition we have demonstrated to the world that the I.T.U. is more than ever before at the forefront in the field of telecommunications in space as well as on the ground.

We have created new and revised rules which will give space communications the greater flexibility which is needed in our dynamic society. The new rules will make space communication the most effective instrument to take good care of the immense new requirements in this period of information explosion.

It has been necessary to work quite hard during the last six weeks, and for an outsider it may be rather difficult to understand that we needed such a long time.

We have all come here with a good knowledge of our own problems, but it was during these six weeks that we had to learn to understand the problems of our neighbours, and that has necessarily been a time-consuming process.

In addition, we had to learn that a solution which in itself is not fully acceptable considering our own needs, may, all the same, turn out to be to our advantage. That will be the case if such a solution has obtained the general acceptance which gives the necessary background for the most efficient use of the radio spectrum on the earth and in space. Only in this way all nations and services will benefit in the future.

The very fact that the many specialists in the field of space and telecommunications technology, from all parts of the world, have been able to solve the problems in connection with radio services for space exploration and utilization, is in itself most encouraging. I believe that within the next decade the results of our Conference will play a most important role in the world's economic and social development. In the long run, the results of our Conference may even prove to be of greater value to mankind in general than the solution of many of the present-day political problems.

Thanks to the valuable technical work which had been carried out in the C.C.I.R., and especially at the Special Joint Meeting under the chairmanship of Mr. Marchand of Canada, we all knew that the Conference had a fine technical background for its work. But even so, I have felt it a heavy responsibility to preside over this Conference.

I have, however, had extremely good and valuable help from the two Vice-Chairmen, Mr. Badalov of the U.S.S.R., and Mr. Tyson of the U.S.A. I can assure you that their good advice has been of the greatest value to the Conference and to me personally. We have been able to discuss the most difficult problems in a most friendly and constructive atmosphere, and I am very grateful to Mr. Badalov and to Mr. Tyson.

The main part of the work has, of course, been carried out in the Committees and in the Working Groups and smaller groups, and here I must pay a special tribute to the Committee Chairmen.

Mr. Martinez of the Credentials Committee did a fine job in connection with the examination of the credentials, and Mr. Constantinescu has taken good care of the Budget Control Committee which was faced with certain difficulties.

The Technical Committee, under the chairmanship of Mr. Sandbach, has solved very difficult problems and it was in such a way that the work of the other committees was facilitated.

Mr. Kieffer, the Chairman of the Allocations Committee, has had perhaps the most difficult and important problems, and he has solved them with energy and drive to a degree seldom seen.

Mr. Basu took very good care of the very complicated problems of modifying the Radio Regulations and finding methods and language to cover the many new ideas which came into the Radio Regulations by way of space.

Mr. Job, as Chairman of the Editorial Committee, has had to work I believe day and night to get the many pages published in fine and correct language. It has always been the good tradition that the delegate of France is Chairman of this Committee, and we certainly have not been disappointed this time.

I must also thank, for the good advice which I have received in meetings and outside meetings, the Secretary-General, Mr. Mili, and the Deputy Secretary-General, Mr. Butler.

I also want to extend my warm thanks to the Chairman and members of the I.F.R.B. for the extremely good help which has been given to the Conference and to me personally from the I.F.R.B. and its staff.

Also, Mr. Herbstreit of the C.C.I.R. has been most helpful in making sound technical suggestions during the work of the Conference.

I am very grateful for the excellent assistance given by Mr. Stead and the members of the Conference Secretariat. I know it has been a most difficult task as the time was short and the work of the Committees was not always concluded in good time.

I must also express my thanks to the very fine interpretation system. It has worked so well during the much too long hours that most of the time we almost forgot that there actually were human beings behind the windows of the booths. I believe that is the greatest compliment you can pay to the interpretation service.

To conclude, I sincerely hope that the results of our work will serve to improve telecommunications in all regions of the world and I hope that the I.T.U. will continue to fulfil its role in the space age.



SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS - GENEVA - 1971

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A. Basic documents of the Conference

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B. The attached Annex contains the complete List of documents in numerical order

ANNEX

LIST OF DOCUMENTS

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No •	Origin	Title	Destination
1	S.G.	Agenda for the Conference	${ m PL}$
2	S.G.	Prop., Symbols, etc.	${ m PL}$
3	Denmark	Prop., RR Art. 5	${ m PL}$
4	F.R. of Germany	Prop., RR Art. 1	${ m PL}$
5 + Corr. 1, 2	F.R. of Germany	Prop., RR Art. 5	$_{ m PL}$
6	S.G.	Opinion expressed by the Plan Committee for Europe and the Mediterranean Basin	${ m PL}$
7 + Corr. 1, 2	Sweden	Prop., RR Art. 5	${ m PL}$
8	Norway	Prop., RR Art. 5	${ t PL}$
9	Australia	Prop., RR Art. 1	${ m PL}$
10 + Corr. 1, 2	Australia	Prop., RR Art. 5	${ m PL}$
11	Australia	Prop., RR Art. 7	PL
12 (Rev.)	Canada	Proposals	${ m PL}$
13(Rev.)	Canada	Prop., RR Art. 1	${ m PL}$
14(Rev.) + Corr.	Canada	Prop., RR Art. 5	${ m PL}$
15(Rev.) + Add.	Canada	Prop., RR Art. 7	PL
16(Rev.)	Canada	Prop., RR Art. 9	PL
17(Rev.)	Canada	Prop., RR Art. 9A	PL
18(Rev.)	Canada	Prop., RR Art. 14	${ m PL}$
19 (Rev.)	Canada	Prop., RR Art. 15	PL
20 (Rev.)	Canada	Prop., RR New App. 1B	${ m PL}$
21	Argentina	Prop., RR Art. 1	${ m PL}$
22 + Corr. 1, 2	Argentina	Prop., RR Art. 5	${ m PL}$
23 + Corr.	Argentina	Prop., RR Art. 7	${ m PL}$
24 + Corr.	Argentina	Prop., RR Art. 14	PL

