Documents of the World Administrative Radio Conference for Space Telecommunications

(Geneva, 1971)

To reduce download time, the ITU Library and Archives Service has divided the conference documents into sections.

- This PDF includes Document No. 201 - 300.
- The complete set of conference documents includes Document No. 1 - 424, DT No. 1 - 103.

This electronic version (PDF) was scanned by the International Telecommunication Union (ITU) Library & Archives Service from an original paper document in the ITU Library & Archives collections.

La présente version électronique (PDF) a été numérisée par le Service de la bibliothèque et des archives de l'Union internationale des télécommunications (UIT) à partir d'un document papier original des collections de ce service.

Esta versión electrónica (PDF) ha sido escaneada por el Servicio de Biblioteca y Archivos de la Unión Internacional de Telecomunicaciones (UIT) a partir de un documento impreso original de las colecciones del Servicio de Biblioteca y Archivos de la UIT.

هذه النسخة الإلكترونية (PDF) نتاج تصوير بالمسح الضوئي أجراه قسم المحفوظات المكتبة في والمحفوظات للاتصالات الدولي الاتحاد (ITU) والمحفوظات المكتبة قسم في المتوفرة الوثائق ضمن أصلية ورقية وثيقة من نقلاً.

此电子版（PDF版本）由国际电信联盟（ITU）图书馆和档案室利用存于该处的纸质文件扫描提供。

Настоящий электронный вариант (PDF) был подготовлен в библиотечно-архивной службе Международного союза электросвязи путем сканирования исходного документа в бумажной форме из библиотечно-архивной службы МСЭ.

SPACE CONFERENCE

Document No. 201-E
24 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

INTERNATIONAL PRESS TELECOMMUNICATIONS COUNCIL

NEWS DISTRIBUTION BY SATELLITE SERVICE

What sort of satellite service is the Press interested in using in the immediate future ?

Distribution satellites should enable the Press to send and receive news material over geographical areas of various sizes. The diversity in the size of these areas may result from considerations which are particular to the Press whose current state of development varies widely not only Continent by Continent, but country by country.

Press users most interested in the dissemination of news material by distribution satellites are news agencies, be they international or national, newspaper chains and the Press syndicates. They expect from synchronous satellites - and where feasible also from non-synchronous satellites - the ability to distribute material to their own branches or plants, to their subscribers or associates over smaller or larger geographical areas with greater reliability and greater flexibility.

This implies that :

a) distribution satellites will probably operate over a frequency range which should be safeguarded from interference from existing transmissions; it appears more and more likely that frequencies above 10 GHz will have to be used;

b) distribution satellites should be equipped with antennae of which the beamwidths should range from one to eight degrees, so that the down-paths can cover geographical areas of different sizes, such as France, larger countries or groups of countries such as the U.S.A., U.S.S.R., Canada, China and the Arabian Peninsular, or even to sub-Continents or Continents, such as Latin America, Africa - south of the Sahara - Europe, etc.;

c) the Press will operate its own receiving ground stations.

ARCHIVES U.I.T. GENÈVE

Considering the current evolution of the satellite and of radio-transmission technology, satisfaction of these basic requirements should not pose insoluble problems, the more so when it is considered that, as far as frequency allocation is concerned, Press requirements are identical to those of the other main communication media.

While the Press may at the present moment only require narrow paths for the transmission of words, pictures, data and facsimile by distribution satellite, larger bandwidths may be needed in future.

Furthermore, the use of higher power and stationary satellites is correlative with the use of smaller receiving antennae and simpler devices for the adjustment of antennae tracking. Hence the possibility that smaller ground stations will be developed whose dimensions will soon be compatible with the financial resources, the physical space, the technical ability and the scientific knowledge at the disposal of the Press.

Such are the various reasons why the Press should be afforded facilities for the dissemination of news material, similar to those which are largely envisaged for the benefit of other communications media in certain regions of the world. Its needs should be given the same priority attention which is accorded to other mass communications media as and when the various needs of potential users of distribution satellites are assessed and accommodated.

If the problem were limited by technical or financial considerations alone, the solution to the distribution of news material by satellite would be found, without too much difficulty, within the next decade.

The real problem, however, lies in the adaptation of rules and regulations which are currently in force for classical telecommunications to the new facilities afforded by the satellite.

The I.P.T.C. therefore requests the W.A.R.C. to make provisions in the Radio Regulations for distribution facilities for the Press multi-destination communications, either :

- by defining a distribution Satellite Service, or

- by extending the definition of Broadcasting-Satellite Service to include the transmission of news intended for dissemination to the general public.

SPACE CONFERENCE

Document No. 202-E
23 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

WORKING GROUP 5E

FIRST REPORT OF SUB-WORKING GROUP 5E-1

TO WORKING GROUP 5E

Broadcasting-Satellite Service

[N.B. The present provisional draft Report has been drawn up at the request of the Group on the basis of the preparatory examination of Proposals, it being understood that agreements will be finalized at a later meeting when in possession of results on related Proposals from Committee 4 and Committee 6.]

- Frequency band : 606-614 Mc/s

- Frequency band : 614-770 Mc/s

1. Introduction

On the suggestion by the Chairman, the Group agreed to study Proposals by the following bands : 606-614 Mc/s, 614-770 Mc/s, 770-790 Mc/s, 790-820 Mc/s, 820-845 Mc/s, 845-890 Mc/s, 890-935 Mc/s, 935-942 Mc/s and 942-960 Mc/s.

2. Frequency band : 606-614 Mc/s

Several delegations explained the difficulty of foreseeing the use of the band 606-614 Mc/s for broadcasting by satellite in view of the present extremely heavy use of the band by the Terrestrial Services to which it is now allocated. At the invitation of the Chairman, the Delegation of the U.S.S.R. agreed to reconsider its Proposals URS/39/20 and 21 insofar as the band 606-614 Mc/s is concerned and would advise as soon as possible. The Delegations of Cuba and Portugal reserved the right to revert to this band at a later date, if they still so desire.

ARCHIVES U.I.T. GENÈVE

3. Frequency band : 614-770 Mc/s

3.1 All Proposals were presented and thoroughly examined by the Group. It was agreed that, although the allocation would be world-wide, in this particular case, it should be the subject of a foot-note because not all parts of all Regions, especially Region 1, would necessarily avail themselves with the allocation.

3.2 Several delegations were unable to give their agreement to the allocation without being in possession of reliable technical criteria (limit of power flux-density taking into account angle of arrival) drawn up by Committee 4 for inclusion in the Radio Regulations, probably in Article 7, and co-ordination procedures to be drawn up by Committee 6 for inclusion in Article 9A or elsewhere in the Final Acts of the Conference.

3.3 Finally a small Group was formed of the Representatives of Denmark, Canada and the U.A.R. which prepared a draft text of a foot-note to be applicable to all three Regions and, initially for the band 614-770 Mc/s. After minor amendment, the new foot-note 332A appearing in the Annex to the present Report was provisionally agreed by Sub-Working Group 5E-1.

It was understood that the wording needed attention but that the sense of the provision was clear.

3.4 The Group agreed that, in order to gain time a request should be made asking Committee 4, in the light of this provisional agreement, to make a technical study to determine the tolerable power flux-density limit at the earth's surface taking into account the angle of arrival and to advise Committee 5 as soon as possible.

3.5 The Group also agreed that Committee 6 should be asked to consider making provisions for the co-ordination procedure to be applied and to advise Committee 5 as soon as possible.

Per ÅKERLIND
Chairman

Annex : 1

A N N E X

ADD 332A The band 614-770 Mc/s [Separate frequency bands between 614-770 Mc/s are] is also allocated to the Broadcasting-Satellite Service [for television], subject to the condition that this service does not [in any way] produce, in the territory of countries whose existing services or services being planned operating in accordance with the Table might be interfered with [No. 148 of the Radio Regulations], a power flux-density which exceeds the value given in Article 7 [No.]. [This use of the band is to be agreed amongst the administrations concerned - see Articles 9 and 9A.]

Corrigendum No. 1 to
Document No. 203-E
5 July 1971
Original : French

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

CORRIGENDUM TO

FIRST REPORT

OF WORKING GROUP 5D TO COMMITTEE 5

Appendix E - page 14

Line 1 :

replace MOD 373A (text to be defined) by :

NOC 273A

Reason : During the meeting of Working Group 5D on 5 July 1971 (tenth meeting) it was decided, by a majority, not to alter the existing provisions.

M. CHEF
Chairman

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 203-E
24 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FIRST REPORT OF WORKING GROUP 5D

TO COMMITTEE 5

1. Having examined all the proposals relating to the Aeronautical and Maritime Mobile Services and the Radiodetermination Service for the bands between 1 800 kc/s and 149.9 Mc/s, Working Group 5D has unanimously adopted the conclusions appended hereto.

1.1 Band 1 800-2 000 kc/s

The Working Group decided to delete Nos. 199 and 199.1 (see Appendix A).

1.2 Use of the 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 and the frequencies 10 003 kc/s, 14 993 kc/s and 19 993 kc/s for search operations and the rescue of manned space vehicles

The Working Group adopted the text of No. 201A which will be inserted in the Table in the parts comprising the frequencies mentioned above. It also decided to delete Note 221A concerning the use of frequency 20 007 kc/s for search and rescue purposes, since this would duplicate frequency 19 993 kc/s (see Appendix B).

1.3 Band 21 850-22 000 kc/s

The Working Group decided to modify the lower limit of the band in question, which becomes 21 870-22 000 kc/s in order to free a band of 20 kc/s for radio astronomy (see Appendix C).

1.3.1 The Delegation of the U.S.S.R. while not formally opposing the proposed revision, explained that the frequency band 21 850-21 870 kc/s was very heavily used in their country by the Aeronautical Fixed and Aeronautical Mobile (R) Services to which the band is allocated at present and consequently were obliged to reserve the right to revert to this subject in Committee 5, if they still so desire.

1.4 Band 80-87 Mc/s

The Working Group decided to amend the text of No. 267 (see Appendix D).

ARCHIVES U.I.T. GENÈVE

1.5 Band 117.975-132 Mc/s

At its third meeting, held on 18 June 1971, the Working Group decided to postpone revision of the text of No. 273A until the Working Groups dealing with definitions (Working Groups 4A and 5 ad hoc) have finished their work. Certain members of the Working Group favoured, however, the preparation of a clear and unambiguous text on the lines of that contained in proposals F/41/64 and GRC/125/10.

1.6 Band 132-136 Mc/s

The Working Group decided to amend the texts of Nos. 274 and 275, to add two new Nos. - 274A and 274B - and to delete Nos. 276, 277 and 279 (see Appendix E). No. 278 was amended in such a way that it no longer refers to the band 132-136 Mc/s.

1.7 Band 136-137 Mc/s

The Working Group also decided to insert No. 274B (see Appendix F) in the Table corresponding to this frequency band (see Appendix E) and to delete No. 281B.

1.8 Band 137-138 Mc/s

The Working Group decided to amend Nos. 281C and 281E and to delete No. 281D (see Appendix G).

1.9 Bands 138-143.6 Mc/s, 143.6-143.65 Mc/s and 143.65-144 Mc/s

The Working Group decided to amend the text of No. 283 and to delete No. 282 (see Appendix H).

1.10 Bands 146-149.9 Mc/s and 150.05-151 Mc/s (Region 1)

The Working Group decided to delete foot-note 274 which appears in the Table with respect to these bands (see Appendix I).

2. After adopting the new No. 201A, and consequentially deleting No. 221A, concerning the designation of precise frequencies to be used in search and rescue operations in respect of manned space vehicles, Working Group 5D took the view that Resolution No. Spa 2 (R.R., page 741) was no longer necessary and might consequently be annulled.

Maurice CHEF
Chairman

Appendices : 9

A P P E N D I X A

kc/s

Region 2	Region 3
1 800-2 000	
AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION 198	

SUP 199

SUP 199.1

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X B

kc/s

Region 1	Region 2	Region 3
2 170-2 194	MOBILE (distress and calling) 201 201A	
2 850-3 025	AERONAUTICAL MOBILE (R) 201A	
5 480-5 680	AERONAUTICAL MOBILE (R) 201A	
8 195-8 815	MARITIME MOBILE 201A 213	
9 995-10 005	STANDARD FREQUENCY 201A 204 214 215	

kc/s

Region 1	Region 2	Region 3
14 990-15 010	STANDARD FREQUENCY 201A 204 219	

19 990-20 010	STANDARD FREQUENCY 201A 204 220 221

SUP 221A

Mc/s

Region 1	Region 2	Region 3
117.975-132	AERONAUTICAL MOBILE (R) 201A 273 273A	

156-174 FIXED MOBILE (except aeronautical mobile) 201A 285 287 288	150.05-174 FIXED MOBILE 201A 285A 287	150.05-170 FIXED MOBILE 201A 285A 287 290

Mc/s

Region 1	Region 2	Region 3
235-267	FIXED MOBILE 201A 305 309	

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.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX C

kc/s

	Region 1	Region 2	Region 3
MOD	21 870-22 000	AERONAUTICAL FIXED AERONAUTICAL MOBILE (R)	

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X D

Mc/s

Region 1	Region 2	Region 3
75.2-87.5 (NOC)	75.4-88 (NOC)	80-87 FIXED MOBILE 254 255 256 257 261 266 ~~267~~

MOD 267 In New Zealand, the bands 87-88 Mc/s and 94-108 Mc/s are allocated to the fixed and mobile services.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX E

Mc/s

Region 1	Region 2	Region 3
132-136	AERONAUTICAL MOBILE (R) 273A 274 274A 274B 275	

MOD 274 In Bulgaria, Japan, Poland, Portugal, Portuguese Overseas Provinces in Region 1 south of the equator, 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 coordinated between the administrations concerned and shall be protected from harmful interference.

ADD 274B In Cuba, the band 132-137 Mc/s is also allocated to the fixed and mobile services.

MOD 273A (Text to be defined.)

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 138-144 Mc/s band 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 132-136 Mc/s band until 1.1.1976.

SUP 276

SUP 277

MOD 278 In New Zealand, the band 138-144 Mc/s is allocated to the aeronautical mobile service (OR).

SUP 279

A P P E N D I X F

Mc/s

	Region 1	Region 2	Region 3
	136-137	136-137	136-137
	FIXED MOBILE	SPACE RESEARCH (Telemetering and tracking)	FIXED MOBILE
	SPACE RESEARCH (Telemetering and tracking)		SPACE RESEARCH (Telemetering and tracking)
MOD	281A	274B 281A	281A

SUP 281B

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X G

MOD 281C In Algeria, Bulgaria, Hungary, Kuwait, Lebanon, Morocco, Poland, the United Arab Republic, Yugoslavia, Roumania, Czechoslovakia and the U.S.S.R., the band 137-138 Mc/s is also allocated to the aeronautical mobile (OR) service.

SUP 281D

MOD 281E In Cuba, Malaysia, Pakistan and the Philippines, the band 137-138 Mc/s is also allocated to the fixed and mobile services.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX H

Ref.

Mc/s

Region 1	Region 2	Region 3
138-143.6 AERONAUTICAL MOBILE (OR) 275 283	138-143.6 FIXED MOBILE Radiolocation	138-143.6 FIXED MOBILE 278 279A 284
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (Telemetering and tracking) 275 283	143.6-143.65 FIXED MOBILE SPACE RESEARCH (Telemetering and tracking) Radiolocation	143.6-143.65 FIXED MOBILE SPACE RESEARCH (Telemetering and tracking) 278 279A 284
143.65-144 AERONAUTICAL MOBILE (OR) 275 283	143.65-144 FIXED MOBILE Radiolocation	143.65-144 FIXED MOBILE 278 279A 284

SUP 282

MOD 283 In Austria, Denmark, Greece, Netherlands, Norway, Portugal, F.R. of Germany, United Kingdom, Sweden, Switzerland and Turkey, the band 138-144 Mc/s is also allocated to the fixed service and mobile, except aeronautical mobile (R), service.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX I

Ref.

Mc/s

Region 1	Region 2	Region 3
146-149.9 FIXED MOBILE except aeronautical mobile (R) 285 285A	146-148 AMATEUR 289	
	148-149.9 FIXED MOBILE 285A 290	
150.05-151 FIXED MOBILE except aeronautical mobile (R) 285 286 286A	150.05-174 FIXED MOBILE	150.05-170 FIXED MOBILE
151-154 FIXED MOBILE except aeronautical mobile (R) Meteorological aids 285 286 286A		
154-156 FIXED MOBILE except aeronautical mobile (R) 285 285A		285A 287 290
156-174 FIXED MOBILE except aeronautical mobile 285 287 288	285A 287	170-174 FIXED MOBILE BROADCASTING

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 204-E
23 June 1971
Original : English

WORKING GROUP 5E

REPORT OF SUB-WORKING GROUP 5E-2 TO WORKING GROUP 5E

Broadcasting-Satellite Service

Frequency bands between 11.7 Gc/s and 12.75 Gc/s

1. The Sub-Working Group examined all Proposals relating to the introduction of allocations to the Broadcasting-Satellite Service in the bands between 11.7 Gc/s and 12.75 Gc/s taking into account as far as possible unconfirmed information from Sub-Working Group 5A-1. By a majority, Sub-Working Group 5E-1 provisionally agreed to the revised provisions appearing in the Annex to the present Report and requested that this information be communicated to Committees 4 and 6.

2. The Sub-Group noted that in the band 11.7-11.95 Gc/s, there was only one Proposal with respect to the Broadcasting-Satellite Service for Region 1, namely URS/59/25 (DT/17, page 25). The Delegation of India expressed a preference for the Broadcasting-Satellite Service allocation to have primary status while that for the Communication-Satellite Service to have secondary status.

3. For the band 11.95-12.2 Gc/s, the Delegation of the U.S.S.R. and of Czechoslovakia considered that the Fixed and Mobile Services in Region 1 should remain primary services and reserved the right to revert to this question later, if they still so desired. The Delegation of Australia wished to go on record as preferring the Region 1 sharing arrangements for Region 3 rather than that shown for Regions 2 and 3. The Delegation of Japan wished to go on record as preferring the inclusion of the Terrestrial Broadcasting Service in the Table for Region 3.

4. For the band 12.2-12.6 Gc/s, in Region 1, the Delegation of the U.S.S.R. wished to go on record as requiring the retention of primary status for the Fixed Mobile and Broadcasting Services in the U.S.S.R.

ARCHIVES U.I.T. GENÈVE

5. For the band 12.2-12.7 Gc/s in Régions 2 and 3, while agreeing to the primary allocations to the FIXED, the MOBILE, except aeronautical mobile, and the BROADCASTING, the Delegations of New Zealand, of Australia and of Argentina would have preferred primary allocation to the Broadcasting and Broadcasting-Satellite Services and secondary allocations to the Fixed and Mobile Services.

6. For the band 12.6-12.75 Gc/s, in Region 1, there was considerable discussion around the upper limit to be chosen, 12.6 Gc/s or 12.7 Gc/s or 12.75 Gc/s. The Delegations of the Federal Republic of Germany and of the Netherlands wished to go on record as opposing any allocation in this frequency range to the Broadcasting Service or the Broadcasting-Satellite Service above 12.6 Gc/s. The Delegations of Greece, Denmark and the United Kingdom recalled the conclusions of the Special Joint Meeting (C.C.I.R.) February/March 1971 to the effect that the allocation at about 12 Gc/s should be in a multiple of 200 Mc/s, paragraph 3.5.2.3 of the Report of the S.J.M. on page 46 refers. A study made by the European Broadcasting Union (E.B.U.) suggests that four channels would be required, accordingly certain delegations were firmly of the opinion that, for these reasons, the band should be of 800 Mc/s width and consequently the upper limit should be fixed at 12.75 Gc/s. For this reason, this alternative upper limit in Region 1 is shown between squared brackets in the Annex hereto.

7. The Delegations of Poland, Czechoslovakia and the U.S.S.R. were in favour of the status quo in the band 12.6-12.7 Gc/s, that is FIXED MOBILE, except aeronautical mobile, and BROADCASTING Services, and reserved the right to revert to this subject at a later date, if they still so desire.

C. TERZANI
Chairman
Sub-Working Group 5E-2

Annex : 1

A N N E X

Gc/s

Region 1	Region 2	Region 3
11.7-11.95 COMMUNICATION-SATELLITE (Space-to-earth) 374A 405BA	11.7-11.95 COMMUNICATION-SATELLITE (Space-to-earth) 374A 405BA Broadcasting-Satellite Mobile except aeronautical	
11.95-12.70 [12.75] BROADCASTING-SATELLITE Broadcasting Fixed Mobile except aeronautical	11.95-12.2 BROADCASTING-SATELLITE Communication-satellite (Space-to-earth) 374A 405BA Mobile except aeronautical	
	12.2-12.7 FIXED MOBILE except aeronautical BROADCASTING	
	NOC	

[Note to Committee 7 : Region 1 11.95-12.75 Gc/s
Broadcasting is a permitted Service]

SPACE CONFERENCE

Document No. 205-E
24 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

CANADA

Ref.

CAN/205/170

DRAFT RECOMMENDATION No. J

relating to the future provision of a band near 10 Mc/s to 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 Mc/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;

d) that successful radio astronomical measurements have, at times, been made at frequencies near 10 Mc/s;

e) that, as a result of the growth in the use of cables and of communication satellites for long distance communication, a reduction in the use, for this purpose, of frequencies just above 10 Mc/s may be anticipated;

f) that IUCAF is co-ordinating the needs of radio astronomers for frequency allocations;

ARCHIVES U.I.T. GENÈVE

Ref.

CAN/205/170 (cont.)

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 14 Mc/s;

2) that administrations give close attention to the recommendation of the IUCAF concerning the specific frequency band between 10 Mc/s and 14 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

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 206-E
24 June 1971
Original : English

WORKING GROUP 5E

Note from the Chairman of Working Group 4B
to the Chairman of Working Group 5E

REPORT ON TECHNO-ECONOMIC COMPARISON AMONG THE CANDIDATE BANDS OF 800, 2 500 AND 12 000 Mc/s FOR BROADCASTING-SATELLITE SERVICE IN NEW AND DEVELOPING COUNTRIES SITUATED IN THE TROPICAL ZONE

1. The C.C.I.R. Special Joint Meeting (S.J.M.) has taken into consideration the contributions relating to the possibility of using certain frequency bands in the vicinity of 800, 2 500 and 12 000 Mc/s for the Broadcasting-Satellite Service for television for both community and individual reception. S.J.M. considered in more detail the method of using any frequency band in the vicinity of 12 Gc/s and has noted that the examples of television systems considered are to apply to an angle of elevation of 30° and to temperate climates, where atmospheric attenuation is negligible at 800 Mc/s and 2 500 Mc/s and small at 12 Gc/s. In other regions, especially tropical and subtropical areas, atmospheric attenuation will require a higher margin. (vide Note 10, to Table 3-3F-I, Annex 3-3F, Part II, Report of the S.J.M.)

2. Any new satellite system that is proposed or planned has to establish its feasibility from both technological as well as economic considerations. Document No. 143 has considered the techno-economic aspects in the use of the 12 Gc/s band for satellite broadcasting in the tropical countries. A comparison of the technical problems related to both space and ground segments at the frequency bands of 800, 2 500 and 12 000 Mc/s are presented in Table 1 of Document No. 143.

3. Taking India as a typical example of a tropical country, values of attenuation due to rain, cloud and precipitation have been calculated for three different places using the data collected over a period of five years. Throughout the monsoon period dense clouds are always present. Calculations based on a model cloud formation suggest that attenuation up to 5 db may occur.

ARCHIVES U.I.T. GENÈVE

4. To bring to focus the impact of choice of an appropriate frequency on the economic aspects of the total system, a comparison of costs of typical front-end converters for direct reception at different frequencies is presented in Document No. 143. As the frequency increases the cost will increase appreciably.

5. Economic considerations play a very important role in deciding the deployment of a satellite broadcasting system and this is all the more so for new and developing countries. The use of 12 Gc/s band would introduce additional difficulties compared with lower frequencies in the following respects :

- increased total cost of the system;
- substantial increase in R.F. power from the satellites due to rain, cloud and precipitation attenuation;
- substantial delay in developing the appropriate equipment and technology;
- the economic penalty may be so high as to retard the establishment of Broadcasting-Satellite Service in these countries where it is most needed to accelerate the pace of development.

6. Frequencies of the order of 800 Mc/s and 2 500 Mc/s thus have some technical and appreciable economic advantages compared with 12 Gc/s, particularly for the coverage of large land areas in the tropical zone. However, at 800 Mc/s and 2 500 Mc/s there are problems of sharing with terrestrial services and these are currently under study by Working Group 4B.

G.C. BROOKS
Chairman
Working Group 4B

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 207-E
24 June 1971
Original : English

COMMITTEE 4

UNITED STATES OF AMERICA

INFORMATION DOCUMENT

TECHNICAL ASPECTS OF SHARING BETWEEN TRANSHORIZON RADIO RELAY SYSTEMS AND BROADCASTING SATELLITE SYSTEMS IN THE VICINITY OF 800 MHz

A transhorizon system located with the service area of a broadcasting satellite and pointing directly at the satellite is likely to experience unacceptable interference. In order to avoid interference in such a situation, the transhorizon receiving antenna must avoid pointing at the satellite by an angle which depends on the figure of merit of the transhorizon receiving station and on its noise and interference objectives. As shown in the S.J.M. Report, this angle can amount to several degrees in the worst case. It was this requirement in part that led the S.J.M. to conclude that "in a significant number of practical situations it would be very difficult to ensure satisfactory operation in shared frequency bands of transhorizon systems with the various satellite systems ...".

At the time of the S.J.M., no administration had made the detailed technical analyses necessary to indicate how large a "significant number" was nor what "very difficult" might mean.

In the three months since the S.J.M. detailed analyses have been made in the United States and elsewhere. These analyses show that, when the locations, path directions, and technical parameters of existing transhorizon links and of proposed broadcasting satellites are taken into account, only a small fraction (in the order of a few per cent) of the registered transhorizon links will be potentially subject to interference. Moreover, in the few cases where interference is possible, it can be avoided effectively by co-ordination of satellite position and frequency assignments between the administrations concerned.

ARCHIVES U.I.T. GENÈVE

These conclusions can be understood in terms of certain intrinsic geometric features of transhorizon systems and of proposed broadcasting satellite systems.

1) Transhorizon systems use highly directive antennae which are pointed within a degree or two of the local horizon.

2) The locations and azimuths of transhorizon paths are such that only a fraction of the transhorizon antennae will point at or near the geostationary orbit.

3) Broadcasting satellites will use highly directional antennae to confine their service areas to a limited geographic region. Figure 1 gives an example of such antenna directivity for an 800 MHz satellite.

4) Within a given broadcasting service area, the elevation angle to the satellite will normally be large.

Thus, for transhorizon systems within the service area of a broadcasting satellite, receiving antenna directivity will provide the necessary interference protection even in the few cases where the antenna points towards the azimuth of the satellite. When the transhorizon system lies outside the broadcasting service area, the satellite transmitting antenna directivity will normally provide most of the needed protection for those few transhorizon antennae that do point near the satellite location.

To illustrate the conclusions with numerical values, we present the following data drawn from an in-progress study by the Institute of Telecommunication Science of the U.S. Department of Commerce.

The transhorizon links which are potentially vulnerable to interference are those that look at or near the geostationary orbit. It can be shown that, if an antenna is located at a latitude ϕ and pointed at a random azimuth, then the probability that it points so as to come within y degrees of the stationary orbit, is approximately $y \sec \phi/90$. For example, if an antenna which points within 5° of the stationary orbit is considered to be vulnerable, and if that antenna is at latitude 45°, then the probability that it will be vulnerable is 0.08.

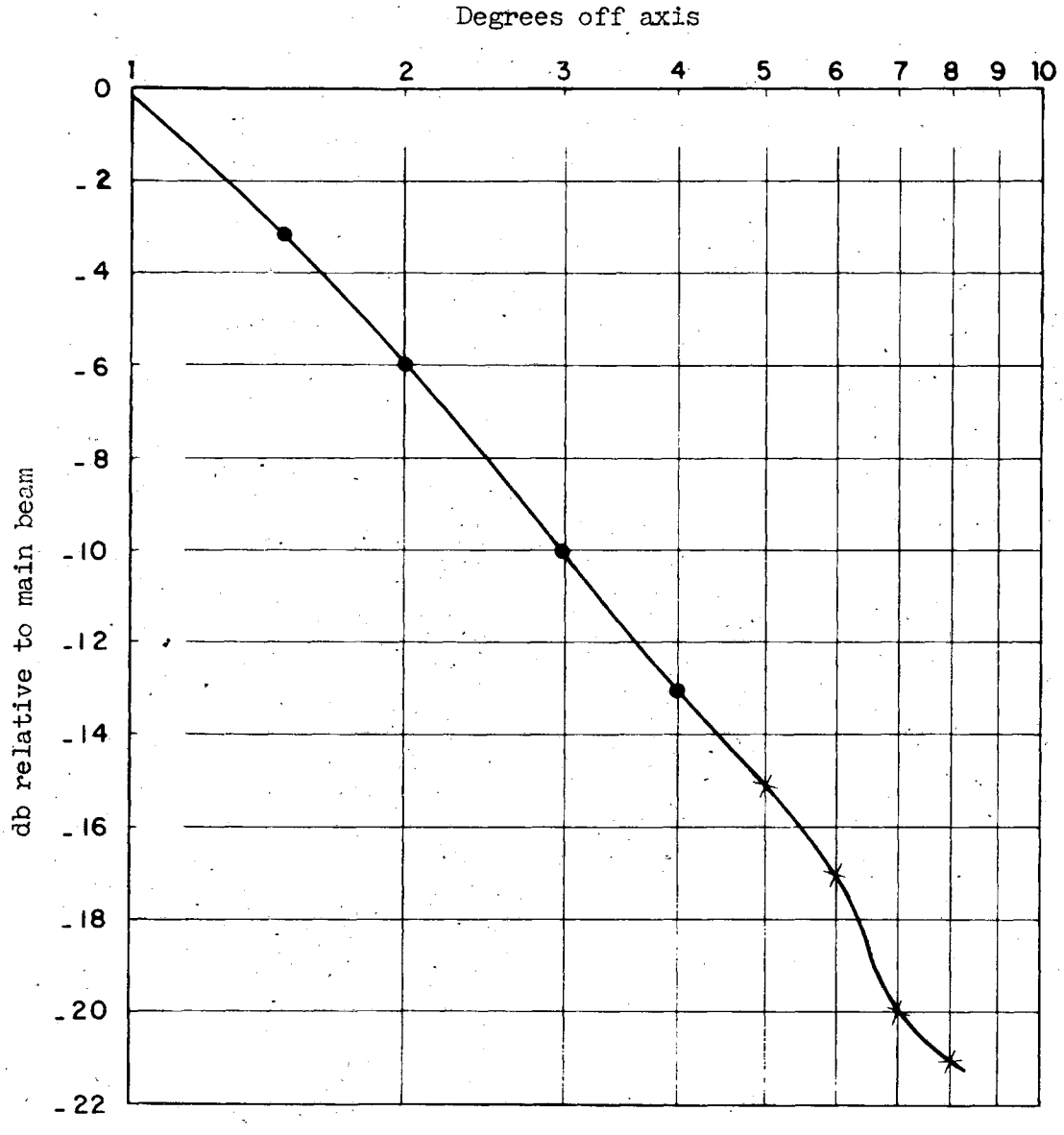


Figure 1 - Typical pattern for 30' parabola at 800 MHz
(3 db beamwidth = 3°)

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

To be more explicit regarding which particular antennae are pointing at or near the stationary orbit requires more information concerning their exact locations and azimuthal directions. Nearly 170 links located in Alaska, Canada, Europe, Japan and South East Asia were analyzed in detail; these included 334 antennae whose locations and pointing azimuths are precisely known. This is estimated to be about one-third of all the existing transhorizon antennae, based on an extrapolation of data given in a review paper, "Tropospheric Scatter Communications - Past, Present, and Future" by F.A. Gunther (I.E.E.E. Spectrum, September 1966, pages 79-100).

In order to determine how close to the geostationary orbit a given transhorizon antenna points, consider a sphere, concentric with the earth, whose radius is 6.619 earth radii. This sphere will be called the synchronous sphere; the stationary orbit is its equator. For the given antenna, we may imagine a ray which leaves the antenna horizontally with the proper azimuth and intersects the synchronous sphere at some point which may be identified by standard latitude and longitude co-ordinates. This projection was made for each of the 334 antennae on which accurate pointing data were available.

Of the 334 antennae considered, it was found that, in the 700-1 000 MHz range, only 28 pointed less than 5° away from the geostationary orbit. Table 1 gives the locations, pointing azimuths, and point of intersection with the synchronous sphere for these 28 antennae. A graphical presentation of this information is given in Figure 2, which uses rectangular co-ordinates for latitude and longitude on the synchronous sphere.

For any particular broadcasting satellite position, Figure 2 may be used to find the off-axis angle θ_T between the main beam of the transhorizon antenna and the line to the satellite. This angle will be very nearly equal to the arc distance between the intersection of the main beam on the synchronous sphere and the satellite position on the equator. Since the projection used in Figure 2 is true on the equator, a simple measurement of the straight line distance will be accurate enough if only small angles are involved.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

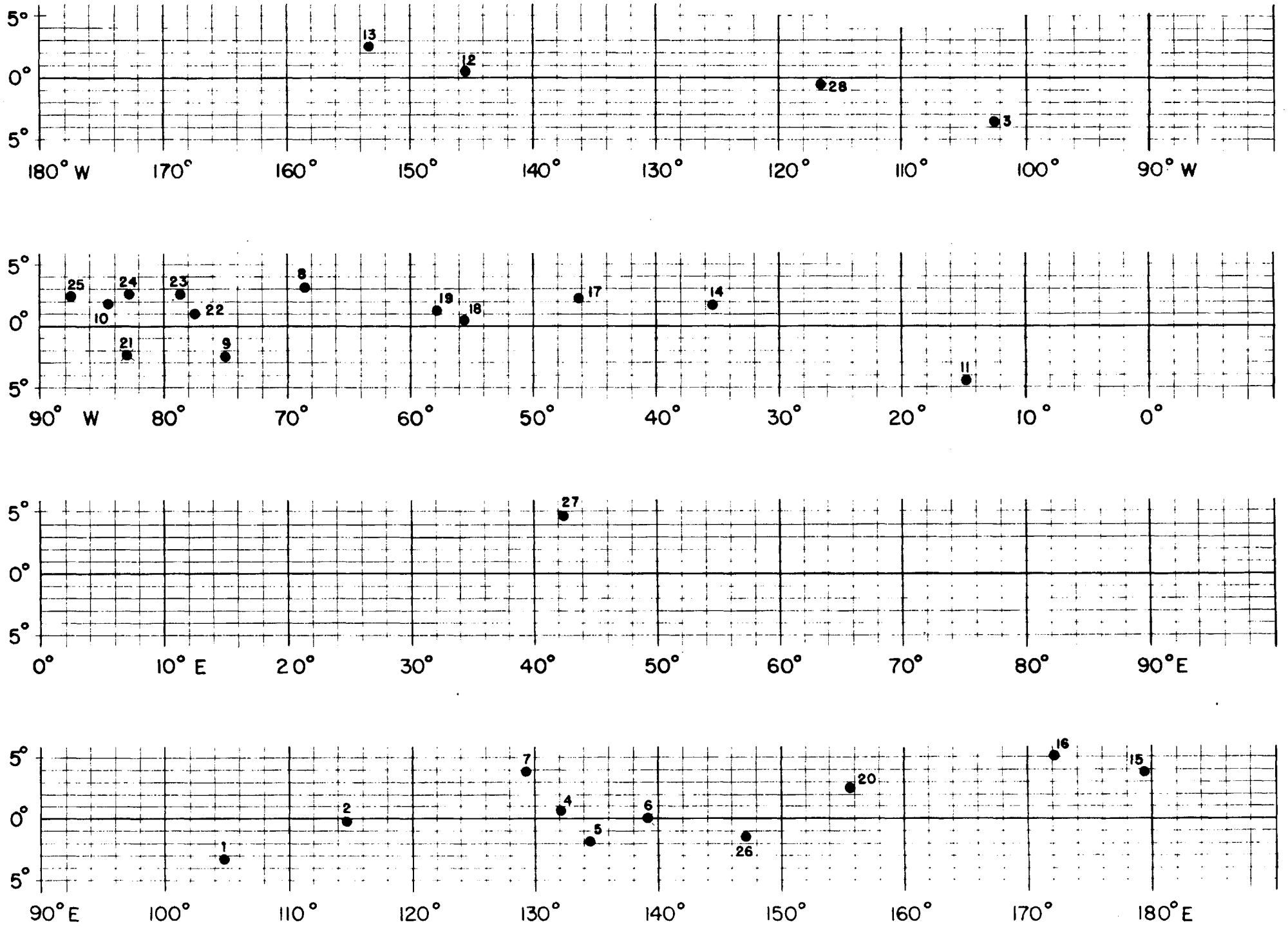
TABLE I
TRANSHORIZON ANTENNAS IN THE 700 MHz TO 1000 MHz
RANGE WHICH POINT WITHIN 5 DEGREES OF THE GEOSTATIONARY ORBIT

	Freq. Range	Intersection Point		ANTENNA Location		Azimuth	Size
1	680-970	3.2°S	104.9°E	40°28'N	29°12'E	101°51'	60 ft.
2	755-985	0.1°S	114.8°E	52°58'N	169°51'W	261°14'	120 ft.
3	755-985	3.8°S	102.4°W	61°47'N	165°57'W	115°14'	60 ft.
4	755-985	0.7°N	132.1°E	64°26'N	156°50'W	253°09'	60 ft.
5	755-985	1.9°S	134.5°E	65°26'N	161°14'W	245°37'	60 ft.
6	755-985	0.0°	139.2°E	65°15'N	151°55'W	250°41'	60 ft.
7	755-985	3.8°N	129.2°E	59°41'N	151°37'W	262°37'	60 ft.
8	755-985	3.1°N	68.3°W	60°25'N	146°09'W	99°02'	60 ft.
9	755-985	2.7°S	75.0°W	60°04'N	142°25'W	111°04'	-----
10	755-985	1.8°N	84.5°W	61°35'N	159°33'W	102°21'	60 ft.
11	755-985	4.6°S	14.8°W	68°26'N	66°44'W	128°18'	30 ft.
12	700-1000	0.5°N	145.3°W	69°06'N	79°02'W	249°30'	30 ft.
13	700-1000	2.4°N	153.2°W	68°46'N	81°12'W	256°29'	60 ft.
14	755-985	1.7°N	35.3°W	69°07'N	105°07'W	108°17'	30 ft.
15	755-985	3.8°N	179.4°E	69°07'N	105°07'W	257°49'	30 ft.
16	755-985	5.0°N	172.1°E	68°46'N	109°04'W	262°22'	60 ft.
17	755-985	2.1°N	46.0°W	68°56'N	116°56'W	107°04'	30 ft.
18	755-985	0.2°N	55.8°W	69°35'N	120°47'W	113°33'	30 ft.
19	755-985	1.1°N	57.9°W	70°10'N	124°44'W	111°41'	30 ft.
20	755-985	2.3°N	155.8°E	69°27'N	133°00'W	253°04'	60 ft.
21	755-985	2.3°S	82.8°W	69°36'N	140°11'W	121°38'	60 ft.
22	755-985	0.8°N	77.6 °W	70°08'N	143°39'W	102°34'	30 ft.
23	755-985	2.6°N	78.7° W	70°31'N	149°53'W	106°07'	30 ft.
24	755-985	2.5°N	82.8° W	70°55'N	153°15'W	108°36'	30 ft.
25	755-985	2.3°N	87.5° W	71°19'N	156°38'W	109°07'	30 ft.
26	755-985	1.6°S	147.0°E	71°19'N	156°38'W	237°14'	30 ft.
27	755-975	4.8°N	42.3°E	65°32'N	37°11'W	095°57'	120 ft.
28	755-985	0.4°S	116.9°W	67°00'N	50°42'W	247°33'	30 ft.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

Figure 2 - Intersections within 5° ' the stationary orbit 700-1 000 MHz



PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

In order to calculate which, if any, of the antennae whose beam intersections with the synchronous sphere are plotted in Figure 2, will be subject to interference from a broadcasting satellite, the following condition for non-interference based on Eq(1) of Annex 3-4C of the S.J.M. Report may be applied,

$$E_{SB} - \Delta G_S - \Delta G_T - \Delta L \leq E_{TA} - C/X$$

where

E_{SB} = pfd of the broadcasting satellite at the centre B of its own service area

ΔGS = off-axis reduction in gain of the satellite transmitting antenna in the direction of the transhorizon receiver location A

ΔG_T = off-axis reduction in gain of the transhorizon receiving antenna at A in the direction of the satellite

ΔL = difference in transmission loss between the paths from the satellite to points A and B

E_{TA} = pfd of the transhorizon signal to be protected at A

C/X = rf protection ratio required to keep broadcasting satellite interference to the transhorizon receiver acceptably low

Note that $E_{TA} - C/X$ is simply the maximum acceptable on-axis pfd of interference that can be accpted at the transhorizon station.

Note also that for a given transhorizon receiving antenna, ΔG_T depends primarily on the angle θ_T previously introduced, and for a given satellite transmitting antenna, ΔG_S depends on the angle at the satellite between the directions to the transhorizon receiver location A and the Broadcasting-Satellite Service area location B.

In the present case, ΔL can be neglected, and $E_{TA} - C/X$ will be taken as -189 dbW/m^2/4 kHz, which is the allowable interference pfd for transhorizon system "A" in Annex 8-4B to the S.J.M. Report. This would correspond to a maximum pfd of -151 dbW/m^2 in the 24 MHz RF bandwidth occupied by the assumed broadcasting satellite signal, assuming uniform spreading of energy. If E_{SB} is taken as -118 dbW/m^2 in 24 MHz, the value cited in Table 3-3F-II of the S.J.M. Report for 800 MHz broadcasting satellites used for community reception, Eq(1) yields a condition for the minimum value of $\Delta G_T + \Delta G_S$. Using Figure 1 as the antenna pattern for the satellite antenna, and using the C.C.I.R. reference interference model $32-25 \log_{10}\theta_T$ for the transhorizon antenna, this condition can be applied to each of the transhorizon antennae referred to in Table 1 and Figure 2 to see whether interference will occur.

The result will of course depend on the location assumed for the broadcasting satellite. For the ATS-F broadcasting experiment in which a satellite at 25°E long. will direct a 30 ft. antenna towards a service area at about 80°E long. and 30°N lat., none of the potentially vulnerable transhorizon systems was found to suffer interference.

In another, more critical example a hypothetical broadcasting satellite with characteristics similar to those of the ATS-F experiment was located in the cluster of beam intersections near 80°W long. and aimed at Brazil. Only one receiver (Number 22 in Table 1) was found to suffer interference. Here the interference was only 3 db above the acceptable limit and a shift of satellite position by only 0.6° would be sufficient to reduce it to an acceptable level.