No.	Origin	Title	Destination
25 + Corr.	Argentina	Prop., RR Art. 41	PL
26 + Corr.	Argentina	Prop., RR Res. Spa. 1	PL
27 + A dd.	Argentina	Prop., RR Rec. 16	PL
28 + Corr. 1, 2, 3	.U.S.A.	Proposals	PL
Corr. 1, 2 to Corr. 1 to 28	U.S.A.	Revised curves for the determination of coordination distance in shared frequency bands between 1 and 40 GHz	PL
29	Japan	Prop., RR Art. 1	PL
30 + Corr. 1, 2, 3	Japan	Prop., RR Art. 5	PL
31 + Corr.	Japan	Prop., RR Art. 7	PL
32	Japan	Prop., RR Art. 8	PL
33	Japan	Prop., RR Arts. 9 & 9A	PL
34	Japan	Prop., RR Rec. Spa. 7	PL
35 + Corr. 1,2	India	Prop., RR Art. 5	PL .
36	India	Prop., RR Art. 9A	PL
37	India	Prop., Frequency sharing	PL
38	India	Prop., RR Art. 1	PL
39 + Corr.	India	Prop., RR Art. 5	PL
40	France	Prop., RR Art. 1	PL
41.	France	Prop., RR Art. 5	PL
42	France	Prop., RR Art. 6	PL
43 + Corr.	France	Prop., RR Art. 7	PL
44	France	Prop., RR Art. 9A	PL
45	France	Prop., RR App. 1A	PL
46 + Corr.	France	Prop., RR App. 1B	PL
47	France	Draft Recommendation	PL
48	France	Draft Recommendation	PL
49	Netherlands	Prop., RR Art. 5	PL
50	S.G.	List of documents	-

No.	Origin	Title	Destination
51	United Kingdom	Explanatory memorandum covering the frequency, administrative and technical aspects of the U.K. Proposals for the World Administrative Radio Conference for Space Telecommunications	PL
52	United Kingdom	Control of interference between geo- stationary satellite systems and non- synchronous inclined-orbit satellite systems using the same frequencies in the communication satellite bands	PL
53	United Kingdom	Prop., RR Art. 1	PL
54 + Corr.	United Kingdom	Prop., RR Art. 5	PL
55	United Kingdom	Prop., RR Art. 7	PL
56	United Kingdom	Prop., RR Arts. 9 & 9A	PL
57	United Kingdom	Draft Resolution C	PL
58	S.G.	International cooperation in the peaceful uses of outer space	PL
59	U.S.S.R.	Prop., RR Art. 5	PL
60	Australia	Prop., RR Art. 5	PL
61 + Corr.	S.G.	Report of the I.F.R.B.	PL
62	New Zealand	Prop., RR Art. 5	PL
63	Sweden	Prop., RR Art. 5	PL
64 + Corr. 1, 2	S.G.	Special Joint Meeting of C.C.I.R. Study Groups	PL
65	s.G.	Suggestions for the organization of the work of the Conference	PL
66	New Zealand	Additional Prop., RR Art. 5	PL
67	Australia	Prop., RR Art. 1	PL
68	Sweden	Additional Prop., RR Art. 5	PL
69	Brazil	Prop., RR Arts. 1, 5, 7, 8, 9, 9A & 14	PL
70	Brazil	Prop., RR Art. 1	PL
71 + Corr.	Brazil	Prop., RR Art. 5	PL
72 + Corr. 1, 2	Brazil	Prop., RR Art. 7	PL
73	Brazil	Prop., RR Art. 8	PL

No.	Origin	Title	Destination
74	Brazil	Prop., RR Art. 9	PL
75	Brazil	Prop., RR Art. 9A	PL
76	Brazil	Prop., RR Art. 14	PL
77	Mexico	Proposals	PL
78	Mexico	Prop., RR Art. 2	PL
79	United Kingdom	Coordination between geostationary communication satellite systems sharing the same frequency bands	PL
80	United Kingdom	Prop., RR App. 1A	PL
81	United Kingdom	Rev. Prop., RR Art. 7	PL
82	China	Prop., RR Art. 1	PL
83	France	Add. Prop., RR Art. 1	PL
84	France	Rev. Prop., RR Art. 5	PL
85	France	Add. Prop., RR Art. 6	PL
86	France	Rev. Prop., RR Art. 7	PL
87	France	Add. Prop., RR Art. 9A	PL
88	France	Proposals concerning the determination of the coordination area for earth stations	PL
89 .	France	Draft Recommendation	PL
90	France	Proposals on the establishment of plans for satellite broadcasting	PL
91	S.G.	Convening of the Conference	PL
92	s.g.	Invitations to the World Administrative Radio Conference for Space Telecommunications	PL
93 + Corr. + Add.	S.G.	Notification to international organizations	PL
94 + Add. 1, 2, 3	S.G.	Situation of certain countries with respect to the International Telecommunication Convention, Montreux (Montreux, 1965)	PL
95	United Kingdom	Rev. Prop., Art. 9A	PL
96	United Kingdom	Draft Recommendation	PL

No.	Origin	Title	Destination
97	Japan	Prop., Art. 1	PL
98 + Corr. 1, 2	Japan	Prop., Art. 5	PL
99	Japan	Prop., Art. 7	PL
100	Secretariat	List of documents	PL
101	U.S.A.	A study of international aero- nautical communications/navigation satellite system-channel/spectrum requirements (1 535-1 660 MHz)	PL
102	U.S.A.	Artificial site shielding	PL
103	U.S.A.	Signal levels in the rear section of an operational earth station antenna	PL
104	Mexico	Amateur service	PL
105	Mexico	Survey of earth resources	
106	Mexico	Satellite broadcasting	$_{ m PL}$
107 (Rev.)	Secretariat	Programme of work for the Conference as recommended by the meeting of Heads of delegations	PL
108	United Kingdom	Proposals for frequency allocations to the maritime mobile service using space communication techniques at frequencies of the order of 450-600 MHz	PL
109(Rev.)	Secretariat	Assignment of proposals	$_{ m PL}$
110	Chile	Proposed amendment concerning the aero- nautical mobile service	PL
lll + Corr.	India	Likelihood of interference to the receivers of tropospheric scatter links operating over the frequency band 845-935 MHz in Regions 1 and 3 from the emissions of an Indian broadcasting satellite proposed to be located at longitude 79 degrees East in the geostationary orbit	PL
112	India	Prop., RR Art. 5 and 7	PL
113	UNESCO	Frequency allocations for space communications	PL
114	Mexico	Proposed amendments to Chapter II (Frequencies)	PL
115	I.P.T.C.	The transmission of news by satellite	PL

No.	Origin	Title	Destination
116	Secretariat	Committee structure	PL
117(Rev.)	U.S.S.R.	Draft Resolution No. Spa. F	PL
<u>,</u> 118	Secretariat	Structure of the Working Groups of Com. 4	Com. 4
119	Argentina	Prop., RR Art. 5	PL
120	Com. 5	Structure of the Working Groups of Com. 5	Com. 5
121	Brazil	Draft Recommendation H	${ t PL}$
122(Rev.)	Com. 6	Structure of the Working Groups of Com. 6	Com. 6
123	Rep. of India	Satellite instructional television experiment (site)	PL
124	Marconi Inter- national Marine Co. Ltd.	Preliminary comments on the proposals for the maritime mobile service	PL
125	Greece	Prop., RR Art. 5	Com. 5
126	Com. 5	Note by the Chairman - Categories of services and allocations	Com. 5
127	Com. 4	Summary Record of the first meeting of Com. 4	Com. 4
128	Com. 2	Summary Record of the first meeting of Com. 2	Com. 2
129	PL	Minutes of the first Plenary Meeting	${ m PL}$
130 + Corr.	Malaysia	General comments concerning RR Art.5 - broadcasting satellite service	Com. 5
131	Japan	Allowable power flux-density produced at the surface of the Earth by a satellite if radio-relay systems were to share the frequency with space services in the band 2.3-3 GHz	Com. 4
132	Japan	Information document relating to allocation of frequencies above 40 Gc/s	PL
133 + Corr.	United Kingdom	Proposals for frequency allocations to the maritime mobile service using space communication techniques at frequencies of the order of 450-600 Mc/s	PL

No.	Origin	Title	Destination
134	I.A.T.A.	I.A.T.A. views on Article 5 of the RR	PL
135	I.M.C.O.	Recommendations concerning maritime requirements for the use of space techniques	WG 5D
136	Norway	Supplementary information to Document No. 8 on spectrum/channel requirements for the international maritime communications satellite system	PL
137	Norway	Modification to No. 322 of Article 5 to the RR	Com. 5
138	Mexico	Draft Resolution No. G	PL
139	Japan	Frequency sharing between communication-satellite systems and radiorelay systems at frequencies above 15.4 GHz	Com. 5
140	Japan	Project of 20 GHz large-capacity digital radio-relay system in Japan	Com. 5
141	Japan	Draft Resolution H	${ m PL}$
142 + Add.	Com. 6	Summary Record of the first meeting of Com. 6	Com. 6
143	India	Techno-economic considerations in the use of the 12 GHz band for satellite broadcasting in the tropical countries	Com. 4 & 5
144	Cuba	Amateur service	${ m PL}$
145	Com. 5	Provisional Summary Record of the first meeting of Com. 5	Com. 5
146	WG 4A	First report from WG 4A, revision of Article 1, Section III	Com. 4
147	Secretariat	Note by the Secretariat - Communi- cation from the Czechoslovak Delegation	$_{ m PL}$
148	Rep. of India	Prop., RR Art. 5	Com. 5
149 + Corr.	Kenya Tanzania Uganda	General observations concerning proposals - Article 5 of the RR	Com. 5
150	Secretariat	List of documents	PL