SPACE CONFERENCE

Document No. 208-E
24 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

UNITED STATES OF AMERICA

GEOGRAPHICAL SHARING BETWEEN THE SPACE AND TERRESTRIAL BROADCASTING SERVICES BELOW 1 GHz

Chapter 3, Section 4 of the Report of the Special Joint Meeting, C.C.I.R., considers, inter alia, sharing of frequencies between space and terrestrial broadcasting services. The S.J.M. stated that :

a) Where the desired service areas overlap, frequency sharing in band 9 (UHF) up to 1 GHz is not feasible between the terrestrial television broadcasting service and the broadcasting-satellite television service either for individual or community reception employing amplitude modulation, vestigial sideband or frequency-modulation ($\Delta f_{pp} \geq 8$ MHz), due to prohibitive interference to the reception of broadcasting-satellite signals within the terrestrial broadcasting service area. However, where it is accepted that the satellite service would not be available within a specified distance from a terrestrial television broadcasting transmitter, geographical sharing would be feasible, with no interference to the terrestrial service within the 70 db rel. 1μV/m contour for a community broadcasting satellite service (rural), provided the angle of arrival exceeds 34° for the 625-line system and 22° for the 525-line system. (System M, U.S.A. and Canada)

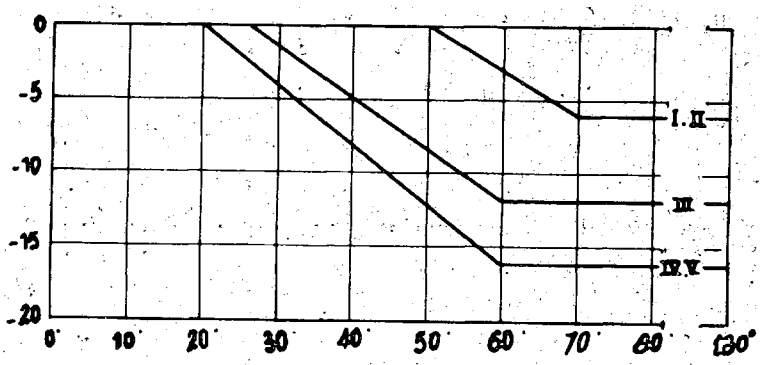
b) With service areas which are adequately separated, frequency sharing in band 9 (UHF) up to 1 GHz is feasible between the terrestrial television broadcasting service and the broadcasting-satellite television service for individual or community reception employing frequency-modulation ($\Delta f_{pp} \geq 8$ MHz). Areas of most likely interference to terrestrial services exist in the region of low satellite elevation, and where the satellite and terrestrial service areas are adjacent.

Figure /*/ shows the influence of the terrestrial service receiving antenna directivity on the allowable flux-density from the satellite at the boundary of the service area of the terrestrial system to provide a specific protection to the terrestrial service.

---

*) Figure from C.C.I.R. Recommendation 419.

ARCHIVES U.I.T. GENÈVE



Angle relative to direction of main response

Figure 1 - Discrimination obtained by the use of directional receiving antennae in broadcasting
(The number of the broadcasting band is shown on the curve)

The maximum permissible field strength for a satellite service as a function of geographical separation between the service areas is developed in Table 3-4B-I, (Annexes to Chapter 3, page 91, S.J.M. Report, Part II). (The equivalent values of power flux-density per square metre have been added.)

TABLE 3-4B-I

Examples for a Geographically Shared Channel

	Closely spaced service areas (non-overlapping) (angle of arrival exceeding 60° (1)	Medium separation between satellite and terrestrial service areas (angle of arrival 40° (1)	Wide separation between satellite and terrestrial service areas (low angle of arrival)(1)
Field strength of terrestrial service to be protected (Recommendation 417-2) (dB rel. 1uV/m)	70	70	70
Radio frequency protection ratio which is selected in this example to be appropriate for a typical good quality domestic colour television installation for 625-line systems (dB) (2)	-45	-45	-45
Receiving antenna discrimination (dB) (Recommendation 419) (polarization discrimination = 0 dB) (3)	16	8	0
Satellite transmitting antenna discrimination (dB) (4)	8	20	25
Difference in transmission loss between the two paths (dB) (5)	0	0	0
Permitted maximum field strength at the center of the satellite service area (dB rel. 1uV/m)	49	53	50
Equivalent maximum power flux density (dBW/m^2)	-97 dBW/m^2	-93 dBW/m^2	-96 dBW/m^2

(1) Referring to the edge of the service area of the terrestrial system.
(2) A higher value of protection ratio may be required for more sensitive receiving installations.
(3) This is the only information at present available. It may not be entirely accurate for interfering signals arriving at high angles of elevation.
(4) The side-lobe level of this antenna is assumed to be held to a value consistent with the state of development, the first side-lobe being attenuated 20 dB with respect to the maximum response.
(5) This figure refers to the satellite signal which enters the terrestrial service receiving antenna directly. In general, there will be a ground reflected signal which can modify the antenna pickup to the extent of causing an increase of 6 dB or severe attenuation in extreme cases.

As the Table indicates, the permitted maximum field strength for a broadcasting satellite service is relatively insensitive to angular separation of the satellite and terrestrial service areas because the sum of terrestrial receiving antenna discrimination and the satellite transmitting antenna discrimination remains essentially constant.

Foot-note 2 to the Table indicates that a higher value of protection ratio may be required for more sensitive receiving installations. It is also possible that some administrations will want to protect their terrestrial service to a value less than + 70 dbμ. Assuming the sum of these changes to be on the order of 15 db, we reach the following conclusion regarding power flux-density limitations for the broadcasting satellite service below 1 GHz.

The maximum power flux-density at the earth's surface produced by a broadcasting satellite space station using frequency modulation with a peak-to-peak frequency deviation of at least 8 MHz shall not exceed [- 110 dbW/m^2] at the edge of the service area of the broadcasting satellite. This limit shall be assumed to relate to the power flux-density under free space propagation conditions.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 209-E
24 June 1971
Original : French, English

COMMITTEE 4

SECOND REPORT OF WORKING GROUP 4D TO COMMITTEE 4

Please find annexed hereto the proposed addition to Article 7 relating to the pointing accuracy of antennae on geostationary satellites, as approved by Working Group 4D after having considered Proposals USA/28Corr./327, 328 and CCIR/64/para. 9.1.

J.K.S. JOWETT
Chairman
Working Group 4D

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT

PROPOSED ADDITION TO ARTICLE 7

(new section)

ADD 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 nominal half power beamwidth relative to the nominal pointing direction,

- 0.5° relative to the nominal pointing direction,

whichever is greater when these beams are not intended only for 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 :

*) /Unacceptable levels of interference shall be assessed according to the latest /recommendations/ of the C.C.I.R./

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 210-E
24 June 1971
Original : English

COMMITTEE 4

FIFTH REPORT OF WORKING GROUP 4D

TO COMMITTEE 4

Enclosed please find in the Annex the proposed addition to Article 7 related to the control of interference between geostationary satellite systems and non-synchronous inclined orbit satellite systems, as approved by Working Group 4D after having considered Proposals G/52/17; G/81/270, 271; CAN/15Rev./121 and 122.

J.K.S. JOWETT
Chairman
Working Group 4D

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT

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 communication satellite space stations shall cease or suppress radio emissions, and their associated earth stations shall not transmit to them whenever there is insufficient angular separation from space stations and / unacceptable interference /*) to space / systems / using geostationary satellites operating in accordance with the Radio Regulations.

Note :

*) / Unacceptable levels of interference shall be assessed according to the latest / recommendations / of the C.C.I.R. /.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 211-E
24 June 1971
Original : English

COMMITTEE 4

SIXTH REPORT OF WORKING GROUP 4D TO COMMITTEE 4

Enclosed please find in the Annex the proposed addition to Article 7 related to power flux-density at the geostationary satellite orbit, as approved by Working Group 4D after having considered Proposals USA/28Corr./335 and 336.

J.K.S. JOWETT
Chairman
Working Group 4D

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT

PROPOSED ADDITION TO ARTICLE 7

(new section)

ADD [Power flux-density at the geostationary satellite orbit]

ADD 470 In the frequency band [8 025 to 8 400 Mc/s] where the Earth Resources Satellite Service using non-geostationary satellites shares on an equal basis with the Communication-Satellite Service (earth-to-space transmissions), the maximum power flux-density produced at the geostationary satellite orbit by any Earth Resources Satellite Service space station shall not exceed -174 dBW/m^2 in any 4 kc/s band.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 212-E
24 June 1971
Original : French

COMMITTEE 3

REPORT ON THE FIRST MEETING OF COMMITTEE 3

Monday, 21 June 1971, at 0930 hrs

Chairman : Mr. L. CONSTANTINESCU
(Socialist Republic of Rumania)

	Subjects discussed	Document No.
1.	Terms of reference of the Budget Control Committee	C3-1
2.	Budget of the Conference	156
3.	Contributions by recognized private operating agencies and international organizations not exempt	157
4.	Cost of printing the Final Acts	158
5.	Position of the Conference accounts at 1 June 1971	159
6.	Organization of the Committee's work	

ARCHIVES U.I.T. GENÈVE

1. Terms of reference of the Budget Control Committee (Document C3-1)

The agenda and the terms of reference of the Committee annexed thereto, quoting Rule 5 of Chapter 9 of the General Regulations annexed to the Montreux Convention, 1965, were both approved.

2. Budget of the Conference (Document No. 156)

The Committee took note of the Space Conference budget as approved by the Administrative Council of the Union at its 25th Session (1970) and subsequently adjusted at the 26th Session (1971).

3. Contributions by recognized private operating agencies and international organizations not exempt (Document No. 157)

Replying to the Delegate of the United States, the Secretary of the Committee confirmed that a further document would be published later giving a list of those recognized private operating agencies and international organizations which were not exempt and which were taking part in the Conference, with details of the number of contributory units chosen. Their contributions were to be regarded as Union income.

4. Cost of printing the Final Acts (Document No. 158)

The Secretary of the Committee, explaining the table on page 2 of the document, said that recent conferences of the Union had generally applied a system whereby the cost of composition of the white, pink and blue documents was apportioned in proportions determined by the conference concerned, whereas the costs of printing and overtime worked by the printers' staff were debited direct to the conference budget. It was only the cost of composition which could justifiably be shared between the I.T.U. publications budget and that of the conference. In accordance with the practice at recent conferences, it was suggested that the Conference should bear one-third of the estimated figure of 60,000 francs, i.e. 20,000 francs, 40,000 francs being posted to the I.T.U. publications budget. The cost of printing and overtime would have to be borne entirely by the Conference.

The Delegate of the U.S.S.R. was astonished that the General Secretariat had not taken care to submit a revised budget for the Conference, including all the expenses, to the Administrative Council, which had met a month before. In fact, the Budget Control Committee was not entitled to increase the amount of the budget provided for the Conference unless it was to last longer than planned.

The Secretary of the Committee explained that the Space Conference budget had been examined by the Council at its 25th Session in 1970, whereas in 1971 it had merely adjusted the salary scales in conformity with the provisions of Additional Protocol I and it had agreed to the entry of an additional credit of 51,000 francs for salaries, while making a reduction of 6,000 francs to take account of the revaluation of the Swiss franc.

The Delegates of the U.S.S.R. and the United Kingdom suggested that Documents Nos. 158 and 159 be examined together, but the Secretary of the Conference thought it would be preferable to deal separately with the cost of printing the Final Acts since that problem arose out of the application of Administrative Council Resolution No. 83, which split up the costs of composition between the Conference budget and I.T.U. publications budget, particularly with respect to the subsequent printing of the definitive version of the Final Acts. The Budget Control Committee should decide whether or not to adopt the rule applied by earlier conferences, whereby one-third of the composition costs was posted to the Conference budget.

The Delegate of the United States considered that the Committee should adopt that rule.

It was so decided.

5. Situation concerning expenditure for the Space Conference at 1 June 1971 (Document No. 159)

Introducing the document, the Secretary of the Committee suggested that, in accordance with the practice of earlier conferences, certain costs should be grouped together, owing to their similarity and to the difficulty of distinguishing between them. It was therefore proposed that a credit of 65,000 francs should be transferred from sub-head 7.302 of Chapter III - Publication of proposals - to sub-head 7.202 of Chapter II - Document production.

The credit transfer was approved.

The Delegate of the U.S.S.R., supported by the Delegate of the United Kingdom, pointed out that on page 2 of that document it was suggested that the budget of the Conference should include an item concerning the publication of the documents resulting from the work of the Joint Meeting of the C.C.I.R. Study Groups held in February. In view of the fact that the C.C.I.R. had its own budget and that the extra credit envisaged had not been approved by the Administrative Council, the amount required to cover that expenditure should be found elsewhere.

There was an essential principle from which his delegation refused to depart, i.e. that the Budget Control Committee of the Conference must keep within the budget limit fixed for the Conference by the Administrative Council. It was only within the budgetary framework fixed by the Council that the Committee could arrange for transfers of credits from one sub-head to another; in no case could it raise the limit of expenditure. It was for the next session of the Administrative Council to examine how the Conference deficit, if any, should be met.

Replying to a question by the Delegate of the United States, the Secretary of the Committee thought it was difficult to see how the excess expenditure could be reduced. It should be borne in mind that the situation described in the document related to the period up to 1 June 1971. Considering the actual expenditure and the methods of work adopted by the Conference, the chances of reducing expenditure were very slight.

The Secretary of the Conference thought that the situation was alarming even before the Conference opened, but it had been further aggravated by the fact that provision had had to be made for considerable overtime during the past two weekends in order to produce the Conference documents and in particular those of the Working Groups of Committe 5.

With respect to the additional 120,000 francs for the publication of the document on the Joint Meeting of the C.C.I.R. Study Groups, it was quite obvious that the amount to be borne would be identical for the Members of the Union, whether the figure appeared in the Conference budget or was considered as excess expenditure in the C.C.I.R. budget.

The considerable increase in the cost of printing the pink and blue documents was absolutely unforeseeable and if it was to be reduced consideration might have to be given to abandoning the idea of publishing the white documents. However that would mean only a minor saving and would in any case not correspond to what had originally been planned. Probably a cheaper method (Roneo) might be used to produce them but the original method (printing) was the only one whereby the documents could be published within the desired time.

According to the provisions of No. 675 of the General Regulations annexed to the Convention, a document could be published stating that by a given date the budget approved by the Administrative Council would be exhausted. It would then be for the Conference to decide for itself whether or not it wished to continue its work. To tell the truth it looked very much as though the budget would be exhausted after four weeks of work. It was probably the first time in 20 years that the I.T.U. had found itself in such a grave situation and with such serious overspending by a Conference.

The Delegate of Yugoslavia found the situation both grave and deplorable and pointed out that most of the Members of the Budget Control Committee also sat on the Administrative Council, where the Conference budget was approved. The Administrative Council itself was bound by the decisions of the Plenipotentiary Conference and could not exceed certain limits of expenditure. And yet Conference budgets were almost always exceeded. Thus, the chief concern of a delegate attending a conference was that it should reach a successful conclusion but, when he found himself in the Administrative Council, things took on a different perspective and the delegate was bound to criticize the decisions which he himself had taken with sincere and profound conviction when a member of the Budget Control Committee. Obviously additional credits would have to be found to meet the expenditure on overtime. He appealed to the Secretary of the Conference and the Secretary of the Committee - who was also Chief of the I.T.U. Finance Department - that with their experience they should find some means of solving the problem confronting the Budget Control Committee.

The Delegate of the Ukraine, reverting to the question of the expenses incurred by the Special Joint Meeting of the C.C.I.R. Study Groups, wondered why the Administrative Council had not examined the problem and why no decision had been taken in that respect. It seemed rather a regrettable lapse for it was at the preparatory stage, that is to say before the actual Conference, that such matters should have been settled.

The Director of the C.C.I.R. pointed out that the budget for the Joint Meeting of the Study Groups had not been exceeded. It was logical that the expenses involved in producing a document intended for the Space Conference should be borne by that Conference.

The Delegate of the United States thought that the latter problem was one for the Administrative Council to face. The job of the Budget Control Committee, according to No. 675 of the General Regulations annexed to the Convention, was to prepare, in collaboration with the Secretariat, an interim statement of expenditure for submission to the Plenary Meeting.

The Delegate of the U.S.S.R. approved the proposal and asked that in the Report to the Plenary Meeting mention should be made of the opinion expressed in the Committee that the Conference could not exceed the budget limits set by the Administrative Council and, moreover, that the funds required to cover the additional expenditure should be found by the Administrative Council at its next meeting.

6. Organization of the work of Committee 3

After a short discussion it was decided that the Secretariat should prepare a draft report by the end of the week for submission to Committee 3 at its next meeting and that it should be published in time for the next Plenary Meeting.

It was so decided.

The meeting rose at 1050 hours.

Secretary :
R. PRELAZ

Chairman :
L. CONSTANTINESCU

SPACE CONFERENCE

Document No. 213-E
25 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

SUB-WORKING GROUP 5D-2

MANDATE OF SUB-WORKING GROUP 5D-2

Taking as a basis the proposal of the Federal Republic of Germany (DT/16, page 11, number F/5/63) that space techniques for the needs of the maritime mobile service be included in the frequencies specified in Appendix 18 of the Radio Regulations (156-174 Mc/s band), prepare a draft Resolution to invite the next I.T.U. Maritime Conference (1974) to study, for this purpose, the possibility of reserving a small number of narrow channels to be uses for maritime safety.

The protection of terrestrial services authorized to operate in the band in question shall be taken into consideration.

Maurice CHEF
Chairman of Working-Group 5D

ARCHIVES U.I.T. GENEVE

SPACE CONFERENCE

Document No. 214-E
25 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

NOTE FROM WORKING GROUP 5C

TO CHAIRMAN OF COMMITTEE 5

At its sixth Meeting held on 25 June 1971, Working Group 5C took note of Document No. 197 containing Proposals from France concerning Earth Resources Satellites in the frequency band 1 525-1 535 Mc/s. Since it had completed the examination of the Proposals concerning the frequency bands 1 660 to 1 700 Mc/s, it decided not to re-open the discussion concerning these frequency bands and to refer the matter to Committee 5.

K. OLMS
Chairman

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 215-E
25 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

WORKING GROUPS 5A AND 5D

Note from Working Group 5C

to Working Groups 5A and 5D

Attention of Working Groups 5A and 5D is drawn to the agreement reached in Working Group 5C to include foot-note 379A in the Table (see below). Reservations concerning this introduction have been expressed by the Delegations of the United Kingdom and of the United States of America.

"ADD 379A The Standard Frequency and Time Signal Services may be authorized the use of the frequency 4 202 Mc/s for space-to-earth transmissions and the frequency 6 427 Mc/s for earth-to-space transmissions. Such transmissions shall be confined within the limits of ± 2 Mc/s 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."

K. OLMS
Chairman

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 216-E
26 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5 AND
WORKING GROUP 5A

NOTE FROM THE CHAIRMAN OF WORKING GROUP 5B

TO THE CHAIRMEN, COMMITTEE 5 AND WORKING GROUP 5A

Frequency band : 19.3-19.4 Gc/s

Working Group 5B unanimously agreed, on 26 June 1971, the deletion of the exclusive allocation to the RADIO ASTRONOMY SERVICE from the framed part of the Table and invites the attention of Committee 5 and Working Group 5A to the remaining Proposals for the allocation of this band to the FIXED, MOBILE and COMMUNICATION-SATELLITE Services together with the consequential deletion of No. 409D, which have not been considered in Working Group 5B. (Proposals CAN/14/92, D/5/88, F/41/131, G/54/119, J/30/16, NZL/62/40, URS/59/26 and USA/28/107 refer.)

B. DESTA
Chairman

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 217-E
26 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

WORKING GROUP 5A

UNITED STATES OF AMERICA

The U.S.A. proposes the following as a replacement for its earlier proposal, USA/28/90, which is herewith withdrawn :

Ref.

MHz

	Region 2
USA/217/291	6 625-7 125 FIXED MOBILE ADD FIXED-SATELLITE (Space-to-earth) / new terminology pursuant to Document No. 186 / 393A

USA/217/292 ADD 393A

The use of this band in the fixed-satellite service is limited to domestic systems and is intended primarily for the distribution of programme material for use by terrestrial broadcasting stations. The power flux-density produced by space stations in this band shall be in accord with Article 7, for Region 2. It shall be at least / 3 / db lower with respect to land masses in Regions 1 and 3. Earth stations receiving signals in this band may not impose restrictions on the physical location or technical parameters of the terrestrial stations of other administrations, except those which would be applicable under Article 7.

Suggested Note to Committees 4, 6 and 7. It is the wish of Committee 5 that the co-ordination procedures of Articles 9 and 9A not apply with respect to receiving earth stations vis-a-vis terrestrial stations in this band.

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Corrigendum No. 1 to
Document No. 218-E
30 June 1971

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FIRST REPORT OF WORKING GROUP 5 Ad hoc

TO COMMITTEE 5

Replace the text of the definition MOD 84AG Fixed-Satellite Service by the following text :

MOD 84AG Fixed-Satellite Service

A radiocommunication service :

- between earth stations at specified fixed points when one or more satellites are used, including in some cases satellite to satellite links; these links 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.).

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 218-E
28 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FIRST REPORT OF WORKING GROUP 5 ad hoc

TO COMMITTEE 5

1. In accordance with the terms of reference prescribed by Committee 5, Working Group 5 ad hoc examined the proposals relating to radio and space systems, services and stations (Section II and IIA, Article 1 of the Radio Regulations).

2. The Group first dealt with the general principles adopted, taking into account the relevant proposals submitted by France, with a view to aligning the terms for the services liable to use space techniques with the corresponding terms in the Terrestrial Services. A Sub-Working Group under the chairmanship of Mr. A. Zaidan (Saudi Arabia) was set up.

3. Among the proposals for definitions, those concerning the Distribution-Satellite Service (G/53/21, AUS/9/1), the Radiolocation-Satellite Service (IND/38/14) and the Radar Astronomy Service (IND/38/23) were not adopted by the Group. However, the Group held the view that the decision taken in respect of the Distribution-Satellite Service should not be regarded as final and that a study would be made at a later date. An overall study would be made to include the proposals from Brazil (B/70/3, B/70/4) on individual and community reception in the Broadcasting-Satellite Service. The definition of satellite broadcasting proposed by the Group could be revised in consequence.

4. The amended and new provisions set out in the annex to this report which are submitted to Committee 5 for approval were unanimously adopted by Working Group 5 ad hoc. In some cases, the proposals for amendment entail deletion of existing terms.

5. The definitions in the annex are set out in the order considered to be logical, but the order may be changed when the Group has made a detailed study of the proposed rearrangements of the various sections of Article 1 (Documents Nos. 77 and 83).

A. PETTI
Chairman

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT TERMS AND DEFINITIONS

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, including the sea, or in the earth's atmosphere :

- intended for communication with one or more space stations;
- or intended for communication with another station(s) using 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(1) 84AA.1 In these Regulations, unless otherwise stated, any radiocommunication service relates to Terrestrial Radiocommunication.

ADD(2) 84AB.1 In these Regulations, unless otherwise stated, any station is a Terrestrial Station.

MOD 84AF Space System

Any group of co-operating earth 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 specified fixed points on the earth when one or more satellites are used, including in some cases satellite to satellite links; these links may also be effected in the Inter-Satellite Service;

- for connection between one or more specified fixed points on the earth 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 technical system used so requires also for connection between these space stations and one or more specific 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 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 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 re-transmitted by space stations are intended for direct reception[1)] by the general public.

ADD 84APA 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, including, in certain cases, transmission or re-transmission 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 earth-based platforms;

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

*) Possibly to be amended.

- 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 purposes of the Amateur Service.

ADD 84ATB Standard Frequency-Satellite Service

A radiocommunication service using space stations on earth satellites for the purposes 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 84ACA 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 84ACB 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 surface of the earth, in the air or in space.

NOC	84AJ	Active Satellite
NOC	84AK	Passive Satellite
NOC	84AW	Space Telemetering
NOC	84AK	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

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 219-E
28 June 1971
Original : English

PLENARY MEETING

LETTER FROM THE CHAIRMAN OF COMMITTEE 6

TO THE CHAIRMAN OF THE CONFERENCE

I sincerely regret that due to other pressing duties and responsibilities it is necessary for me to leave the Conference this week for Liberia. I have also been recently informed that the designated Member of our Delegation, who was due to arrive last week, is unable to attend the Conference because of illness in the family.

Through you, Mr. Chairman, I wish to thank the Heads of Delegations and the Plenary for its sponsorship and approval of Liberia for the Chairmanship of Committee 6.

While we take leave of you, the work of Committee 6 is being left in the good hands of its Vice-Chairman, Mr. M.K. Basu (Republic of India).

I thank you again, on behalf of Liberia, and express the hope that the progress of telecommunications, through the utilization of outer space, will serve to promote peace, goodwill and understanding among mankind.

Samuel H. BUTLER

Chairman,
Committee 6

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 220-E
28 June 1971
Original : English

COMMITTEE 4

SEVENTH REPORT OF WORKING GROUP 4D TO COMMITTEE 4

Proposed contribution to the "omnibus" Recommendation

The annexed document concerning the "omnibus" Recommendation to the C.C.I.R. and to Administrations relating to frequency bands shared between space services, prepared by an ad hoc Sub-Group has been considered in Working Group 4D in substance and essential agreement has been reached to the "recommends", however it is assumed that the Drafting Group of Committee 4 would wish to modify the text in detail and co-ordinate it with similar texts from other Working Groups for inclusion in the "omnibus" Recommendation. For this reason, we have not considered the early part of this document prior "recommends".

C.W. SOWTON
for J.K.S. JOWETT
Chairman
Working Group 4D

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT

RECOMMENDATION No. Spa

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

relating to frequency bands
shared between space 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 from 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 No. 465	"GENERALIZED EARTH STATION ANTENNA RADIATION PATTERN FOR USE IN INTERFERENCE CALCULATIONS, INCLUDING CO-ORDINATION PROCEDURES, IN THE FREQUENCY RANGE 2-10 GHz"
Recommendation No. 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 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;
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-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 /communication-satellite systems/ which affect the utilization of the geo-stationary 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 /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;

recommends

1. 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 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 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 maximum /permissible/ amount of interference into a geostationary 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 :

2.4.1 frequency-modulated telephony signals;

2.4.2 frequency-modulated television signals;

2.4.3 digitally-modulated signals;

and the most appropriate manner in which /permissible/ interference should be specified in these and other cases;

2.5 the interference criteria applicable to frequency sharing between non-geostationary satellite /systems/;

2.6 the possibility of establishing a technical criterion for expressing the efficiency of use of the geostationary satellite orbit.

SPACE CONFERENCE

Document No. 221-E
28 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

EIGHTH REPORT OF WORKING GROUP 4D TO COMMITTEE 4

Working Group 4D has now completed the task assigned to it by Committee 4 and, unless further work is remitted to it, it will not need to hold any further meetings.

C.W. SOWTON
for J.K.S. JOWETT
Chairman
Working Group 4D

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 222-E
28 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5
WORKING GROUP 5B

UNITED STATES OF AMERICA

FREQUENCY BAND : 115.16-115.38 GHz - RADIO ASTRONOMY

After discussion with several other delegations concerning the recent detection of the carbon monoxide (CO) radio spectral line at 115.271 GHz by Radio Astronomers, the United States' Delegation desires to submit the following foot-note for consideration by Working Group 5B.

> "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 are urged to take all practicable steps to protect Radio Astronomy observations from harmful interference in the band 115.16-115.38 GHz."

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 223-E
28 June 1971
Original : English

COMMITTEE 6

NOTE FROM THE CHAIRMAN, COMMITTEE 4,

TO THE CHAIRMAN, COMMITTEE 6

Working Group 4E of Committee 4 examined the proposal of Brazil in Document No. 121, as modified in DT/56, and agreed the text of a draft recommendation appearing in the Annex to this document, except the last paragraph thereof which invites the I.F.R.B. to issue technical standards.

Working Group 4E and Committee 4 had some doubt about their competence in dealing with the last paragraph and were of the view that the matter should be referred to Committee 6 for its opinion. The attention of Committee 6 is drawn to the provisions of Nos. 636 and 639CP of Radio Regulations in this context.

E. SANDBACH
Chairman,
Committee 4

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

PROPOSED DRAFT RECOMMENDATION [No. H]

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 (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 Radiocommunication 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 issue 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., that may allow either the I.F.R.B. or the Administrations to ascertain the probability of harmful interference.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 224-E
28 June 1971
Original : English

PLENARY MEETING

REPUBLIC OF THE PHILIPPINES

Ref.

PHL/224/1

DRAFT RECOMMENDATION No. K

relating to the use of satellite communication systems in the event of natural disasters

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

considering

a) that in the case of disasters caused by natural phenomena such as earthquakes, tidal waves, floods, cyclones, typhoons, etc., the loss of life can frequently be substantially limited if relief operations can be initiated at the earliest possible moment;

b) that the conduct of effective and timely relief operations is greatly enhanced when supported by reliable international communications facilities;

c) that in the event of such disasters the normal communication means are frequently damaged or completely interrupted and that they often cannot be quickly restored through local resources;

d) that geostationary communication-satellite systems could effectively provide such relief communications;

ARCHIVES U.I.T. GENÈVE

Ref.

PHL/224/1 (cont.)

noting

a) that known planning of transponder utilization makes no provision for specific frequencies or channels for emergency communications;

b) that in the absence of such information it is not feasible to proceed with specifications for rapidly transportable universally operable earth stations;

recommends

that Administrations individually or in collaboration,

1) provide for the needs of eventual relief operations in planning their international communication-satellite systems;

2) identify for this purpose preferred radio-frequency channels which could quickly be made available;

requests

the Secretary-General to arrange, in co-operation with international organizations operating or planning communication-satellite systems, standard specifications for transportable earth stations for the utilization of these systems;

invites Administrations

to study and advise on the optimum locations for the eventual deployment of such stations within short transportation range of disaster-prone areas.

SPACE CONFERENCE

Document No. 225-E
28 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FIRST REPORT BY WORKING GROUP 5A TO COMMITTEE 5
(ALLOCATIONS)

COMMUNICATION-SATELLITE SERVICE

Frequency bands : 4 200-4 400 Mc/s
6 425-7 250 Mc/s
17.7-31 Gc/s

1. Frequency band 4 200-4 400 Mc/s

1.1 Proposal IND/37/9, by which it was foreseen to add a world-wide allocation to the Communication-Satellite Service on an equal primary basis with the existing allocation to the Aeronautical Radionavigation Service, was fully examined.

1.2 Several delegations gave reasons why they were unable to envisage the proposed revision and the Working Group was unable to agree with the Proposal.

1.3 The Delegation of India reserved the right to revert to this question in Committee 5, if it still so desires and requested that this question be referred to C.C.I.R. for further study.

1.4 The Working Group has examined the Note from Working Group 5C contained in Document No. 215 and could not make any contribution to the matter.

2. Frequency band 6 425-7 250 Mc/s

2.1 The proposals in this band were discussed both in Working Group 5A and Sub-Working Group 5A-2. World-wide allocation did not meet with approval of the majority of administrations. Regional allocation (to Region 2) was then discussed, and in spite of a fairly complete technical debate, some administrations in Region 2 could not accept the proposals.

2.2 The Working Group was unable to agree with these proposals. The Delegation of the U.S.A. informed the Group that, taking into consideration the importance of this band for their administration, a new different proposal would be submitted at a later date.

ARCHIVES U.I.T. GENÈVE

3. Frequency bands 17.7-31 Gc/s

3.1 The proposals in this band were first discussed in Sub-Working Group 5A-3, resulting in a compromise proposal presented in Document No. DT/46.

3.2 After consideration of this document the Working Group agreed on a suggestion to Committee 5 that the allocations included in the Annex should be adopted.

3.3 The Delegation of Japan asked that their views on the possibility of sharing in this band be recorded and reserved the right to revert to this question in Committee 5, if it still so desires.

Luiz C. BAHIANA
Chairman

Annex : 1

A N N E X

Gc/s

	Region 1	Region 2	Region 3
MOD	17.7-19.7	FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-earth) 374A	
MOD	19.7-21.2	COMMUNICATION-SATELLITE (Space-to-earth) 374A	
MOD	21.2-22	FIXED MOBILE	
NOC	22-23	FIXED MOBILE	
MOD	23-23.6	FIXED MOBILE	

/Note Committee 7 : Existing No. 374A to be added in boxes as shown above, subject to changes to definitions which would render this foot-note superfluous/

(SUP) 409D

MOD 407 Spa — In Albania, Bulgaria, Hungary, Poland, Roumania, Czechoslovakia and the U.S.S.R., the bands 13.25-13.5 Gc/s, 14.175-14.3 Gc/s, 15.4-17.7 Gc/s, 23.6-24.25 Gc/s and 33.4-36 Gc/s are also allocated to the Fixed and Mobile Services.

SUP 410 — [SUP for the frequency 22.125 Gc/s]

[Note to Working Group 5C and Committee 7 : The frequency designated for industrial, etc. will be 24.125 Gc/s]

MOD 408 — In Sweden the bands 13.3-14 Gc/s, 15.7-17.7 Gc/s and 33.4-36 Gc/s are also allocated to the Fixed and Mobile Services.

Gc/s

	Region 1	Region 2	Region 3
NCC	25.25-27.5	FIXED MOBILE	
MOD	27.5-29.5	FIXED MOBILE COMMUNICATION-SATELLITE (Earth-to-space) 392A	
MOD	29.5-31	COMMUNICATION-SATELLITE (Earth-to-space) 392A	

[Note Committee 7 : Existing No. 392A to be added in boxes as shown above, subject to changes to definitions which would render this foot-note superfluous]

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 226-E
28 June 1971
Original : English

COMMITTEE 5 and
WORKING GROUPS 5A,
5B and 5E

NOTE FROM CHAIRMAN, WORKING GROUP 5B
TO CHAIRMEN, WORKING GROUPS 5A AND 5E

TELECOMMAND, TELEMETRY AND TRACKING

Working Group 5B at its meeting today unanimously agreed 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 Spa This band may also be used for the transmission of tracking and telemetering signals associated with communication-satellite space stations operating in the same band.

392A Spa This band may also be used for the transmission of telecommand signals associated with communication-satellite earth stations operating in the same band.

B. DESTA
Chairman

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 227-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

SUMMARY RECORD

OF THE

FOURTH MEETING OF COMMITTEE 4

(TECHNICAL)

Friday, 25 June 1971, at 1500 hrs.

Chairman : Mr. E. SANDBACH (Australia)

Subjects discussed		Document No.
1.	Approval of Summary Record of Third Meeting	192
2.	Progress report by Working Group Chairmen	
3.	Consideration of any documents from Working Groups	155, 174(Rev.), 193, 194, 196, 198, 206, 209, 210, 211
4.	General Recommendation requesting the C.C.I.R. to carry out further work	191
5.	Organization of work	

ARCHIVES U.I.T. GENÈVE

1. Approval of Summary Record of Third Meeting (Document No. 192)

Approved.

(2. Progress Report by Working Group Chairmen
(
(3. Consideration of any documents from Working Groups (Documents Nos. 155, 174(Rev.), 193, 194, 196, 198, 206, 209, 210, 211)
(
(4. General recommendation requesting the C.C.I.R. to carry out further work (Document No. 191)

a) Working Group 4E

The Chairman of Working Group 4E said that proposals B/121, J/141, D/5/37, USA/28/263(Rev.) and G/95/321, had been considered by the Working Group and that draft texts would be ready for submission to the next meeting of Committee 4. As work on Appendices I, IA and IB depended on the outcome of work in progress in other Working Groups and in Committee 6 they had not yet been examined. However, to save time it was hoped to work in parallel with Committee 6 on this matter.

b) Working Group 4D

The Chairman of Working Group 4D said that the Working Group had almost completed the work assigned to it. Six reports were before the Committee for its approval.

Introducing Document No. 174(Rev.), he said that to comply with the Committee's wishes the following two alterations had been made to the document submitted at the previous meeting : the wording of the first foot-note, page 3, had been revised and the word "synchronous" in the same foot-note had been put in square brackets so that the editorial group might consider what other term would be more suitable.

The document was approved.

The following amendments to Document No. 209 were agreed. First paragraph, fourth line: delete the word "nominal". First paragraph, seventh line: delete the word "not" and add the words "less than the" after "for".

The document, as amended, was approved.

Introducing Document No. 193, the Chairman of Working Group 4D indicated two corrections to be made to the document : the words "and CCIR/64/2.5.4" to be added after "Proposal F/89/318" page 1, first paragraph, third line, and the signatures to be deleted from the foot of the Annex, page 3.

The document, as amended, was approved.

Introducing Document No. 194, the Chairman of Working Group 4D said that the words "link" and "system" had been given in square brackets throughout the document so that the editorial group might consider what would be the best terms to express the concepts involved. It was agreed that the drafting group look into the query from the Delegate of the Federal Republic of Germany as to whether "transmission gain" (page 7, Table 1, fifth paragraph) was the correct term to use, since loss as well as gain was involved.

On a proposal from the Delegate of the United States of America, supported by the Delegates of the United Kingdom and France, it was agreed that an example of how the calculation would be used in practice should be provided by Working Group 4D as an addendum to the proposed new Appendix 29.

The following amendments were agreed.

Page 3, section 2, first paragraph, third line : delete "(constituting a satellite [link])".

Page 6, first paragraph : retain the first sentence. Replace the second sentence by the text given in Corrigendum No. 1 to Document No. 194.

Page 6, section 3, second line of title : replace the word "system" by "link".

Page 6, section 3, third paragraph, last line : replace the words "C.C.I.R. Reports 455 and 388-1" by "the relevant current C.C.I.R. Recommendations and Reports".

Page 6, section 3, fourth paragraph, first line : replace the word "calculation" by "comparison" (English text only).

Page 6, section 3 : enclose third and fourth paragraphs in square brackets.

Corrigendum No. 1 to Document No. 194, first paragraph, first line: replace "Second and third paragraphs" by "The second paragraph".

Second paragraph, fourth line : insert the word "an" after "forming"; fifth line : replace "In this event" by "In the event that precise actual data are not available".

The document, as amended, and subject to the addition of an example, was approved.

It was agreed that the Drafting Group should align the French and English texts of the title in the Annex to the fifth report of Working Group 4D (Document No. 210).

The report was approved, on that understanding.

The Chairman of Working Group 4D, introducing the Group's sixth report (Document No. 211), said that reference should be made on the first page to CCIR/64/6.2.3, in view of the statement in the second paragraph of page 81 of the report of the Special Joint Meeting.

The Chairman said that "ADD 470" in the Annex should be followed by three dots and that the words "Earth Resources Satellite Service" should be placed in square brackets.

After a discussion concerning a suggestion that the words "on an equal basis" should also be placed in square brackets, it was decided to delete those words.

The report, as amended, was approved.

c) Working Group 4C

The Chairman of Working Group 4C said he hoped to be able to report on the Group's work on co-ordination distances to the next meeting of Committee 4.

d) Working Group 4B

The Chairman of Working Group 4B said that the Group had prepared five documents, covering the bulk of its work, and hoped to report on the two main outstanding items, sharing criteria for the Broadcasting-Satellite Service and the 800-2 500 Mc/s band, to the next meeting of Committee 4.

The Working Group wished to resubmit Document No. 155, which had been referred back to it at the preceding meeting for further explanations.

The Director of the C.C.I.R. said that the reference to C.C.I.R. Report in the foot-notes to pages 3 and 4 should read 393-1 and be placed in square brackets.

Document No. 155 was approved.

The Chairman of Working Group 4B said that Document No. 191 was a partial revision of Recommendation No. Spa 3 of the Radio Regulations, which might be regarded as the input of the Working Group to the overall recommendation which would ultimately be produced on matters to be dealt with by the C.C.I.R.

The Committee agreed to follow that procedure.

The Director of the C.C.I.R. said that, since the actual recommendations of the C.C.I.R. were never provisional, although the results used in them might be so described, it would be more accurate to delete the words "are provisional and" and "before they can become definite" from "considering" paragraph a) in the annex to the document.

The Chairman said that questions of detail should be left to Working Group 4B and the Drafting Group which would coordinate the final overall Recommendation.

The list of C.C.I.R. Recommendations, Questions and Study Programmes requiring further study, given in "considering" paragraphs a) and b), was approved.

It was agreed that the last phrase of "recommends" paragraph 1 should be amended to read "... so that Recommendations can be prepared for adoption by the Plenary Assembly of the C.C.I.R." and to delete the words "allocated by the WARC-ST, Geneva, 1971", from "recommends" paragraph 2.3.

The Director of the C.C.I.R. suggested that it would be more convenient to put "recommends" section 2 in the form of a Question originating from the Conference.

Document No. 191, as amended, was approved provisionally.

The Chairman of Working Group 4B said that Documents Nos. 196 and 206 required no specific action, since they merely consisted of technical guidance given to Working Groups 4A and 4E, respectively.

The Committee took note of Documents Nos. 196 and 206.

The Chairman of Working Group 4B said that the Group had not yet completed its recommendations with regard to the power flux-density limits for the 2.3-3 Gc/s band. On page 8 of Document No. 198, against "ADD 470NZ", the entry "470NX" should read "470NY" and the entry in the second line against "ADD 470NAB" should read "470NQ, 470NU and 470NY /". He pointed out that all the limits were in accordance with the results obtained by the C.C.I.R. Special Joint Meeting. The blank spaces would be filled in when the conclusions of Committee 5 became available.

It was agreed that the limits against ADD 470NX should be designated as "between 15.4 and 23 Gc/s" instead of "above 15.4 Gc/s" and that the wording of ADD 470NY should be aligned on that of ADD 470NU.

The Committee approved Document No. 198 as amended, on the understanding that the text would be considered by the Editorial Committee after the necessary information was received from Committee 5.

4. Introduction and consideration of documents in Annex (Document No. MEX/78)

The Chairman invited the Committee to consider the proposal in the Mexican document purely from the technical point of view, leaving aside the question of the Committee's competence to recommend the universal use of the term "Hertz" for "cycle per second" in English and Spanish.

After a discussion during which it was pointed out that the use of the term "Hertz" was gaining ground in all technical circles, it was decided, at the suggestion of the representative of the I.F.R.B., to align the relevant passages of the Radio Regulations in English and Spanish with the French version, where the term "Hertz" was already used, and to request the Drafting Group to prepare a short paper on the matter.

5. Organization of work

The Chairman said that Documents Nos. 168, 207 and 208 should be considered by Working Group 4B, Documents Nos. 186 and 188 by Working Group 4C and the documents under headings 3, 4 and 5 of the Annex to Document No. C4-4 by Working Group 4E. The documents under heading 2 - which should read "Introductory explanation of proposals" - should be left in abeyance. Consideration of documents under headings 6, 7, 8 and 9 was postponed to the following meeting.

It was so agreed.

The meeting rose at 1835 hours.

The Secretary :

I. DOLEZEL

The Chairman :

E. SANDBACH

SPACE CONFERENCE

Document No. 228-E
28 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS — GENEVA — 1971

PLENARY MEETING

FIRST REPORT OF THE BUDGET CONTROL COMMITTEE

The Budget Control Committee held two meetings at which it considered the various points arising out of its terms of reference.

Pursuant to its deliberations and under Article 5 of the General Provisions regarding Conferences annexed to the International Telecommunication Convention, Montreux, 1965, the Budget Control Committee submits the present report to the Plenary Meeting.

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.

ARCHIVES U.I.T. GENÈVE

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 21 June 1971, compiled by the General Secretariat (Annex 2 attached), shows that an excess of expenditure over credits of about 246,000 Swiss francs may now be expected. This excess relates to the following items :

a) Printing of C.C.I.R. Study Group Report : 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 : 122,000 Swiss francs;

d) postage for despatch of Conference 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. Study Group 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, irrespective of the decision ultimately adopted by the Plenary Meeting, the sum of 92,000 Swiss francs will remain an exceeding 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 26,500 Swiss francs for the first week alone, so that in view of the fact that it is customary to force the pace towards the end of conferences, overtime costs can be expected to total about 180,000 Swiss francs. The Plenary Assembly must decide whether the rate of work or the volume of documentation should be reduced to eliminate or cut down this overtime.

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 contributions 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 329,000 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 246,000 Swiss francs.

*

* *

After a lengthy study of this situation, the Budget Control Committee concluded that Conference expenditure must be kept within the limits of the budget approved by the Administrative Council.

However, the Committee was unable to solve the problem, firstly because a large part of the expenditure incurred cannot be compressed (premises, staff contracts), and secondly because other costs cannot be cut without jeopardizing the smooth running of the Conference.

Under No. 675 of the International Telecommunication Convention, Montreux, 1965, therefore, the Budget Control Committee is compelled to draw the Plenary Meeting's attention to this fact.

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.

The 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 of the
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
	Swiss francs		
Chapter 1 - Staff			
Salaries and related expenditure		1,005,000	1,050,000
Travel expenses		40,000	40,000
Insurance		13,000	13,000
	701,000	1,058,000	1,103,000
Chapter 2 - Premises and equipment			
Premises, furniture, machines	92,000	140,000	140,000
Document reproduction	48,000	50,000	50,000
Supplies and overheads	32,000	33,000	33,000
Technical installations	14,000	14,000	14,000
Sundry and unforeseen	6,000	20,000	20,000
	192,000	257,000	257,000
Chapter 3 - Exceptional expenditure			
Preparatory work	17,000	40,000	40,000
Publication of proposals	75,000	65,000	65,000
Final Acts	73,000	80,000	80,000
	165,000	185,000	185,000
Total Section 7	1,058,000	1,500,000	1,545,000

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX 2

SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE
(at 21 June 1971)

Chapters and items	BUDGET including add.cred.	Credit transfers		Total credits available	Actual expenditure	Commitments to expenditure	Estimated expenditure	Total estimated expenditure
		item to item	chapter to chapter					
I. Staff								
7.101 - Salaries and related expenses								
- Salaries					67,744.55	697,060.--	145,000.--	909,804.55
- Overtime					1,715.25	37,300.--	140,000.--	179,015.25
- Sundry expenses					-	-	180.20	180.20
	1,050,000	+ 11,000		1,061,000	69,459.80	734,360.--	285,180.20	1,089,000.--
7.102 - Travel expenses								
- Travel expenses and subsistence allowances					10,746.20	11,076.65	4,177.15	26,000.--
	40,000	- 14,000		26,000	10,746.20	11,076.65	4,177.15	26,000.--
7.103 - Insurance								
- Accident insurance					-	-	5,600.--	5,600.--
- Sickness insurance					917.95	-	6,600.--	7,517.95
- Other insurances					1,438.50	-	1,443.55	2,882.05
	13,000	+ 3,000		16,000	2,356.45	-	13,643.55	16,000.--
TOTAL, CHAPTER I	1,103,000	-	-	1,103.000	82,562.45	745,436.65	303,000.90	1,131,000.--

SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE AT 21 JUNE 1971

Chapters and items	BUDGET including add.cred.	Credit transfers		Total credits available	Actual expenditure	Commitments to expenditure	Estimated expenditure	Total estimated expenditure
		item to item	chapter to chapter					
II. Premises and equipment								
7.201 - Premises, furniture, machines								
- Renting of Palais des Expositions					52,500.--	52,500.--	-	105,000.--
- Upkeep of Palais des Expositions premises					-	-	10,500.--	10,500.--
- Electricity					-	-	6,000.--	6,000.--
- Installation					-	1,300.--	3,700.--	5,000.--
- Renting and upkeep of furniture and machines					-	5,000.--	-	5,000.--
- Renting of vehicles					1,639.--	4,000.--	1,000.--	6,639.--
- Sundry expenses					1,578.35	1,205.50	1,077.15	3,861.--
	140.000	-	-	140,000	55,717.35	64,005.50	22,277.15	142,000.--
7.202 - Document production								
- Cost of producing Conference documents					12,052.80	26,468.--	25,479.20	64.000.--
- Printing of C.C.I.R. Study Group Report					85,526.25	6,473.75	-	92.000.--
- Other expenses					27,127.--	28,873.--	-	56,000.--
	50,000	-	+ 65,000	115,000	124,706.05	61,814.75	25,479.20	212,000.--
7.203 - Office supplies and overheads								
- Office supplies and equipment					8,969.50	-	2,000.--	10,969.50
- Postage, telephones, telegrams					33,603.05	-	16,249.15	49,852.20
- Guide, badges, etc.					5,395.--	-	3,000.--	8,395.--
- Sundry expenses					-	4,525.--	3,258.30	7,783.30
	33,000	-	-	33,000	47,967.55	4,525.--	24,507.45	77,000.--

SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE AT 21 JUNE 1971

Chapters and items	BUDGET including add.cred.	Credit transfers		Total credits available	Actual expenditure	Commitments to expenditure	Estimated expenditure	Total estimated expenditure
		item to item	chapter to chapter					
Article II. (contd.)								
7.204 - Simultaneous interpretation and other technical installations								
- Rental of equipment, Palais des Expositions					-	-	12,000.--	12,000.--
- Cost of installing I.T.U. equipment					-	-	2,000.--	2,000.--
	14,000	-	-	14,000	-	-	14,000.--	14,000.--
7.205 - Sundry and unforeseen					1,362.95	1,618.25	17,018.80	20.000.--
	20,000	-	-	20,000	1,362.95	1,618.25	17,018.80	20.000.--
TOTAL, CHAPTER II	257,000	-	+ 65,000	322,000	229,753.90	131,963.50	103,282.60	465.000.--

SITUATION CONCERNING EXPENDITURE FOR THE SPACE CONFERENCE AT 21 JUNE 1971

Chapters and items	BUDGET including add.cred.	Credit transfers		Total credits available	Actual expenditure	Commitments to expenditure	Estimated expenditure	Total estimated expenditure
		item to item	chapter to chapter					
Article III. Exceptional expenditure								
7.301 - Preparatory work								
- Supernumerary staff for the I.F.R.B.					15,838.--	2,946.--	-	18,784.--
- Electronic computer					-	-	-	-
- Other expenses					20,226.55	-	989.45	21,216.--
	40,000	-	-	40,000	36,064.55	2,946.--	989.45	40.000.--
7.302 - Publication of proposals					-	-	-	-
	65,000	-	- 65,000	-	-	-	-	-
7.303 - Final Acts								
- Printing of Final Acts					-	-	140,000.--	140,000.--
- Translation into Russian					-	-	7,500.--	7,500.--
- Translation into Chinese					-	-	7,500.--	7,500.--
	80,000	-	-	80,000	-	-	155,000.--	155,000.--
TOTAL, CHAPTER III	185,000	-	- 65,000	120,000	36,064.55	2,946.--	155,989.45	195,000.--
TOTAL, SECTION 7 SPACE CONFERENCE	1,545,000	-	-	1,545,000	348,380.90	880,346.15	562,272.95	1,791,000.--

ANNEX 3

LIST OF RECOGNIZED PRIVATE OPERATING AGENCIES AND INTERNATIONAL ORGANIZATIONS TAKING PART IN THE CONFERENCE

	Number of contributory units
I. Recognized private operating agencies	
Marconi International Marine Co. Ltd.	*)
Radio-Austria AG	*)
II. International organizations	
International Air Transport Association (I.A.T.A.)	**)
Inter-American Association of Broadcasters (I.A.A.B.)	**)
International Association of Lighthouse Authorities (I.A.L.A.)	½
International Chamber of Shipping (I.C.S.)	*)
International Committee of the Red Cross (C.I.C.R.)	**)
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.)	**)
International Telecommunications Satellite Consortium (INTELSAT)	½
Ecumenical Satellite Commission	*)
International Astronautical Federation (I.A.F.)	**)
International Transport Workers Federation (I.T.F.)	*)
International Broadcast Institute (I.B.I.)	*)
European Space Research Organization (E.S.R.O.)	*)
European Space Vehicle Launcher Development Organization (E.L.D.O.)	*)

	Number of contributary units
International Radio and Television Organization (O.I.R.T.)	**)
World Intellectual Property Organization (W.I.P.O.)	*)
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.)	**)
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

SPACE CONFERENCE

Document No. 229-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

UNITED STATES OF AMERICA

CO-ORDINATION DISTANCES FOR EARTH STATIONS IN THE EARTH RESOURCES SATELLITE SERVICE

INFORMATION DOCUMENT

Working Group 5C considered the United States proposal for coequal allocation of 8 025-8 400 MHz for the Earth Sciences Satellite (ESS) Service (space-to-earth) at its 5th and 6th meetings on 23 and 25 June. Several Administrations voiced concern over the potential problems of co-ordination between terrestrial stations and ESS earth stations.

It is possible that these objections were based in part on the co-ordination distances set forth in Table 8-2E-II in the Annexes to Chapter 8 of the Report of the SJM. These computations were based on a zero degree horizon angle, and thus resulted in unusually large co-ordination distances.

The use of horizon angles more representative of those which result from proper siting of any earth station in consideration of sharing requirements lead to much smaller co-ordination distances. The procedures of Chapter 8 of the SJM Report have been used to compute co-ordination distances with a horizon angle of 3°. The results are compared in the following tabulation.

	5° ant. elev. angle 0° horizon angle	7° ant. elev. angle 3° horizon angle
Zone A	350 km	205 km
Zone B	600 km	250 km
Zone C	1100 km	260 km

ARCHIVES U.I.T. GENÈVE

The actual siting of a particular earth station, in consideration of the locations of potentially interfering terrestrial stations, should lead to separation distances smaller than the distances established for initial co-ordination of an earth station.

The power flux-density of the desired signal in the ESS Service will be no greater than that in the Communication Satellite Service, and the Service Probability of the ESS Service is less stringent than that of the Communication Satellite Service. These factors should lead to co-ordination and separation distances equal to or less than those required to protect Communication Satellite earth stations.

R.C. TYSON

Addendum No. 1 to
Document No. 230-E
5 July 1971
Original : English

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

IRAQ

GENERAL OBSERVATIONS CONCERNING THE VARIOUS PROPOSALS FOR ALLOCATING THE BANDS BETWEEN 40 GHz AND 275 GHz FOR VARIOUS SERVICES

Since submitting our proposal to Committee 5 (Document No. 230), all Working Groups of this Committee were drafting the various proposals which have been submitted together with our proposal to Committee 5 for its consideration. In order to facilitate the discussion of our proposal at Committee 5 we have taken the liberty to compile in the ascending order, bands allocated to various services between 40 and 275 GHz to the best of our understanding of Documents Nos. DT/69, DT/64, DT/60, DT/70 and DT/74 of Working Groups 5A, 5B, 5C, 5D and 5E respectively. See Annex No. 1 attached.

Our Administration still maintains its stand, as elaborated in Document No. 230.

Annex : 1

ARCHIVES
U.I.T.
GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

ALLOCATION OF BANDS BETWEEN 40 AND 275 GHz AS COMPILED FROM REPORTS OF WORKING GROUPS 5A, 5B, 5C, 5D AND 5E

Serial No.	Band GHz From	Band GHz To	Band width GHz	Services to which bands are allocated	Alloc. Comt.	Ref.	Remark
1	40	41	1	UNALLOCATED			L
2	41	43	2	BROADCASTING-SATELLITE	5E	DT/74	E
3	43	48	5	AERO. MOB. and MAR. RADIO NAV. SERV.	5D	DT/70	F
4	48	51	3	UNALLOCATED			L
5	51	52	1	SPACE RESEARCH (MET.)	5B 5C	DT/64 DT/60	G
6	52	54.25	2.25	SPACE RESEARCH (PASSIVE)	5B	DT/64	H
7	54.25	58.2	3.95	COM.-SAT. (SPACE-TO-SPACE)	5A	DT/69	D
8	58.2	59	0.8	SPACE RESEARCH (PASSIVE)	5B	DT/64	H
9	59	64	5	COM.-SAT. (SPACE-TO-SPACE)	5A	DT/69	D
10	64	65	1	SPACE RESEARCH (PASSIVE)	5B	DT/64	H
11	65	66	1	SPACE RESEARCH (MET.)	5B 5C	DT/64 DT/60	G
12	66	71	5	AERO. MOB. AND MAR. RADIO NAV. SERV.	5D	DT/70	F
13	71	84	13	UNALLOCATED			L
14	84	86	2	BROADCASTING-SATELLITE	5E	DT/74	E

Serial No.	Band GHz From	Band GHz To	Band width GHz	Services to which bands are allocated	Alloc. Comt.	Ref.	Remark
15	86	92	6	RADIO ASTRONOMY	5B	DT/64	K
16	92	95	3	COM.-SAT. (EARTH-TO-SPACE)	5A	DT/69	A
17	95	101	6	AERO. MOB. AND MAR. RADIO NAV. SERV.	5D	DT/70	F
18	101	102	1	SPACE RESEARCH (GENERAL)	5B	DT/64	J
19	102	105	3	COM.-SAT. (SPACE-TO-EARTH)	5A	DT/69	B
20	105	130	25	COM.-SAT. (SPACE-TO-SPACE)	5A	DT/69	D
21	130	140	10	SPACE RESEARCH	5B	DT/64	J
22	140	142	2	COM.-SAT. (EARTH-TO-SPACE)	5A	DT/69	A
23	142	150	8	AERO. MOB. AND MAR. RADIO NAV. SERV.	5D	DT/70	F
24	150	152	2	COM.-SAT. (SPACE-TO-EARTH)	5A	DT/69	B
25	152	170	18	UNALLOCATED			M
26	170	182	12	COM.-SAT. (SPACE-TO-SPACE)	5A	DT/69	D
27	182	185	3	SPACE RESEARCH	5B	DT/64	J
28	185	190	5	COM.-SAT. (SPACE-TO-SPACE)	5A	DT/69	D
29	190	200	10	AERO. MOB. AND MAR. RADIO NAV. SERV.	5D	DT/70	F
30	200	220	20	UNALLOCATED			M
31	220	230	10	COM.-SAT.	5A	DT/69	C

Serial No.	Band GHz From	Band GHz To	Band width GHz	Services to which bands are allocated	Alloc. Comt.	Ref.	Remark
32	230	240	10	SPACE RESEARCH (RADIO AST.)	5B	DT/64	I
33	240	250	10	UNALLOCATED			M
34	250	265	15	AERO. MOB. AND MAR. RADIO NAV. SERV.	5D	DT/70	F
35	265	275	10	COM.-SAT.	5A	DT/69	C

TOTAL 235 GHz

A - TOTAL BAND ALLOCATED FOR COM.-SAT. (EARTH-TO-SPACE)	5	GHz
B - " " " " COM.-SAT. (SPACE-TO-EARTH)	5	GHz
C - " " " " COM.-SAT. (UNSPECIFIED)	20	GHz
D - " " " " COM.-SAT. (SPACE-TO-SPACE)	50.95	GHz
E - " " " " BROADCASTING SATELLITE	4	GHz
F - " " " " AERO. MOB. AND MAR. RADIO NAV. SERV.	49	GHz
G - " " " " SPACE RESEARCH (MET.)	2	GHz
H - " " " " SPACE RESEARCH (PASSIVE)	4.05	GHz
I - " " " " SPACE RESEARCH (AST.)	10	GHz
J - " " " " SPACE RESEARCH (GENERAL)	14	GHz
K - " " " " RADIO ASTRONOMY	6	GHz
L - TOTAL UNALLOCATED BAND BETWEEN 40 AND 150 GHz	17	GHz
M - " " " " 150 AND 275 GHz	48	GHz

UNALLOCATED BAND TO TOTAL BAND BETWEEN 40 AND 150 GHz	15.4 %
UNALLOCATED BAND TO TOTAL BAND BETWEEN 150 AND 275 GHz	38.3 %
UNALLOCATED BAND TO TOTAL BAND BETWEEN 40 AND 275 GHz	27.7 %

SPACE CONFERENCE

Document No. 230-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

IRAQ

GENERAL OBSERVATIONS CONCERNING THE VARIOUS PROPOSALS FOR ALLOCATING THE BANDS BETWEEN 40 GHz and 275 GHz FOR VARIOUS SERVICES

Document No. DT/44 summarizes in a diagramatic form the various proposals for allocations of bands between 40 and 275 GHz to various services. Our administration have the following observations to make :

1. The various proposals were submitted by the following technologically advanced countries, namely: Australia, Canada, France, U.K., Greece, Japan, New Zealand and U.S.A.

2. During the discussions that took place within the various groups of Committee 5, only the developed countries have shown interest and participated in the constructive efforts to reach unanimous agreements among themselves. As a Member of the developing countries we found it difficult to share with the advanced countries the responsibilities of deciding the final picture of this radio spectrum, this being the outcome of the wide technological gap separating the developed and the developing countries.

3. Ultimately, if the advanced countries are going to reach a decision on this matter and we, a developing country, are going to follow suit as we have no technical reason to base our approval or disapproval at this stage of our development.

4. We may, however, be in a much better position as the technological gap narrows with the sincere assistance of the developed countries and the I.T.U. in the not so distant future. This may result in our full understanding of what will be in the interest of our country.

ARCHIVES U.I.T. GENÈVE

5. The last, but not the least important observation is that the developed countries are trying to allocate the whole usable spectrum to the various services that may be realized in the near future and they want to do it at this Radio Conference. However, exclusive bands may be needed for unforeseen future services. We can recall the obvious case of having to find means of sharing with the Terrestrial Services, the Satellite Communication Services in the bands below 40 GHz. Twenty years ago, the Satellite Service was not in existence.

Considering the above observations and to comply with the terms of reference of Committee 5 in Document No. 65, our Administration would like to put before the Committee the following proposals with a view to avoid any reservation from our Administration :

1. Limit the allocation to various services in the radio spectrum to up to (say) 150 GHz in this 1971 World Administrative Radio Conference.

2. Provide various unallocated bands for future allocations, by future Radio Conferences in the spectrum from 40 to 150 GHz for unforeseen Space or Terrestrial Services.

SPACE CONFERENCE

Document No. 231-E(Rev.)
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

NOTE FROM WORKING GROUP 5C

TO COMMITTEE 5

Working Group 5C has now completed the task assigned to it by Committee 5 and, unless further work is remitted to it, it will not need to hold any further meetings.

During the last meeting of Working Group 5C held on 29 June 1971, the delegation of Cuba stated that it reserved its right to come back to any decision taken by the Working Group, if it so desires.

K. OLMS
Chairman
Working Group 5C

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 231-E
29 June 1971
Original : English

COMMITTEE 5

EIGHTH REPORT OF WORKING GROUP 5C

TO COMMITTEE 5

Working Group 5C has now completed the task assigned to it by Committee 5 and, unless further work is remitted to it, it will not need to hold any further meetings.

During the last meeting of Working Group 5C held on 29 June 1971, the delegation of Cuba stated that it reserved its right to come back to any decision taken by the Working Group, if it so desires.

K. OLMS
Chairman
Working Group 5C

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 232-E(Rev.)
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

UNITED STATES OF AMERICA

PROPOSAL FOR AMENDMENT OF ARTICLE 5

OF THE RADIO REGULATIONS

During the deliberations of Committee 5C the Committee considered a proposal by Canada (CAN/14/76 ADD 379A) for an allocation for standard frequency signals on frequencies 4 202 MHz ± 2 MHz and 6 427 MHz ± 2 MHz. Although the U.S.A. had no proposal before the Committee, an alternative proposal to that proposed by Canada was made by the U.S.A. from the floor. This alternative proposal suggested that the band 400.05-400.15 MHz be allocated for standard frequency use with a foot-note designating the standard frequency as 400.1 MHz ± 25 kHz.

The Chairman suggested that the U.S.A. proposal was a new proposal that should be documented for Committee perusal.

Accordingly the U.S.A. proposes for Committee 5 consideration the following

Ref.

MHz

	Region 1	Region 2	Region 3
USA/232/293	400.05-400.15 STANDARD FREQUENCY SATELLITE 312 ~~312A~~ 313 314 312AB		
	~~400.05~~-401 400.15 (NOC)		

USA/232/294 ADD 312AB In this band the standard frequency is 400.1 MHz ± 25 kHz.

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 232-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

UNITED STATES OF AMERICA

PROPOSAL FOR AMENDMENT OF ARTICLE 5

OF THE RADIO REGULATIONS

During the deliberations of Committee 5C the Committee considered a proposal by Canada (CAN/14/76 ADD 379A) for an allocation for standard frequency signals on frequencies 4 202 MHz ± 2 MHz and 6 427 MHz ± 2 MHz. Although the U.S.A. had no proposal before the Committee, an alternative proposal to that proposed by Canada was made by the U.S.A. from the floor. This alternative proposal suggested that the band 400.05-400.15 MHz be allocated for standard frequency use with a foot-note designating the standard frequency as 400.1 MHz ± 25 kHz.

The Chairman suggested that the U.S.A. proposal was a new proposal that should be documented for Committee perusal.

Accordingly the U.S.A. proposes for Committee 5 consideration the following

Ref.

MHz

	Region 1	Region 2	Region 3
USA/232/293	400.05-400.15 STANDARD FREQUENCY 312 ~~312A~~ 313 314 312AB		
	~~400.05~~-401 400.15 (NOC)		

USA/232/294 ADD 312AB In this band the standard frequency is 400.1 MHz ± 25 kHz.

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 233-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS — GENEVA — 1971

WORKING GROUP 5B

REPORT OF SUB-WORKING GROUP 5B-1 TO WORKING GROUP 5B

(concerning Proposal USA/28/264 draft Recommendation B)

DRAFT RECOMMENDATION

relating to the Protection of Radio Astronomy Observations on the Far Side 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 "far side" of the moon offer /unique/ opportunities for observations which are not affected by such absorption;

d) that the shielded area of the moon appears to be the only area accessible to man which is completely free from interference by/from terrestrial transmissions;

e) that the shielded area or "far side" 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;

ARCHIVES U.I.T. GENÈVE

noting

the desirability of maintaining the far 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 far 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 far 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.

K.J. KERLING
Chairman
Working Group 5B-1

SPACE CONFERENCE

Document No. 234-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

FIRST REPORT OF
WORKING GROUP 4E

PROPOSED NEW DRAFT RESOLUTION
RELATING TO THE EXPERIMENTAL USE OF
RADIO WAVES BY IONOSPHERIC RESEARCH SATELLITES

After having examined the proposal J/141 and Document No. DT/52, Working Group 4E at its third meeting on 29 June 1971 approved the proposed new draft Resolution appearing in the Annex relating to the experimental use of radio waves by ionospheric research satellites.

Working Group 4E was of the view that this type of research was very valuable in obtaining information about the earth's ionosphere and that administrations should be urged to continue to authorize the use of ionospheric research satellites in the MF and HF bands. Committee 4 may like to draw the attention of Committee 5 to this draft Resolution.

N. OHYAMA
Chairman
Working Group 4E

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT RESOLUTION [No. ...]

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 the research of the earth's ionosphere is very important for investigation of the relationship between the sun and the earth and also for effective use of radio-wave transmission via the ionosphere;

b) that successful researches have been made by the use of the satellites such as Alouette 1, 2, ISIS 1 and 2 in which top-side sounding equipment is installed;

c) that ionosphere research satellites similar to the above satellites will successively be used for further investigation into the ionosphere and the space above them;

d) that the top-side sounding equipment is mostly operated in frequency-sweeping pulse mode;

e) that these kinds of satellites are usually operated intermittently during a period of a fraction of each day according to the orbital condition;

f) that it is easy to identify the sounder's signals because the operation of the sounder can be accurately commanded at will by the earth station concerned;

resolves

that transmission of radio waves from ionospheric research satellites orbited above the ionosphere may continue to be authorized in the MF and HF bands provided that suitable means are available for controlling the operation of the satellite and preventing harmful interference to other services concerned.

SPACE CONFERENCE

Document No. 235-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

SECOND REPORT OF WORKING GROUP 4E

PROPOSED TEXT FOR SECTION IX OF ARTICLE 7

Enclosed please find in the Annex the proposed new text for Section IX of Article 7 on the subject of cessation of emissions. The proposal was approved by Working Group 4E in its third meeting on 29 June 1971 after having considered proposals CAN/15(Rev.)/119, ARG/23/54,55, USA/28 Corr./337,338, G/81/269 and F/86/308-310.

N. OHYAMA
Chairman
Working Group 4E

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX

DRAFT NEW TEXT OF SECTION IX, ARTICLE 7

Section [IX] 7. Space Services

Cessation of emissions

MOD 470V 24. Space stations shall be fitted with appropriate devices to ensure immediate cessation of radio emissions by telecommand, whenever such cessation is required under the provisions of [Articles 9, 9A and 14] of these Regulations.

SUP Note 1

SPACE CONFERENCE

Document No. 236-E(Rev.)
2 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

SECOND REPORT OF WORKING GROUP 5C

TO COMMITTEE 5

1. The Working Group considered the proposals concerning the use of space techniques by the Amateur Service in the frequency band around 24 Gc/s.

1.1 It unanimously decided to allocate the band 24.0-24.050 Gc/s exclusively on a world-wide basis to the Amateur Service and to the Amateur-Satellite Service and to add the Amateur Service as a secondary service in the band 24.05-24.25 Gc/s (see Appendix (A)

1.2 It also revised the text of the foot-notes 407 and 408 as a consequence of the decision mentioned in paragraph 1.1 (see Appendix A).

1.3 Attention of Committee 5 is drawn to the proposals concerning modification of foot-note 410.

2. The Working Group considered the proposals concerning the Meteorological-Satellite Service and Earth Exploration Satellite Service.

2.1 Frequency Band 137-138 Mc/s

The Working Group decided unanimously not to modify the existing Table of Frequency Allocations as far as Meteorological-Satellite Service is concerned.

2.2 Frequency Bands 401-402 Mc/s and 402 to 403 Mc/s

The Working Group decided unanimously to add the Meteorological-Satellite Service (Earth-to-space) as a secondary service to the existing allocations with the addition of a new foot-note ADD 315C (see Appendix B).

ARCHIVES U.I.T. GENÈVE

2.3 Frequency Band 460-470 Mc/s

The Working Group decided unanimously to modify the Table so as to indicate that transmissions should be made in the direction space to earth and to add a new foot-note ADD 324C (see Appendix C)

The Working Group has taken note of Proposals G/108/321 and 322 concerning the use of space techniques in this frequency band by the Maritime Mobile Service. It expressed its concern on the proposed introduction of that technique in this frequency band and decided to draw the attention of Working Group 5D to this fact (see Document No. 185(Rev)).

2.4 Frequency Bands 1 660-1 664.4 Mc/s, 1 664.4-1 668.4 Mc/s and 1 668.4-1 670 Mc/s

The Working Group unanimously decided to delete the Meteorological-Satellite Service from the Table in these frequency bands. As a consequence of this modification, foot-note 324A should no longer apply to these frequency bands and should be removed from corresponding boxes of the Table.

Attention of Committee 5 is drawn to these deletions when considering the decisions of Working Group 5B concerning these frequency bands.

K. OLMS
Chairman

Appendices : 3

A P P E N D I X A

Gc/s

	Region 1	Region 2	Region 3
MOD	24-24.05	AMATEUR AMATEUR-SATELLITE	

MOD	24.05-24.25	RADIOLOCATION Amateur 407 410

MOD 407 In Albania, Bulgaria, Hungary, Poland, Roumania, Czechoslovakia and the U.S.S.R. the bands 13.25-13.5 Gc/s, 14.175-14.3 Gc/s, 15.4-17.7 Gc/s, 21-22 Gc/s, 23-24 Gc/s, 24.05-24.25 Gc/s and 33.4-36 Gc/s are also allocated to the fixed and mobile services.

MOD 408 In Sweden, the bands 13.4-14 Gc/s , 15.7-17.7 Gc/s, and 33.4-36 Gc/s are also allocated to the fixed and mobile services.

/MOD 410/

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X B

Mc/s

	Region 1	Region 2	Region 3
MOD	401-402	METEOROLOGICAL AIDS SPACE (Telemetering) 315A Meteorological-Satellite (Earth-to-space) Fixed Mobile except aeronautical mobile 314 315 315B 315C 316	

MOD	402-403	METEOROLOGICAL AIDS Meteorological-Satellite (Earth-to-space) Fixed Mobile except aeronautical mobile 314 315 316 315C

ADD 315C Earth exploration-satellite service applications other than the meteorological-satellite service may also be authorized in this band for earth-to-space transmissions subject to not causing harmful interference to stations operating in accordance with the Table.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX C

Mc/s

	Region 1	Region 2	Region 3
MOD	460-470	FIXED MOBILE Meteorological-Satellite (Space-to-earth) 318A 324C	

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.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 236-E
29 June 1971
Original : English

COMMITTEE 5

SECOND REPORT OF WORKING GROUP 5C

TO COMMITTEE 5

1. The Working Group considered the proposals concerning the use of space techniques by the Amateur Service in the frequency band around 24 Gc/s.

1.1 It unanimously decided to allocate the band 24.0-24.050 Gc/s exclusively on a world-wide basis to the Amateur Service and to add the Amateur Service as a secondary service in the band 24.05-24.25 Gc/s. It also adopted the text of a new foot-note ADD 408A (see Appendix A).

1.2 It also revised the text of the foot-notes 407 and 408 as a consequence of the decision mentioned in paragraph 1.1 (see Appendix A).

1.3 Attention of Committee 5 is drawn to the proposals concerning modification of foot-note 410.

2. The Working Group considered the proposals concerning the Meteorological-Satellite Service and Earth Sciences Satellites (E.S.S.).

2.1 Frequency Band 137-138 Mc/s

The Working Group decided unanimously not to modify the existing Table of Frequency Allocations as far as Meteorological-Satellite Service is concerned.

2.2 Frequency Bands 401-402 Mc/s and 402 to 403 Mc/s

The Working Group decided unanimously to add the Meteorological-Satellite Service (Earth-to-Space) as a secondary service to the existing allocations with the addition of a new foot-note ADD 315C (see Appendix B).

ARCHIVES U.I.T. GENÈVE

2.3 Frequency Band 460-470 Mc/s

The Working Group decided unanimously to modify the Table so as to indicate that transmissions should be made in the direction space to earth and to add a new foot-note ADD 324C (see Appendix C).

The Working Group has taken note of Proposals G/108/321 and 322 concerning the use of space techniques in this frequency band by the Maritime Mobile Service. It expressed its concern on the proposed introduction of that technique in this frequency band and decided to draw the attention of Working Group 5D to this fact (see Document No. 185(Rev)).

2.4 Frequency Bands 1 660-1 664.4 Mc/s, 1 664.4-1 668.4 Mc/s and 1 668.4-1 670 Mc/s

The Working Group unanimously decided to delete the Meteorological-Satellite Service from the Table in these frequency bands. As a consequence of this modification, foot-note 324A should no longer apply to these frequency bands and should be removed from corresponding boxes of the Table.

Attention of Committee 5 is drawn to these deletions when considering the decisions of Working Group 5B concerning these frequency bands.

K. OLMS
Chairman

Appendices : 3

A P P E N D I X A

Gc/s

	Region 1	Region 2	Region 3
MOD	24.0-24.050	AMATEUR 408A	

ADD 408A Space communications techniques may be used by the amateur service in this band.

MOD	24.050-24.25	RADIOLOCATION Amateur 407 408 410	

MOD 407 In Albania, Bulgaria, Hungary, Poland, Roumania, Czechoslovakia and the U.S.S.R. the bands 13.25-13.5 Gc/s, 14.175-14.3 Gc/s, 15.4-17.7 Gc/s, 21-22 Gc/s, 23-24 Gc/s, 24.05-24.25 Gc/s and 33.4-36 Gc/s are also allocated to the fixed and mobile services.

MOD 408 In Sweden, the bands 13.4-14 Gc/s , 15.7-17.7 Gc/s, and 33.4-36 Gc/s are also allocated to the fixed and mobile services.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX B

Mc/s

	Region 1	Region 2	Region 3
MOD	401-402	METEOROLOGICAL AIDS SPACE (Telemetering) 315A Meteorological-Satellite (Earth-to-Space) Fixed Mobile except aeronautical mobile 314 315 315B 315C 316	

MOD	402-403	METEOROLOGICAL AIDS Meteorological-Satellite (Earth-to-space) Fixed Mobile except aeronautical mobile 314 315 316 315C	

ADD 315C Earth sciences-satellite service applications other than the meteorological-satellite service may also be authorized in this band for earth-to-space transmissions on a secondary basis to those services operating in accordance with the Table.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX C

Mc/s

	Region 1	Region 2	Region 3
	460-470		
MOD		FIXED MOBILE Meteorological-Satellite (Space-to-Earth) 318A 324C	

ADD 324C Earth sciences-satellite service applications other than the meteorological-satellite service may also be authorized in this band for space-to-earth transmissions on a secondary basis to those services operating in accordance with the Table.

SPACE CONFERENCE

Document No. 237-E(Rev.)
2 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

THIRD REPORT OF WORKING GROUP 5C

TO COMMITTEE 5

1. The Working Group considered the Proposals concerning the Meteorological Satellite Service and Earth Exploration-Satellites in the following frequency bands :

1 670-1 690 Mc/s
1 690-1 700 Mc/s
1 790-2 290 Mc/s
6 425-7 750 Mc/s.

1.1 Frequency band 1 670-1 690 Mc/s

The Working Group decided to include the Meteorological Satellite Service (down link) in this band on a sharing basis with the Fixed and Mobile Services in Regions 1 and 3 and with the Meteorological Aids Service in all regions. It also decided to include foot-note 324A in the Table. However, the question of the inclusion of this foot-note should be reconsidered in accordance with the results of the work of Committee 6 and Working Group Ad hoc of Committee 5 (see Appendix A)

1.2 Frequency band 1 690-1 700 Mc/s

The Working Group decided unanimously to modify the Table so as to indicate that transmissions from the Meteorological Satellite Service should be made in the direction space-to-earth and to add a foot-note 324C. It also decided to retain foot-note 324A in the Table. However, this retention should be reconsidered in accordance with the results of the work of Committee 6 and Working Group Ad hoc of Committee 5 (see Appendix B).

ARCHIVES U.I.T. GENÈVE

1.3 Frequency band 1 790-2 290 Mc/s

The Working Group decided by a majority to include foot-note 356AB in the Table for Regions 2 and 3. The inclusion of this foot-note in the Table for Region 1 with the frequency limits mentioned therein was opposed by a majority. The acceptable frequency limits are subject to reconsideration so far as Region 1 is concerned (see Appendix C).

1.3.1 The Delegation of India reserved its right to re-open the question of the inclusion of foot-note 356AB for Region 3 if it still so desires.

1.3.2 The Delegation of Spain stated that it was prepared to accept the text of this foot-note for Region 1.

1.4 Frequency bands between 6 425-7 750 Mc/s

The United Kingdom Delegation withdrew their Proposal G/54/102. The Working Group decided by a majority to modify the foot-note 392F which no longer applies to frequency bands 6 425-7 250 Mc/s (see Appendix D). The Delegation of Japan reserved its right to re-open the discussion as to whether the following sentence should be added to the foot-note. "The location of such earth-stations is subject to agreement among administrations concerned and those having services operating in accordance with the Table which may be affected."

K. OLMS
Chairman

Appendices : 4

APPENDIX A

Mc/s

	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	1 670-1 690 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-earth) 324A	1 670-1 690 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-earth) 324A FIXED MOBILE except Aeronautical Mobile

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX B

Mc/s

	Region 1	Region 2	Region 3
MOD	1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE 324A (Space-to-earth) Fixed Mobile except aeronautical mobile 353 354A 324C	1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE 324A (Space-to-earth) 354A 354C 324C	

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.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX C

Mc/s

	Region 1	Region 2	Region 3
MOD	1 790-2 290 FIXED Mobile 356 356A [356AC]	1 790-2 290 FIXED MOBILE 356A 356AB	

ADD 356AB In the band 2 025-2 120 Mc/s earth-to-space transmissions in the [space research and] earth exploration-satellite services may be authorized, with equality of right to operate with stations of other space 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 356AC In the band [Mc/s] earth-to-space transmissions in the [space research and] earth exploration-satellite services may be authorized with equality of right to operate with stations of other space 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.]

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X D

M/cs

	Region 1	Region 2	Region 3
MOD	6 425-7 250 FIXED MOBILE 392B 393 379A		
MOD	7 300-7 450 FIXED MOBILE FIXED-SATELLITE (Space-to-earth) 392D		
MOD	7 450-7 550 FIXED MOBILE FIXED-SATELLITE (Space-to-earth) METEOROLOGICAL-SATELLITE (Space-to-earth) 392D		
MOD	7 550-7 750 FIXED MOBILE FIXED-SATELLITE (Space-to-earth) 392D		

SUP 374A

SUP 392F

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 237-E
29 June 1971
Original : English

COMMITTEE 5

THIRD REPORT OF WORKING GROUP 5C

TO COMMITTEE 5

1. The Working Group considered the Proposals concerning the Meteorological Satellite Service and Earth Resources Satellites (ERS) in the following frequency bands :

1 670-1 690 Mc/s
1 690-1 700 Mc/s
1 790-2 290 Mc/s
6 425-7 750 Mc/s.

1.1 Frequency band 1 670-1 690 Mc/s

The Working Group decided to include the Meteorological Satellite Service (down link) in this band on a sharing basis with the Fixed and Mobile Services in Regions 1 and 3 and with the Meteorological Aids Service in all regions. It also decided to include foot-note 324A in the Table. However, the question of the inclusion of this foot-note should be reconsidered in accordance with the results of the work of Committee 6 and Working Group Ad hoc of Committee 5 (see Appendix A).

1.2 Frequency band 1 690-1 700 Mc/s

The Working Group decided unanimously to modify the Table so as to indicate that transmissions from the Meteorological Satellite Service should be made in the direction Space to Earth and to add a foot-note 324C. It also decided to retain foot-note 324A in the Table. However, this retention should be reconsidered in accordance with the results of the work of Committee 6 and Working Group Ad hoc of Committee 5 (see Appendix B).

ARCHIVES U.I.T. GENÈVE

1.3 Frequency band 1 790-2 290 Mc/s

The Working Group decided by a majority to include foot-note 356AB in the Table for Regions 2 and 3. The inclusion of this foot-note in the Table for Region 1 with the frequency limits mentioned therein was opposed by a majority. The acceptable frequency limits are subject to reconsideration so far as Region 1 is concerned (see Appendix C).

1.3.1 The Delegation of India reserved its right to re-open the question of the inclusion of foot-note 356AB for Region 3 if it still so desires.

1.3.2 The Delegation of Spain stated that it was prepared to accept the text of this foot-note for Region 1.

1.4 Frequency bands between 6 425-7 750 Mc/s

The United Kingdom Delegation withdrew their Proposal G/54/102. The Working Group decided by a majority to modify the foot-note 392F which no longer applies to frequency bands 6 425-7 250 Mc/s (see Appendix D). The Delegation of Japan reserved its right to re-open the discussion as to whether the following sentence should be added to the foot-note. "The location of such earth-stations is subject to agreement among administrations concerned and those having services operating in accordance with the Table which may be affected."

K. OLMS
Chairman

Appendices : 4

APPENDIX A

Mc/s

	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	1 670-1 690 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-earth) 324A	1 670-1 690 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (Space-to-earth) 324A FIXED MOBILE except Aeronautical Mobile

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX B

Mc/s

	Region 1	Region 2	Region 3
MOD	1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE 324A (Space to earth) Fixed Mobile except aeronautical mobile 353 354A 324C	1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE 324A (Space to earth) 354A 354C 324C	

ADD 324C Earth sciences-satellite service applications other than the meteorological-satellite service may also be authorized in this band for space-to-earth transmissions on a secondary basis to those services operating in accordance with the Table.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X C

Mc/s

Region 1	Region 2	Region 3
1 790-2 290 FIXED Mobile 356 356A /356AC/	1 790-2 290 FIXED MOBILE 356A 356AB	

ADD 356AB In the band 2 025-2 120 Mc/s earth-to-space transmissions in the / space research and / earth sciences satellite services may be authorized, co-equally with other space 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 356AC In the band / Mc/s / earth-to-space transmissions in the / space research and / earth sciences satellite services may be authorized co-equally with other space 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. /

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX D

M/cs

Region 1	Region 2	Region 3
6 425-7 250 FIXED MOBILE 392B 393		
7 300-7 450 FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-Earth) 374A 392D		
7 450-7 550 FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-Earth) METEOROLOGICAL-SATELLITE (Space-to-Earth) 374A 392D 392F		
7 550-7 750 FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-Earth) 374A 392D		

MOD

MOD 392F This band may also be used for the transmission of tracking and telemetering signals associated with meteorological-satellite space stations operating in this band.

SPACE CONFERENCE

Document No. 238-E(Rev.)
2 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FOURTH REPORT OF WORKING GROUP 5C

TO COMMITTEE 5

---

1. The Working Group considered the Proposals concerning the Meteorological-Satellite Service and Earth Exploration-Satellite Service in the frequency bands :

8 025-8 400 Mc/s
21.2-22 Gc/s
51-52 Gc/s
65-66 Gc/s

1.1 Frequency band 8 025-8 400 Mc/s

1.1.1 The Working Group decided to add the Earth Exploration-Satellite Service in the Table as a secondary service in Regions 1 and 3 and as a primary service in Region 2 (see Appendix A). The Delegations of Australia and New Zealand reserved their right to re-open the question as to whether this allocation should not be as a primary service in Region 3, if they still so desire.

1.1.2 The Working Group also decided to add foot-note 394E (see Appendix A).

1.2 Frequency band 21.2-22 Gc/s

The Working Group decided to allocate this frequency band also to the Earth Exploration-Satellite Service (Space-to-earth) on a primary basis (see Appendix B). The Delegation of Japan reserved its right to re-open this question, if it still so desires.

Attention of Committee 5 is drawn to the fact that the present text of foot-note 407 might have to be revised as far as this frequency band is concerned, depending on the decision to include Fixed and Mobile Services.

ARCHIVES U.I.T. GENEVE

1.3 Frequency bands 51-52 Gc/s and 65-66 Gc/s

The Working Group decided unanimously to allocate these bands to the Earth Exploration-Satellite Service (see Appendix C).

2. The Working Group considered the Proposals concerning the Standard Frequency and Time Signals in the following frequency bands :

2 495- 2 505 kc/s
4 995- 5 005 kc/s
9 995-10 005 kc/s
14 990-15 010 kc/s
19 990-20 010 kc/s
24 990-25 010 kc/s
4 200- 4 400 Mc/s
6 425- 7 250 Mc/s

2.1 Frequency bands 2 495-2 505 kc/s, 4 995-5 005 kc/s, 9 995-10 005 kc/s, 14 990-15 010 kc/s, 19 990-20 010 kc/s and 24 990-25 010 kc/s

2.1.1 The Working Group took note of the deletion of foot-note 204 as agreed upon in Working Group 5B.

2.1.2 The Working Group agreed to the addition of foot-note 203A as agreed upon in Working Group 5B.

2.1.3 The Working Group agreed to the addition of foot-note 201A in the Table in the boxes corresponding to the following frequency bands : 9 995-10 005 kc/s, 14 990-15 010 kc/s and 19 990-20 010 kc/s as agreed upon in Working Group 5D.

2.2 Frequency bands 4 200-4 400 Mc/s and 6 425-7 250 Mc/s

The Working Group decided to add foot-note 379A in the Table corresponding to these frequency bands (see Appendix D). The Delegations of the United Kingdom and of the United States of America reserved their right to re-open the question of this addition, if they still so desire.

3. Miscellaneous

The Working Group drew the attention to all relevant provisions of the Radio Regulations and for example to No. 116 and No. 1566 as far as the Amateur-Satellite Service is concerned.

K. OLMS
Chairman

Appendices : 4

A P P E N D I X A

Mc/s

	Region 1	Region 2	Region 3
MOD	8 025-8 400 FIXED MOBILE FIXED-SATELLITE [(Earth-to-space) 392A] Earth Exploration Satellite (Space-to-earth) 394 394B 394E	8 025-8 400 FIXED MOBILE FIXED-SATELLITE [(Earth-to space) 392A] EARTH EXPLORATION-SATELLITE (Space-to-earth) 394E	8 025-8 400 FIXED MOBILE FIXED-SATELLITE [(Earth-to-space) 392A] Earth Exploration-Satellite (Space-to-earth) 394 394E

ADD 394E The band 8 175-8 215 Mc/s is also allocated to the meteorological-satellite service for earth-to-space transmissions.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X B

Gc/s

	Region 1	Region 2	Region 3
MOD	21.2-22.	[FIXED] [MOBILE] EARTH EXPLORATION-SATELLITE (Space-to-earth)	

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X C

Gc/s

	Region 1	Region 2	Region 3
ADD	51-52 EARTH EXPLORATION-SATELLITE		

ADD	65-66 EARTH EXPLORATION-SATELLITE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX D

Mc/s

	Region 1	Region 2	Region 3
MOD	4 200-4 400	AERONAUTICAL RADIONAVIGATION 352A 379A 381 382 383	

MOD	6 425-7 250 FIXED MOBILE 379A 392B 393

ADD 379A The standard frequency-satellite service and the time signal-satellite service may be authorized to use the frequency 4 202 Mc/s for space-to-earth transmissions and the frequency 6 427 Mc/s for earth-to-space transmissions. Such transmissions shall be confined within the limits of ± 2 Mc/s 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.