No.	Origin	Title	Destination
151	WG 5D	Note from Working Group 5D to Working Groups 5B and 5C	WG 5B and WG 5C
152	WG 5D	Note from Working Group 5D to Working Group 5B	WG 5B
153	WG 5D	Note from Working Group 5D to Working Group 5E	WG 5E
154	Com. 2	First report by the Working Party of Committee 2 (Credentials)	Com. 2
155	WG 4B	Note by the Chairman of Working Group 4B	WG 4B
156	S.G.	Budget of the Conference	Budget Control Committee
157	S.G.	Contributions of recognized private operating agencies and international organizations not enjoying exemption	Budget Control Committee
158	S.G.	Cost of printing the Final Acts	Com. 3
159	s.G.	Situation concerning expenditure for the Space Conference at 1 June 1971	Budget Control Committee
160	WG 4A	Second report - Revision of Section I of Article 1	Com. 4
161	Com. 5	Summary Record of the Second Meeting of Committee 5	Com. 5
162	Rep. of Indonesia	Proposal for amendment of foot-note 311A of the Radio Regulations	Com. 5
16 3	WG 4B	Article 7 - Proposed partial text of Section VIII	WG 4B
164	U.S.A. and Canada	Prop., RR Art. 5	Com. 5
165(Rev.)	Rep. of Indonesia	Reservation regarding 470BA	Com. 4
166	WG 4A	Third Report - Revision of Article 1, Section IIB	Com. 4
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No.	Origin	Title	Destination
167(Rev.) + Corr.	Com. 2	Summary Record of the Second Meeting of Committee 2 (Credentials)	Com. 2
168	U.S.A.	Recommendation No. I	Com. 4
169	Com. 4	Summary Record of the Second Meeting of Committee 4 (Technical)	Com. 4
170(Rev.)	United Kingdom	Draft Resolution No. I	WG 6A
171	United Kingdom	Protection ratio measurements and interference calculations for FM television signals affecting V.S.B. AM television reception in the same channel (625 lines PAL colour system)	Com. 4
172 + Corr.	United Kingdom	Aeronautical and Maritime Satellite Services in the band 1 535-1 660 MHz	Com. 5
173	Chairman of the Conference	Memorandum relating to proposals presented by Poland	${ m PL}$
174(Rev.)	WG 4D	First report of Working Group 4D to Committee 4	Com. 4
175	PL	Minutes of the Second Plenary Meeting	${ m PL}$
176	WG 5D	Note from Working Group 5D to Chairman of Committee 5	Com. 5
177(Rev.)	WG 5B	First report of Working Group 5B to Committee 5 (Allocations)	Com. 5
178	U.S.A.	Proposals in the band 2 500-2 690 MHz	Com. 5
179 + Corr.	Argentina	Survey of earth resources	$_{ m PL}$
180(Rev.)	Com. 4	Proposals concerning Broadcasting Satellite Service	Com. 6
181(Rev.2)	WG 5C	First Report of Working Group 5C to Committee 5	Com. 5
182	I.A.R.U.	Space techniques in the Amateur Service	${ m PL}$
183	Argentina	Prop. RR App. 10	Com. 6
184	Com. 2	Second report by the Working Party of Committee 2 (Credentials)	Com. 2

No.	Origin	Title	Destination
185(Rev.)	WG 5C	Note from Working Group 5C to Working Group 5D	WG 5D
186	Sub-WG 5 Ad hoc-1	Terms and Definitions, Section IIa, RR Art. 1	WG 5 Ad hoc
187(Rev.)	WG 5B	Second Report to Com. 5	Com. 5
188(Rev.)	France	Draft Resolution No. J	Com. 4
189	I.A.F.	Position paper for the World Administrative Radio Conference for Space Telecommunications	PL
190	Australia	Prop. RR Art. 5	WG 5E
191	WG 4B	Partial revision of Recommendation No. Spa 3	Com. 4
192	Com. 4	Summary Record of the Third Meeting of Com. 4	Com. 4
193	WG 4D	Third Report of WG 4D to Committee 4	Com. 4
194 + Corr. + Add. 1, 2 (Rev.)	WG 4D	Fourth Report of Working Group 4D to Committee 4. Proposed new Appendix 29	·Com. 4
195	WG 6B	First Report - Revision of Articles 8, 14, 15 and Article 1 (Section III)	Com. 6
196	WG 4B	Note from the Chairman to WG 4A and Com. 4	Com. 4
197	France	Amendment to French proposals F/41/86, F/41/87 and F/41/87A	Com. 5
198 + Add. 1 (Rev.)	WG 4B	Art. 7 - Proposed partial text of Section VIII	Com. 4
199	Sub-WG 5D-1	Terms of reference	Sub-WG 5D-1
200	Secretariat	List of documents	PL
201	I.P.T.C.	News distribution by satellite service	PL
202	Sub-WG 5E-1	First Report of Sub-Working Group 5E-1 to Working Group 5E	WG 5E
203 + Corr.	WG 5D	First Report to Committee 5	Com. 5