SPACE CONFERENCE

Document No. 238-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FOURTH REPORT OF WORKING GROUP 5C

TO COMMITTEE 5

1. The Working Group considered the Proposals concerning the Meteorological-Satellite Service and Earth Resources Satellites (ERS) in the frequency bands :

8 025-8 400 Mc/s
21.2-22 Gc/s
51-52 Gc/s
65-66 Gc/s

Frenquency band 8 025-8 400 Mc/s

1.1.1 The Working Group decided to add the Earth Sciences Satellites (ESS) in the Table as a secondary service in Regions 1 and 3 and as a primary service in Region 2 (see Appendix A). The Delegations of Australia and New Zealand reserved their right to re-open the question of this allocation as a primary service in Region 3, if they still so desire.

1.1.2 The Working Group also decided to add foot-note 394E (see Appendix A).

1.2 Frequency band 21.2-22 Gc/s

The Working Group decided to allocate this frequency band also to the Earth Sciences Satellites (Space-to-Earth) on a primary basis (see Appendix B). The Delegation of Japan reserved its right to re-open this question, if it still so desires.

Attention of Committee 5 is drawn to the fact that the present text of foot-note 407 might have to be revised as far as this frequency band is concerned, depending on the decision to include Fixed and Mobile Services.

ARCHIVES U.I.T. GENÈVE

1.3 Frequency bands 51-52 Gc/s and 65-66 Gc/s

The Working Group decided unanimously to allocate these bands to the Earth Sciences Satellites (see Appendix C).

2. The Working Group considered the Proposals concerning the Standard Frequency and Time Signals in the following frequency bands :

2 495-2 505 kc/s
4 995-5 005 kc/s
9 995-10 005 kc/s
14 990-15 010 kc/s
19 990-20 010 kc/s
24 990-25 010 kc/s
4 200-4 400 Mc/s
6 425-7 250 Mc/s

2.1 Frequency bands 2 495-2 505 kc/s, 4 995-5 005 kc/s, 9 995-10 005 kc/s, 14 990-15 010 kc/s, 19 990-20 010 kc/s and 24 990-25 010 kc/s

2.1.1 The Working Group took note of the deletion of foot-note 204 as agreed upon in Working Group 5B.

2.1.2 The Working Group agreed to the addition of foot-note 203A as agreed upon in Working Group 5B.

2.1.3 The Working Group agreed to the addition of foot-note 201A in the Table in the boxes corresponding to the following frequency bands : 9 995-10 005 kc/s, 14 990-15 010 kc/s and 19 990-20 010 kc/s as agreed upon in Working Group 5D.

2.2 Frequency bands 4 200-4 400 Mc/s and 6 425-7 250 Mc/s

The Working Group decided to add foot-note 379A in the Table corresponding to these frequency bands (see Appendix D). The Delegations of the United Kingdom and of the United States of America reserved their right to re-open the question of this addition, if they still so desire.

3. Miscellaneous

The Working Group drew the attention to all relevant provisions of the Radio Regulations and for example to No. 116 and No. 1566 as far as the Amateur Service is concerned.

K. OLMS
Chairman

Appendices : 4

A P P E N D I X A

Mc/s

	Region 1	Region 2	Region 3
	8 025-8 400	8 025-8 400	8 025-8 400
MOD	FIXED MOBILE COMMUNICATION-SATELLITE /(Earth-to-Satellite) 392A/ Earth Sciences Satellite (Space-to-Earth) 394 394B 394E	FIXED MOBILE COMMUNICATION-SATELLITE /(Earth-to-Satellite) 392A/ EARTH SCIENCES SATELLITE (Space-to-Earth) 394E	FIXED MOBILE COMMUNICATION-SATELLITE /(Earth-to-Satellite) 392A/ Earth Sciences Satellite Space-to-Earth) 394 394E

ADD 394E The band 8 175-8 215 Mc/s is also allocated to the meteorological-satellite service for earth-to-space transmissions.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X B

Gc/s

	Region 1	Region 2	Region 3
MOD	21.2-22	/FIXED/ /MOBILE/ EARTH SCIENCES SATELLITE (Space-to-Earth)	

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX C

Gc/s

	Region 1	Region 2	Region 3
ADD	51-52 EARTH SCIENCES SATELLITE		

ADD	65-66 EARTH SCIENCES SATELLITE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X D

Mc/s

	Region 1	Region 2	Region 3
	4 200-4 400		
MOD	AERONAUTICAL RADIONAVIGATION		
	352A 379A 381 382 383		

	6 425-7 250
MOD	FIXED MOBILE
	379A 392B 392F 393

ADD 379A The standard frequency and time signal services may be authorized to use the frequency 4 202 Mc/s for space-to-earth transmissions and the frequency 6 427 Mc/s for earth-to-space transmissions. Such transmissions shall be confined within the limits of ± 2 Mc/s 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.

SPACE CONFERENCE

Document No. 239-E
29 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

SECOND REPORT OF WORKING GROUP 5D

TO COMMITTEE 5

1. The Working Group examined the proposals for amendment or addition of foot-notes to the table in respect of the following frequency bands :

149.9 -150.5 Mc/s
235 -267 Mc/s
399.9 -400.05 Mc/s
400.05-401 Mc/s
420 -460 Mc/s

1.1 149.9-150.5 Mc/s band

The Working Group decided to amend No. 285B (see Appendix A).

1.2 235-267 Mc/s band

The Working Group decided to add No. 305A in the relevant part of the table in respect of this frequency band (see Appendix B).

1.3 399.9-400.05 Mc/s band

The Working Group decided to amend No. 311A (see Appendix C).

1.4 400.05-401 Mc/s band

The Working Group decided to delete No. 312A (see Appendix D).

ARCHIVES U.I.T. GENÈVE

1.5 420-460 Mc/s band

1.5.1 The Working Group decided to amend No. 318.

1.5.2 The Working Group decided to amend No. 322 (see Appendix E).

M. CHEF
Chairman

Appendices : 5

A P P E N D I X A

MOD 285B In Austria, Bulgaria, Cuba, Hungary, Iran, Kuwait, Pakistan, Poland, the United Arab Republic, Yugoslavia and Roumania, the band 149.9-150.05 Mc/s is also allocated to Fixed and Mobile Services (see Recommendation No. Spa 8).

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X B

Mc/s

Region 1	Region 2	Region 3
235-267		
MOD	FIXED MOBILE 305 305A 309	

ADD 305A In New Zealand the band 235-239.5 Mc/s is also allocated to the aeronautical radionavigation service.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX C

MOD 311A In Cuba, Greece, Hungary, Indonesia, Iran, Kuwait, Lebanon, the United Arab Republic and Yugoslavia, the band 399.9-400.05 Mc/s is also allocated to the Fixed and Mobile Services (See Recommendation No. Spa 8).

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX D

Mc/s

	Region 1	Region 2	Region 3
	400.05-401		
MOD		METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (Maintenance telemetering) SPACE RESEARCH (Telemetering and tracking) 313 314	

SUP 312A

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X E

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 322 In Norway, the bands 430-432 Mc/s and 438-440 Mc/s are also allocated ot the Fixed Service.

SPACE CONFERENCE

Document No. 240-E
29 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

THIRD REPORT OF WORKING GROUP 5D TO COMMITTEE 5

MOBILE SERVICES AND RADIODETERMINATION

Frequency bands :	10 000	-10 500	Mc/s
	15.4	-15.7	Gc/s
	43	-48	Gc/s
	66	-71	Gc/s
	95	-101	Gc/s
	142	-150	Gc/s
	190	-200	Gc/s
	250	-265	Gc/s

1. Bands 10 000-10 500 Mc/s and 15.4-15.7 Gc/s

The Working Group decided to add foot-note 402A in the Table corresponding to the band 10 000-10 500 Mc/s and not to alter the Table of Allocations or the notes thereto concerning the band 15.4-15.7 Gc/s. (See Appendix A).

2. Bands above 40 Gc/s

2.1 The Delegation of New Zealand provisionally withdrew its proposals concerning bands 62.5-64.5 Gc/s and 115-117 Gc/s. It also amended the proposals it had submitted concerning the bands between 138 and 146 Gc/s by moving the proposed allocations to the higher frequencies in the bands between 142 and 150 Gc/s.

2.2 The United Kingdom Delegation amended the proposals which it had previously submitted on the bands between 138 and 148 Gc/s by moving the allocations proposed for the Aeronautical and Maritime Mobile Services to the higher frequencies in the 142-150 Gc/s band.

ARCHIVES U.I.T. GENÈVE

2.3 The Greek delegation amended the proposals which it had previously submitted on the bands between 140 and 153 GHz by moving the allocations proposed for the Aeronautical and Maritime Mobile Services to the lower frequencies in the 142-150 Gc/s band.

2.4 The Working Group unanimously decided to allocate the bands 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 on a primary basis to the Aeronautical and Maritime Mobile Services and to the Aeronautical and Maritime Radionavigation Services using space techniques. It also adopted the text of 412I, which will be inserted in the appropriate division of the Table under each of the frequency bands listed above (see Appendix A).

Maurice CHEF
Chairman

Appendices : 2

APPENDIX A

Mc/s

	Region 1	Region 2	Region 3
MOD	10 000-10 500	RADIOLOCATION Amateur 401A 402A 402 403	

ADD 402A In France, the band 10 000-10 500 Mc/s is also allocated to the aeronautical radionavigation service.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

APPENDIX B

Gc/s

Region 1	Region 2	Region 3
43-48	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION 412I	
66-71	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION 412I	
95-101	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION 412I	
142-150	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION 412I	

ADD

Gc/s

Region 1	Region 2	Region 3
190-200	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION 412I	
250-265	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE MARITIME MOBILE MARITIME RADIONAVIGATION 412I	

ADD 412I The bands 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 are allocated for the use and development of systems using space techniques for communication and radionavigation in the aeronautical and maritime services.*) [It should be noted that future radio conferences may wish to allocate these bands also to the corresponding terrestrial systems.]

*) This question may be the subject of a Recommendation

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 241-E
29 June 1971
Original : French

COMMITTEE 5

FOURTH REPORT OF WORKING GROUP 5D

TO COMMITTEE 5

Frequency band : 156-174 Mc/s

The Working Group decided to add foot-note ADD 287A in the Table in the box corresponding to the band 156-174 Mc/s (See Appendix A).

In this respect, it also adopted a draft Resolution which appears at Appendix B.

M. CHEF
Chairman

Appendices : 2

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A P P E N D I X A

Mc/s

Region 1	Region 2	Region 3
150.05-151 FIXED MOBILE except aeronautical mobile (R) 274 285 286 286A	150.05-174 FIXED MOBILE	150.05-170 FIXED MOBILE
151-154 FIXED MOBILE except aeronautical mobile (R) Meteorological aids 285 286 286A		
154-156 FIXED MOBILE except aeronautical mobile (R) 285 285A		285A 287 287A 290
156-174 FIXED MOBILE except aeronautical mobile 285 287 287A 288	285A 287 287A	170-174 FIXED MOBILE BROADCASTING

MOD

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 use shall not be earlier than 1 January 1976 (see Resolution No. ...).

APPENDIX B

DRAFT RESOLUTION .....

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

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

considering

a) that there is a need to develop the use of space techniques to meet the future requirements of the Maritime Mobile Service;

b) that of the bands used at present by the Maritime Service, there may be advantages in using narrow channels from the maritime mobile sub-bands between 156-174 Mc/s for safety and distress;

recognizing

1) that the maritime mobile sub-bands between 156-174 Mc/s are also used for non-maritime purposes;

2) that the power flux-densities laid down by maritime satellites in this band may cause harmful interference to terrestrial receivers illuminated by a satellite and that the satellite receiver may suffer harmful interference from terrestrial transmissions;

3) that the Maritime Terrestrial Services make 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 Service to be able to introduce space techniques for safety and distress, on an exclusive basis, as soon as practicable;

having provided for

the possible use of space techniques for safety and distress by the Maritime Mobile Service on narrow channels 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 space techniques 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.

SPACE CONFERENCE

Document No. 242-E
29 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

SUB-WORKING GROUP 5D-3

TERMS OF REFERENCE OF SUB-WORKING GROUP 5D-3

To study the various proposals to introduce the use of space techniques for the purposes of the Mobile Service in the bands between 230 and 615 Mc/s.

To seek possibilities of agreement and propose acceptable solutions.

Documentation contained in DT/16, pages 16-20 to 16-29 bis inclusive (and, where necessary, the relevant documents submitted by administrations) to which should be added :

a) Document No. 185 (Note from WG 5C to WG 5D) drawing the latter's attention to the protection of band 460-470 Mc/s;

b) The document submitted by Sweden on 29 June 1971;

c) Any results of the work of Sub-Working Group 4B-8 set up to consider sharing criteria for the Maritime Mobile Service using space techniques and Terrestrial Services.

Maurice CHEF
Chairman
Working Group 5D

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 243-E
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

SUMMARY RECORD

OF THE

FIFTH MEETING OF COMMITTEE 4

Tuesday, 29 June 1971, at 0930 hrs

Chairman : Mr. E. SANDBACH (Australia)

Subjects discussed	Document No.
1. Progress report by Working Group Chairmen)	194/Add.1, 220, 221, 223
2. Consideration of any documents from Working Groups)	
3. Introduction and consideration of documents in Annex	69, 28, 51, 37 12, 27
4. Any other business	

ARCHIVES U.I.T. GENÈVE

1. Progress Report by Working Group Chairmen

2. Consideration of any documents from Working Groups
(Documents Nos. 194/Add.1, 220, 221, 223)

Working Group 4A

The Chairman of Working Group 4A said the Working Group had not met since Committee 4's previous meeting, but at its next meeting it would consider the definitions proposed by other Working Groups of Committee 4 as well as Document No. DT/66. A joint meeting of Working Group 4A and Working Group 5 Ad hoc would be required to consider the order of definitions in Article 1 as a whole.

On the proposal of the Chairman, it was agreed that the blue unnumbered Note dated 28 June 1971 from the Acting Chairman of Committee 6 to the Chairman of Committee 4 should also be considered by the Working Group at its next meeting.

Working Group 4B

The Chairman of Working Group 4B said the Working Group had no further documents to present at that stage. Three main subjects were still under consideration, namely : 1) sharing between Broadcasting Satellite and Terrestrial Services at 800 MHz; 2) sharing between Broadcasting Satellite and Terrestrial Services at 2500 MHz; and 3) sharing between the Maritime Satellite Service and the Terrestrial Services in the band 400-600 MHz. The Group had agreed on characteristics of the Broadcasting Satellite Service and the necessary power flux-density, and there appeared to be a fair measure of agreement on sharing criteria which would allow the Broadcasting Satellite Service to share the spectrum with existing Terrestrial Services. One main aspect of the latter would be the need for co-ordination between the Broadcasting Satellite and Terrestrial Trans-horizon Services.

Working Group 4C

The Chairman of Working Group 4C said the Working Group had not met since the Committee's previous meeting but it would that afternoon consider a proposed text on co-ordination distance. It would also study the various notes to Working Groups on factors requiring consideration, such as Documents Nos. DT/65 and DT/66.

It was agreed that Documents Nos. DT/65 and DT/66 would be considered at the Committee's next meeting, after study by the Working Groups involved.

Working Group 4D

The Chairman of Working Group 4D said the Working Group had completed consideration of the items remaining for study under its terms of reference. He introduced Documents Nos. 194/Add.1 and 220, and said that the Working Group's views on the definition of certain terms had been communicated to the Chairman of Working Group 4A. The Working Group had thus, as indicated in Document No. 221, completed the task assigned to it.

Document No. 194/Add.1

The Chairman of Working Group 4D recalled that it had been proposed that, with the concurrence of Committee 6, a worked example illustrating the method of calculation of ΔT should be included in the text, and it was agreed that Dr. Jansky (United States of America), Mr. Baker (United Kingdom), and the Delegate of France should attempt to produce a worked example in time for discussion at the Committee's next meeting.

The Delegate of the U.S.S.R. stated that since most delegations had accepted the figure of 2 per cent increase in equivalent noise temperature, his delegation would also do so, but it maintained the view that that value had not been sufficiently studied, and did not have a solid basis for acceptance.

As a result of drafting changes proposed by the Delegates of Canada and Australia, the following wording for the Draft in the Annex to Document No. 194/Add.1 was approved : "As an example of this method, 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 ..... radio-relay systems and 1,000 pWOp ..... "

Document No. 220

The Chairman explained that the Committee would, at that time, merely approve in principle the inclusion of the additions proposed by Working Group 4D to the "omnibus" Recommendation, which were : Study Programme 2 - 1C/4 on page 4 of Document No. 220, and the whole of pages 5, 6 and 7.

On the proposal of the Delegate of Canada, it was agreed that the words "and geostationary satellite systems" should be added at the end of paragraph 2.5 on page 7. Reference was made to the need to make it clear in

Recommendation 1 on page 6 that Recommendations were to be prepared for adoption by the Plenary Assembly of the C.C.I.R., and it was agreed that it should be left to the Drafting Group to co-ordinate the French and English versions of that text.

The proposed additions to the "omnibus" Recommendation, as amended, were approved.

Document No. 221

Noted.

Working Group 4E

The Chairman of Working Group 4E said the Working Group had studied two documents submitted by its Sub-Working Group. The first, a draft Recommendation inviting the C.C.I.R. to study technical criteria for defining harmful interference, was given in the Annex to Document No. 223. No final conclusion had been reached on the second, which dealt with a resolution for establishing machinery to update sharing criteria, and it had been referred back to the Sub-Working Group for re-drafting. The Working Group hoped to consider proposals concerning Appendices 1, 1A and 1B at its next meeting.

Document No. 223

Approved, on the understanding that the draft Recommendation was acceptable so far as Committee 4's responsibility went.

3. Introduction and consideration of documents in Annex (Documents Nos. 69, 28, 51, 37, 12, 27)

The Delegate of Brazil introduced Document No. 69, on Brazilian proposals for amendments to the Radio Regulations.

The Delegate of the United States of America introduced Document No. 28, Parts I - V, and emphasized that his delegation felt strongly about the advantages of and the need for sharing, with a view to making the most efficient use of the radio spectrum.

The Delegate of the United Kingdom introduced Proposals Nos. G/51/3, 14-16. He highlighted the need to differentiate between broadcasting satellites and distribution-type satellites, and suggested the Committee might consider the possibility of doing so in terms of power-flux-density. On the

proposal of the Delegate of the United States, it was agreed that the Committee should refer the problem to Working Group 4B, with a view to the insertion of wording in Article 7 to differentiate between community reception satellite type broadcasting and direct broadcasting.

Proposals in Documents Nos. 69, 28 (Parts I - V) and 51 were noted.

The Delegate of India introduced Proposal IND/37/9, explaining that because of the importance of the subject for human safety in the air, it had been felt that further technical submissions were necessary, and the proposal was to be referred to the C.C.I.R. for further study.

It was agreed, on the Chairman's proposal, that the topic be included in the "omnibus" Recommendation, thus ensuring its reference by the Conference to the C.C.I.R.

The Delegate of Canada introduced Document No. 12 (Ref. CAN/12/1 and CAN/12/2). CAN/12/1, the proposal for spectrum allocation, had already been discussed by Committee 5, and that Committee also had before it a joint alternative proposal to CAN/12/2, submitted by the Delegations of Canada and the United States.

It was agreed that any further action on that subject should be taken in Committee 5.

The Delegate of Argentina introduced Document No. 27, whose aim was to bring Recommendation No. 16 into line with the new text proposed for No. 422 by the Argentine Administration.

At the suggestion of the Delegate of France, supported by the Delegates of Canada, United States of America and Argentina, it was decided to refer that document to Committee 6.

The Delegate of the United States of America, referring to Document No. 28/266, said his Delegation considered Resolution No. Spa 3 no longer necessary, since the arrangements it dealt with were being discussed at the Conference, and proposed that it should be suppressed.

It was so agreed.

4. Any other business

The Delegate of Austria, referring to the discussion in Working Group 5D on foot-note 285B (Radio Regulations, page 78), wondered whether Recommendation No. Spa 8 mentioned in the foot-note, required revision. The Director of the C.C.I.R. said the problem had been studied at the Special Joint Meeting; he would prefer to go into it more fully at a later stage. The Delegate of Morocco said he was prepared to suppress Morocco's reservations, and was reminded by the Chairman that that notification should be made in Committee 5.

The meeting rose at 1100 hours.

The Secretary :

I. DOLEZEL

The Chairman :

E. SANDBACH

SPACE CONFERENCE

Document No. 244-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

SWEDEN

PROPOSAL FOR ALLOCATION OF BANDS FOR THE INTRODUCTION OF SPACE TECHNIQUES FOR THE MARITIME MOBILE SERVICE IN THE HIGHER VHF-LOWER UHF RANGE

In view of the lengthy discussions on the above-mentioned matter in Working Group 5D, it is proposed to concentrate further efforts in trying to find solutions in the bands 430-440 MHz for the downward direction and 606-614 MHz for the upward direction. More specifically, the following proposals are submitted for the purpose of providing a start for discussions.

MHz

Region 1	Region 2	Region 3
432-434.25 ADD MARITIME MOBILE SUP Existing allocations Review : Existing foot-notes Note 1		
611.75-614 ADD MARITIME MOBILE ADD Broadcasting SUP Existing allocations Review : Existing foot-notes; protection to radio astronomy as stated in foot-notes should in principle remain effective Note 1 Note 2		

ARCHIVES U.I.T. GENÈVE

Note 1 : The bands 432-434.25 MHz and 611.75-614 MHz are primarily intended for the introduction of space techniques in the Maritime Mobile Service. The first band should be used for the down-direction and the second for the up-direction. In the up-band, the portion 612-614 MHz must not be used within 100 km off any coast.

Note 2 : In the Broadcasting Service, this band shall as far as possible be used only for broadcast transmissions not intended to be received in coastal areas. The total e.i.r.p. from any broadcast station in this band shall not exceed / to be stated / dbW in directions above the horizon (as seen from the transmitting antenna) within / to be stated / degrees from the geostationary orbit.

SPACE CONFERENCE

Document No. 245-E
29 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

REPUBLIC OF INDIA

PROPOSALS FOR AMENDMENT OF ARTICLE 6

OF THE RADIO REGULATIONS

Ref.

IND/245/36 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.

IND/245/37 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.

Reason : To provide for extending the provisions of Radio Regulations 415 and 417 to the / Fixed Satellite Service. /

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 246-E
30 June 1971
Original : English

COMMITTEE 2

SUMMARY RECORD

OF THE

THIRD MEETING OF COMMITTEE 2

(CREDENTIALS)

Friday, 25 June 1971, at 0930 hrs

Chairman : Mr. C.J. MARTÍNEZ (Venezuela)

Subjects discussed	Document No.
1. Summary record of the second meeting	167
2. Second report of the Working Group	184
3. Draft report	DT/49

ARCHIVES U.I.T. GENÈVE

1. Summary record of the second meeting of Committee 2 (Document No. 167)

The Delegates of Poland, Bielorussia, Bulgaria and Ukraine said they had also made statements which they wished to have included in the summary record of the second meeting.

The Delegate of the U.S.S.R. said that in the English text of Annex 1 "Taiwan" should be replaced by "Formosa". At his suggestion, it was agreed that a revised version of Document No. 167 would be issued with the required correction and additions.

The Chairman stated that another meeting of Committee 2 would be convened, subject to confirmation, at 0930 hrs, 2 July to approve Document No. 167(Rev.).

2. Second report by Working Group (Document No. 184)

The credentials of the Delegation of the People's Republic of Bulgaria, which had just been submitted, were examined in the meeting by the Working Group and found to be in order.

3. Draft report of Committee 2 (Document No. DT/49)

The Chairman indicated that a sub-paragraph 2.d) should be added, to read :

"d) Credentials indicating the membership of the delegations, provided that they contain no restriction whatever on the powers of the delegations."

The Secretary of the Conference pointed out that the Plenary meeting had asked Committee 2 to complete its work by the end of the third week of the Conference. He therefore suggested that the additional meeting should be restricted to approval of the revised version of Document No. 167, since Document No. DT/49 contained a provision whereby credentials deposited after the meeting were examined by the Chairman of Committee 2, (the wording of paragraph 5 on page 1 of that document would be amended to read "...deposited after the meeting held on 25 June 1971 should be examined...").

Page 2

It was agreed to indicate that the credentials of Bulgaria had been found in order.

Page 5

It was agreed that in addition to the foot-note 4) against Paraguay in column 5, a cross would be added in column 3, since according to the Convention credentials notified by telegraph were not acceptable.

An inconsistency between Document No. DT/49 and Document No. 184 was pointed out in relation to the situation of Peru. The Chairman said that Document No. DT/49 reflected accurately the position, i.e. that provisional credentials had been submitted.

Page 6

It was agreed to replace the cross in column 4 against Turkey with foot-note 3) in column 5.

Following a suggestion that each country at present marked as having submitted provisional credentials should have instead a cross in column 3 (credentials not in order), the Secretary of the Conference explained that provisonal credentials were acceptable as far as voting was concerned, but did not authorize delegations to sign the Final Acts of Conferences.

The draft Report in Document No. DT/49 was adopted, as amended.

The meeting rose at 1020 hrs.

The Secretary :
W.W. SCOTT

The Chairman :
C.J. MARTÍNEZ

SPACE CONFERENCE

Document No. 247-E
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 6

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

Committee 4 examined during its Fifth Meeting the proposals of Argentina Nos. ARG/27/59 and 60 aiming to bring Recommendation No. 16 into line with the new text for No. 422 proposed by the same Administration. As these proposals deal with a regulatory subject, Committee 4 decided to refer them for consideration in Committee 6 (Summary Record of the Fifth Meeting of Committee 4, Document No. 243).

E.F. SANDBACH
Chairman
Committee 4

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 248-E
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FIRST REPORT OF THE WORKING GROUP 5E TO COMMITTEE 5 (ALLOCATIONS)

BROADCASTING-SATELLITE SERVICE

Frequency bands : 87-100 Mc/s
100-108 Mc/s

1. Frequency band : 87.0-100 Mc/s, ADD 268A

Proposals CAN/14/31 and 32 and USA/28/19 and 21 sought to make provision for authorizing the use of the band by the Broadcasting-Satellite Service subject to agreement among administrations concerned and those having services operating in accordance with the Table which may be affected. Delegations from all three Regions were unable to accept these modifications; the Delegations of Denmark and Ethiopia sought to find a compromise solution. Finally, the Proposals were withdrawn and the Working Group agreed on the status quo in the bands 87.5-100 Mc/s in Region 1, 88-100 Mc/s in Region 2 and 87-100 Mc/s in Region 3.

2. Frequency band : 100-108 Mc/s

2.1 Proposals USA/28/20 and 21 and DNK/3/1 were examined. In the preliminary discussion some delegations supported the world-wide exclusive allocation of the band 100-108 Mc/s to the Broadcasting-Satellite Service with foot-notes to cover particular cases where further time would be needed to clear the band, other delegations were opposed to any change of the present provisions and some delegations explained difficulties of clearing all or part of the band, in particular the portion between 100 Mc/s and 104 Mc/s. The Delegation of Denmark accepted the suggestion to consult with the Delegations of Canada and the U.S.A. with a view to formulating a revised solution bearing in mind the discussions in Working Group 5E.

ARCHIVES U.I.T. GENÈVE

2.2 The revised solution was presented in Document No. DT/27. This provided for no change of substance in the framed part of the Table and the insertion of a new foot-note (ADD 268A), which is reproduced hereunder, in the portion covering 104-108 Mc/s only, and on a world-wide basis :

ADD 268A The broadcasting-satellite service also may be authorized in this band, subject to agreement among administrations concerned and those having services operating in accordance with the Table, which may be affected.

2.3 After a thorough examination of this proposed solution, Working Group 5E agreed, by a large majority, not to provide for the Broadcasting-Satellite Service in the band 104-108 Mc/s and consequently to keep the status quo.

R. GALIĆ
Chairman

SPACE CONFERENCE

Document No. 249-E
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

FIRST REPORT FROM COMMITTEE 6

The modifications of the provisions of the Radio Regulations appearing in the Annexes hereto have been approved by Committee 6.

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

M.K. BASU
Acting-Chairman
Committee 6

Annexes : 2

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX 1

Article 8

MOD RR477

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;

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 2

Article 15

MOD RR717 (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.

SPACE CONFERENCE

Document No. 250-E
2 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
7 + Corr.1, 2	Sweden	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
22+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

ARCHIVES U.I.T. GENÈVE

No.	Origin	Title	Destination
25 + Corr.	Argentina	Prop., RR Art. 41	PL
26	Argentina	Prop., RR Res. Spa. 1	PL
27+ Add.	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

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	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

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)	PL
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 (1 535-1 660 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	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

No.	Origin	Title	Destination
109(Rev.)	Secretariat	Assignment of proposals	PL
110	Chile	Proposed amendment concerning the aeronautical mobile service	PL
111 + 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
116	Secretariat	Committee structure	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	Com. 5
121	Brazil	Draft Recommendation H	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	Marconi International 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	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

No.	Origin	Title	Destination
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 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 broadcasting 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 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
163	WG 4B	Article 7 Proposed partial text of Section VIII	WG 4B
164	U.S.A. & Canada	Prop., RR Art. 5	Com. 5

No.	Origin	Title	Destination
165(Rev.)	Rep. of Indonesia	Reservation regarding 470BA	Com. 4
166	WG 4A	Third Report - Revision of Article 1, Section IIB	Com. 4
167(Rev.)	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	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

No.	Origin	Title	Destination
180(Rev.)	Com. 4	Proposals concerning Broadcasting Satellite Service	Com. 6
181 (Rev.)	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	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. (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.	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	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	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

No.	Origin	Title	Destination
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
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.	Origin	Title	Destination
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	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 by ionospheric research satellites	Com. 4
235	WG 4E	Second report - proposed text for Section IX of Article 7	Com. 4
236	WG 5C	Second report of Working Group 5C to Committee 5	Com. 5
237	WG 5C	Third report of Working Group 5C to Committee 5	Com. 5

No.	Origin	Title	Destination
238	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

SPACE CONFERENCE

Document No. 251-E
30 June 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

SECOND REPORT OF WORKING GROUP 5 Ad hoc

TO COMMITTEE 5

1. The Working Group considered the following proposals :

- G/53/21 and AUS/9/1 on the Distribution-Satellite Service; and
- B/70/3 and B/70/4 on individual and community reception in the Broadcasting-Satellite Service.

2. Proposals G/53/21 and AUS/9/1 were not accepted by the Working Group; a large majority was opposed to them, while some administrations had no definite opinion on the subject.

3. Proposals B/70/3 and B/70/4 were approved by the Working Group despite the fact that certain administrations expressed the view that it was premature, in the present stage of technique, to formulate the definitions in question and several others expressed no opinion. The texts of the above-mentioned definitions are given in the annex to this report. It was agreed that these definitions should appear after the definition of the Broadcasting-Satellite Service with the appropriate numbers.

A. PETTI
Chairman

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

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.

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.

SPACE CONFERENCE

Document No. 252-E
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

REPORT BY COMMITTEE 2 (CREDENTIALS)

1. Committee 2 met on 10, 17 and 25 June 1971. At its first meeting it set up a Working Group to ascertain whether the delegations were accredited to vote and sign the Final Acts of the Conference.

2. Committee 2 decided to accept the credentials signed by the competent authorities in the following form :

a) credentials conferring full powers;

b) credentials giving the delegations the right to sign the Final Acts;

c) credentials indicating that delegations are authorized to represent their governments, so long as such credentials contain no restriction whatever on the powers of the delegations;

d) credentials indicating the membership of the delegations, provided that they contain no restriction whatever on the powers of the delegations.

3. On the basis of these criteria, Committee 2 reached the conclusions set out in the Annex to this report.

4. In connection with the credentials of certain delegations, a number of statements were made during the second meeting of Committee 2 and, as requested by the delegations concerned, were annexed to the summary record of that meeting (Document No. 167(Rev.)).

5. Committee 2 recommends that any credentials deposited after the meeting held on 25 June 1971 should be examined by its Chairman, who will report to the Plenary Assembly.

C. J. MARTÍNEZ
Chairman of Committee 2

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

POSITION ON 25 JUNE 1971, OF THE CREDENTIALS OF THE COUNTRIES REPRESENTED AT THE SPACE CONFERENCE

Country	Credentials			Comments
	in order	not in order	not received	
1	2	3	4	5
1. Albania (People's Republic of)	X			
2. Algeria (Algerian Democratic and Popular Republic)	X			
3. Saudi Arabia (Kingdom of)	X			
4. Argentine Republic	X			
5. Australia (Commonwealth of)	X			
6. Austria	X			
7. Belgium	X			
8. Bielorussian Soviet Socialist Republic	X			
9. Brazil	X			
10. Bulgaria (People's Republic of)	X			
11. Cameroon (Federal Republic of)	X			
12. Canada	X			
13. Central African Republic	X			
14. Ceylon	X			
15. Chile	X			1)
16. China	X			

1	2	3	4	5
17. Cyprus (Republic of)	X			
18. Vatican City State	X			
19. Colombia (Republic of)	X			1)
20. Congo (Democratic Republic of the)	X			
21. Congo (People's Republic of the)			X	
22. Korea (Republic of)	X			
23. Ivory Coast (Republic of the)	X			
24. Cuba	X			
25. Denmark	X			
26. Group of French Overseas Territories	X			
27. Spain	X			
28. United States of America	X			
29. Ethiopia	X			
30. Finland	X			
31. France	X			
32. Gabon Republic			X	
33. Ghana				1) 3)
34. Greece				3)
35. Equatorial Guinea (Republic of)	X			
36. Upper Volta (Republic of)			X	
37. Hungarian People's Republic	X			
38. India (Republic of)	X			
39. Indonesia (Republic of)	X			
40. Iran	X			

1	2	3	4	5
41. Iraq (Republic of)	X			
42. Ireland	X			
43. Iceland	X			
44. Israel (State of)	X			
45. Italy	X			
46. Jamaica	X			
47. Japan	X			
48. Jordan (Hashemite Kingdom of)				3)
49. Kenya	X			
50. Kuwait (State of)	X			
51. Liberia (Republic of)	X			1)
52. Libyan Arab Republic	X			
53. Liechtenstein (Principality of)	X			
54. Luxembourg	X			
55. Malaysia	X			
56. Malagasy Republic			X	
57. Mali (Republic of)			X	
58. Morocco (Kingdom of)	X			
59. Mauritania (Islamic Republic of)	X			
60. Mexico	X			
61. Monaco	X			
62. Nicaragua	X			
63. Niger (Republic of the)			X	
64. Nigeria (Federal Republic of)	X			
65. Norway	X			

1	2	3	4	5
66. New Zealand	X			
67. Uganda	X			
68. Pakistan			X	
69. Paraguay		X		4)
70. Netherlands (Kingdom of the)	X			
71. Peru				3)
72. Philippines (Republic of the)	X			1)
73. Poland (People's Republic of)	X			
74. Portugal	X			
75. Portuguese Oversea Provinces	X			
76. Syrian Arab Republic	X			
77. United Arab Republic	X			
78. Federal Republic of Germany	X			
79. Ukrainian Soviet Socialist Republic	X			
80. Roumania (Socialist Republic of)	X			
81. United Kingdom of Great Britain and Northern Ireland	X			
82. Rwanda (Republic of)	X			
83. Senegal (Republic of the)	X			
84. Singapore (Republic of)	X			
85. South Africa (Republic of)	X			
86. Sweden	X			
87. Switzerland (Confederation of)	X			
88. Tanzania (United Republic of)	X			
89. Czechoslovak Socialist Republic	X			

1	2	3	4	5
90. Territories of the United States of America	X			
91. United Kingdom Overseas Territories	X			
92. Thailand	X			
93. Togolese Republic			X	
94. Tunisia			X	
95. Turkey				3)
96. Union of Soviet Socialist Republics	X			
97. Uruguay (Oriental Republic of)				2) 3)
98. Venezuela (Republic of)	X			
99. Viet-Nam (Republic of)	X			
100. Yugoslavia (Socialist Federal Republic of)				3)

1) Has not ratified the International Telecommunication Convention (Montreux, 1965)

2) Has not acceded to the International Telecommunication Convention (Montreux, 1965)

3) Delegations provisionally accredited by the Head of the Permanent Delegation to the European Office of the United Nations.

4) Credentials notified by telegraph.

SPACE CONFERENCE

Document No. 253-E
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

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

1. Committee 4, having discussed the Proposals D/5/37, USA/28 Corr./263(Rev.) and G/96/321 at its third meeting (vide paragraph 9 of the Summary Record of the third meeting, Document No. 192), agreed that Working Group 4E should prepare a document incorporating the principles discussed at the meeting of Committee 4 for agreement by Committee 4 and for subsequent submission to the Plenary.

2. Working Group 4E considered these proposals and after discussion thereon as well as on Documents Nos. DT/58 and DT/58(Rev.), hereby submits the text of the proposed new draft Resolution enclosed in the Annex to this document.

3. During the discussions, the Working Group 4E could not reach an agreement on the text of paragraph 4 b). The Working Group therefore decided to transmit the text of the draft Resolution indicating therein two alternative texts for the last two lines of that paragraph. These alternative texts are shown in square brackets. Committee 4 may wish to finalize this part of paragraph 4 b) before submitting the text to the Plenary. The two alternative texts arose due to the fact that some delegates participating in Working Group 4E were of the view that a no reply from an Administration to the enquiry should not affect its rights flowing from its acceptance of the Radio Regulations.

N. OHYAMA
Chairman
Working Group 4E

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT NEW 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;

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 [60] days, to which of the C.C.I.R. Recommendations or to which specific tehcnical 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 [60] days period shall be deemed to have no opinion, for the time being, on the use of said technical criteria;

4. however, if at a later stage a need arises to apply the relevant technical criteria with respect to cases involving such administration as mentioned in 3. above :

a) and if such administration has initiated the case, the I.F.R.B. shall not take any action until that administration has replied to the inquiry mentioned in 2. above;

b) but if such administration has not initiated the case, the I.F.R.B. shall ask again that administration as in 2. above. In case of no reply within [30] days after receiving acknowledgement of delivery, [the I.F.R.B. shall apply the technical criteria acceptable to the administration initiating the case;] or [the I.F.R.B. shall apply the technical criteria defined in the Radio Regulations;]

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 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 indicate those administrations mentioned in paragraph 3. 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.

SPACE
CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Corrigendum N° 1 au
Document N° 254-F/E/S
Original : anglais

Dans la première page, sous le numéro du document, lire

COMMISSION 5

au lieu de "Groupe de travail 5A"

Does not concern the English text.

No concierne al texto español.

ARCHIVES
U.I.T.
GENÈVE

SPACE CONFERENCE

Document No. 254-E
30 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

SECOND REPORT OF WORKING GROUP 5A
TO COMMITTEE 5 (ALLOCATIONS)

FREQUENCY BANDS ABOVE 40 Gc/s

1. Working Group 5A examined and discussed, both at Group level and in Sub-Working Group 5A-3, the Proposals submitted to this Conference which concern the frequency bands above 40 Gc/s. The Working Group agreed to suggest for adoption by Committee 5 the allocations presented in Annex 1 to the present Report. The Japanese Delegation, finding it difficult to accept the majority point of view that their Proposal J/98/81 could not be retained, reserved its right to revert to this subject in Committee 5 if it still so desires.

2. The Working Group found it useful to provide the next World Administrative Radio Conference with some guidance with respect to the possibilities of additional allocations in the bands proposed for Space-to-space Services. Accordingly, the Working Group agreed to transmit to Committee 5 the draft Recommendation at Annex 2 to the present Report.

Luiz C. BAHIANA
Chairman

Annexes : 2

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 1

Gc/s

Region 1	Region 2	Region 3
54.25-58.2	SPACE (Space-to-space)	
59-64	SPACE (Space-to-space)	
92-95	COMMUNICATION-SATELLITE (Earth-to-space) 392A	
102-105	COMMUNICATION-SATELLITE (Space-to-earth) 374A	
105-130	SPACE (Space-to-space)	
140-142	COMMUNICATION-SATELLITE (Earth-to-space) 392A	
150-152	COMMUNICATION-SATELLITE (Space-to-earth) 374A	

/ Note to Committee 7 : Existing No. 392A to be added in boxes as shown above, subject to changes to definitions which would render this foot-note superfluous /

/ Note to Committee 7 : Existing No. 374A to be added in boxes as shown above, subject to changes to definitions which would render this foot-note superfluous /

Gc/s

Region 1	Region 2	Region 3
170-182	SPACE (Space-to-space)	
185-190	SPACE (Space-to-space)	
220-230	COMMUNICATION-SATELLITE	
265-275	COMMUNICATION-SATELLITE	

ANNEX 2

DRAFT RECOMMENDATION

relating to the future exploitation of bands
allocated to the SPACE (Space-to-space)
/ 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 SPACE (Space-to-space) Service / to the Inter-Satellite Service /;

b) that all the foregoing bands are located in parts of the radio-frequency spectrum close to peaks of atmospheric absorption;

and recognizing

that the attenuation due to atmospheric absorption largely screens the earth from interference to or from Terrestrial Services; so that these bands could most usefully be exploited also by the Fixed and Mobile (except Aeronautical Mobile) Services;

recommends

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

SPACE CONFERENCE

Document No. 255-E
6 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

NOTE FROM THE CHAIRMAN OF COMMITTEE 5 RELATING TO THE NEWLY ADOPTED SERVICE NAMES AND THE EQUIVALENT TERMS

Attached hereto are two lists of service names showing the newly adopted names against the equivalent terms and vice versa, which may be helpful to Delegations.

H.A. KIEFFER
Chairman

ARCHIVES U.I.T. GENÈVE

Existing terms	Revised or new terms
Communication-Satellite Service	Fixed-Satellite Service
Communication-Satellite Earth Station	SUP.
Communication-Satellite Space Station	SUP.
Distribution-Satellite Service	Fixed-Satellite Service
Earth Sciences-Satellite Service	Earth Exploration-Satellite Service
Earth Resources-Satellite Service	Earth Exploration-Satellite Service
Meteorological-Satellite Earth Station	SUP.
Meteorological-Satellite Space Station	SUP.
Radionavigation-Satellite Earth Station	SUP.
Radionavigation-Satellite Space Station	SUP.
Space Research Earth Station	SUP.
Space Research Space Station	SUP.
Space Service	Space Radiocommunication
Space Service (Telemetering Tracking or Tracking)	Space Operation
Space Service (space-to-space)	Inter-Satellite Service
Terrestrial Service	SUP.

	Revised or new names	Equivalent terms
84AGB	Aeronautical Mobile-Satellite Service	
84ATA	Amateur-Satellite Service	
84AP	Broadcasting-Satellite Service	
	Community reception	
84ASA	Earth Exploration-Satellite Service	Earth Sciences-Satellite Service Earth Resources-Satellite Service Earth Resources Survey by Satellite
84AD	Earth Station	
84AG	Fixed-Satellite Service	Communication-Satellite Service Distribution Satellite Service
	Individual reception	
84ACB	Inter-Satellite Service	Space Service (space-to-space)
84AGD	Land Mobile-Satellite Service	
84AGC	Maritime Mobile-Satellite Service	
84AT	Meteorological-Satellite Service	
84AGA	Mobile-Satellite Service	
84APA	Radiodetermination-Satellite Service	
84AQ	Radionavigation-Satellite Service	
69	Safety Service	
84AL	Satellite System	
84ACA	Space Operation Service	
84AC	Space Radiocommunication	
84AM	Space Research Service	
84AE	Space Station	
84AF	Space System	
84ATB	Standard Frequency-Satellite Service	

	Revised or new names	Equivalent terms
84AA	Terrestrial Radiocommunication	
84AB	Terrestrial Station	
AQA	Aeronautical Radionavigation-Satellite Service	
AQB	Maritime Radionavigation-Satellite Service	
ATC	Time Signal-Satellite Service	

SPACE CONFERENCE

Document No. 256-E
7 July 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

SUMMARY RECORD

OF THE

THIRD MEETING OF COMMITTEE 5

(ALLOCATIONS)

Thursday, 1 July 1971, at 0930 hrs

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

Subjects discussed	Document No.
1. Approval of the Summary Record of the 2nd meeting	161
2. First Report of Working Group 5 Ad hoc	218 & Corr.
3. Second Report of Working Group 5 Ad hoc	251
4. Any other business	

ARCHIVES U.I.T. GENÈVE

1. Approval of the Summary Record of the 2nd Meeting (Document No. 161)

The Chairman said that the words "Sub-Group 5A" at the beginning of the second paragraph of page 3 of the English version of Document No. 161 should be replaced by "Sub-Group 5A-1".

The Summary Record of the 2nd meeting of the Committee, as amended, was approved.

2. First Report of Working Group 5 Ad hoc (Document No. 218 & Corr.)

The Chairman of Working Group 5 Ad hoc read out the following amendments to be made in Document No. 218 and its Corrigendum :

a) French text

Page 5 : ADD 84AGD, delete the word "la" in the last line and write the word "terre" with a small t; 84AP, delete the asterisk at the beginning of the paragraph and the corresponding foot-note in view of the results of the Group's work since the publication of Document No. 218. This correction applies to the English and Spanish text also.

Page 6 : MOD 69, replace the word "et" by "ou" in the last line;

Corrigendum : MOD 84AG, delete the word "ou" at the beginning of the last paragraph.

b) English text

Page 4 : ADD 84AGA, replace the word "specific" by the word "specified" in the last paragraph.

Page 6 : ADD 84ATA and ADD 84ATB, insert the word "same" between "the" and "purposes" and insert the words "as those" after "purposes" in the second lines of both definitions.

c) Spanish text

Page 5 : ADD 84AGD, write the word "tierra" with a small t.

The definitions in Document No. 218 and its Corrigendum had been unanimously approved by Working Group 5 Ad hoc.

At the proposal of the Delegate of the United Kingdom it was decided to insert the words : "... and emergency position-indicating radiobeacon stations ..." after the words "Survival craft stations" in the second sentences of definitions ADD 84AGB (page 4) and ADD 84AGC (page 5).

The Delegates of Israel, Finland, China, Sweden, Chile and Ireland spoke during the ensuing general discussion on the definitions contained in Document No. 218.

In reply to a remark by the Delegate of Finland, the Chairman of Working Group 5 Ad hoc said that the Group had decided to follow the general principles set forth in the French proposal. The definition of the term "space" came within the competence of Committee 4.

The Delegate of France, speaking as the Chairman of Working Group 4A, said that a definition of "space" or "outer space" was necessary, but that no agreement had been reached on the subject. A recommendation to the C.C.I.R. proposed that the question should be studied by the C.C.I.R. in conjunction with the United Nations and other interested organizations. Speaking as the Delegate of France, he said that the terms "space station" and "earth station" in Document No. 218 were used in a generic sense to apply to all the stations in the various services using space techniques.

The Chairman invited the Group to consider the Annex to Document No. 218 page by page.

Page 3 :

The Delegate of Sweden, supported by the Delegates of Chile, Israel and Cuba, regretted that, in definition 84AA, terrestrial radiocommunication in MOD 84AA should be defined negatively, by excluding space radiocommunication and radio astronomy.

The Chairman of Working Group 5 Ad hoc said that that definition should be taken in conjunction with No. 9 of the Radio Regulations.

The Delegate of France said that the purpose of the definition was to designate all radiocommunications other than space radiocommunications by a generic term.

The Delegate of Argentina supported the view expressed by the Delegates of Sweden and Chile; it was essential to give a positive definition of "terrestrial radiocommunication" (84AA). The experience gained in many years of operating the existing services made it possible to formulate a definition covering all the services provided within the limits laid down, and he proposed orally a tentative definition for this purpose. The Chairman of Working Group 5 Ad hoc pointed out that any new proposal must be submitted in writing before it could be considered by the Group.

The Chairman said that the Swedish Delegate had not insisted on his proposal, but that it had since been taken up by other delegates. He therefore proposed, since the Group Ad hoc seemed to be willing to accept new definitions and the suitability of the present definition was being questioned, that the Committee should vote on whether it should be adopted or referred back to Working Group 5 Ad hoc. There were 26 votes in favour of referring back the definition, 38 in favour of the existing text, and 7 abstentions.

Thus, definition 84AA, as given in Document No. 218, together with the foot-note 84AA.1 which forms an integral part of the definition, was adopted.

The Delegate of Portugal proposed that the words "the major portion of" should be inserted after the words "or in" in the second line of definition 84AD - Earth Station. Without that amendment, a space station might, in certain cases, be regarded as an earth station.

The Chairman of Working Group 5 Ad hoc approved the Portuguese proposal, which was adopted.

At the proposal of the Delegate of Cuba, it was decided to delete the words "including the sea" in the same line of definition 84AD.

Definition 84AD, as amended, was adopted. (With the first two lines reading : "A station located either on the earth's surface or in the major portion of the earth's atmosphere:").

The Delegate of Tanzania, referring to definition 84AE - Space Station - recalled that the United Nations had not yet succeeded in finding a suitable definition of the word "space". Since, however, a space station was defined as "a station located on an object which is beyond, or is

intended to go beyond, or has been beyond, the major portion of the earth's atmosphere", he suggested that "space" might be defined as "that area beyond the major portion of the earth's atmosphere". That definition would, of course, be only provisional, until a more accurate definition of the term was found.

The Chairman said that the suggestion would be noted.

The Delegate of Sweden said that for readers who had not participated in the Space Conference, it might be better to amend definition 84AE by deleting the words "is intended to go beyond, or has been beyond". The new definition would therefore read : "A station located on an object which is beyond the major portion of the earth's atmosphere. Such a station is a space station also during launching and landing".

The Chairman of Working Group 5 Ad hoc, speaking as the Delegate of Italy, said that he was not satisfied with the proposed definition because it would imply that before launching and after landing the space station could not be regarded as such.

The Delegate of New Zealand, supported by the Delegate of Spain, proposed that the discussion should be closed.

Thus, definition 84AE was finally adopted as given in the document.

Definition 84AC was also adopted.

Definition 84AB was adopted, with foot-note 84AB.1 regarded as an integral part of the definition.

All the definitions on page 3, as amended, were adopted.

Page 4 :

At the proposal of the Delegate of Spain, definition 84AF was adopted, with an amendment consisting in replacing the word "or" in the first line by "and/or".

The Delegate of Roumania drew attention to a discrepancy between definitions 84AF and 84AC. It was nevertheless decided to maintain them as adopted.

Definition 84AL was adopted.

Corrigendum No. 1 to Document No. 218

Following an exchange of views between the Delegate of Cuba and the Chairman of Working Group 5 Ad hoc, it was decided to adopt definition 84AG - Fixed-Satellite Service - as given in the Corrigendum.

Document No. 218, page 4 (continued) :

The Delegate of Sweden, supported by the Delegate of Finland, proposed that the third paragraph of definition 84AGA - Mobile-Satellite Service - should be deleted, since it obviously referred to the fixed service. He also proposed that the words "or between space stations used by this Service" in the first paragraph of the definition should be deleted.

Following a discussion in which the Delegates of Finland, the United States, Canada, Sweden and Italy took part, the Swedish proposal was rejected by 41 votes to 9, with 21 abstentions.

Thus, definition 84AGA was adopted without amendment, but with a correction in the English text by which the word "specific" in the third line of the third paragraph was replaced by the word "specified".

At the proposal of the Delegate of the United States supported by the Delegate of France, it was decided that the second sentence of definition 84AGB - Aeronautical Mobile-Satellite-Service - should be amended to read : "Survival craft stations and emergency position-indicating radiobeacon stations may also participate in this Service", thus conforming to the text of No. 68 of the Radio Regulations.

All the definitions on page 4, as amended, were adopted.

Page 5 :

It was decided to amend definition 84AGC - Maritime Mobile-Satellite Service - in the same way as definition 84AGB. Definition 84AGC, as amended, was adopted.

Definition 84AGD was adopted.

Definition 84AP was adopted with the deletion of the asterisk and on the understanding that foot-note 84AP.1 1) formed an integral part of the text of the definition.

The Delegate of Australia, supported by the Delegate of Kenya, proposed that the words "by the general public" should be deleted in the foot-note, but not in the definition. The Chairman of Working Group 5 Ad hoc approved that proposal.

3. Second report of Working Group 5 Ad hoc (Document No. 251)

The Chairman of Working Group 5 Ad hoc, presenting the document, said that two of the proposed definitions were identical with those (1.4.1.3.1/2) on page 10 of the Report of the Special Joint Meeting. A foot-note in the C.C.I.R. publication said that further study of the definition of "community reception" was necessary, but that had not been possible during the Conference.

The Delegate of Spain gave a brief account of how the two definitions in Document No. 251 had been prepared: they had been discussed at length at Palma de Majorca, at the last C.C.I.R. Assembly in New Delhi and at the Special Joint Meeting in Geneva.

The Delegate of Syria, supported by the Delegate of Cuba, thought that a distinction based on the size and complexity of the antennae used for individual and for community reception respectively was illusory.

Despite explanations by the Delegate of France, who favoured the adoption of the texts, the Delegate of Cuba considered that both the proposed definitions should be rejected.

Following statements by the Delegates of Australia, United States, Brazil, India and New Zealand, all in favour of adoption, the Chairman invited the Committee to vote on the definitions contained in Document No. 251. The definitions were adopted by 55 votes to 6, with 17 abstentions.

The Delegate of Venezuela explained that he had abstained from voting because he considred that the proposed definitions were contrary to the provisions of No. 417 of the Convention.

The Chairman of Working Group 5 Ad hoc said that the proposed definitions were in accordance with the provisions of No. 417 of the Convention, since they referred only to a technique of reception and did not affect the definition of a broadcasting-satellite service in which the words "for direct reception by the general public" had been maintained.

Document No. 218, page 5 (continued) :

The Delegate of Australia proposed that the words "by the general public" in foot-note 84AP.1 1) should be deleted on the understanding that they would be maintained in the text of definition 84AP.

It was so decided.

All the definitions on page 5, as amended, were adopted.

Page 6 :

Subject to the explanations given earlier by the Chairman of Working Group 5 Ad hoc, all the definitions on page 6 were adopted.

Page 7 :

It was decided that the first group of definitions would remain unchanged and that the second group would be deleted.

The Chairman said that all questions about capital letters, small letters or hyphens should be submitted directly to him or to the Committee 5 Drafting Group (Mr. Bes, Chairman, Mr. Malone and Mr. Valladares).

4. Any other business

While provisionally accepting the definitions contained in Document No. 218 and its Corrigendum, the Delegate of the Federal Republic of Germany said that his delegation had submitted some proposals concerning Article 1 which were based on logic and involved a restructuring of the terminology of the Radio Regulations. Working Group 5 Ad hoc had not thought it possible, at the present stage, to undertake such a restructuring, but he hoped that, later, a further step could be taken towards standardizing the definitions in the radio services which, at the moment, were sub-divided into "terrestrial" and "space services".

The Chairman of Working Group 5 Ad hoc thanked the members of Sub-Working Group 5-1 Ad hoc and its Chairman, Mr. A. Zaidan of Saudi Arabia, for the efficiency with which they had carried out the task entrusted to them.

The meeting rose at 1600 hours.

H.A. KIEFFER

Chairman

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Corrigendum N° 1 au
Document N° 257-F/E/S
2 juillet 1961

COMMISSION 5
GROUPE DE TRAVAIL 5A
GROUPE DE TRAVAIL 5E

Page 4, Renvoi [A]

3e ligne, lire : et mobile existants et prévus ne doivent pas...

6e ligne, lire : ...de planification pour l'assignation de fréquences à la radiodiffusion...

9e ligne, lire : ...décisions de cette conférence.

Page 5, supprimer le Renvoi [A] et dans le Renvoi [B] et la note y relative, lire 12,5 - 12,75 GHz au lieu de 12,2 - 12,75 GHz.

COMMITTEE 5
WORKING GROUP 5A
WORKING GROUP 5E

Page 4, at the end of foot-note [A] read : ...of that conference.

Page 5, delete foot-note [A] and, in foot-note [B] and the associated note, read 12.5 - 12.75 Gc/s instead of 12.2 - 12.75 Gc/s.

COMISIÓN 5
GRUPO DE TRABAJO 5A
GRUPO DE TRABAJO 5E

Página 4, en la última línea de la nota al pie de la página [A] léase:

...en las decisiones de dicha conferencia.

Página 5, suprímase la nota [A]

En [B] y en la Nota, léase "12,5 - 12,75 Gc/s en lugar de 12,2 - 12,75 Gc/s.

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 257-E
1 July 1971
Original : English

COMMITTEE 5
WORKING GROUP 5A
WORKING GROUP 5E

NOTE BY THE CHAIRMEN OF WORKING GROUPS 5A AND 5E

COMMUNICATION-SATELLITE AND BROADCASTING-SATELLITE SERVICES

Frequency bands between 10.7 Gc/s and 14.5 Gc/s

Following co-ordination between the Chairmen of Working Groups 5A and 5E and consultations with Delegations, the attached draft proposals are presented for examination by Working Groups 5A and 5E.

Luiz BAHIANA
Chairman
Working Group 5A

R. GALIĆ
Chairman
Working Group 5E

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

Gc/s

Region 1	Region 2	Region 3
10.7-10.95	FIXED MOBILE	
10.95-11.2	FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-earth) (Earth-to-space) 374A [405BA]	
11.2-11.45	FIXED MOBILE	
11.45-11.7	FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-earth) 374A [405BA]	

Gc/s

(cont.)

Region 1	Region 2	Region 3
11.7-11.95 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) / A /	11.7-11.95 COMMUNICATION-SATELLITE (Space-to-earth) Broadcasting-Satellite / 405BA /	
11.95-12.2 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) / A / 374A	11.95-12.2 BROADCASTING-SATELLITE Communication-Satellite / 405BA /	

/ A / In the band 11.7-12.5 GHz 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 ...) and this requirement shall be taken into account in the decisions of this Conference.

Gc/s

(cont.)

Region 1	Region 2	Region 3
12.2-12.5 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) /A/ 374A	12.2-12.5 FIXED MOBILE (except aeronautical mobile) BROADCASTING	
12.5-12.75 COMMUNICATION-SATELLITE (Space-to-earth) /B/ /C/	12.5-12.75 FIXED MOBILE (except aeronautical mobile) BROADCASTING	

/A/ In the band 11.7-12.5 GHz 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 ...) and this requirement shall be taken into account in the decisions of this Conference.

/B/ In the U.S.S.R. ... the band 12.2-12.75 Gc/s is also allocated to the fixed and mobile services.

/Note : This foot-note will be used if a majority of countries wish to have an exclusive allocation to the satellite-communication service in this band. If, however, the majority wish to retain fixed and mobile services in this band they will be included in the Table and the following foot-note will be used : "In the U.K. ... the band 12.2-12.75 Gc/s is allocated to the communication-satellite service"./

/C/ In France the band 12.7-12.75 GHz is also allocated, on a secondary basis, to the fixed and mobile services.

Gc/s

(cont.)

Region 1	Region 2	Region 3
12.75-13.25	FIXED MOBILE	
13.75-13.4	AERONAUTICAL RADIONAVIGATION 406 407	
13.4-14	RADIOLOCATION 407 408 409	
14.14.3	RADIONAVIGATION COMMUNICATION-SATELLITE (Earth-to-space) 407	
14.3-14.4	RADIONAVIGATION-SATELLITE COMMUNICATION-SATELLITE (Earth-to-space)	
14.4-14.5	FIXED MOBILE COMMUNICATION-SATELLITE (Earth-to-space)	

Ref.

CD 405BA The use of the bands [11.7-11.95 Gc/s and 11.95-12.2 Gc/s] by the broadcasting-satellite and the communication-satellite services is limited to domestic systems and is subject to agreement among administrations concerned and having services operating in accordance with the Table, which may be affected.]

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Addendum No. 1 to
Document No. 258-E
5 July 1971
Original : English

WORKING GROUP 4C

NOTE OF THE CHAIRMAN OF THE WORKING GROUP 4C

CALCULATION OF CO-ORDINATION DISTANCE

The enclosed flow-charts are to be added to Annex A contained in Document No. 238 (Draft Appendix 28, Procedure for calculating co-ordination distance).

M.A. DEL MORAL
Chairman
Working Group 4C

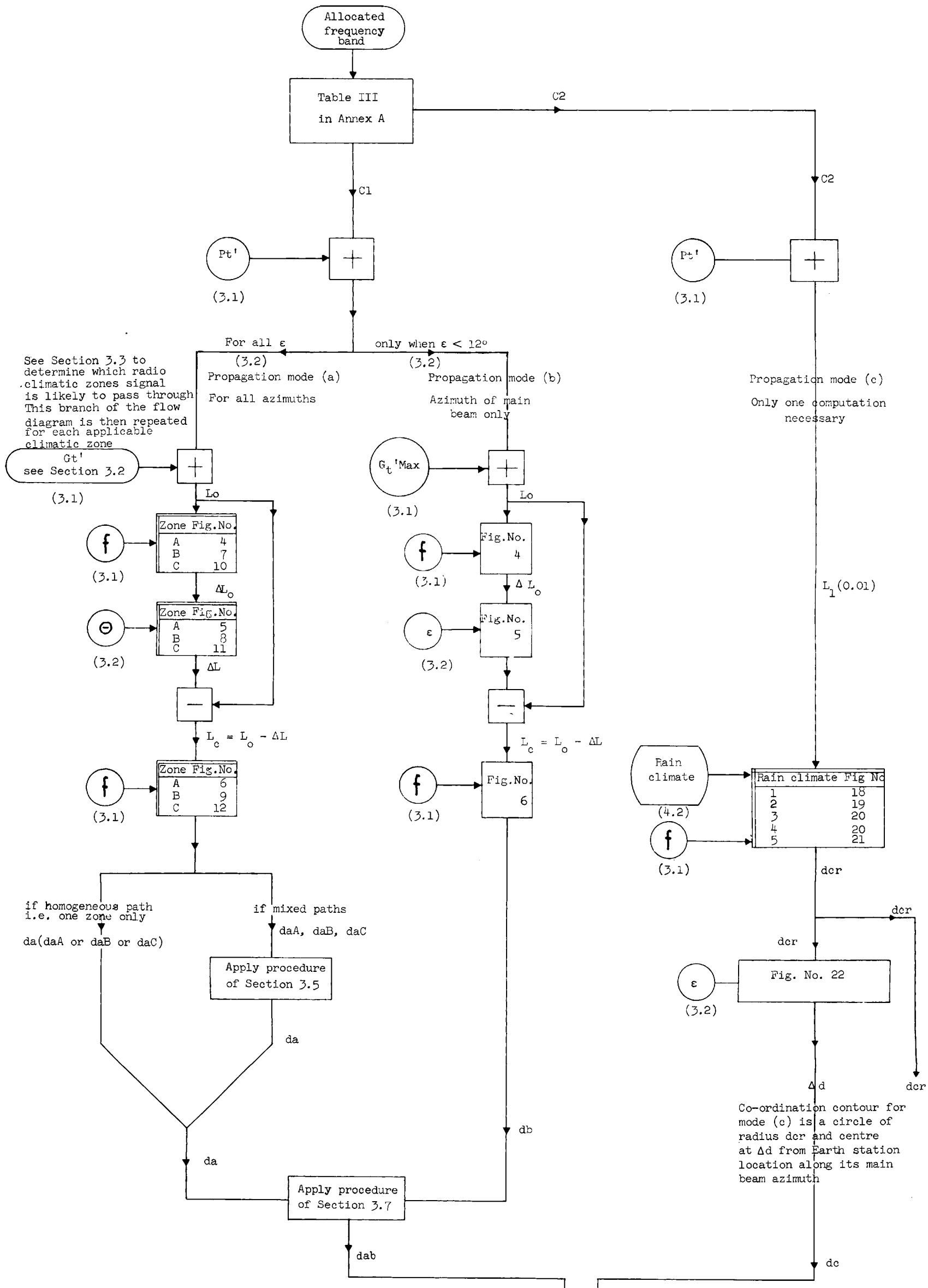
Annexes : 2 drawings

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

1. FLOW DIAGRAM TO PRODUCE CO-ORDINATION DISTANCE CONTOUR FOR EARTH STATION TRANSMITTING



Notes : 1) The number in brackets near each symbol refers to the section in Appendix 28 where the symbol is defined

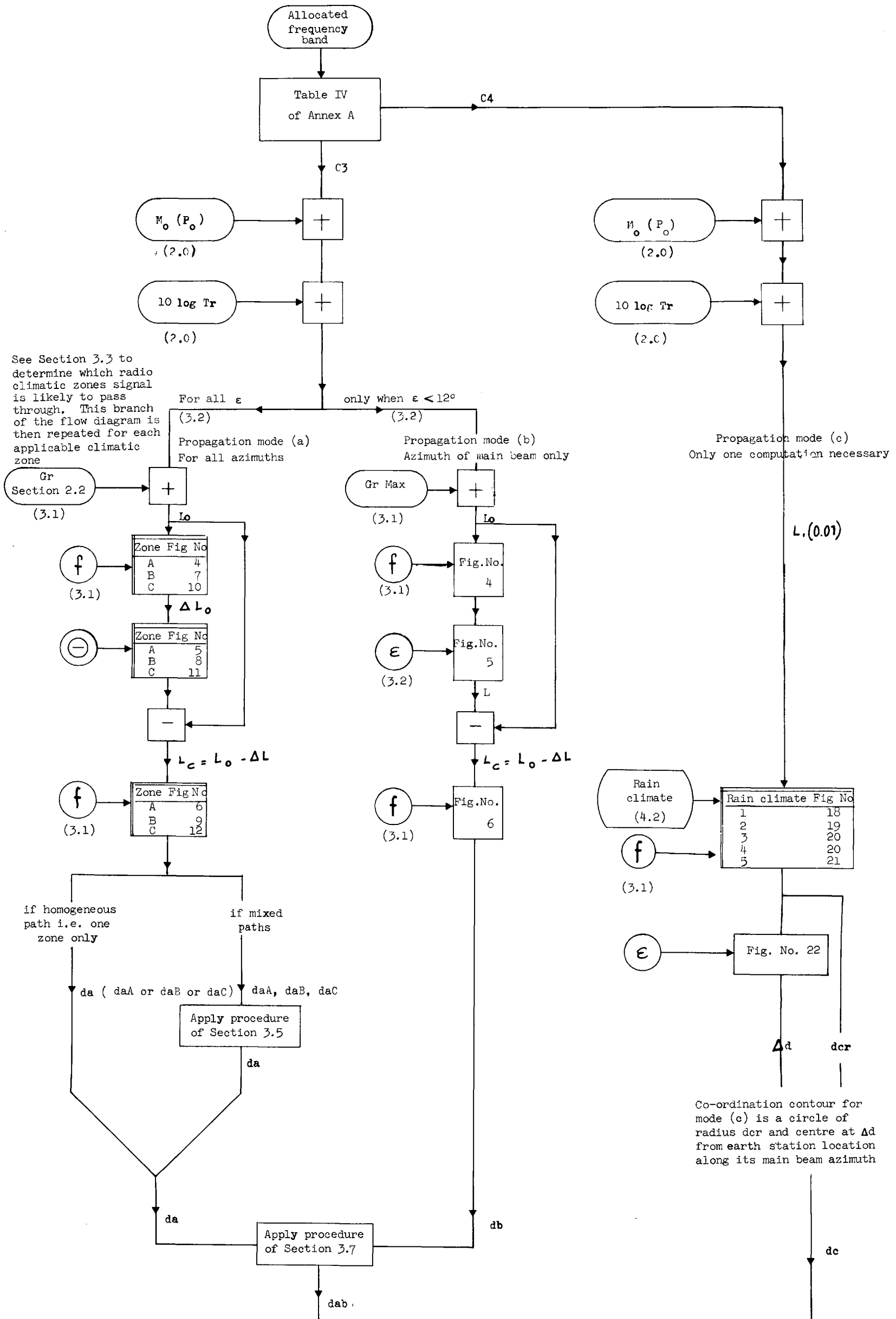
2) In practice it will be necessary to evaluate propagation mode (a) for all azimuths before evaluating propagation for mode (b)

The value of co-ordination distance 'd' plotted for each azimuth is whichever is the larger of dab and dc

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

2. FLOW DIAGRAM TO PRODUCE CO-ORDINATION DISTANCE CONTOUR FOR EARTH STATION RECEIVING



Notes : 1) The number given in brackets near each symbol refers to the section in Appendix 28 where the symbol is defined

2) In practice it will be necessary to evaluate propagation for mode (a) in all azimuths before evaluating propagation for mode (b)

SPACE CONFERENCE

Document No. 258-E
1 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

WORKING GROUP 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

1. Objectives

The co-ordination distance is the distance from an earth station within which a terrestrial station sharing the same frequency band may cause or be subject to more than a permissible level of interference.

Co-ordination distances are calculated in all azimuthal directions from the earth station, and drawn to scale on an appropriate map. The line joining the points defined by the ranges of the respective co-ordination distances from the earth station defines the co-ordination contour. The co-ordination contour encloses the co-ordination area around an earth station.

It must be emphasized that the presence or installation of terrestrial stations within the co-ordination area of an earth station in no way precludes the successful operation of either the earth station or the terrestrial stations, 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).

A co-ordination contour must be drawn for each frequency [band] which the earth station proposes to share with terrestrial stations.

ARCHIVES U.I.T. GENÈVE

The procedure given in this Appendix for calculating co-ordination distance is fairly complex. For this reason it is considered useful to present the procedure in a simplified manner, which will assist a user in following the necessary steps to produce co-ordination contours. The simplified presentation is given in Annex A to this Appendix.

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 recourse to more precise calculations being necessary) 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. Maximum permissible values of interference

The maximum permissible interference power (in dbW) in the reference bandwidth not to be exceeded for more than p percent of the time at the receiver input of an interfered-with station, from each source of interference.

$$P_r(p) = 10 \log_{10} (kT_rB) + J + M(p) - W \qquad (1)$$

where

$$M(p) = M(p_o/n) = M_o(p_o) \qquad (1a)$$

with

k = Boltzmann's constant ($1.38 \cdot 10^{-23}$ joule per °K);

T_r = thermal noise temperature of the receiving system (°K);

B = reference bandwidth (in Hz) (bandwidth over which the interference power can be averaged);

J [1] = ratio (in db) of the maximum permissible interfering power to the thermal noise power in the receiving system, long term (for 20% of the time);

p_o = percentage of the time during which the interference from all sources may exceed the permissible maximum value;

n = number of expected entries of interference, assumed to be uncorrelated;

p = percentage of the time during which the interference from one source may exceed the permissible maximum value; since the entries are not likely to occur simultaneously : $p = p_o/n$;

$M_o(p_o)$ [2] = ratio (in db) between the maximum permissible interference power during p_o% and 20% of the time respectively, for all entries of interference;

$M(p)$ = ratio (in db) between the maximum permissible interference power during p % of the time for one entry of interference, and during 20% of the time for all entries of interference, respectively;

W [3] = equivalence factor (in db) relating the effect of interference to that of thermal noise of equal power in the reference bandwidth.

Tables I and II list values for the above parameters.

1), 2), 3) see following 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 pWp (C.C.I.R. Recommendation 357-1) and the mean thermal noise power in a single hop is 25 pWp. 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 communication-satellite system, the total allowable interference power is also 1 000 pWp (C.C.I.R. Recommendation 356-2), but the thermal noise contribution of the [down-link] is not likely to exceed 7 000 pWp; hence J ≥ -8.5 db. In digital systems it may be necessary to protect each communication [link] 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 and the short term (p_o%) allowable interference powers. For analogue radio-relay and communication-satellite systems in bands between 1 and 15 GHz, this is the ratio (in db) between 50 000 and 1 000 pWp (17 db). In the case of digital systems, $M_o(p_o)$ may tentatively be set equal to the fading margin which depends 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 an 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 :

$$W = 10 \log_{10} \frac{\text{Interfering power in the receiving system after demodulation}}{\text{Thermal noise power in the receiving system after demodulation}} \times \frac{\text{Thermal noise power at the receiver input in the reference bandwidth}}{\text{Interfering power at the radio frequency in the reference bandwidth}}$$

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 character 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 co-ordination distance associated with propagation by rain scatter 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 :

$$L_o\ (0.01\%) = P_t' + G_t' + G_r - P_r(p) - F(p) - 20 \log (f/4) \qquad (2)$$

where

P_t' *) = 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; in the case of a terrestrial station, the maximum antenna gain is to be used. When G_t' is the main beam gain it is denoted G_t'max. (In the case of terrestrial stations, see Table Ia)

*) Primes refer to the parameters associated with the interfering station.

G_r = gain (in db relative to isotropic) of the receiving antenna of the interfered-with station. If the interfered-with 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 Ia.)

F(p) = correction factor in db to relate the effective percentage of the time p to 0.01%, 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 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 not exceeded for more than 10% of the time, whichever is the greater.

---

*) 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).

3.2 Antenna gain at the earth station horizon for stationary 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 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 synchronous altitude 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 θ (α) is added to the plot of Figure 3, , which shows 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 α_o (=210°) with a horizon elevation θ = 4°.

If this is done for all azimuths (in suitable increments, e.g., 5°), a relationship φ (α) results. The relationship φ (α) may be used to derive a function for the horizon antenna gain, G (α), 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 (D/λ) exceeds 100, the following equation should be used :

$$G(\varphi) = 32 - 25 \log_{10} \varphi \text{ (db)} \qquad (1° \leq \varphi \leq 48°)$$

$$= -10 \text{ db} \qquad (48° < \varphi \leq 180°)$$

The application of the 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 acute angle between the main beam of the earth station antenna and a 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

For convenience of use 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 1 000 m, whichever is the lesser distance.

- Zone B : sea, at latitudes greater than 23.5° (North or South) and including the coastal strip defined above wherever land borders on sea at latitudes greater than 23.5°, excluding the Mediterranean and the Black Seas.

- Zone C : sea, at latitudes smaller than 23.5° (North or South) and including the coastal strip defined above wherever land borders on sea at latitudes smaller than 23.5°, including the Mediterranean and the Black Seas.

3.4 Procedure for the determination of co-ordination distance, propagation mode (a)

To obtain the co-ordination distance for Zone A it is necessary to subtract from $L_o(0.01\%)$ a correction ΔL which accounts for the difference in basic transmission loss over paths that have different horizon elevation angles at the earth station. ΔL is computed in two steps. First a correction ΔL_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_o 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 :

$$L_c = L_o(0.01\%) - \Delta L \qquad (3)$$

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 daA, daB and daC for Zones A, B and C respectively.

3.5 Coordination distance for mixed paths

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 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_c in any zone (which would, of course, not be the case if the horizon elevation angle were greater than 0.2 degrees). The procedure is as follows :

i) Determine the distance entirely in Zone A that would give the coordination loss. Mark this distance (in this case it is 380 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 coordination loss. Mark this distance (in this case it is 650 km) from the origin along the ordinate axis of the chart as indicated by the point B;

iii) draw a straight line between the two points 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 A_1;

v) 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 B_1 to the point of intersection of the mixed path curve as indicated by X. This distance is found to be 80 km;

vii) the coordination distance is the sum of the distances OA_1, A_1B_1 and B_1X and is equal to 75 + 375 + 80 = 530 km.

The distance B_1X can also be found numerically from the total distance in Zones A, $OA_1 + B_1X$, given by

$$OA_1 + B_1X = OA \left(1 - \frac{A_1B_1}{OB}\right) ;$$

from where :

$$B_1X = OA \left(1 - \frac{A_1B_1}{OB}\right) - OA_1 .$$

Hence,

$$B_1X = 380 \left(1 - \frac{375}{650}\right) - 75 = 86 \text{ km.}$$

Three Zones

In some special cases the mixed path involves all three radio-climatic 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 coordination loss (L_c) of 200 db. It is required to find the coordination distance from the earth station in the given direction. Here an earth station is situated in Zone A at a distance of 75 km in a given azimuthal direction from Zone 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 coordination loss. Mark this distance (in this case it is 1 270 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 290 km.

vi) The coordination distance is then the sum of the distances $OA_1 + A_1B_1 + DX$ and in this example is equal to $75 + 375 + 290 = 740$ km.

The distance DX can also be found numerically from the formula :

$$DX = OC \left(1 - \frac{OA_1}{OA} - \frac{A_1B_1}{OB}\right)$$

Hence,

$$DX = 1\,270 \left(1 - \frac{75}{300} - \frac{375}{650}\right) = 287 \text{ km}$$

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 co-ordination distance propagation mode (b)

If the main beam of the earth station antenna is elevated less than 12° for long periods of time, as 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 is used instead of the horizon angle, 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 irrespectively of the actual Zone involved.

This procedure yields a distance for propagation mode (b) to be labelled db.

When considering moving 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 mode (a) and mode (b) propagation

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 mechanism :

i) Draw two straight lines from the earth station at azimuthal angles of $\pm 5°$ 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 $\pm 5°$ relative to the azimuthal direction of the main beam;

iv) outside the preceding sector $\pm 5°$ the co-ordination contour for the great circle propagation mechanism is the one obtained for propagation mode (a).

The distances obtained after application of the procedures set forth in Sections 3.4 to 3.7 are, for reference purposes, to be labelled d_{ab}.

4. Determination of co-ordination distance for scattering from hydrometeors ("rain scatter", Propagation Mode c.)

The determination of co-ordination distance for the rain scatter propagation mechanism 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 :

$$L_1\ (0.01\%) = P_t' + \Delta G - P_r(p) - F_1(p,f)\ \text{db} \qquad (4)$$

where :

ΔG = difference (in db) between the maximum gain of terrestrial station antennae in the frequency band under investigation (see Table I a) and the value of 42 db;

$F_1(p,f)$ = correction factor (in db) to relate the effective percentage of the time to 0.01%, in the frequency band under consideration; Figure 16.

All other parameters have been defined in Section 2. For terrestrial stations, values of P_t' 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 co-ordination distance (rain scatter) for rain-climate 1, the normalized transmission loss obtained by solving

equation (4), used with the appropriate frequency in Figure 18, yields the rain scatter distance, d_{cr}.

Figures 19 to 21 show corresponding curves for rain-climates 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.

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; around the point so reached is drawn a circle of radius d_{cr}. This circle is the rain scatter contour.

The rain scatter co-ordination distance, to be labelled d_c, 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 calculations of the co-ordination distances for any mode of propagation, 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 for the propagation mode under consideration shall be 100 km.

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.

7. Parameters for calculation

The values of parameters necessary for the determination of the co-ordination contour are given in Tables I and Ia 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 Tables I and II, may be justified. Attention is drawn to the fact that for specific systems the bandwidths B or the percentage of the time p and p_o, given in Table II, may have to be changed, in order to protect the desired signals received at the earth station.

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 also given in Tables I and Ia, and in Table II, respectively.

TABLE I

Parameters required for the determination of co-ordination distance for a transmitting earth station

Type of Terrestrial Station		Line-of-sight Radio-Relay Station				Transhorizon Radio-Relay Station (TH)	
Frequency (GHz)		1-10	10-15		15-40	1-10	
Type of modulating signal of terrestrial station		A	A		N	A	
Interference parameters and criteria	p_o(%)	0.01	0.01		0.003	0.01	
	n	2	2		1	1	
	p (%)	0.005	0.005		0.003	0.01	
	J (dB)	16	16		0	9	
	($M_o(p_o)$) (dB)	17	17		30	17	
	W (dB)	0	0		0	0	
Terrestrial station parameters	B (Hz)	4.10^3	4.10^3		10^6	4.10^3	
	G_r (dB)	45 (1)	50 (1)		50 (1)	52 (1)	
	T_r (°K)	750	1500		3200	500	
S (dBW)		176	178		153.5	191	
$P_r(p)$ in (dbW B)		-131	-128		-103.5	-139	

TABLE IA

Terrestrial station maximum antenna gain and sensitivity factor

Allocated frequency bands GHz	2	4	6	7-8	10-15	TH 2
G (2) (db)	37	42	45	47	50	52
S (dbW)	168	173	176	178	153.5	191
$P_r(p)$ (dbW in B)	-131	-131	-131	-131	-103	-139

(1) This value is frequency dependent. Use values from Table 1A above for specific allocated frequency bands.

(2) Feeder losses are not included in these values.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

TABLE II

Parameters required for the determination of co-ordination distance for a receiving earth station

Type of earth station		Communication satellite					Space research: Near-earth	Space research: Deep space and manned	Earth re-sources	MET-SAT	Tele-metry and Com-mand (1)	Broad-cast-ing
Frequency (GHz)		1-10		10-15		15-40	1-10	1-10	3-9	1-15		
Type of modulating signal	Earth station	A	N	A	N	N	—	—	—	—		
	Terrestrial station	A	A	A	A	N	A	A	A	A		
Interference parameters and criteria	p_o (%)	0.03	0.03	0.03	0.003	0.003	0.1	0.001	0.2			
	n	3	3	2	1	1	2	1	2			
	p (%)	0.01	0.01	0.015	0.003	0.003	0.05	0.001	0.1			
	J (dB)	- 8	0	- 8	0	0	—		—			
	M_o (p_o) (dB)	17	5(2)	17	5(2)	5(2)	—	—	—			
	W (dB)	4	0	4	0	0	—	—	—			
Terrestrial station: E (dBW) in B	Line-of-sight	55	55	55	55	35(3)	25(4)	25(4)	55			
	Transhorizon	91.5	91.5	—	—	—	61.5(4)	61.5(4)	—			
Terrestrial station: P_t dBW in B	Line-of-sight	13	13	10	10	5	-17(4)	-17(4)	13			
	Transhorizon	40	40				10(4)	10(4)	-			
Station subject to interference	B (Hz)	10^6	10^6	10^6	10^6	10	1	1	10^6			
P_r (p) (dBW)		—	—	—	—	—	−220	−220	−153			

A = Analogue
N = Digital

(1) Parameters associated with these services may vary over a rather wide range. Further study is required before representative values become available.
(2) See note (2) in section 2. $M_p(p_o)$ may assume values between 5 and 40 dB, depending on frequency, rain-climate and system design.
(3) This is based on 55 dBW per emission and an r.f. bandwidth not less than 100 MHz.
(4) These values are estimates for 1 Hz bandwidth and lie 30 dB below total power assumed per emission.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

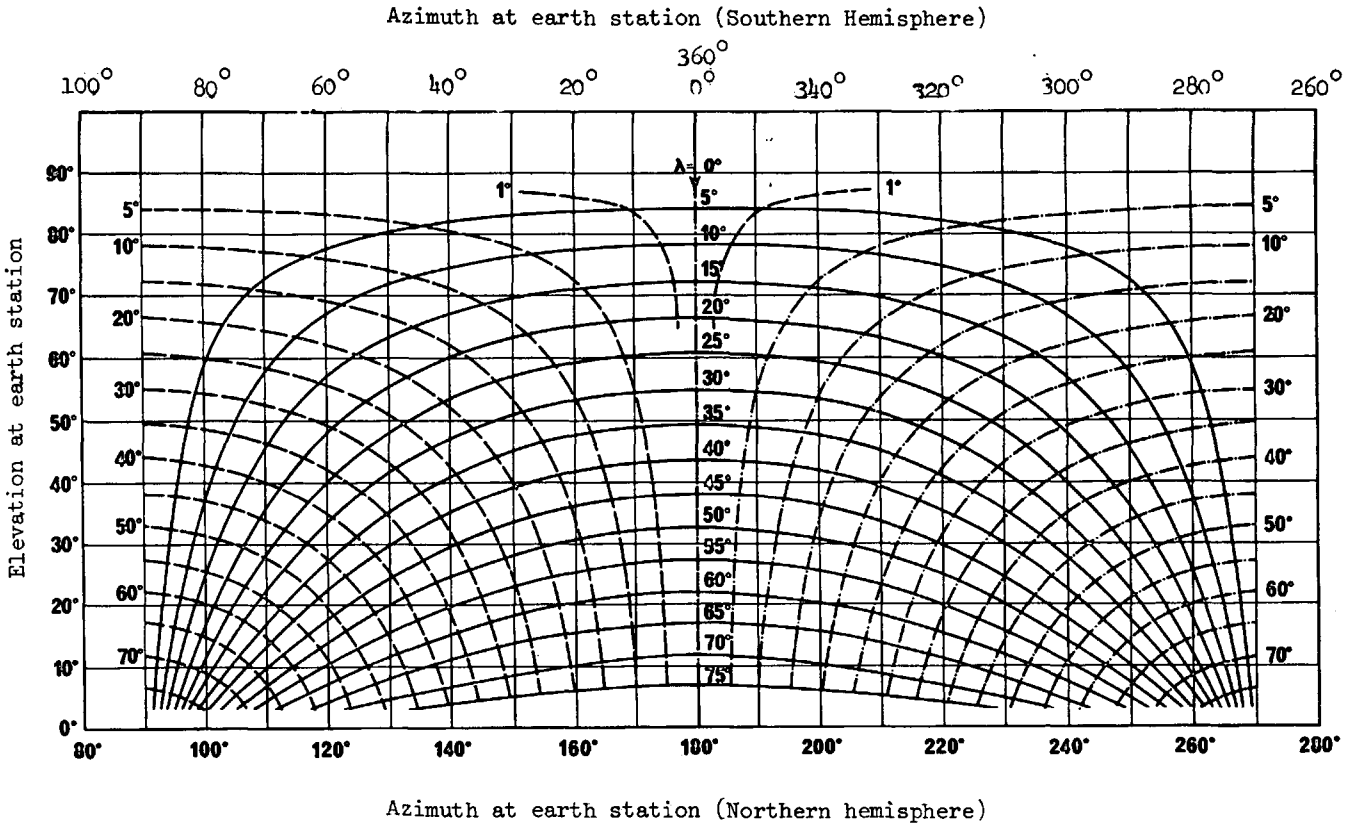


FIGURE 1

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 O relative to the earth station.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

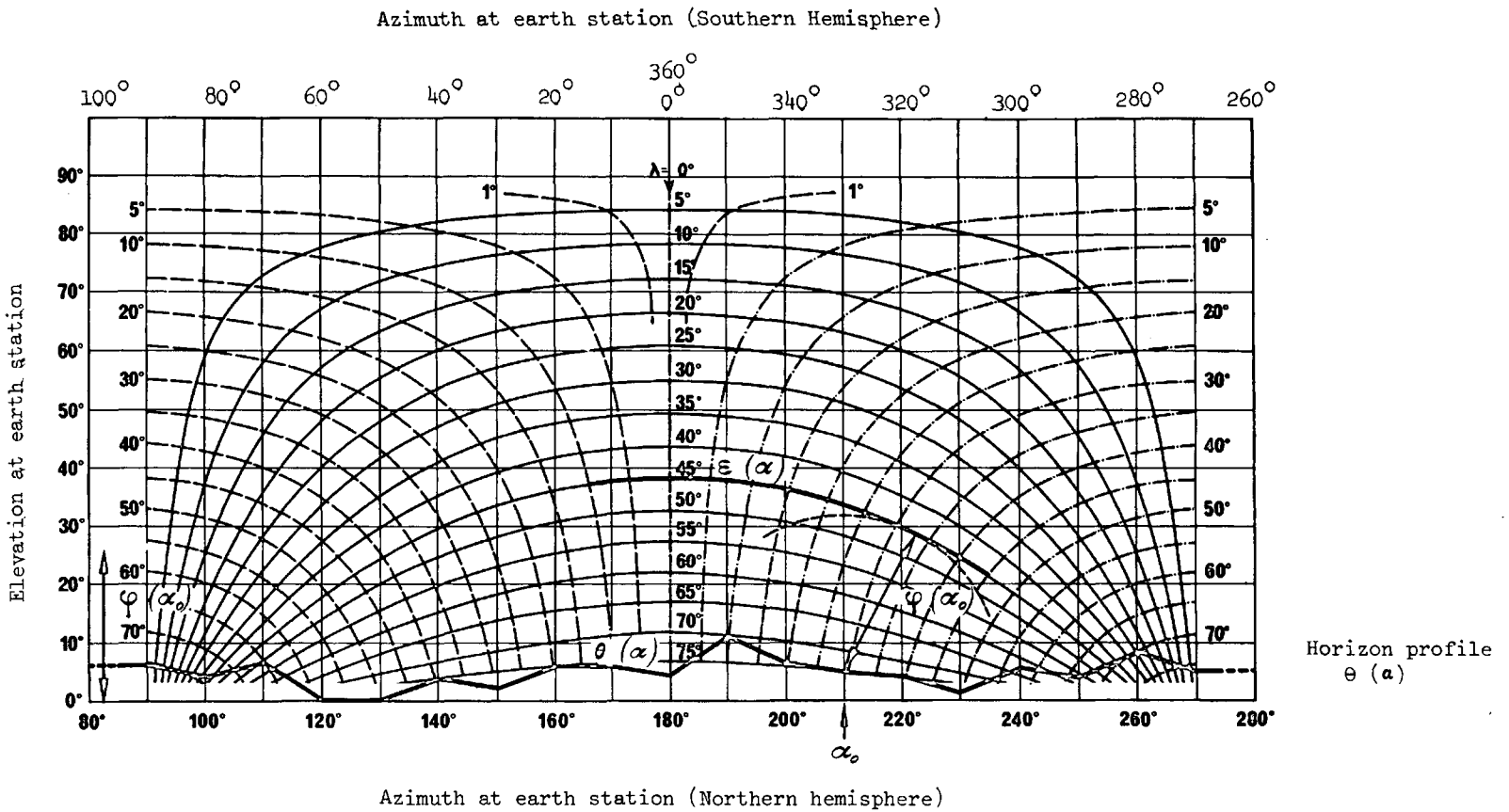


FIGURE 2

Example of derivation of ϕ

——— 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 O relative to the earth station.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