No.	Origin	Title	Destination
204	Sub-WG 5E-2	Report of Sub-Working Group 5E-2 to Working Group 5E	WG 5E
205	Canada	Draft Recommendation No. J	Com. 5
206	WG 4B	Note from the Chairman of Working Group 4B. Report on techno-economic comparison among the candidate bands of 800, 2 500, 12 000 Mc/s for broadcasting satellite service in new and developing countries situated in the tropical zone	WG 5E
207	United States	Technical aspects of sharing between transhorizon radio relay systems and broadcasting satellite systems in the vicinity of 800 MHz	Com. 4
208	United States	Geographical sharing between the space and terrestrial broadcasting services below 1 GHz	Com. 4
209	WG 4D	Second report to Committee 4	Com. 4
210	WG 4D	Fifth report to Committee 4	Com. 4
211	WG 4D	Sixth report to Committee 4	Com. 4
212	Com. 3	Report of the first meeting of Committee 3	Com. 3
213	Sub-WG 5D-2	Mandate of Sub-Working Group 5D-2	Sub-WG 5D-2
214	WG 5C	Note from Working Group 5C to Chairman of Committee 5	Com. 5
215	WG 5C	Note from Working Group 5C to Working Groups 5A and 5D	WG 5A and 5D
216	WG 5B	Note from the Chairman of Working Group 5B to the Chairmen, Committee 5 and Working Group 5A	Com. 5 and WG 5A
217	United States	Amendment to Proposal USA/28/90	WG 5A
218 + Corr.	WG 5 Ad hoc	First report of Working Group 5 Ad hoc to Committee 5	Com. 5
219	Com. 6	Letter from the Chairman of Committee 6 to the Chairman of the Conference	PL

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No.	Origin	Title	Destination
220	WG 4D	Seventh report of Working Group 4D to Committee 4	Com. 4
. 221	WG 4D	Eighth report of Working Group 4D to Committee 4	Com. 4
222	United States	Frequency band: 115.16-115.38 GHz - radio astronomy	Com. 5 and WG 5B
223	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 6	Com. 6
224	Rep. of the Philippines	Draft Recommendation No. K	PL
225	WG 5A	First report by Working Group 5A to Committee 5	Com. 5
226	WG 5B	Note from Chairman, Working Group 5B to Chairmen, Working Groups 5A and 5E	Com. 5 and WG 5A, 5B and 5E
227	Com. 4	Summary Record of the fourth meeting of Committee 4	Com. 4
228	Budget Control Committee	First report of the Budget Control Committee	PL
229	United States	Co-ordination distances for earth stations in the earth resources satellite service	PL
230 + Add.	Iraq	General observations concerning the various proposals for allocating the bands between 40 GHz and 275 GHz for various services	Com. 5
231(Rev.2)	WG 5C	Note Working Group 5C to Committee 5	Com. 5
232(Rev.1)	United States	Prop., RR Art. 5	Com. 5
233	Sub-WG 5B-1	Report of Sub-Working Group 5B-1 to Working Group 5B	WG 5B
· 234	WG 4E	First report - proposed new draft resolution relating to the experimental use of radio waves	
1		by ionospheric research satellites	Com. 4

No.	Origin	Title	Destination
235	WG 4E	Second report - proposed text for Section IX of Article 7	Com. 4
236(Rev.)	WG 5C	Second report of Working Group 5C to Committee 5	Com. 5
237(Rev.)	WG 5C	Third report of Working Group 5C to Committee 5	Com. 5
238(Rev.)	WG 5C	Fourth report of Working Group 5C to Committee 5	Com. 5
239	WG 5D	Second report of Working Group 5D to Committee 5	Com. 5
240	WG 5D	Third report of Working Group 5D to Committee 5	Com. 5
241	WG 5D	Fourth report of Working Group 5D to Committee 5	Com. 5
242	Sub-WG 5D-3	Terms of reference of Sub-Working Group 5D-3	Sub-WG 5D-3
243	Com. 4	Summary Record of the fifth meeting of Committee 4	Com. 4
244	Sweden	Proposals for allocation of bands for introduction of space techniques for the maritime mobile service in the higher VHF-lower UHF range	Com. 5
245	Rep. of India	Prop., RR Art. 6	Com. 5
246	Com. 2	Summary Record of the third meeting of Committee 2	Com. 2
247	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 6	. Com. 6
248	WG 5E	First report of Working Group 5E to Committee 5	Com. 5
249	Com. 6	First report from Committee 6	PL
250	Secretariat	List of documents	PL