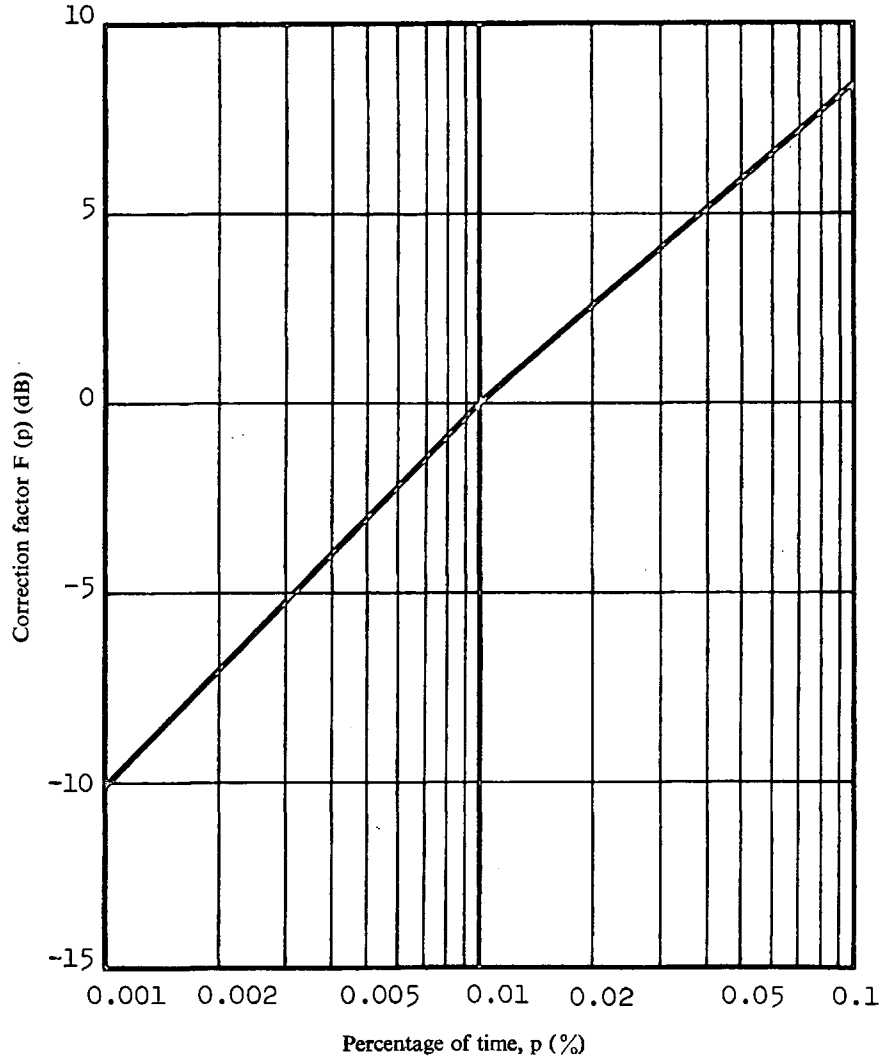


FIGURE 3

Correction factor F (p) for percentages of the time p other than 0.01 %

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

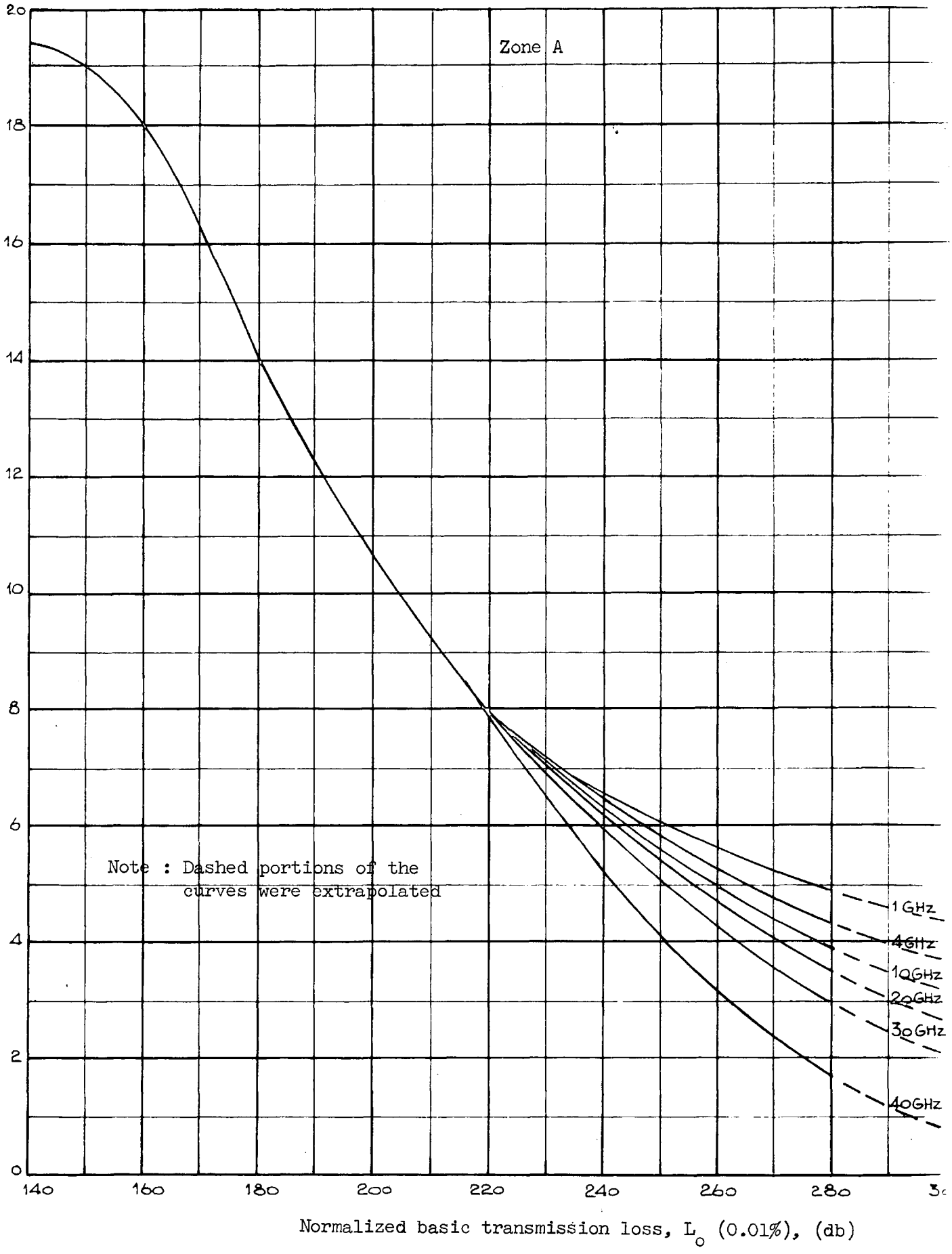


Figure 4 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone A

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

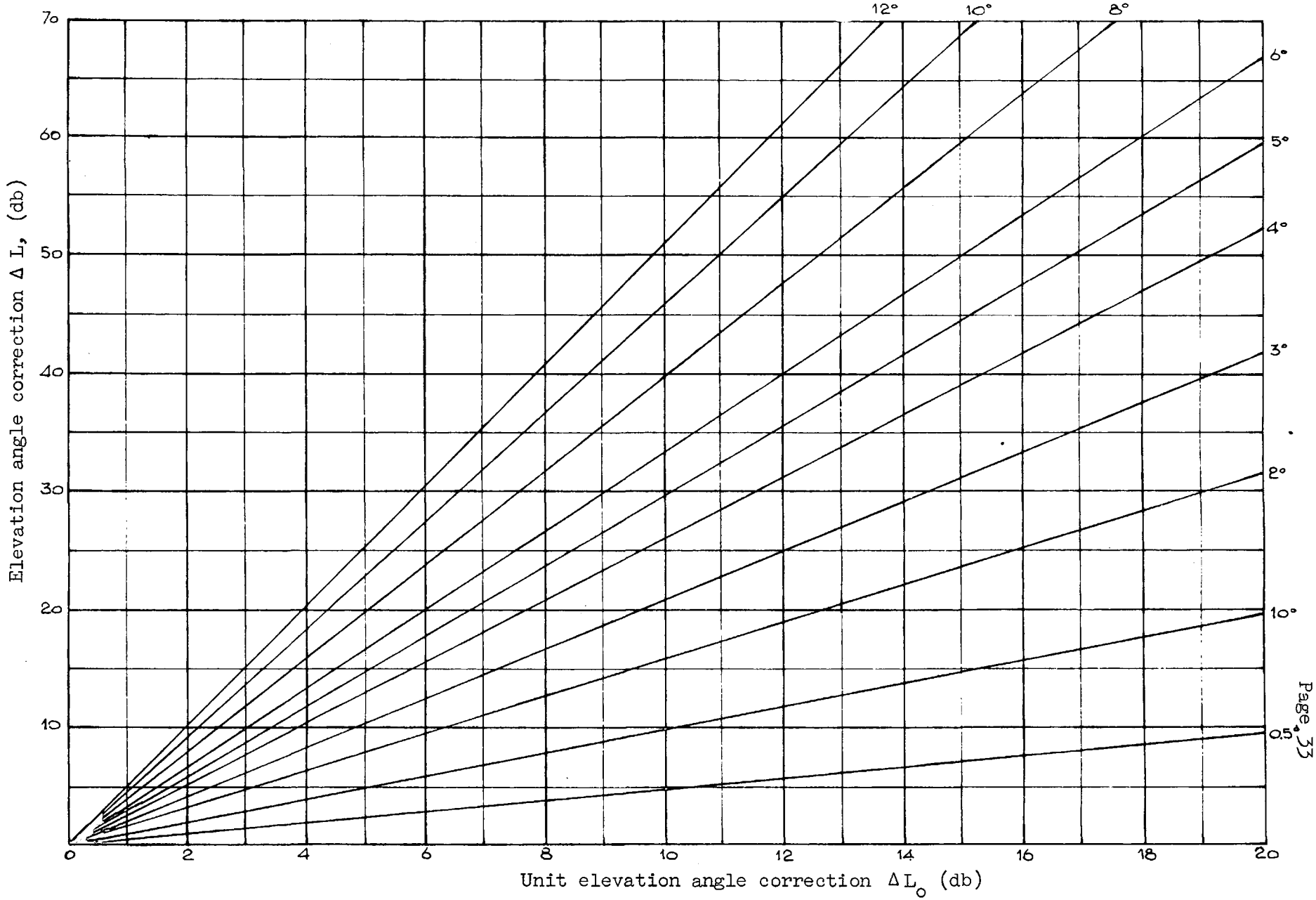


Figure 5 - Elevation angle correction, Zone A

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

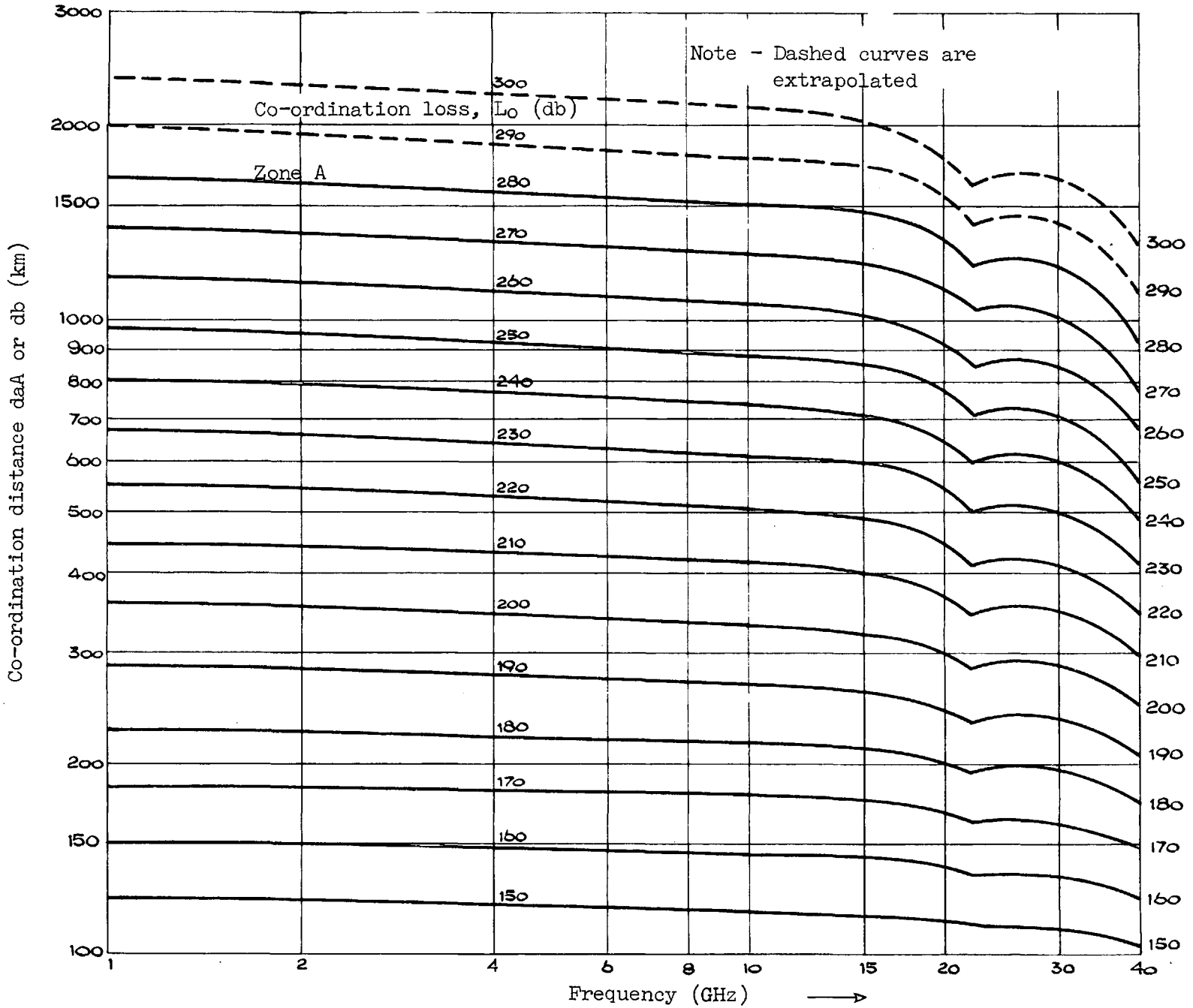


Figure 6 - Co-ordination distance daA or db as a function of frequency and co-ordination loss, Zone A

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

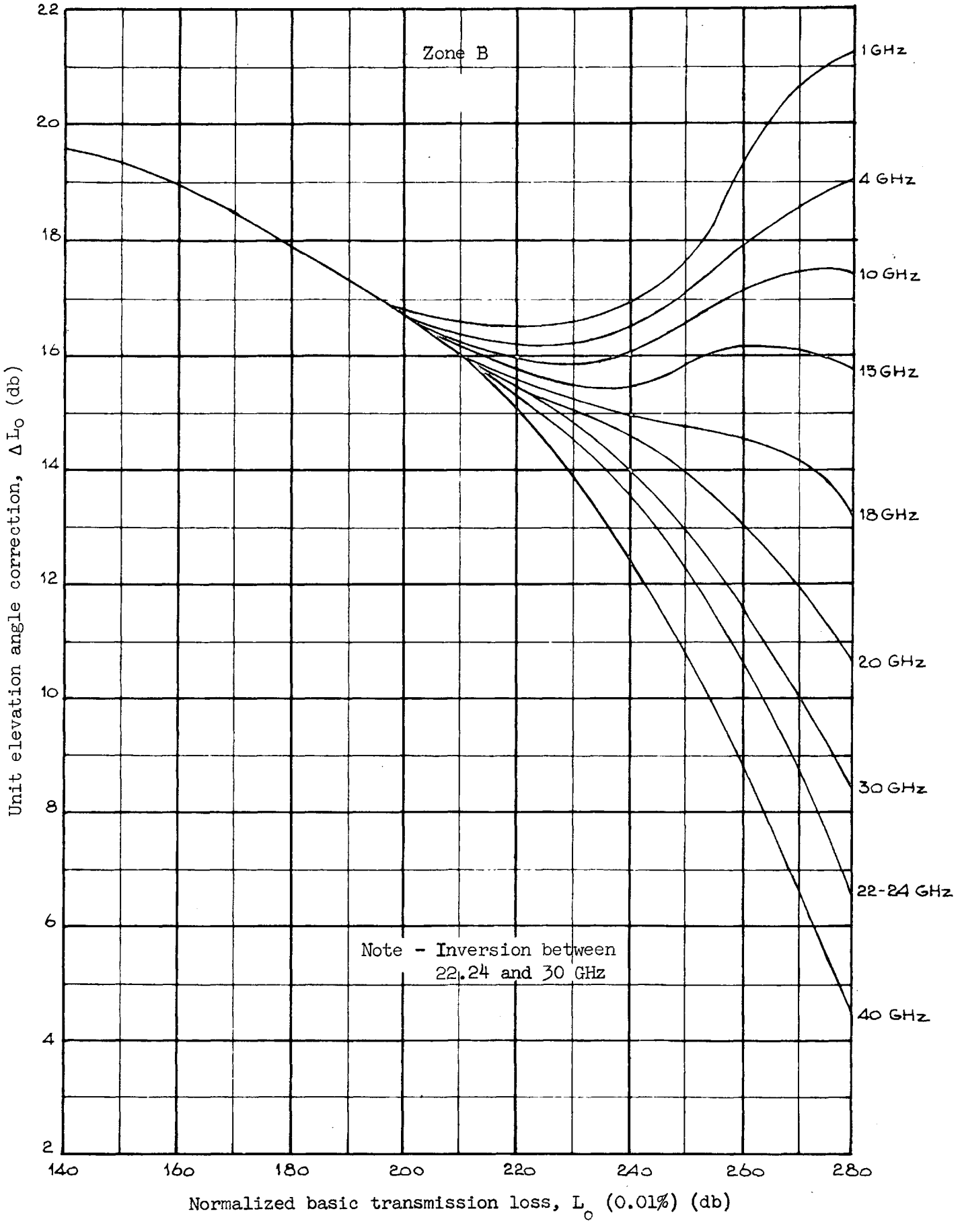


Figure 7 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone B

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

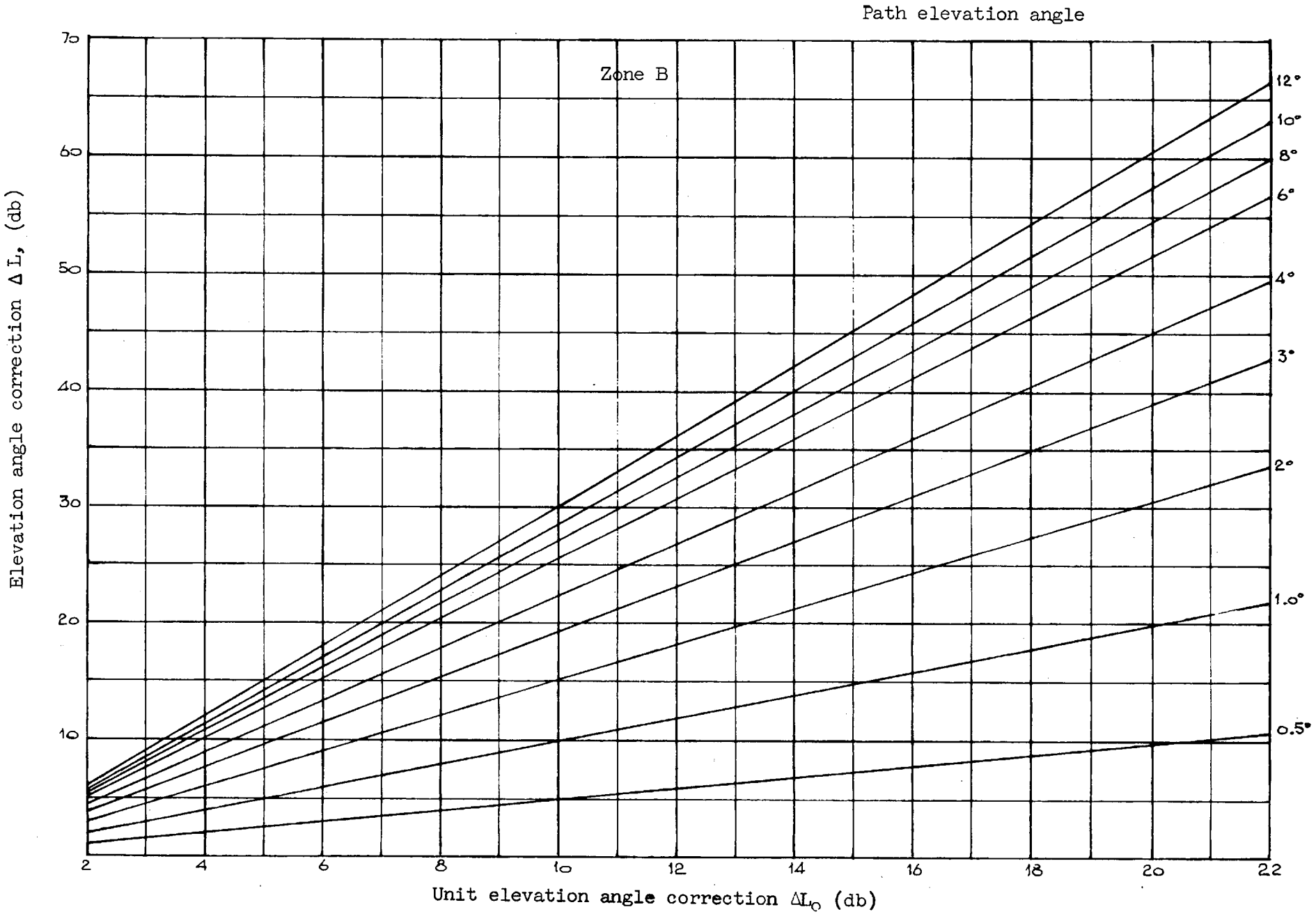


Figure 8 - Elevation angle correction, Zone B

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

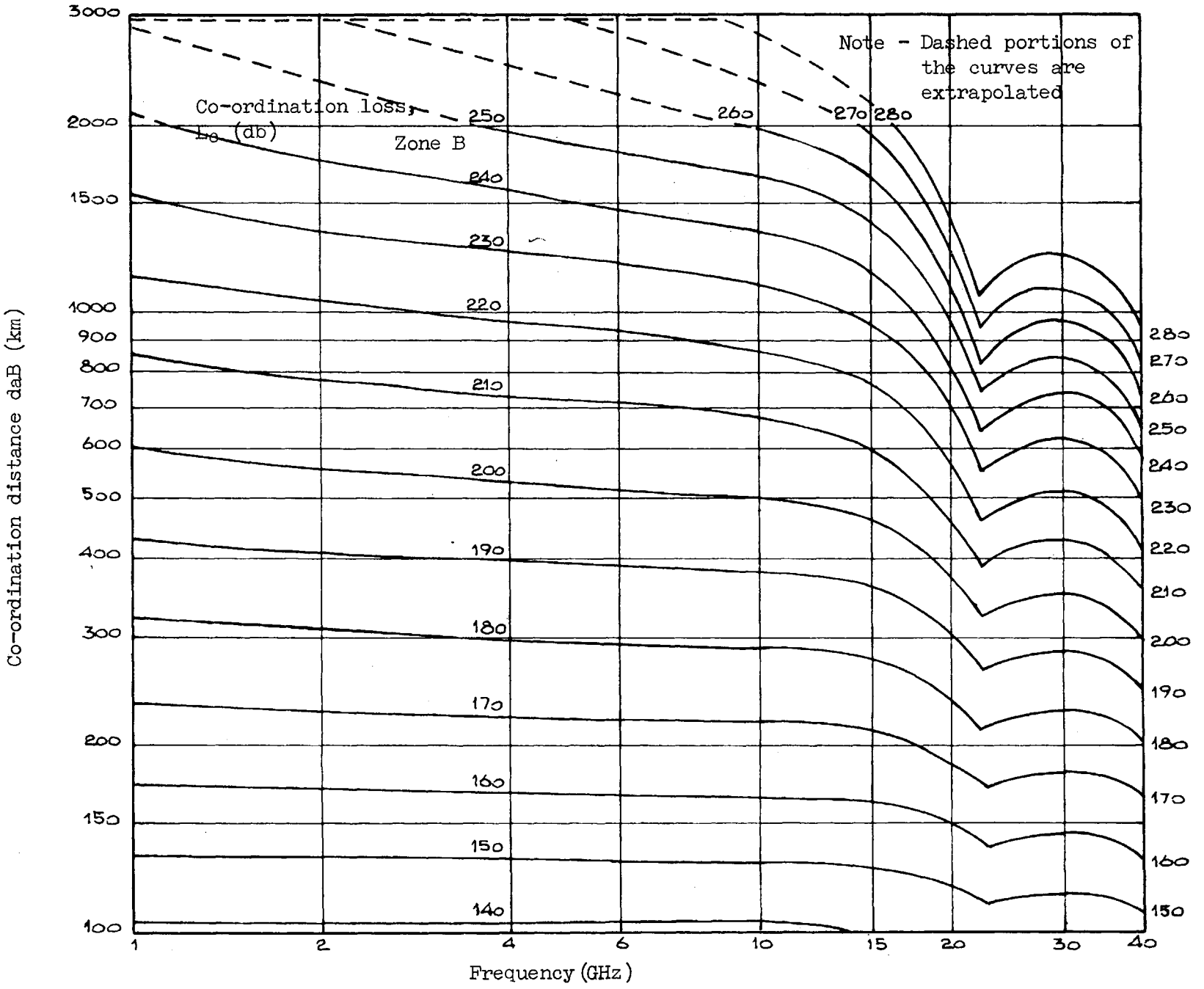


Figure 9 - Co-ordination distance daB as a function of frequency and co-ordination loss, Zone B

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

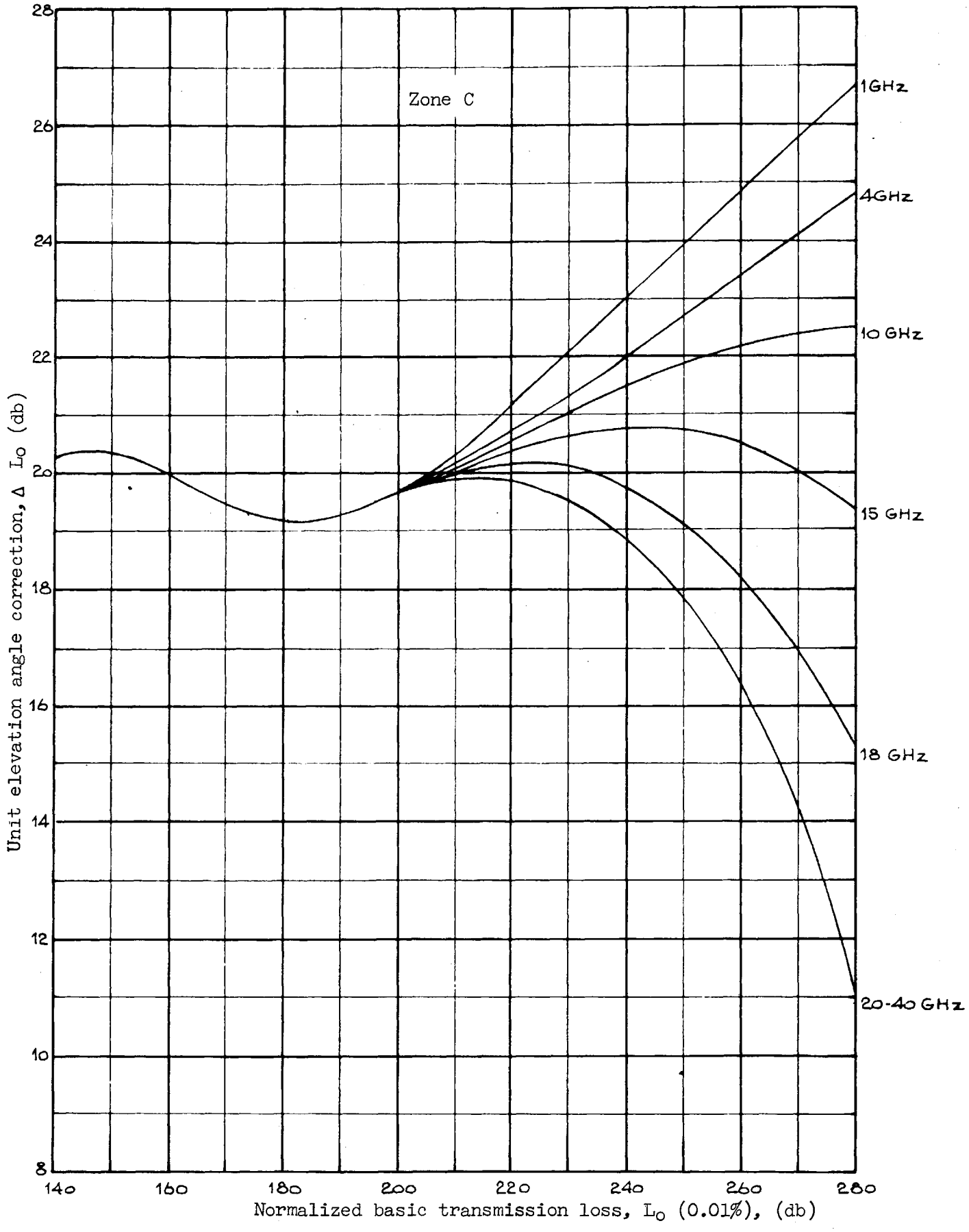


Figure 10 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone C

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

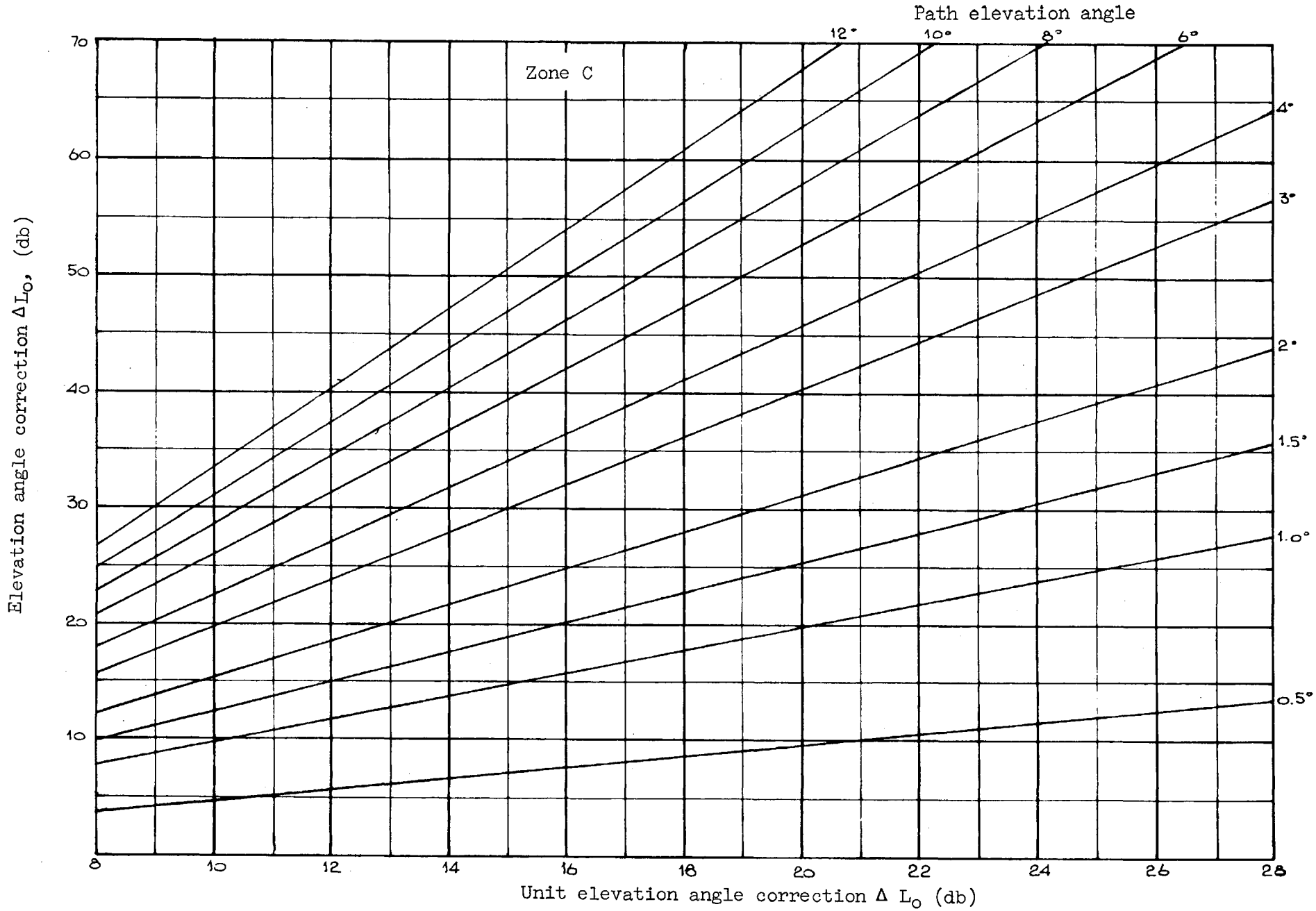


Figure 11 - elevation angle correction, Zone C

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

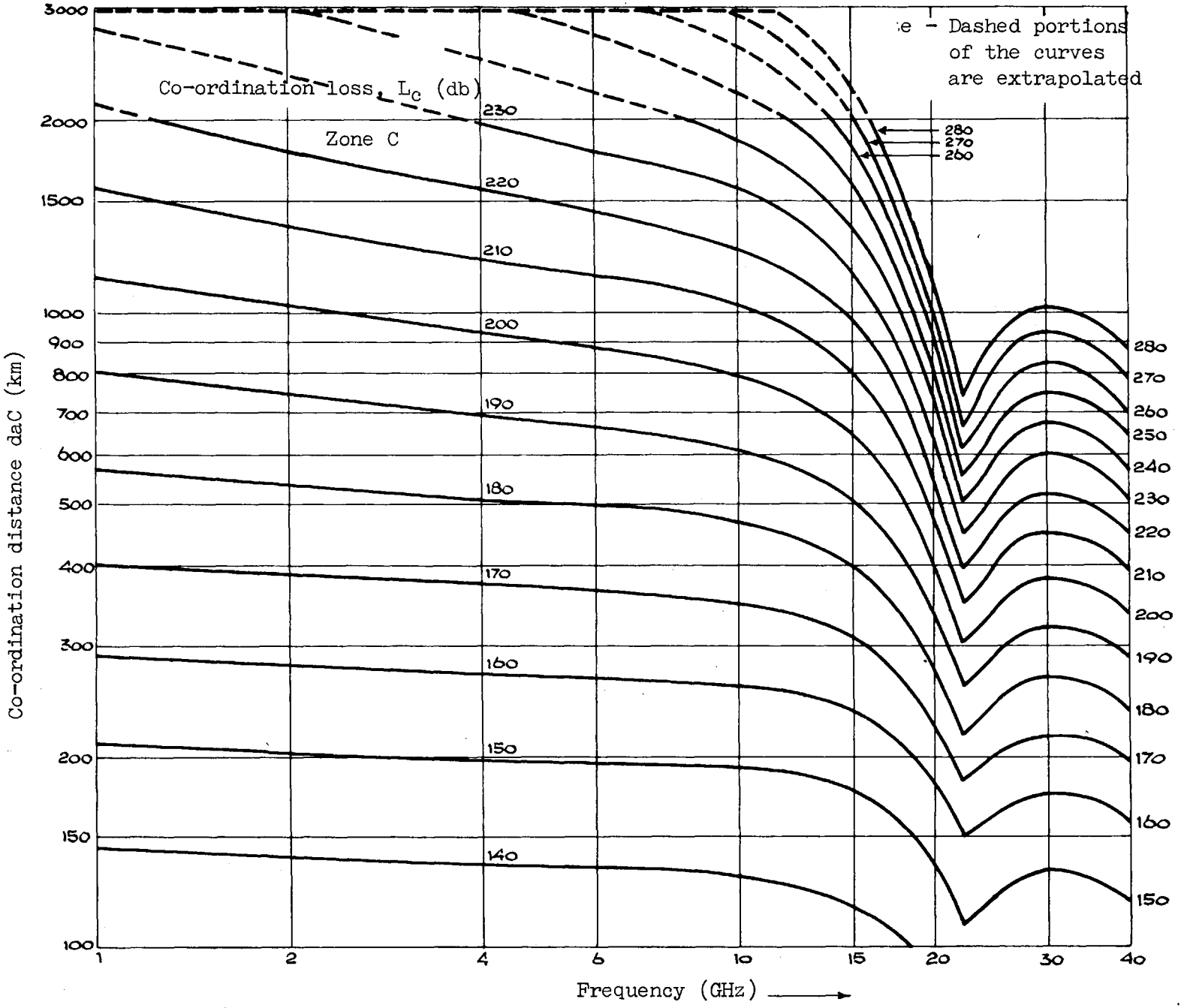


Figure 12 - Co-ordination distance daC as a function of frequency and co-ordination loss, Zone C

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

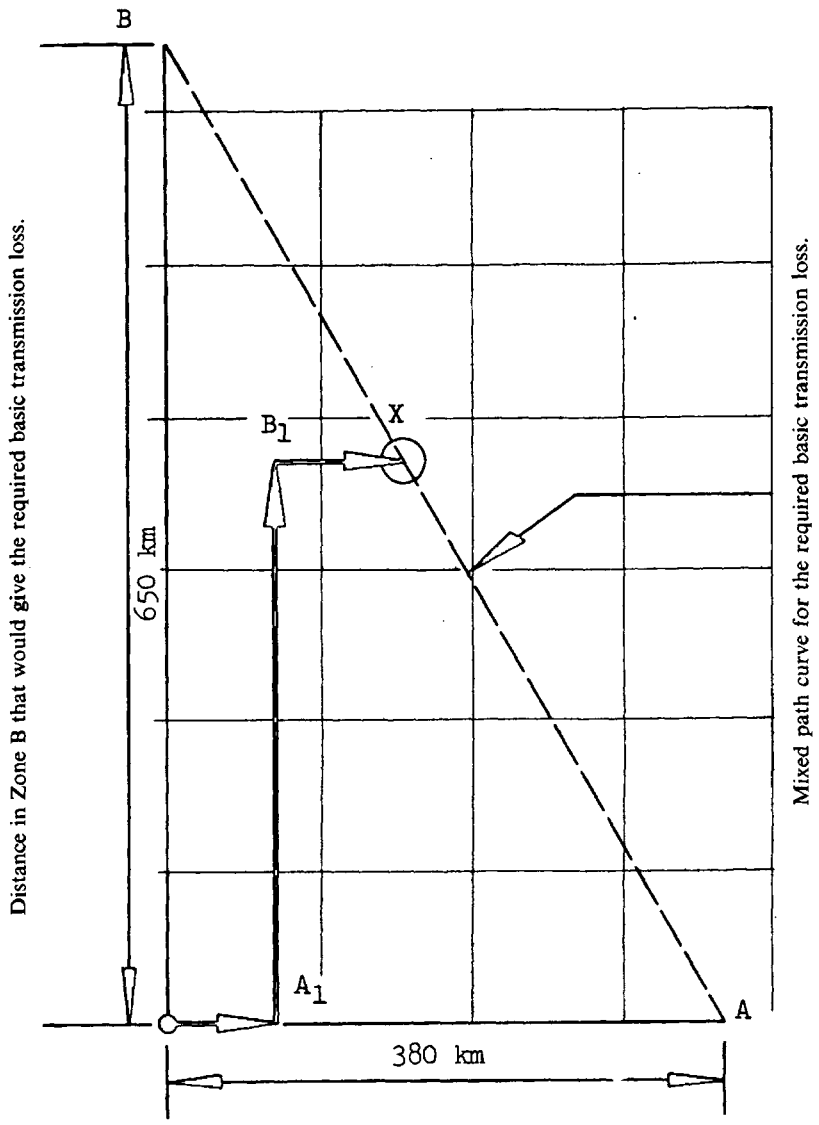


FIGURE 13 a

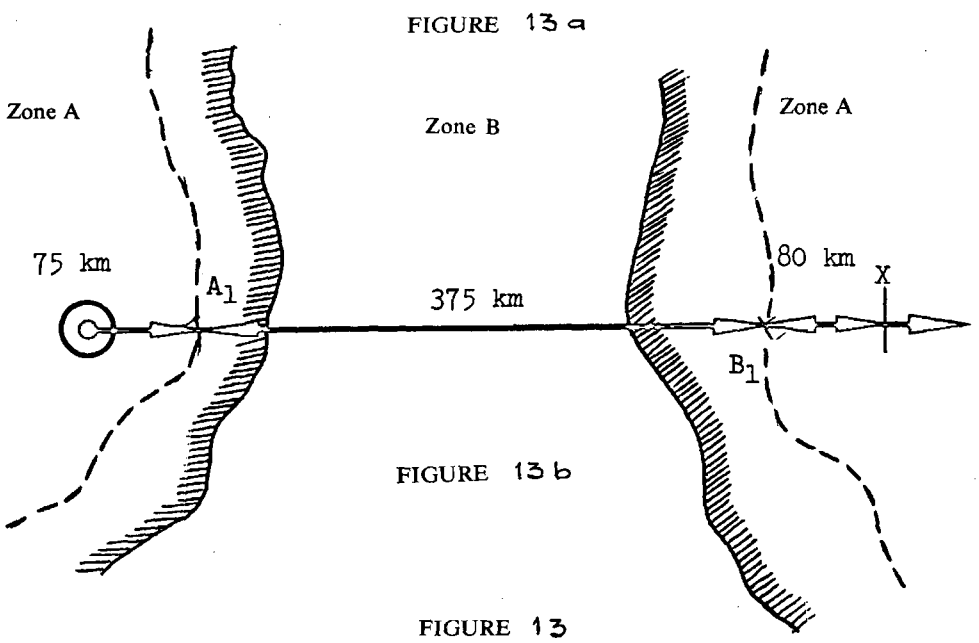


FIGURE 13 b

FIGURE 13

Example of coordination distance calculation for a mixed path

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

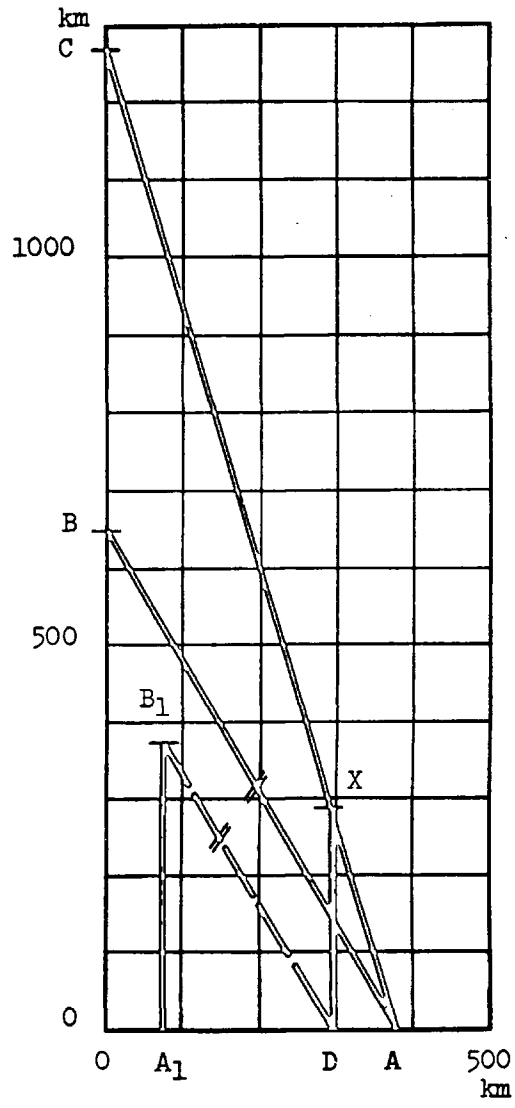


FIGURE 14 b

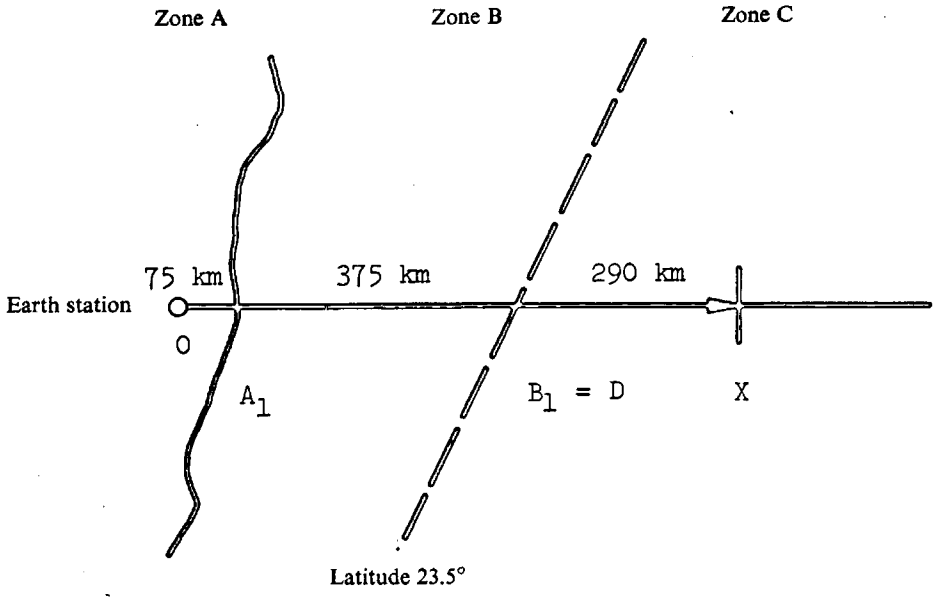


FIGURE 14 a

FIGURE 14

Example of determination of coordination distance for mixed paths involving Zones A, B and C

ARCHIVES
U.I.T.
GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

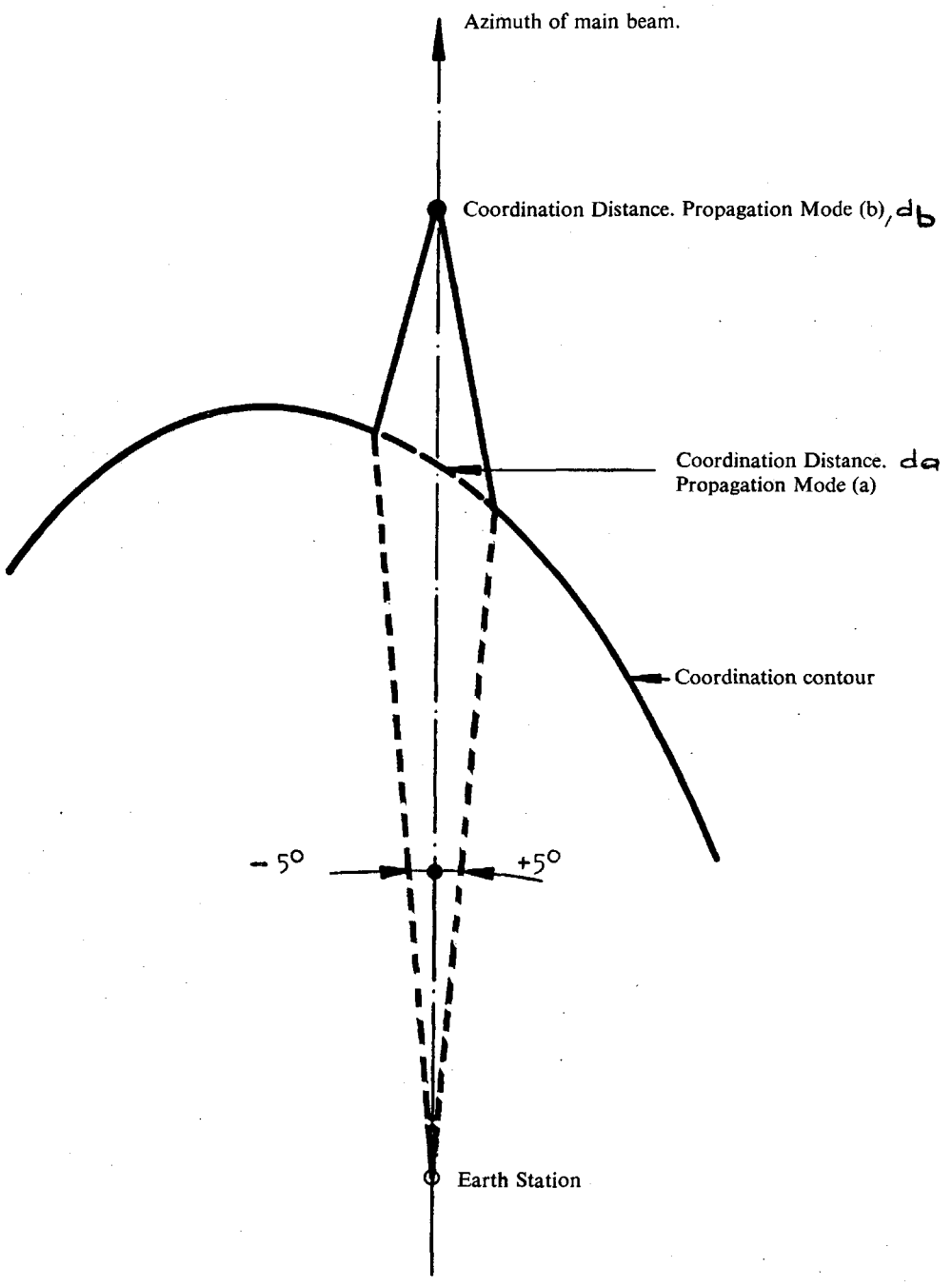
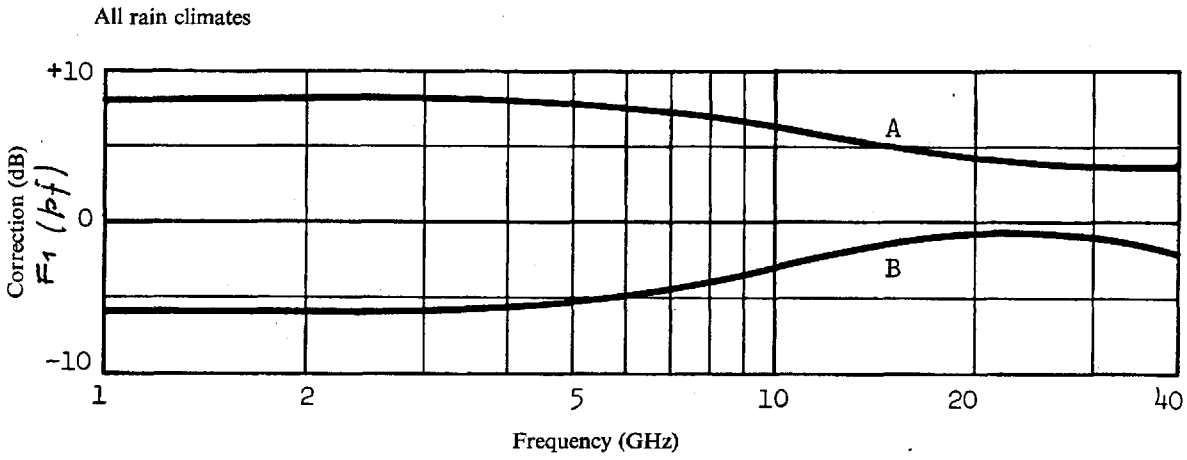


FIGURE 15

Example of the determination of the coordination distance in the case where the elevation of the earth station main beam is less than 12°

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT



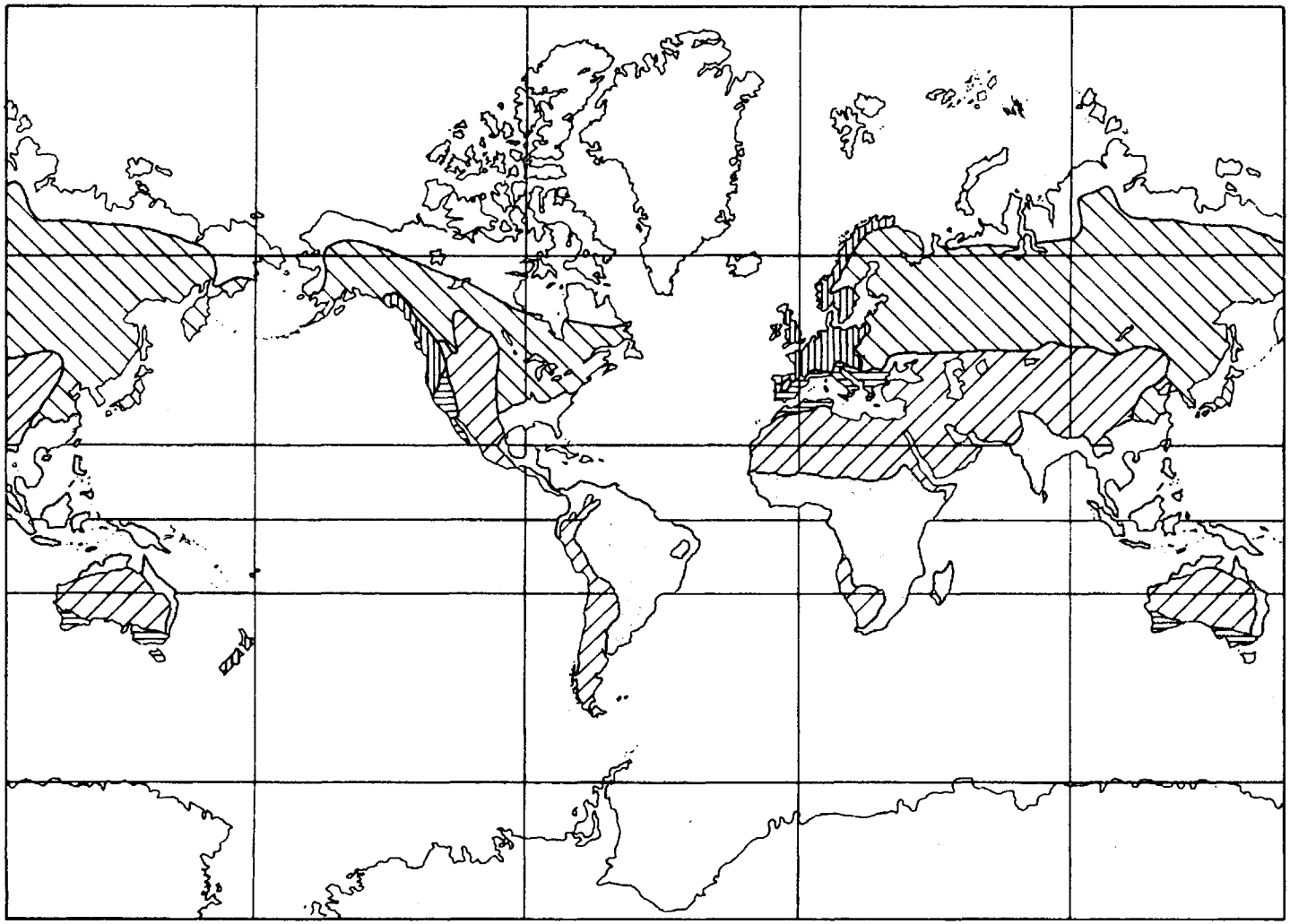
A: Correction for 0.1% of the time
B: Correction for 0.001% of the time

FIGURE 16

Correction factor to relate the effective percentage of time to 0.01%, as a function of frequency for rain scatter

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT



1
2
3
4
5

FIGURE 17

Rain climates of the world

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

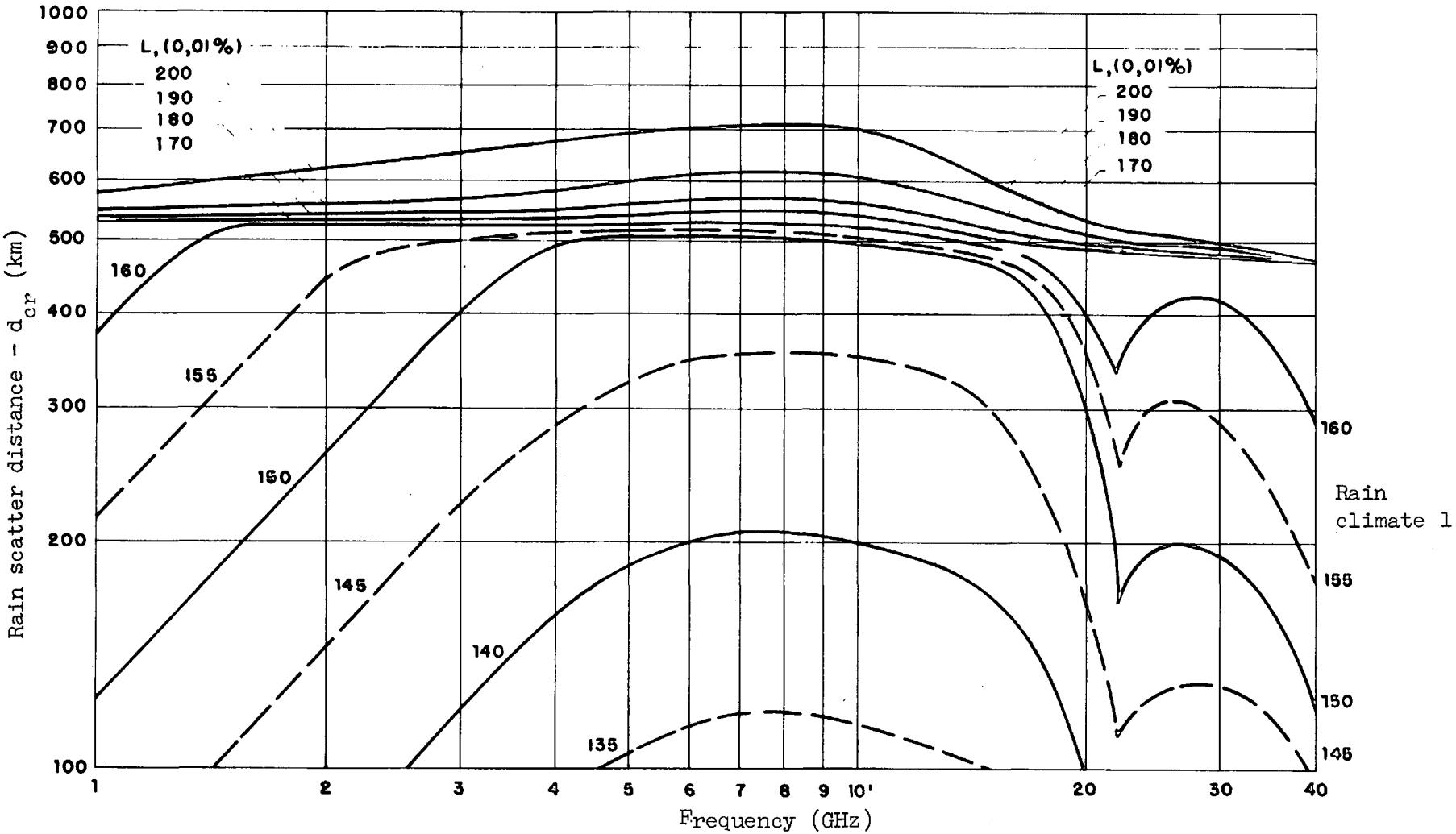


Figure 18 - Rain scatter distance as a function of frequency and normalized co-ordination loss - rain climate

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

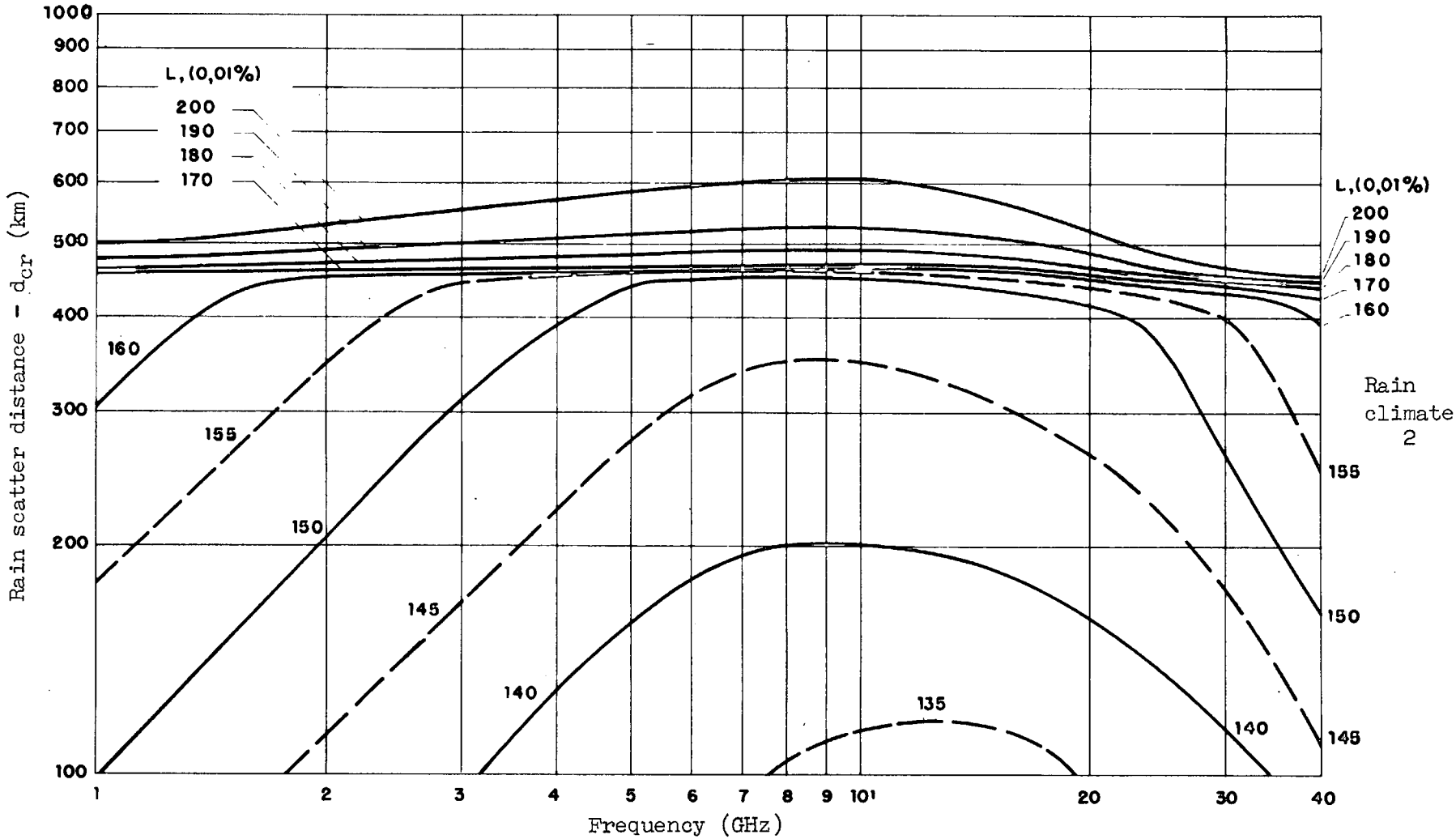


Figure 19 - Rain scatter distance as a function of frequency and normalized co-ordination loss

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

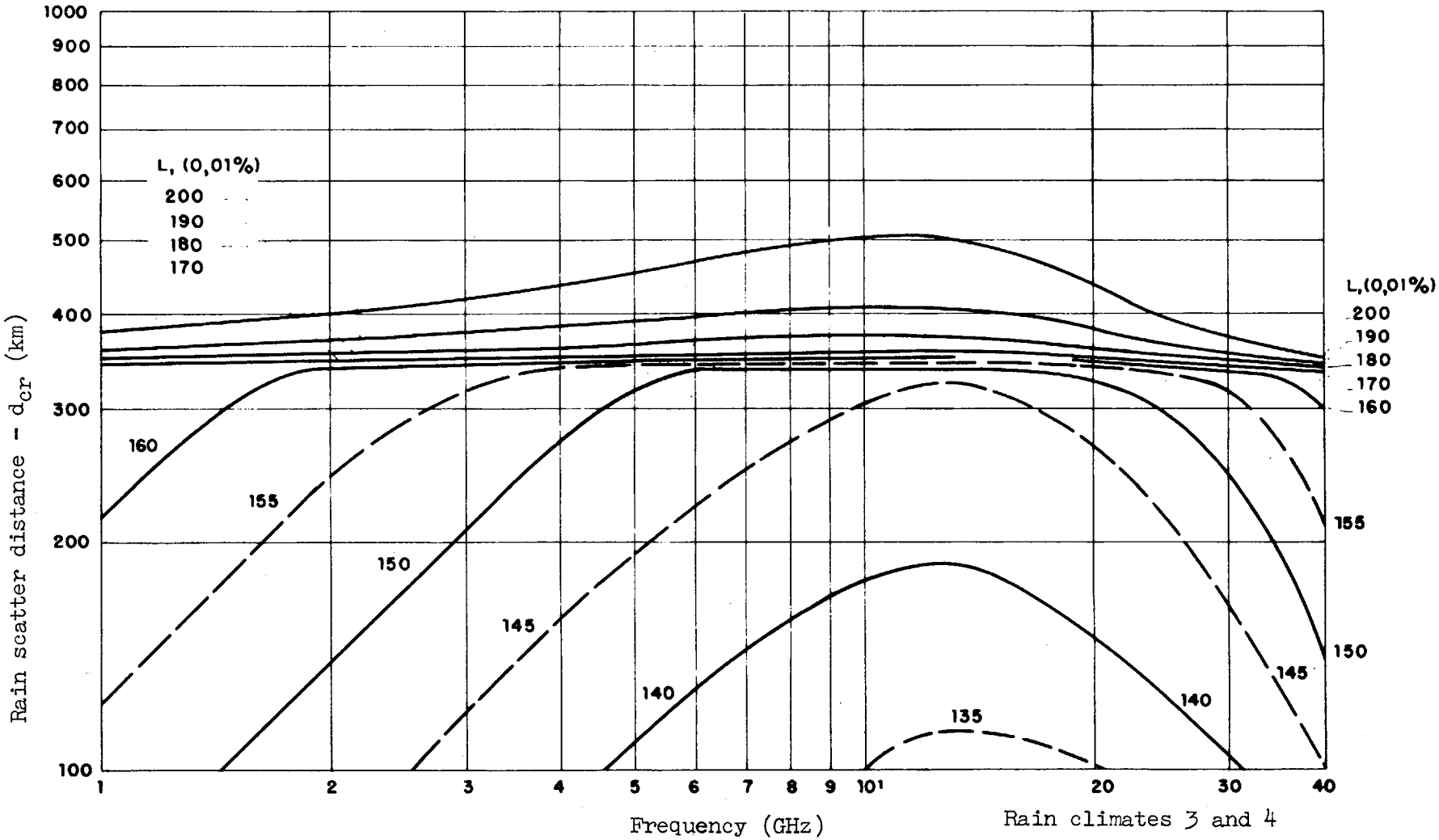


Figure 20 - Rain scatter distance as a function of frequency and normalized transmission loss

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

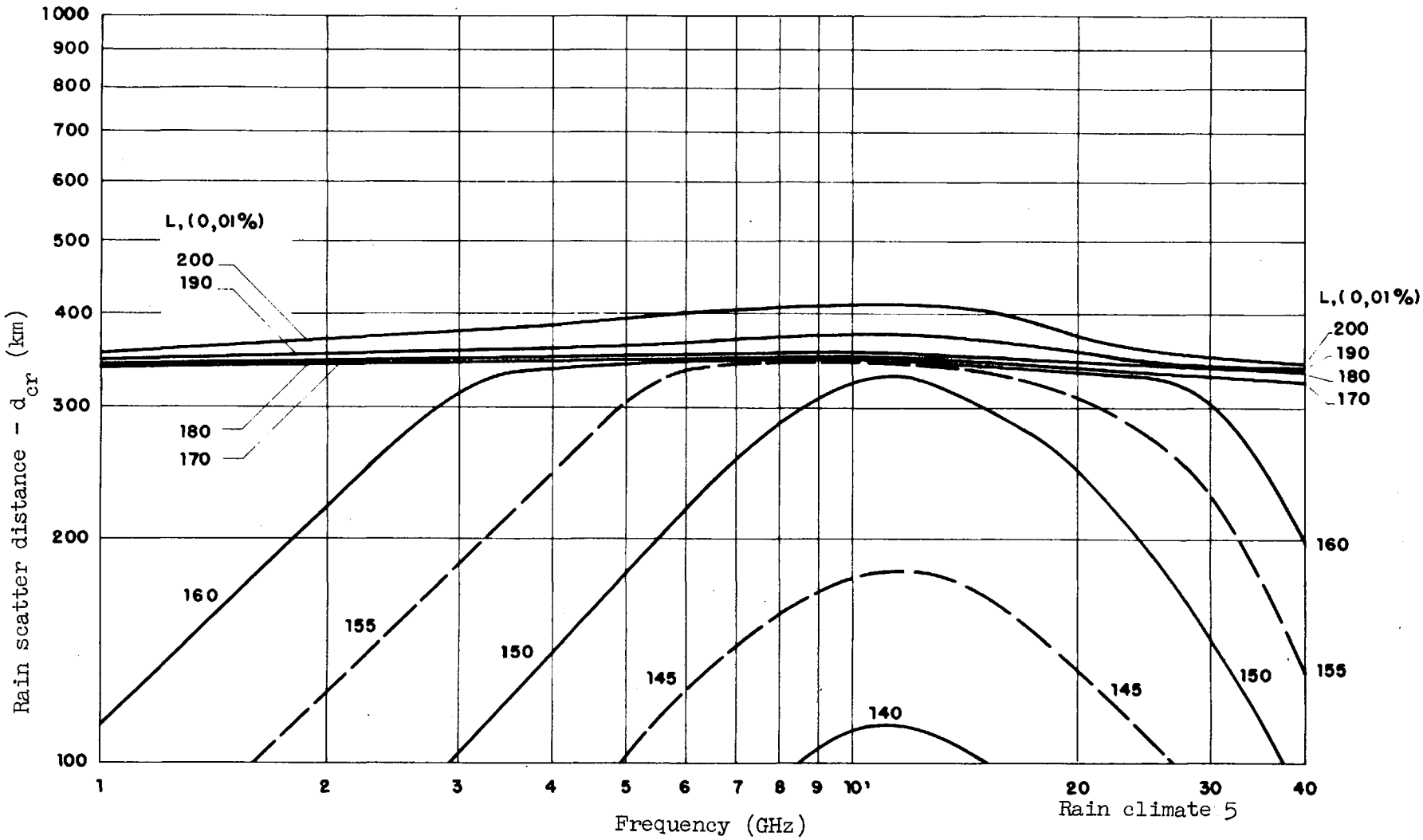


Figure 21 - Rain scatter distance as a function of frequency and normalized transmission loss

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

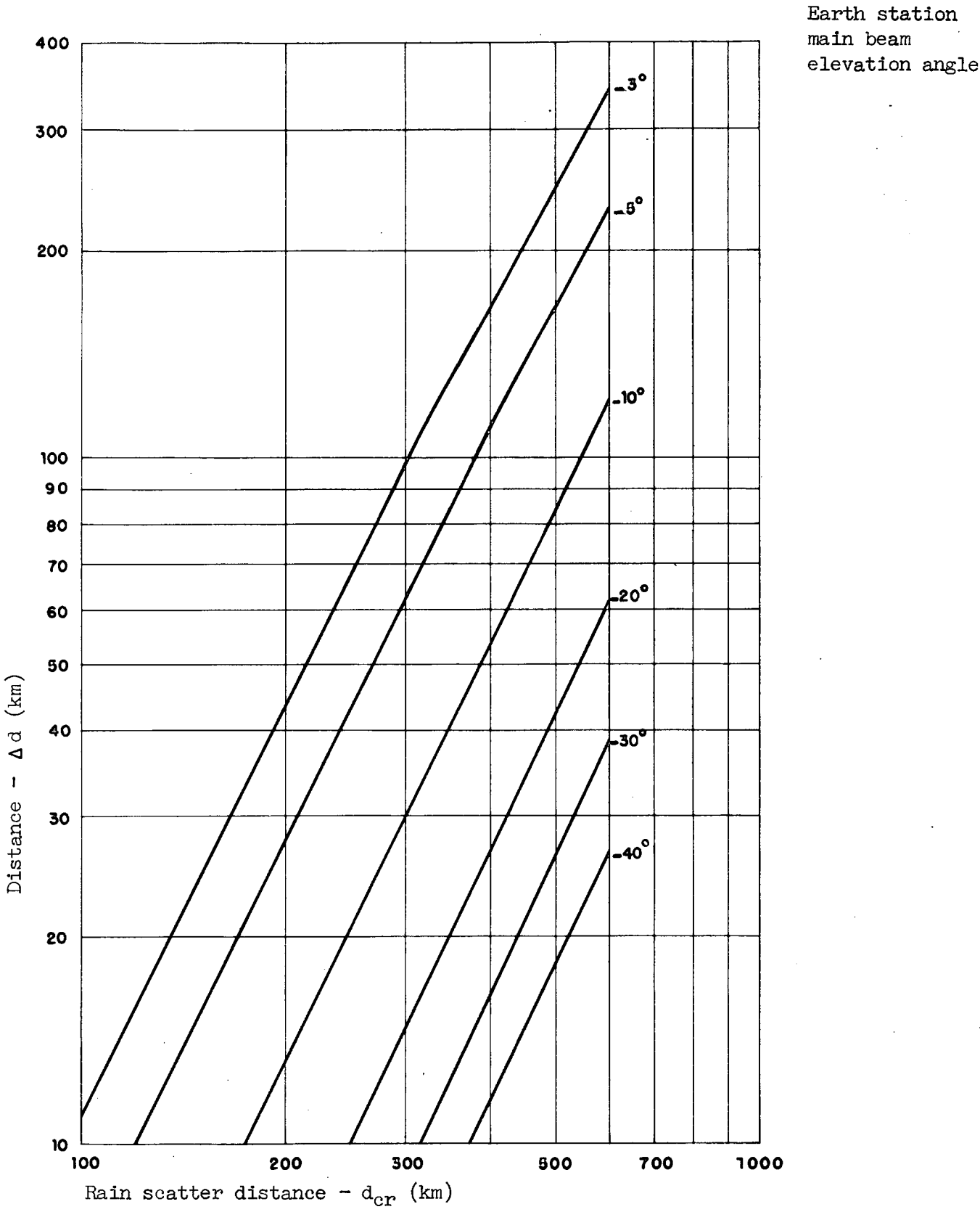


Figure 22 - The distance Δ d

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX A TO APPENDIX 28

CALCULATION OF CO-ORDINATION DISTANCE IN ALLOCATED FREQUENCY BANDS

1. Article 9A requires co-ordination distances to be calculated only in the particular frequency bands given in Article 5 and listed in Tables I and II 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) :

$$C_1 = G_r - P(r) - 20 \log f/4 - F(p)$$

For propagation by mode (c) :

$$C_2 = - P(r) - F_1(p.f) + \Delta G$$

The transmission losses L_o and $L(0.01)$ are given by :

$$L_o = P_t' + G_t' + C_1$$

$$L(0.01) = P_t' + C_2$$

The values of C_1 and C_2 for each band allocated for earth station transmission are given in Table III, together with the bandwidth unit (B) which is used in calculating P_t'.

Earth station reception

3. In the bands used for earth station reception (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 transmission losses L_o and $L(0.01)$ are given by :

$$L_o = G_r + C_3 - 10 \log Tr - M(p)$$

$$L(0.01) = C_4 - 10 \log Tr - M(p)$$

The values of C_3 and C_4 for each band allocated for earth station reception are given in Table IV.

Flow diagrams

4. The procedure for calculating co-ordination distance is illustrated by the flow diagrams given in Figures 1 and 2. The steps required to determine co-ordination distances for a transmitting earth station are shown in Figure 1, and those for a receiving earth station are shown in Figure 2. The symbols used in these diagrams are defined in the main text of Appendix 28.

TABLE I

Earth station transmission

Frequency Band (GHz)	C_1 (dB)	C_2 (dB)	Reference Bandwidth (kHz)
5.925-6.425	176	134	4

TABLE II

Earth station reception

Frequency Band (GHz)	Type of Service	C_3 (dB)	C_4 (dB)
3.7-4.2	COMSAT - A	199	157
"	COMSAT - N	224	178
	Space Research	-	-
	ERS		

Notes : A = Analogue modulation
N = Digital modulation

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

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 contours 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) 5, 10, 15, 20 db etc. lower than the value (given in Tables I and Ia 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 the great circle propagation mechanism only (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 to 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.

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))

For each transmitting terrestrial station situated within the co-ordination 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 to cause negligible interference and therefore may be eliminated from further considerations with respect to 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 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.

Document No. 259-E
1 July 1971
Original : English

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

FOURTH REPORT OF WORKING GROUP 4E

PROPOSED DRAFT TEXT FOR ADDITION TO ARTICLE 41 OF THE RADIO REGULATIONS

Having examined proposals ARG/25/55a, 56 and USA/28 Corr./339, 340 during its fifth meeting on 1 July 1971, Working Group 4E proposes the draft text for addition to Article 41 of the Radio Regulations, as in Annex to this document. The proposed draft text results from the proposal USA/28 Corr./340.

Proposals ARG/25/55a, 56 were not supported and therefore were not considered further by Working Group 4E.

N. OHYAMA
Chairman
Working Group 4E

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

PROPOSED TEXT FOR ADDITION TO ARTICLE 41 OF THE RADIO REGULATIONS

ADD 1567bis 5bis. 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.)

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 260-E
1 July 1971
Original : English

COMMITTEE 4

FIFTH REPORT OF WORKING GROUP 4E

1. During its fifth meeting on 1 July 1971, Working Group 4E discussed paragraphs 2.2.4 and 3.2 of Document No. 61, which were assigned to it by Committee 4 (vide Annex 4 of Document C4-2).

2. Paragraph 2.2.4 of Document No. 61

The Working Group noted that this paragraph was also assigned to Working Groups 4B and 4C. Working Group 4E also noted that the contents of this paragraph may be relevant to the examination of draft Appendices 1, 1A and 1B, which are at present under consideration of Committee 6. The Working Group therefore decided to defer further consideration of this paragraph until draft texts of Appendices 1, 1A and 1B are received from Committee 6.

3. Paragraph 3.2 of Document No. 61

The Working Group agreed that additional basic technical data to that contained in Appendices 1 and 1A of the present Radio Regulations is necessary for the purposes of calculation of co-ordination distance and assessment of the probability of harmful interference. It was also of the opinion that the designation of emissions as contained in Article 2 and Appendix 5 of the present Radio Regulations is not adequate to provide sufficient information on complex emissions using multiple modulation processes in Space and certain Terrestrial Systems. The Working Group therefore decided :

3.1 to draw the attention of other Working Groups of Committee 4 to paragraph 3.2 of Document No. 61 and Recommendation 432-1 of the C.C.I.R. with reference to their work; and

3.2 to request them to advise Working Group 4E on :

3.2.1 the additional basic technical characteristics that may be required to be included in Appendices 1, 1A and 1B;

3.2.2 the need or otherwise to revise the provisions of Article 2 and Appendix 5 of the present Radio Regulations.

N. OHYAMA
Chairman
Working Group 4E

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 261-E
1 July 1971
Original : French

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 3

SUMMARY RECORD
OF THE
SECOND MEETING OF COMMITTEE 3

Monday, 28 June 1971, at 0930 hrs

Chairman : Mr. L. CONSTANTINESCU
(Socialist Republic of Roumania)

Subjects discussed	Document No.
1. Approval of the summary record of the first meeting of Committee 3	212
2. Draft report of the Budget Control Committee	DT/55

ARCHIVES U.I.T. GENÈVE

1. Approval of the summary record of the first meeting of Committee 3 (Document No. 212)

The summary record was approved.

2. Draft report of the Budget Control Committee (Document No. DT/55)

The Delegate of the U.S.S.R. considered that the conclusions on page 4 should be amended to show quite clearly not only that the Committee had found no satisfactory solution for meeting the costs of the Conference, but also that the problem should be discussed and solved at the next session of the Administrative Council.

There was no question of any decision to curtail the Conference because there were not enough credits. The Conference was very important and was being attended by delegates from over a hundred countries. It would be ridiculous to stop it after four weeks owing to lack of funds. Accordingly, the Secretary-General should take the necessary steps to ensure the normal continuation of work and should then report to the Administrative Council, which should find the additional credits to cover the expenses.

It would be erroneous for the Secretary-General to argue in the Council that, because the Conference was master of its own decisions, it was responsible for its decisions concerning the scope of its work and its expenses. It should be borne in mind that the terms of reference of the Conference did not include the solution of material problems.

The Conference should continue for the prescribed six weeks. Where its expenses were concerned, the Secretary-General could have submitted to the last session of the Administrative Council in May a revised budget taking into account all the new information at his disposal, so that the Conference would not have been confronted with financial difficulties which were none of its concern.

The Delegate of the United Kingdom agreed that there could be no question of shortening the duration of the Conference. It would be inadvisable to convene a Plenary Meeting to discuss budgetary problems, but they should be brought to the attention of the Chairman of the Conference.

With regard to the text of the report, the last phrase, beginning with the words : "... it should decide ...", should be deleted.

The Vice-Chairman, speaking as the Delegate of Saudi Arabia, considered that all the facts should be submitted to the Plenary Meeting. The Conference should shoulder its responsibilities and take a decision on the matter, if only a decision to refer the question to the

Administrative Council. Moreover, the Secretary-General could only assume responsibilities if he was instructed to do so by the Conference itself, particularly with regard to the report which he would submit to the Council concerning excess expenditure. He therefore thought that the last phrase on page 4 of Document No. DT/55 should remain unchanged.

The Delegate of the U.S.S.R. considered that that point of view would be perfectly justified if new and unexpected problems had arisen as a result of the actual work of the Conference. That was not the case, however, since all the excess expenditure mentioned in the document could have been foreseen before the Conference. The Secretary-General should therefore be instructed to settle the question with the Administrative Council through the ordinary channels, by submitting a report to the 1972 session.

The Vice-Chairman, speaking as the Delegate of Saudi Arabia, considered that the Secretary-General should be given an opportunity to explain himself with regard to the excess expenditure, both before the members of the Budget Control Committee and in Plenary Meeting.

The Delegate of the United States of America considered that it was out of the question to include any mention of the possible shortening of the Conference in the report to the Plenary Meeting. It would, however, be advisable for the Secretary-General to explain in a Plenary Meeting why the cost of the Conference had been underestimated, mainly in connection with certain inflationary factors.

The Delegate of Yugoslavia said he was in favour of deleting the last phrase on page 4. It was always difficult to shorten the duration of a conference, and the text should contain no reference to the subject. The procedure to be followed was to submit the problem to the Administrative Council.

After a discussion in which the Delegates of the United Kingdom, the U.S.S.R., Saudi Arabia and Yugoslavia took part, the Delegate of the United States of America, supported by the Delegates of the United Kingdom and the Federal Republic of Germany, proposed that the second paragraph on page 4 should end with the words : "... the Budget Control Committee draws the Plenary Meeting's attention to the facts contained in this report".

The Delegate of the U.S.S.R. stressed that the Budget Control Committee should recommend the Plenary Meeting to adopt the budget as it had been established by the Administrative Council and to instruct the Secretary-General to report to the Council on the excess expenditure. That procedure would make it possible to avoid any further discussion of the budget in the Plenary Meeting.

The Vice-Chairman, supported by the Delegate of the United States of America, considered that it would suffice to present all the facts objectively, as they were set out in the report, to enable the Conference to discuss them and to take its decisions freely in the Plenary Meeting.

The Delegate of the U.S.S.R. said he was afraid that that procedure would greatly complicate the work of the Conference.

In conclusion, it was decided to amend the last paragraph on page 4 to read as follows : "Under No. 675 of the International Telecommunication Convention, Montreux, 1965, therefore, the Budget Control Committee is compelled to draw the Plenary Meeting's attention to this fact".

In reply to a remark by the Delegate of the U.S.S.R., the Secretary of the Committee said that, under Article 16, paragraph 2, of the Financial Regulations, the Committee's report should contain a list of the recognized private operating agencies and international organizations which were contributing towards the Conference expenses.

The Delegate of the U.S.S.R. nevertheless considered that the best place for Annex 2 would be at the end of Document No. DT/55.

After a brief exchange of views, it was decided that the question should be left to the Secretary of the Committee, as it related to the presentation of the document.

In reply to a question by the Delegate of the U.S.S.R., the Secretary of the Committee said that it was important to fix the date at which the financial situation of the Conference had been established, as that situation was changing constantly as the work proceeded. He suggested that the words "at 21 June 1971" should be entered in brackets under the title of Annex 3.

It was so decided.

In pursuance of remarks by the Delegates of the U.S.S.R. and the United States of America, the Delegate of Saudi Arabia proposed that the figures in Document No. DT/55 should be retained and that the Secretary-General should be invited to submit to a Plenary Meeting further figures reflecting the financial situation on the date when the Committee's report was considered.

It was so decided.

After a brief discussion on the exact title to be given to the Committee's report, it was decided that it should be entitled "First report of the Budget Control Committee".

Document No. DT/55 was approved, in the light of the above considerations.

The meeting rose at 1055 hrs.

The Secretary :

R. PRELAZ

The Chairman :

L. CONSTANTINESCU

SPACE CONFERENCE

Document No. 262-E
1 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

MINUTES

OF THE

EXTRAORDINARY PLENARY MEETING

held on

Wednesday, 30 June 1971

Subject : Accidental death of the cosmonauts of Soyuz 11

Ambassador Tyson, Acting Chairman, called the meeting to order and made the following statement :

"In the absence of the Chairman, Mr. Gunnar Pedersen, and in deference to Vice-Chairman Badalov, this Extraordinary Plenary Meeting has been called on the occasion of a very sad event. A tragic accident this morning which caused the death of three Soviet cosmonauts as they neared completion of their very historic voyage has saddened the hearts of the entire world.

I am sure every member of this Conference shares in our shock and deepest condolences to our fellow delegates from the Soviet Union and to their countrymen. I know each delegation here would like to express its own feelings but in lieu thereof I would ask that we rise and join in a moment of silence to the memory of these courageous men and as a mark of sympathy for their families.

The Secretary-General has prepared a message which we propose to send to the Soviet Government as an expression of the feelings of this Conference. I would now ask him to read this message."