No.	Origin	Title	Destination
251	WG 5 Ad hoc	Second report of Working Group 5 Ad hoc to Committee 5	Com. 5
252	Com. 2	Report by Committee 2	PL
253	WG 4E	Third report of Working Group 4E - Proposed new draft resolution relating to the technical criteria recommended by the C.C.I.R. for sharing between the space and terrestrial services and within the space service	Com. 4
254 + Corr.	WG 5A	Second report of Working Group 5A to Committee 5 - Frequency bands above 40 Gc/s	. Com. 5
255	Com. 5	Note from the Chairman of Committee 5 relating to the newly adopted service names and the equivalent terms	Com. 5
256	Com. 5	Summary record of the Third meeting of Committee 5	Com. 5
257 + Corr.	WG 5A and 5E	Note by the Chairmen of Working Groups 5A and 5E - Communication- satellite and broadcasting- satellite services	Com. 5 WG 5A and WG 5E
258 + Add.	WG 4C	Draft New Appendix 28 - Procedure for calculating co-ordination distance between earth stations and terrestrial stations sharing the same frequency band in the range 1-40 GHz	wg 4c
259	WG 4E	Fourth report of Working Group 4E - Proposed draft text for addition to Article 41 of the RR	Com. 4
260	WG 4E	Fifth report of Working Group 4E	Com. 4
261	Com. 3	Summary record of the Second meeting of Committee 3	Com. 3
262	PL	Minutes of the Extraordinary Plenary Meeting held on 30 June 1971	PL

No.	Origin	Title	Destination
263	WG 4C	Question from the Chairman of Working Group 4C to the Chairman of Working Group 4E	W G 4E
264	WG 5A	Third report from Working Group 5A to Committee 5 - Frequency bands: 1 435-2 690 Mc/s and 3 500-3 700 Mc/s	Com. 5
265	WG 4C	Report of the Chairman of Working Group 4C concerning the draft recommendation on the co-ordination of earth stations and a proposed addition to draft Recommendation No. Spa 3	Com. 4
266	WG 4C	Report of the Chairman of Working Group 4C concerning the notes to be considered by Committee 6	Com. 6
267	Com. 4	First report from Committee 4	PL
268	Com. 5	Note from the Chairman of Committee 5 relating to the presentation of reports containing revisions to Article 5 of the RR	Com. 5
269	WG 4C	Report from the Chairman of Working Group 4C to Committee 4	Com. 4
270	Com. 7	Summary record of the first meeting of Committee 7	Com. 7
271	Com. 4	Second report from Committee 4	PL
272	Canada and New Zealand	Joint alternative proposal to Proposal CAN-USA/164/4	Com. 5
273(Rev.)	WG 5A and 5E	Joint report by Working Groups 5A and 5E to Committee 5	Com. 5
27 ⁴	WG 4B	Report of the Chairman of Working Group 4B on space services sharing frequency bands with terrestrial services around 2.5 Gc/s	Com. 4

No.	Origin	Title	Destination
275	WG 4B	Report from the Chairman of Working Group 4B relating to proposed partial text of Section VIII, Art. 7, relating to limits of power flux-density from space stations in the bands between 2.3 to 3 Gc/s	Com. 4
276	Chairman	Memorandum by the Chairman concerning the letter sent by the Heads of the Delegations of the Union of Soviet Socialist Republics, the Ukrainian Soviet Socialist Republic and the Bielorussian Soviet Socialist Republic	PL
277	Greece	Draft Resolution No. K	Com. 5
278	WG 4B	Report from the Chairman of Working Group 4B relating to the power fluxdensity limits in the frequency band 614-790 Mc/s for broadcasting-satellite service	Com. 4
279	WG 5B	Third report of Working Group 5B to Committee 5	Com. 5
280	WG 5B	Fourth report of Working Group 5B to Committee 5	Com. 5
281	WG 5E	Third report of Working Group 5E to Committee 5	Com. 5
282	Sweden	New foot-note to Art. 5 of RR, 430-440 MHz	Com. 5
283	Com. 7	B.1	PL,
284	Com. 4	Third report of Committee 4	PL
285	Com. 4	Draft fourth report from Committee 4	Com. 4
286	Com. 4	Report from the Chairman of Committee 4 to the Chairman of Committee 6 - draft resolution relating to the technical criteria recommended by the C.C.I.R. for sharing between the space and terrestrial services and within the space service	Com. 6

No.	Origin	Title	Destination
287 + Corr.	Com. 4	Summary record of the Sixth meeting of Committee 4	Com. 4
288	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 5	Com. 5
289	Com. 4	Note from the Chairman, Committee 4 to the Chairman, Committee 6	Com. 6
290	Chairman	Memorandum from the Chairman concerning a letter from the Head of the Delegation of Cuba	PL
291	United Kingdom	Proposed new foot-note relating to the protection of radio astronomy observations in the band 2 690-2 700 Mc/s	Com. 5
292	Com. 2	Summary record of the Fourth meeting of Committee 2	Com. 2
293 (Rev.)	United Kingdom, Sweden and Norway	Prop. Art. 5 RR	Com. 5
294 + Corr. 1 and 2	WG 4C	Report by the Chairman of Working Group 4C - Draft new Appendix 28 concerning the procedure for cal- culating co-ordination distance between earth and terrestrial stations sharing the same frequency band in the range 1-40 GHz	Com. 4
295	WG 4A	Fourth report of Working Group 4A	Com. 4
296	Com. 7	B.2	PL
297	Com. 5	Summary record of the Fourth meeting of Committee 5	Com. 5
298	Com. 5	First report of Committee 5	PL
299	WG 5B	Fifth report of Working Group 5B to Committee 5	Com. 5
300	Secretariat	List of documents	PL

No.	Origin	Title	Destination
301	WG 4B	Report of the Chairman, Working Group 4B regarding additions to be made to the proposed "Omnibus" Recommendation to be addressed to the C.C.I.R. to replace Recommendation No. Spa 3	Com. 4
302	WG 4B	Report of the Chairman of Working Group 4B on sharing of a Maritime-Satellite Service with other services in the frequency range 450 to 614 Mc/s	Com. 4
303	GT 4B	Report of the Chairman, Working Group 4B regarding Document No. 260 from Chairman of Working Group 4E	Com. 4 and WG 4E
304	Com. 5	Second Report of Committee 5	PL
305	Com. 5	Summary Record of the Fifth Meeting of Committee 5 (Allocations)	Com. 5
306	Sub-WG 5E-1	Second Report of Sub-Working Group 5E-1 to Working Group 5E	WG 5E
307	Com. 6	Summary Record of the Second Meeting of Committee 6	Com. 6
308	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 6	Com. 6
309	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 5	Com. 5
310	GT 6A	Report of Working Group 6A on Art. 9A	Com. 6
311	WG 4E	Seventh Report of Working Group 4E to Committee 4	Com. 4
312	WG 5 ad hoc	Third Report of Working Group 5 Ad hoc to Committee 5	Com. 5

No.	Origin	Title	Destination
313	Com. 7	B.3	PL
314	Com. 4	Fourth Report from Committee 4	${ t PL}$
<i>3</i> 15	United Kingdom	Prop., Art. 5 RR	PL
316(Rev.) + Corr. 1	WG 5E	Second Report of Working Group 5E to Committee 5 (Allocations) - Broadcasting-Satellite Service	Com. 5
317 + Corr.	WG 5D	Fifth Report of Working Group 5D to Committee 5	Com. 5
318 + Corr.	WG 5D	Sixth Report of Working Group 5D to Committee 5	Com. 5
319	France	Additional proposals	Com. 5
320	WG 5A	Fourth Report of Working Group 5A to Committee 5 (Allocations)	Com. 5
321	Sub-WG 5E-1	Third Report by Sub-Working Group 5E-1 to Working Group 5E	WG 5E
322	USA	Prop., Art. 6 and 27 RR	Com. 5
323	USA	Proposed allocation for the development and use of a world-wide emergency position-indicating radiobeacon system using space techniques	Com. 5
324	Com. 4	Fifth Report from Committee 4	${ m PL}$
325	France	Proposed modifications to the text of Document No. / DT/77_/	Com. 4
326	Com. 7	B.4	PL
327 + Corr.	Com. 4	Summary Record of the Seventh Meeting of Committee 4 (technical)	Com. 4
328	Argentina	Art. 7 - Section IX - Space Services	Com. 4

No.	Origin	Title	Destination
329	WG 6A	Report of Working Group 6A	Com 6
330	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 6	Com. 6
331	India	Prop., Art. 5 RR	Com. 5
332	Chairman	Memorandum by the Chairman concerning a letter received from the Head of the Delegation of the Czechoslovak Socialist Republic	PL
333	Com. 4	Draft Recommendation No. Spa 3 to the C.C.I.R. and to Administrations relating to frequency bands shared between Space Services and between Space and Terrestrial Services	Com. 4
334	WG 4E	Eighth Report of Working Group 4E to Committee 4	Com. 4
335	Com. 4	Sixth Report from Committee 4	PL
336	Com. 4	Draft Appendix 29 - A method of calculation to determine the degree of interference between geostationary satellite / systems / sharing the same frequency bands	Com. 4
337	Com. 5	Summary Record of the Sixth Meeting of Committee 5	Com. 5
338	Com. 5	Third Report of Committee 5	PL
339	WG 5B	Sixth and last Report of Working Group 5B to Committee 5 (Allocations)	Com. 5
340	Com. 5	Summary Record of the Seventh Meeting of Committee 5	Com. 5

No.	Origin	Title	Destination
341	Com. 5	Draft Recommendations on the use of frequency bands above 40 Gc/s	Com. 5
342 + Corr.	Italy	Proposals concerning the allocation of small bands to the Amateur-Satellite Service between 1 and 10.5 GHz	PL
343	Com. 7	B.5	PL
344	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 5	Com. 5
345	Com. 4	Note from the Chairman of Committee 4 to the Chairman of Committee 6	Com. 6
346	WG 6A	Report of Working Group 6A on Art. 9	Com. 6
347	Com. 6	Second Report of Committee 6 (Regulations) Art. 9A	PL _:
348	Com. 4	Seventh Report from Committee 4 - Art. 1	PL
349	PL	Draft Recommendation No. relating to the use of satellite communication systems in the event of natural disasters, epidemics, famines and similar emergency situations	PL
350	Secretariat	List of documents	PL
351	Com. 4	Eighth Report from Committee 4	PL
352	Com. 7	B.6	PL
353	Com. 6	Summary Record of the Third meeting of Committee 6	Com. 6
354	Com. 6	Third Report from Committee 6	PL
355	WG 6A	Report of Working Group 6A	Com. 6
356	WG 6A	Appendix 10	Com. 6
357	Com. 4	Ninth Report of Committee 4	PL

No.	Origin	Title	Destination
358	Sub-WG 6A-2	Report of Sub-Working Group 6A-2 to Committee 6	Com. 6
359	WG 6A	Final Report by the Chairman of Working Group 6A to the Chairman of Committee 6	Com. 6
360	Com. 7	B.7	PL
361	Com. 7	в.8	PL
362 + Corr.	Com. 5	Fourth Report of Committee 5	PL
363	Budget Control Committee	Final Report by the Budget Control Committee	PL
364	Com. 7	B.9	${ m PL}$
365	Com. 4	Tenth Report of Committee 4	PL
366	New Zealand	Draft Resolution A	Com. 6
367	Chairman	Memorandum from the Chairman concerning a letter from the Head of the Delegation of the People ^{\$} s Republic of Bulgaria	PL
368	Com. 4	Summary Record of the Eighth meeting of Committee 4	Com. 4
369	Com. 7	B.10	PL
370	WG 6A	Appendix 9	Com. 6
371	Com. 5	Summary Record of the Eighth meeting of Committee 5	Com. 5
372	Com. 5	Summary Record of the Ninth meeting of Committee 5	Com. 5
373	Com. 5	Summary Record of the Tenth meeting of Committee 5	Com. 5
374 + Corr.	Com. 5	Fifth Report of Committee 5	${ m PL}$
375 + Add. + Corr.	Com. 5	Sixth Report of Committee 5	PL
376	WG Ad hoc Com. 6	Report of the Ad hoc Group of Committee 6	Com. 6
377	Com. 6	Fourth Report of Committee 6	PL
378 + Corr.	PL	Minutes of the Third Plenary	PL

No.	Origin	Title	Destination
379	Chairman	Memorandum by the Chairman con- cerning a letter from the Head of the Delegation of the People's Republic of Poland	PL
380	Com. 6	Fifth Report of Committee 6	PL
381	Com. 7	B.11	PL
382	Com. 7	B.12	PL
383	Com. 7	B.13	PL
384	Com. 7	B.14	PL
385 + Corr. & Add.	Com. 5	Seventh Report of Committee 5	PL
386	Com. 5	Eighth and last Report of Committee 5	PL
387	Com. 7	R.1	PL
388	Com. 7	R.2	PL
389	Com. 4	Eleventh Report of Committee 4	PL
390	Com. 4	Twelfth and final Report of Committee 4	PL
391	Com. 6.	Summary Record of the Fourth meeting of Committee 6	Com. 6
392	Com. 6	Summary Record of the Fifth meeting of Committee 6	Com. 6
393	Chairman	Memorandum of the Chairman concerning a letter from the Head of the Delegation of the Republic of Viet—Nam	PL
394	Com. 7	B.15	PL
395	Com. 7	R.3	PL
396	Com. 3	Summary Record of the Third and last meeting of Committee 3	Com. 3
397	Com. 6	Seventh Report of Committee 6	PL
398	Com. 6	Eighth Report of Committee 6	PL
399	Com. 6	Ninth Report of Committee 6	PL.
400	Com. 6	Sixth Report of Committee 6	PL.
401	Chairman	Memorandum by the Chairman concerning a letter from the Head of the Delegation of the Socialist Republic of Roumania	PL

No.	Origin	Title	Destination
402 + Add. 1, 2, 3, 4, 5	Secretariat	Final Protocol	PL
403	Chairman	Memorandum by the Chairman concerning a letter from the Head of the Delegation of the United States of America	PL
404	PL	Minutes of the Fourth Plenary Meeting	${ m PL}$
405	Chairman	Memorandum by the Chairman concerning a letter from the Head of the Delegation of the Republic of Korea	PL
406 + Corr.	Chairman	Memorandum by the Chairman concerning a letter from the Head of the Delegation of the Republic of China	PL
407	Algeria Australia Canada Chile New Zealand Syria	Recommendation relating to the preferred frequency bands for tropospheric scatter systems	m PL
408	Com. 7	Draft Resolution	${ m PL}$
409	Chairman	Memorandum by the Chairman concerning a letter from the Head of the Delegation of Chile	PL
410	PL	Minutes of the Sixth Plenary Meeting	${ m PL}$
411	Com. 7	Revision of Article 41 of the RR	${ t PL}$
412	Com. 7	Recommendation No. Spa NN	${ m PL}$
413	Secretariat	Final Acts	${ m PL}$
414	Com. 6	Summary Record of the Sixth meeting of Committee 6	Com. 6
415	PL	Minutes of the Seventh Plenary Meeting	${ m PL}$
416	PL	Minutes of the Fifth Plenary Meeting	${ m PL}$
417	PL	Minutes of the Eighth Plenary Meeting	${ m PL}$
418	PL	Minutes of the Ninth Plenary Meeting	${ m PL}$
419	PL	Minutes of the Tenth Plenary Meeting	${ m PL}$
420	PL .	Minutes of the Eleventh Plenary Meeting	PL

No.	Origin	Title	Destination
421	PL	Minutes of the Twelfth Plenary Meeting	$_{ m PL}$
422	PL	Minutes of the Thirteenth Plenary Meeting	${ m PL}$
423	PL	Minutes of the Fourteenth and last Plenary Meeting	PL
424	Secretariat	Final List of documents	