ARCHIVES U.I.T. GENEVE

The Secretary-General read the following text :

H.E. Kosygin,
Chairman of the Council of Ministers of the Soviet Government,
Kremlin, Moscow

THE WORLD ADMINISTRATIVE CONFERENCE FOR SPACE TELECOMMUNICATIONS, IN EXTRAORDINARY PLENARY MEETING, DEEPLY MOVED BY THE TRAGIC ACCIDENT CAUSING THE DEATH OF THE THREE COSMONAUTS OF SOYUZ 11, DOBROVOLSKY, VOLKOV AND PATSAEV, AFTER ACCOMPLISHING EXCEPTIONAL WORK IN NAME OF SCIENCE AND PROGRESS, EXPRESSES ITS DEEPEST SYMPATHY TO YOUR GOVERNMENT AND TO THE FAMILIES OF THE DECEASED = GUNNAR PEDERSEN, CHAIRMAN OF CONFERENCE

Ambassador Tyson said he was sure that all participants in the Conference agreed that the sending of the message was a proper action and one which they all wished to take in memory of those three fine men.

Mr. Badalov, Vice-Chairman, made the following statement :

"Mr. Chairman, Mr. Secretary-General, Ladies and Gentlemen,

Might I, on behalf of the Delegation of the Soviet Union, express to all of you our heartfelt gratitude for your deep sympathy on the occasion of the death of these three excellent Soviet cosmonauts. Our country has lost its most talented scientists, valiant men who were making a great contribution to the discovery and mastery of space in the interests of the whole of humanity.

As you know, they spent 25 days in the Salyut cosmic laboratory and did a great deal of research work. Their labour has not been in vain : it has become an achievement that is available to science and technology. The names of Dobrovolsky, Volkov and Patsaev will for centuries remain in the history of humanity as an example of brave service to a noble task - the conquest of space and the fulfilment of the aims of science and progress.

Once again I should like to thank all of you for your compassion and sympathy."

Ambassador Tyson said that the Soviet Delegation continued to have the respect and admiration of the Conference for the accomplishments of those who had just died.

*

* *

The Chairman, temporarily absent from the Conference, wished to have the following included in these minutes :

"The news of the tragic accident came to me as a shock and I greatly regret having been unable to take part in the Extraordinary Plenary Meeting.

I fully agree with the heartfelt words expressed by the Acting Chairman, Ambassador Tyson. The Soyuz 11 experiment has so rightly been looked upon as a new demonstration of the highly-developed space technology in the U.S.S.R. and as one of the most important steps in connection with the conquest of space - an experiment of the greatest importance to the future of mankind.

It is only natural that the loss of these three brave and clever astronauts must create a feeling of sorrow in the hearts of millions of people in all parts of the world."

A. WINTER-JENSEN
Acting Secretary

ROBERT C. TYSON
Acting Chairman

SPACE CONFERENCE

Document No. 263-E
28 June 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

WORKING GROUP 4E

QUESTION FROM THE CHAIRMAN OF WORKING GROUP 4C

TO THE CHAIRMAN OF WORKING GROUP 4E

In connection with Appendices [1, and 1A and 1B] to the Radio Regulations, Working Group 4C brings to the notice of Working Group 4E that certain implementation and operating parameters associated with earth stations may be useful in order to facilitate subsequent consultation between administrations.

Such parameters are :

1) P_t' = maximum radio frequency transmitting power (in dbW) at the input terminals to the earth station antenna, in the reference bandwidth (4 kHz between 1 and 15.4 GHz, 1 MHz between 15.4 and 40 GHz);

2) G_t', G_r' = transmitting or receiving antenna gain at the earth station, in the form of measured antenna diagrams, or by indicating the reference pattern used;

3) T_r = receiving system noise temperature (in °K) at the input to the earth station receiver;

4) $M_o(p_o)$ = ratio (in db) between the maximum permissible interference power during p_o% and 20% of the time respectively, for all entries of interference.

In addition, while Tables I and II of Appendix 28 specify values for all other parameters of interest, administrations may have reason to believe that for their specific circumstances a departure from these specified values may be justified. It may be the desire of Working Group 4E to consider whether in such cases a corresponding notification of the values assumed is to be required.

M.A. DEL MORAL
Chairman
Working Group 4C

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 264-E
1 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

THIRD REPORT FROM WORKING GROUP 5A

TO COMMITTEE 5

(ALLOCATIONS)

FREQUENCY BANDS : 1 435-2 690 Mc/s AND 3 500-3 700 Mc/s

1. Frequency band 1 435-2 690 Mc/s

1.1 After examination and discussion of the Joint CAN-USA Proposal in the band 2 075-2 110 Mc/s, the Working Group did not agree to suggest this allocation to Committee 5.

The Delegation of Canada expressed its view that the sharing problems in this band did not justify the rejection of its Proposal, since the suggested band is the guard band in the C.C.I.R. channelling plan for the 2 Gc/s band. Therefore the probability of interference should be very small. Accordingly, this Delegation reserved its right to revert to the problem in Committee 5, if it still so desires.

1.2 The Proposals concerning the frequency band 2 655-2 690 Mc/s were discussed by the Group, and as a result the Delegations of New Zealand and India decided to support the joint proposal by Canada and U.S.A. The opinion of the majority (13 in favour and 10 against) was that the Group agreed in suggesting to Committee 5 the allocation shown in Annex 1 to the present Report.

The Delegation of Chile, on the grounds that it could not be present at the time of agreement, reserved its right to revert to this problem in Committee 5, if it still so desires.

ARCHIVES U.I.T. GENÈVE

1.3 The Proposal of the Administration of India, concerning the frequency band 2 400-2 655 Mc/s had no support from the delegations present at the meeting and therefore was not discussed.

The Indian Delegation reserved its right to revert to this matter in Committee 5, if it still so desires.

2. Frequency band 3 500-3 700 Mc/s

After a brief discussion, the Working Group agreed to propose to Committee 5 the modification of foot-note 377 as shown in Annex 2 to the present Report.

Luiz C. BAHIANA
Chairman

Annexes : 2

A N N E X 1

Mc/s

	Region 1	Region 2	Region 3
MOD	2 550-2 655 FIXED MOBILE 362 363 364		
MOD	2 655-2 690 FIXED MOBILE 362 363 364	2 655-2 690 COMMUNICATION-SATELLITE (Earth-to-space) FIXED 392A	2 655-2 690 COMMUNICATION-SATELLITE (Earth-to-space) FIXED MOBILE 392A

/ Note to Committee 7 : Existing No. 392A to be added in boxes as shown above, subject to changes to definitions which would render this foot-note superfluous./

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX 2

Mc/s

	Region 1	Region 2	Region 3
NOC	3 400-3 600 FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-earth) 374A Radiolocation 372 373 374 375	3 400-3 500 RADIOLOCATION COMMUNICATION-SATELLITE (Space-to-earth) 374A Amateur 376	
NOC	3 600-4 200 FIXED COMMUNICATION-SATELLITE (Space-to-earth) 374A Mobile 374	3 500-3 700 FIXED MOBILE RADIOLOCATION COMMUNICATION-SATELLITE (Space-to-earth) 374A	3 500-3 700 RADIOLOCATION COMMUNICATION-SATELLITE (Space-to-earth) 374A Fixed Mobile 377 378
		3 700-4 200 FIXED MOBILE COMMUNICATION-SATELLITE (Space-to-earth) 374A 379	

MOD 377 In China, Japan and Korea, the band 3 500-3 700 Mc/s is also allocated to the fixed and mobile services.

/ Note to Committee 7 : No. 374A subject to change in the definitions which would render this foot-note superfluous. /

SPACE CONFERENCE

Document No. 265-E
1 July 1971
Original : Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

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

When document 88/317 (France) was discussed by Working Group 4C, it was considered necessary to prepare a separate Recommendation for the invitations to the C.C.I.R. and the recommendations to the administrations with regard to the co-ordination distance.

A proposed addendum to draft Recommendation No. Spa 3 (Document No. 191) on the need to improve and simplify the method of determining the co-ordination area was also drawn up.

M.A. DEL MORAL
Chairman
Working Group 4C

Annexes : 2

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 1

DRAFT RECOMMENDATION

on 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 with / Fixed and Mobile or Terrestrial 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 Gc/s range;

c) that Tables I, Ia and II in this Appendix do not show numerical values for the parameters of certain Space Radiocommunication Services and Terrestrial Services, sharing frequency bands with equal rights;

invites the C.C.I.R.

to continue as a matter of urgency its study :

- of 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,

- of 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;

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 Gc/s and above 40 Gc/s, which may be the subject of a C.C.I.R. Recommendation.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 2

PROPOSED ADDITION TO DRAFT RECOMMENDATION No. Spa 3

(Document No. 191)

- Add the following considerandum :

c) 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;

- Add the following recommendation :

2.4 that a study should be made of any improvement and simplification that could be made in the method of determining the co-ordination area as described in Appendix 28.

SPACE CONFERENCE

Document No. 266-E
1 July 1971
Original : Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 6

REPORT OF THE CHAIRMAN OF WORKING GROUP 4C

CONCERNING THE NOTES TO BE CONSIDERED BY COMMITTEE 6

During the meetings of Working Group 4C, it became necessary to submit to Committee 6 the text which is inserted in the text concerning co-ordination distance and which refers to co-ordination for distances of less than 100 km so that the Committee can consider the advisability of incorporating a paragraph on these lines in Article 9A.

Also, when the text on co-ordination distance was being drafted, the terms "co-ordination area" and "co-ordination contour" were defined. It is therefore considered necessary to submit this text to Committee 6 so that it may take it into account when it deems fit.

M.A. del MORAL
Chairman
Working Group 4C

Annexes : 2

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 1

The proposed methods of calculating co-ordination distance cannot be used below 100 km from the earth station. For this reason, it has been felt that the Radio Regulations, in an appropriate form, should contain provisions to cover these cases. It is proposed that such a provision should be inserted in the Appendix 28, and have the following wording :

> "In the calculations of the co-ordination distances for any mode of propagation, 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 for the propagation mode under consideration shall be 100 km."

It is also proposed that this question should be submitted to Committee 6 for their consideration and further action, whether it would be appropriate to have a similar paragraph in Article 9A.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX 2

During the development of a suitable text for Appendix 28 (determination of co-ordination distance), it became necessary to define the terms "co-ordination area" and "co-ordination contour".

In view of the fact that the procedure developed leads, in the most general case, to a different co-ordination distance for each azimuth at an earth station, unlike the procedure described in the Annex to Recommendation No. Spa 1, it may be the desire of Committee 6 to consider whether references in the regulatory articles which now use the term "co-ordination distance" in a sense which sometimes implies a co-ordination area, ought not in fact to be suitably modified to refer primarily to "co-ordination area".

It appears that this might be a logical modification since, in any case, co-ordination areas and not co-ordination distances are to be notified.

To bring in line language in the various parts of the Radio Regulations, this matter is also brought to the attention of Sub-Group 4A.

SPACE CONFERENCE

Document No. 267-E
1 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

FIRST REPORT FROM COMMITTEE 4

The modifications and additions to the provisions of the Radio Regulations 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

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

SECTION IIB OF ARTICLE 1

MOD 84BH **Spacecraft**

A man-made vehicle which is intended to go beyond the major part of the earth's atmosphere.

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 84BHA **Satellite**

A body which revolves round another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of this body.

Note : A body so defined which revolves round 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 gravitational attraction.

2. By extension, the path described by the centre of mass of an object in space subjected to natural forces and occasional low-energy corrective forces exerted by a propulsive device in order to achieve and maintain a desired path.

MOD 84BC **Inclination of an orbit (of satellite)**

The angle between 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 Altitude of the perigee

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 become a geostationary satellite is called "geostationary satellite orbit".

SECTION III OF ARTICLE 1

"MOD 93 Harmful interference

The effect of any emission, radiation or induction which endangers the functioning of a radionavigation service or of any other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with these Regulations."

"ADD 98A Equivalent isotropically radiated power

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."

Furthermore, it is proposed to add a footnote relating to the title of Article 5, worded as follows :

"See Resolution No. 6"

SPACE CONFERENCE

Document No. 268-E
1 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

NOTE FROM THE CHAIRMAN

RELATING TO THE PRESENTATION OF REPORTS CONTAINING
REVISIONS TO ARTICLE 5 OF THE RADIO REGULATIONS
(TABLE OF FREQUENCY ALLOCATIONS)

Allocations to services should be shown as follows :

Primary service RR 137 : Capital letters

Permitted service RR 138 : Small letters /permitted/

Secondary service RR 139 : Small letters.

Changes to the Table or to foot-notes should be indicated by the abbreviations :

ADD, MOD, (MOD), SUP, NOC.

See Specimen in the Annex.

H.A. KIEFFER
Chairman

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

SPECIMEN

Mc/s

Region 1	Region 2	Region 3
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (Space-to-earth) 275 282 283	143.6-143.65 FIXED MOBILE SPACE RESEARCH (Space-to-earth) Radiolocation [Permitted]	143.6-143.65 FIXED MOBILE SPACE RESEARCH (Space-to-earth) 278 279A 284
143.65-144 AERONAUTICAL MOBILE (OR) Space Research (Space-to-earth) 275 282 283	143.65-144 FIXED MOBILE Radiolocation [Permitted] Space Research (Space-to-earth)	143.65-144 FIXED MOBILE Space Research (Space-to-earth) 278 279A 284

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.

[where Space Research in the band 143.65-144 Mc/s is a secondary service and Radiolocation in Region 2 is a permitted service.]

[Note to Committees 5 and 7 : Radiolocation in Region 2 is a permitted service - RR 137b)]

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 269-E
1 July 1971
Original : English

COMMITTEE 4

REPORT FROM THE CHAIRMAN OF WORKING GROUP 4C TO COMMITTEE 4

1. Working Group 4C has, during its third meeting on 29 June 1971, examined the following documents which were submitted to them for consideration and remark :

a) Documents Nos. 160, 166 and 186

The Working Group expressed no comments on these documents.

b) Document No. 188(Rev.)

After consideration, the Working Group proposed the following changes :

i) under considering ...

c) ... ~~would~~ may hamper ...

d) ... to an ~~excessive~~ increase ...

M.A. DEL MORAL
Chairman
Working Group 4C

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 270-E
2 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 7

SUMMARY RECORD

OF THE

FIRST MEETING OF COMMITTEE 7

(EDITORIAL)

Friday, 2 July 1971, at 0900 hrs

Chairman : Mr. F. JOB (France)

Vice-Chairmen : Mr. D.E. BAPTISTE (United Kingdom)
Mr. B.A. DURAN (Spain)

Subjects discussed

1. Appointment of Rapporteurs

2. Organization of work

1. Appointment of Rapporteurs

The Chairman said that the following had agreed to act as Rapporteurs :

for the French language	: Mr. J.B. Bes and Mr. G. Joel (France) and Miss C. Verdon (Canada)
for the English language	: Mr. I. St.Q. Severin and Mrs. A. Spier (United Kingdom) and Mr. R.E. Lee (United States of America)
for the Spanish language	: Mr. B.A. Durán Mingorance (Spain), assisted by representatives from other Spanish-speaking delegations as necessary.

The Chairman announced that the General Secretariat had designated the following three members for the French, English and Spanish texts respectively.:

Mr. J. Revoy, Mr. R. Rees and Mr. E. Luraschi.

The above persons would form the permanent Committee and would be notified individually of meetings; it was understood that assistance could be sought from other delegates if necessary.

2. Organization of work

The Chairman explained Editorial Committee procedure : three copies in each language of texts approved by Committees 4, 5 and 6 would be passed to the Editorial Committee which would perfect their form without altering the sense (as stipulated in No. 759 of the Convention). Those texts (on blue paper) would then be submitted to the Plenary Meeting for a first reading, following which the Editorial Committee would incorporate any amendments and re-submit the texts (on pink paper) for a second reading in Plenary. Texts were considered definitive when approved at the second reading in Plenary Meeting (No. 763 of the Convention). The Editorial Committee then made any necessary changes and prepared the texts of the Final Acts (printed in a single volume on white paper) to be submitted for signature. The layout would be modelled on the texts of the 1963 Space Conference and the 1967 Maritime Conference.

The Chairman announced that the Committee would hold its first working meeting that same afternoon when it would examine Document No. 267 from Committee 4 and No. 249 from Committee 6.

The Assistant Secretary of the Conference said that the Delegation of China had accepted responsibility for translation of the texts into Chinese in time for signature of the Final Acts and that the Delegation of the U.S.S.R. had similarly accepted responsibility for translation of that part of the Final Acts relative to the Agreement. The Secretary of the Committee would ensure liaison with the two Delegations concerned.

The meeting rose at 0920 hrs.

The Secretary :
R. MACHERET

The Chairman :
F. JOB

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 271-E
2 July 1971
Original : English

PLENARY MEETING

SECOND REPORT FROM COMMITTEE 4

The modifications and additions to the provisions of the Radio Regulations 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 : Article 7, Section VII, Terrestrial Services sharing frequency bands with Space Services above 1 Gc/s

2 : Article 7, Power flux-density at the geostationary satellite orbits

3 : Draft Recommendation relating to carrier energy dispersal in Communication-Satellite systems.

ARCHIVES U.I.T. GENEVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 1

ARTICLE 7

PROPOSED PARTIAL TEXT OF SECTION VII

MOD

Section VII. Terrestrial services sharing frequency bands with space services above 1 / Gc/s /

Choice of sites and frequencies

/ MOD / 470A 18. Sites and frequencies for terrestrial 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 earth stations.

ADD 470AA 18bis (1) As far as practicable, sites for transmitting*) stations, in the Fixed or Mobile Service, employing maximum values of equivalent isotropically radiated power exceeding 35 dBW in the frequency bands between 1 and 10 Gc/s, 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.**)

ADD 470AB (2) As far as practicable, sites for transmitting*) stations, in the Fixed or Mobile Service, employing maximum values of equivalent

ADD *)470AA.1 For their own protection receiving stations in the Fixed or Mobile Services operating in bands shared with space services (satellite-to-earth) should also avoid directing their antennae towards the geostationary satellite orbit if their sensitivity is sufficiently high so that interference from space station transmissions may be significant.

ADD **)470AA.2 Information on this subject is given in the latest version of C.C.I.R. Report No. 393.

isotropically radiated power exceeding 45 dBW in the frequency bands between 10 and 15 [Gc/s], 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.**)

ADD 470AC (3) In the frequency bands above 15 [Gc/s] there shall be no restriction as to the direction of maximum radiation for stations operating in the Fixed or Mobile Service.

Power limits

MOD 470B 19. (1) The maximum equivalent isotropically radiated power of the transmitter and associated antenna, of a station in the Fixed or Mobile Service, shall not exceed +55 dBW.

ADD 470BA (1bis) Where compliance with 470AA is impracticable the maximum equivalent isotropically radiated power of the transmitter and associated antenna 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

+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.**)

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 [Gc/s], shall not exceed +13 dBW.

ADD **)470AA.2 Information on this subject is given in the latest version of C.C.I.R. Report 393.

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 [Gc/s], shall not exceed +10 dBW.

Note to Committee 7 : This text will need to be supplemented by additional paragraph(s) after 470CA which would indicate the frequency bands allocated for reception by space stations.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX 2

DRAFT

PROPOSED ADDITION TO ARTICLE 7

(new section)

ADD /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-to-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/m^2 in any 4 k/c/s/ band.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX 3

ADD

DRAFT RECOMMENDATION

relating to carrier energy dispersal in
/ communication-satellite systems / / * /

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

considering

a) that use of carrier energy dispersal techniques in / communication-satellite systems / 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 / communication-satellite systems / operating in the same frequency bands;

c) that such techniques are being regularly and successfully employed in / communication-satellite systems / without noticeable deterioration of the quality of operation;

recommends

1) that / communication-satellite systems / employing angle modulation by analogue signals should use carrier energy dispersal techniques as far as is practical with a view to spreading energy at all times and in a manner consistent with the satisfactory operation of the / systems /;

2) that / communication-satellite systems / employing digital modulation should use carrier energy dispersal techniques when this becomes technically feasible and is practical.

/ Note : * See No. 84AG. /

SPACE CONFERENCE

Document No. 272-E
2 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

CANADA - NEW ZEALAND

JOINT ALTERNATIVE PROPOSAL TO PROPOSAL CAN-USA/164/4

(see pages 4 and 5 of Document No. 164)

Ref.

Mc/s

	Region 1	Region 2	Region 3
CAN-NZL/272/1	2 450-2 500 FIXED MOBILE Radiolocation 357 361	2 450-2 500 FIXED MOBILE RADIOLOCATION 357	
	2 500-2 515 ADD BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE ~~Radiolocation~~ 361A	2 500-2 515 ADD BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE ~~RADIOLOCATION~~ 361A	

ARCHIVES U.I.T. GENÈVE

Ref.

Mc/s

	Region 1	Region 2	Region 3
CAN-NZL/272/1 (cont.)	2 515-2 550 ADD BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE ~~Radiolocation~~ 361A	2 515-2 550 ADD BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE ~~RADIOLOCATION~~ ADD FIXED-SATELLITE (Space-to-Earth) 392A 361A	
	2 550-2 655 ADD BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE 362 363 364		
	2 655-2 690 ADD BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE	2 655-2 690 ADD BROADCASTING-SATELLITE 361B 361C ADD COMMUNICATION-SATELLITE (Earth-to-Space) 392A FIXED 364C ~~MOBILE~~	2 655-2 690 ADD BROADCASTING-SATELLITE 361B 361C FIXED 364C MOBILE ADD FIXED-SATELLITE (Earth-to-Space) 392A

SPACE CONFERENCE

Document No. 273-E(Rev.)
7 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

JOINT REPORT BY WORKING GROUPS 5A AND 5E

TO COMMITTEE 5 (ALLOCATIONS)

FIXED-SATELLITE AND BROADCASTING-SATELLITE SERVICES

Frequency bands between 10.7 Gc/s and 14.5 Gc/s

Frequency band : 2 500-2 535 Mc/s (Regions 2 and 3)

Frequency band : 2 655-2 690 Mc/s (Regions 2 and 3)

1. The Joint Meetings of Working Groups 5A and 5E agreed to recommend to Committee 5 the adoption of the revised provisions appearing in Annex 1 to the present Report.

2. Frequency band : 11.7-12.2 Gc/s

With respect to foot-notes [D] and [E], the Delegations of Argentina, Chile and Cuba reserved the right to revert to the subject later should they still so desire. In particular, the Delegation of Argentina felt that no final decision should be taken on foot-note [D] until the conclusions of Committee 6 on the draft Recommendation in question was available.

3. Frequency band : 12.5-12.75 Gc/s

3.1 The Delegation of the U.S.S.R. reserved the right to revert in Committee 5 to the question of the deletion of the allocations to the FIXED and MOBILE Services, except Aeronautical Mobile, from the framed part of the Table for Region 1.

3.2 The Delegation of Austria reserved the right to revert in Committee 5 to the question of which foot-note [B] or [C] it would wish the name of Austria to appear.

ARCHIVES U.I.T. GENEVE

3.3 With respect to the direction to be shown for the FIXED-SATELLITE Service in Region 1, some delegations reserved the right to revert to this question in Committee 5 with a view to inserting in the framed part of the Table provisions for transmission in both directions.

4. Frequency band : 13.4-14 Gc/s

The Delegation of France reserved the right to revert to this question in Committee 5 should it still so desire.

5. Frequency band : 14.0-14.3 Gc/s

At the time agreement was reached on this band, the Delegation of Japan reserved the right to revert to the question of an allocation to the FIXED-SATELLITE Service (Earth-to-space) in the band from 12.75 Gc/s to 13.25 Gc/s, should it still so desire.

6. Frequency band : 13.25-14 Gc/s

With respect to the bands from 13.25 Gc/s to 14 Gc/s, the Joint Group Meeting only considered the existing foot-notes, to confirm that it had made no change whatsoever to foot-notes 407 and 409.

7. Frequency bands : 2 500-2 535 Gc/s and 2 655-2 690 Gc/s

7.1 The Joint Group Meeting of Working Groups 5A and 5E examined the joint alternative Proposal CAN-NZL/272/1 for the above bands. Regions 2 and 3 agreed the revised provisions shown in Annex 2 to the present Report insofar as the Fixed-Satellite Service only is concerned.

7.2 The Group did not consider the provisions pertaining to Region 1 nor did it consider those parts of the Proposal concerning services other than the Fixed-Satellite Service.

7.3 The Delegations of Cuba and Venezuela reserved the right to revert to this matter in Committee 5, if they still so desire.

Luiz BAHIANA
Chairman
Joint Meeting Working Groups 5A/5E

Annexes : 2

A N N E X 1

Gc/s

Region 1	Region 2	Region 3
10.7-10.95 FIXED MOBILE		
10.95-11.2 FIXED MOBILE FIXED-SATELLITE (Space-to-earth) (Earth-to-space)	10.95-11.2 FIXED MOBILE FIXED-SATELLITE (Space-to-earth)	
11.2-11.45 FIXED MOBILE		
11.45-11.7 FIXED MOBILE FIXED-SATELLITE (Space-to-earth)		

Gc/s

Region 1	Region 2	Region 3
11.7-12.5 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile)	11.7-12.2 FIXED-SATELLITE (Space-to-earth) BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) [D, E]	11.7-12.2 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) [A]
[A]	12.2-12.5 FIXED MOBILE (except aeronautical mobile) BROADCASTING	

ADD [A] In the band 11.7-12.2 Gc/s in Region 3 and in the band 11.7-12.5 Gc/s in Region 1, exisitng 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. [...]) and this requirement shall be taken into account in the decisions of that conference.

ADD [D] 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 [E] The use of the band 11.7-12.2 Gc/s 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.

[Note to Committee 5 : Texts of foot-notes A and D are to be adjusted with a view to having a single foot-note for world-wide application according to the results of the work of the present conference pertinent to this subject.]

Gc/s

Region 1	Region 2	Region 3
12.5-12.75 FIXED-SATELLITE (Space-to-earth) [B] [C]	12.5-12.75 FIXED-SATELLITE (Earth-to-space) FIXED MOBILE (except aeronautical mobile)	12.5-12.75 FIXED-SATELLITE (Space-to-earth) FIXED MOBILE
12.75-13.25 FIXED MOBILE		
13.25-13.4 AERONAUTICAL RADIONAVIGATION 406 407		
13.4-14 RADIOLOCATION 407 408 409		

[B] In Algeria, Bulgaria, the Ivory Coast, Hungary, Iraq, Kuwait, Mali, Poland, Syria, United Arab Republic, Roumania, Czechoslovakia, Togo and the U.S.S.R., the band 12.5-12.75 Gc/s is also allocated to the fixed and mobile services.

[C] In Denmark, Spain, Finland, France, Norway, the Netherlands, F.R. of Germany, Senegal, Sweden and Switzerland the band 12.5-12.75 Gc/s is also allocated on a secondary basis, to the fixed and mobile services.

Gc/s

Region 1	Region 2	Region 3
14-14.3	RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 407	
14.3-14.4	RADIONAVIGATION-SATELLITE FIXED-SATELLITE (Earth-to-space)	
14.4-14.5	FIXED MOBILE FIXED-SATELLITE (Earth-to-space)	

ANNEX 2

Mc/s

Region 1	Region 2	Region 3
	2 500-2 535 [BROADCASTING-SATELLITE] 361B 361C FIXED 364C MOBILE FIXED-SATELLITE (Space-to-earth) 361A [A]	
	2 535-2 550	
2 550-2 655		
	2 655-2 690 [BROADCASTING-SATELLITE] 361B 361C FIXED-SATELLITE (Earth-to-space) FIXED 364C [A]	2 655-2 690 [BROADCASTING-SATELLITE] 361B 361C FIXED 364C MOBILE FIXED-SATELLITE (Earth-to-space) [A]

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].

SPACE CONFERENCE

Document No. 273-E
5 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

JOINT REPORT BY WORKING GROUPS 5A AND 5E

TO COMMITTEE 5 (ALLOCATIONS)

FIXED-SATELLITE AND BROADCASTING-SATELLITE SERVICES

Frequency bands between 10.7 Gc/s and 14.5 Gc/s

1. The Joint Meetings of Working Groups 5A and 5E agreed to recommend to Committee 5 the adoption of the revised provisions appearing in the Annex to the present Report.

2. With respect to foot-notes [D] and [E], the Delegations of Argentina and Cuba reserved the right to revert to the subject later should they still so desire. In particular, the Delegation of Argentina felt that no final decision should be taken on foot-note [D] until the conclusions of Committee 6 on the draft Recommendation in question was available.

3. Frequency band : 12.5-12.75 Gc/s

3.1 The Delegation of the U.S.S.R. reserved the right to revert in Committee 5 to the question of the deletion of the allocations to the FIXED and MOBILE Services, except Aeronautical Mobile, from the framed part of the Table for Region 1.

3.2 The Delegation of Austria reserved the right to revert in Committee 5 to the question of which foot-note [B] or [C] it would wish the name of Austria to appear.

3.3 With respect to the direction to be shown for the FIXED-SATELLITE Service in Region 1, some delegations reserved the right to revert to this question in Committee 5 with a view to obtaining authority for both directions to apply.

4. Frequency band : 14.0-14.3 Gc/s

At the time agreement was reached on this band, the Delegation of Japan reserved the right to revert to the question of an allocation to the FIXED-SATELLITE Service in the band from 14.575 Gc/s to 15.075 Gc/s (Proposal J/98/79).

ARCHIVES U.I.T. GENÈVE

5. With respect to the bands from 13.25 Gc/s to 14 Gc/s, the Joint Group Meeting only considered the existing foot-notes, to confirm that it had made no change whatsoever to foot-notes 407 and 409.

Luiz BAHIANA
Chairman

Annex : 1

A N N E X

Gc/s

Region 1	Region 2	Region 3
10.7-10.95 FIXED MOBILE		
10.95-11.2 FIXED MOBILE FIXED-SATELLITE (Space-to-earth) (Earth-to-space)	10.95-11.2 FIXED MOBILE FIXED-SATELLITE (Space-to-earth)	
11.2-11.45 FIXED MOBILE		
11.45-11.7 FIXED MOBILE FIXED-SATELLITE (Space-to-earth)		

Gc/s

Region 1	Region 2	Region 3
11.7-12.5 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) [A]	11.7-12.2 FIXED-SATELLITE (Space-to-earth) BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) [D, E]	11.7-12.2 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE (except aeronautical mobile) [A]
	12.2-12.5 FIXED MOBILE (except aeronautical mobile) BROADCASTING	

ADD [A] In the band 11.7-12.2 Gc/s in Region 3 and in the band 11.7-12.5 Gc/s 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. [...]) and this requirement shall be taken into account in the decisions of that conference.

ADD [D] Terrestrial services in these bands shall be introduced only after the elaboration of agreed plans for the space services, so as to ensure compatibility between the uses made by all countries.

ADD [E] The use of the band 11.7-12.2 Gc/s 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.

[Note to Committee 5 : Texts of foot-notes A and D are to be adjusted with a view to having a single foot-note for world-wide application according to the results of the work of the present Conference pertinent to this subject.]

Gc/s

Region 1	Region 2	Region 3
12.5-12.75 FIXED-SATELLITE (Space-to-earth) /B/ /C/	12.5-12.75 FIXED-SATELLITE (Earth-to-space) FIXED MOBILE (except aeronautical mobile)	12.5-12.75 FIXED-SATELLITE (Space-to-earth) FIXED MOBILE
12.75-13.25 FIXED MOBILE		
13.25-13.4 AERONAUTICAL RADIONAVIGATION 406 407		
13.4-14 RADIOLOCATION 407 408 409		

/B/ In Algeria, Bulgaria, the Ivory Coast, Hungary, Kuwait, Mali, Poland, Syria, United Arab Republic, Roumania, Czechoslovakia, Togo and the U.S.S.R. /Iraq/, ... the band 12.5-12.75 Gc/s is also allocated to the fixed and mobile services.

/C/ In Denmark, Spain, Finland, France, Norway, the Netherlands, F.R. of Germany, Senegal, Sweden and Switzerland the band 12.5-12.75 Gc/s is also allocated on a secondary basis, to the fixed and mobile services.

Gc/s

Region 1	Region 2	Region 3
14-14.3	RADIONAVIGATION COMMUNICATION-SATELLITE (Earth-to-space) 407	
14.3-14.4	RADIONAVIGATION-SATELLITE COMMUNICATION-SATELLITE (Earth-to-space)	
14.4-14.5	FIXED MOBILE COMMUNICATION-SATELLITE (Earth-to-space)	

SPACE CONFERENCE

Document No. 274-E
5 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

REPORT OF THE CHAIRMAN OF WORKING GROUP 4B ON SPACE SERVICES SHARING FREQUENCY BANDS WITH TERRESTRIAL SERVICES AROUND 2.5 Gc/s

1. After having considered the Documents IND/112, J/113, relevant parts of Annex to Document No. 64 (Report of the S.J.M.) and Documents Nos. DT/71 and DT/71(Rev.), Working Group 4B approved the following report at its 10th meeting on 2 July 1971 on space services sharing frequency bands with terrestrial services around 2.5 Gc/s. The report is submitted to Committee 4 for approval and transmission to Committee 5 with reference to paragraph 2 of Document No. DT/42.

2. Power flux-density limits for broadcasting-satellite space stations

In the frequency band [around 2.5 Gc/s], the power flux-density at the earth's surface produced by an emission from a space station in the Broadcasting-Satellite Service shall not exceed the following values except by agreement of the administrations concerned and affected :

- 152 dbW/m^2/4kc/s for angles of arrival between 0° and 5° above the horizontal plane;

- $152 + \frac{3(\delta - 5)}{4}$ dbW/m^2/4kc/s for angles of arrival (δ) between 5° and 25° above the horizontal plane;

- 137 dbW/m^2/4kc/s for angles of arrival between 25° and 90° above the horizontal plane.

3. The acceptance of the above power flux-density limits is based on :

- a broadcasting-satellite model with approximately 20° spacing between satellites in the geostationary-satellite orbit;

- 26 db of energy dispersal;

- a service area power flux of up to - 111 dbW/m^2 in the occupied bandwidth of broadcasting-satellite emission.

ARCHIVES U.I.T. GENÈVE

4. Use of directional antenna in the satellite is necessary to provide the proposed flux-density within the service area of the broadcasting satellite as well as to provide the necessary protection to the Terrestrial Services. A minimum acceptable power flux of -118 dbW/m^2, at the edge of the beam, was agreed by the S.J.M. (Annex 3.3F Table 3.3F-II, page 87, Part II of the S.J.M. Report) as suitable for a community style broadcasting satellite service in this band. The proposed maximum value of -111 dbW/m^2 is therefore expected to allow a viable service to be developed.

5. The interfering effect to line-of-sight radio-relay systems of the proposed power flux-density and model, is expected to be similar to that which would be produced, by the 6° satellite spacing, communication satellite type model, assumed in Document No. 131, for a power flux-density of -154 dbW/m^2/4kc/s escalating to -144 dbW/m^2/4kc/s.

6. The Sub-Working Group also examined the technical criteria, given in the Report of the S.J.M. of the C.C.I.R. and in Document IND/112, for the protection of transhorizon systems. The Report of the S.J.M., Annex 8.4B, page 264, Part II, states that, for 1 000 pWp noise increase in the worst telephone channel of two example transhorizon systems, the maximum allowable direct entry interfering power flux-density should not exceed -170 dbW/m^2/4kc/s and -189 dbW/m^2/4kc/s, including polarization discrimination.

7. The S.J.M. also states that, if this value of noise is not to be exceeded due to interference from a satellite in the geostationary orbit producing a low angle power flux-density of -152 dbW/m^2/4kc/s, the angle between the main beam of the transhorizon receiving antenna and the direction of the satellite should not be less than 2.5 and 5.5 degrees respectively, for the two example systems. The directivity of the transhorizon antennae were assumed to be defined by the formula $35 - 25 \log_{10} \Phi$ for angles (Φ) greater than one degree from the direction of maximum radiation.

8. The direct entry interfering power flux-density limits for the systems studied in IND/112 range between -168 and -191 dbW/m^2/4kc/s without taking into consideration polarisation discrimination. Assuming the same antenna characteristic and a power flux-density of -152 dbW/m^2/4kc/s, similar values of angular discrimination would be required to limit the noise due to the interfering power flux-density. The Sub-Working Group concluded from the studies that sharing between transhorizon systems and the Broadcasting-Satellite Service in this band would be technically feasible only if both services accepted some technical and operational limitations. These may include co-ordinating proposed Broadcasting Satellite Services with existing transhorizon systems. By these means, it would be possible for both services to continue to develop in this band.

9. The interference sensitivity of the transhorizon systems studied by the S.J.M. and in IND/112 varied by up to 22 db. The Sub-Working Group recommends, therefore, that the actual characteristics of the transhorizon system concerned, be used in effecting co-ordination and that the interfering signal into the receiver of a transhorizon system as a result of such co-ordination should not exceed -168 dbW/4kc/s, except by agreement of the administrations concerned.

10. In so far as the protection of Broadcasting-Satellite Service from the Terrestrial Services is concerned, the Sub-Working Group was of the opinion that :

i) because the typical co-ordination distance with respect to line-of-sight radio-relay systems would be sufficiently small, special co-ordination procedure may not be required;

ii) although the protection to broadcasting-satellite receivers from transhorizon radio-relay systems would not be adequate (vide paragraph 3.4.3.2.2 b.2) of Part I of the Report of the S.J.M., pages 41 and 42), the situations of this type would be rare and the Sub-Working Group did not consider this possibility in more detail.

11. Specific proposals for inclusion of texts arising out of the above are shown in Document No. DT/82.

G.C. BROOKS
Chairman
Working Group 4B

SPACE CONFERENCE

Document No. 275-E
5 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

REPORT FROM THE CHAIRMAN, WORKING GROUP 4B RELATING TO PROPOSED PARTIAL TEXT OF SECTION VIII, ARTICLE 7 RELATING TO LIMITS OF POWER FLUX-DENSITY FROM SPACE STATIONS IN THE BANDS BETWEEN 2.3 TO 3 Gc/s

1. Enclosed please find in the Annex the proposed partial text of Section VIII, Article 7 relating to limits of power flux-density from space stations in the Broadcasting-Satellite Service sharing frequency bands between 2.3 to 3 Gc/s with Terrestrial Fixed Services. The text would need to be completed by indication of the frequency band in the appropriate paragraph of the proposed text, for which the power flux-density limits would be applicable. This will be done as soon as the decisions of Committee 5 are known. Consequential drafting amendments will also be made to the proposed text as necessary.

2. In the event that this band is allocated to the Communication-Satellite Service (Space-to-earth), the limits of 470NE of Document No. 198 would apply. This should be drawn to the attention of Committee 7 for a possible inclusion of this band in 470NG.

3. This document and Document No. 274 should be forwarded to Committees 5 and 6 for their information. Committee 6 should note in particular the proposal for 470NK in the Annex to this document where the requirement for angular discrimination with reference to a broadcasting-satellite space station at transhorizon fixed service receiving station antenna is mentioned. This discrimination must be attained as a result of suitable co-ordination between the administrations concerned and Committee 6 is requested to ensure that this co-ordination is provided for in Articles 9 and 9A.

4. The drafting committee of Committee 4 should note that in this document and Document No. 198, the frequency bands in the sub-titles in square brackets should be replaced by the actual band limits as decided by Committee 5.

ARCHIVES U.I.T. GENÈVE

5. The Working Group 4B approved these power flux-density limits during its 10th meeting on 2 July 1971 while considering Document No. DT/71(Rev.).

G.C. BROOKS
Chairman
Working Group 4B

Annex : 1

A N N E X

ADD 470NH (3) Power flux-density limits [between 2.3 Gc/s to 3 Gc/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 kc/s band for angles of arrival between 0 and 5 degrees above the horizontal plane;

$-152 + \frac{3(\delta - 5)}{4}$ dbW/m^2 in any 4 kc/s band for angles of arrival between 5 and 25 degrees above the horizontal plane;

-137 dbW/m^2 in any 4 kc/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 :

- [ ]

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 fixed service using line-of-sight techniques. Where 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 kc/s band.

SPACE CONFERENCE

Document No. 276-E
5 July 1971

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

MEMORANDUM BY THE CHAIRMAN

The Heads of the Delegations of :

- the Union of Soviet Socialist Republics
- the Ukrainian Soviet Socialist Republic
- the Bielorussian Soviet Socialist Republic

have sent me the letter reproduced in the Annex.

Gunnar PEDERSEN
Chairman of the Conference

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

TO THE CHAIRMAN OF THE WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS

Geneva, 3 July 1971

Mr. G. Pedersen

Dear Mr. Chairman,

We are sending you herewith a statement by the Heads of the Delegations of the U.S.S.R., the Ukrainian S.S.R. and the Bielorussian S.S.R. on the participation in the Conference of 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,

Head, U.S.S.R. Delegation (Signed : A. BADALOV)

Head, Ukrainian Delegation (Signed : I. TIMCHENKO)

Head, Bielorussian Delegation (Signed : L. PODORSKI)

Annex : 1

Annex

The Delegations of the Union of Soviet Socialist Republics, the Ukrainian Soviet Socialist Republic and the Bielorussian Soviet Socialist Republic to the World Administrative Radio Conference for Space Telecommunications express their profound regret that delegations from the sovereign States - 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 is not in the interest of the widening of international collaboration on telecommunications and conflicts with United Nations General Assembly Resolution No. 1721(XVI), which proclaims that space telecommunications shall be accessible to all countries of the world without discrimination.

Head, U.S.S.R. Delegation	(Signed : A. BADALOV)
Head, Ukrainian Delegation	(Signed : I. TIMCHENKO)
Head, Bielorussian Delegation	(Signed : L. PODORSKI)

SPACE CONFERENCE

Document No. 277-E
5 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

GREECE

Ref:

GRC/277/30

DRAFT RESOLUTION No. K

relating to the use of the band (468-470) MHz
and (611-613) MHz from small ships
when using space techniques

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

considering

a) that there is a need to develop the use of space techniques to meet the future requirements of the Maritime Mobile Service;

b) that the bands between ..... MHz and .....MHz permit the engineering of relatively low-powered and economical equipment with simple antennae for (a co-operation with) a satellite system;

c) that such equipment and antennae from an economical and technical point of view are the most appropriate for small ships when using space techniques;

recognizing

1) that a viable and economical system has to be provided to small ships in order that they may utilize space techniques for their communications;

2) that the bigger ships can also use other systems with more elaborate equipments in the band 1 535-1 660 MHz,

ARCHIVES U.I.T. GENÈVE

Ref.

GRC/277/30 (cont.)

having provided for

the possible use of space techniques for the Maritime Mobile Service in bands .....MHz and .....MHz;

resolves

that the World Administrative Maritime Radio Conference to be held in 1974 be invited to consider the matter further and to decide the necessary steps and specify the required criteria so that the bands .....MHz and .....MHz will be mainly used from small ships when using techniques for their operational requirements and crew and passenger traffic.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 278-E
5 July 1971
Original : English

COMMITTEE 4

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

1. With reference to Document No. 202 from Sub-Working Group 5E-1, Working Group 4B studied the power flux-density necessary to protect Terrestrial Broadcasting Service in the band 614-790 Mc/s.

2. Working Group 4B could not agree on a power flux-density for inclusion in Article 7. There were two distinct viewpoints. The first was to accept the C.C.I.R. S.J.M. power flux-density limits and the second was to provide more protection than that indicated in the S.J.M. Report. This second viewpoint resulted from the tests undertaken in the United Kingdom and reported to this Conference in Document No. 171.

3. As a compromise, Working Group 4B agreed on a draft Recommendation shown in the Annex to this document. This draft Recommendation indicates some of the problem areas and recommends provisional limits to be applicable until such time as the C.C.I.R. recommends new values. The delegations of Spain, France, Federal Republic of Germany, Italy, Portugal and the United Kingdom indicated that they could not accept these provisional limits.

4. These delegations considered that the provisional limits given in "recommends 1" of the draft Recommendation would not provide adequate protection for terrestrial television services. These Administrations consider that the maximum value of the provisional limits should in no circumstances be greater than the following values :

-129 dbW/m^2	$\delta < 20°$
$-129 + 0.4\ (\delta - 20°)$ dbW/m^2	$20° < \delta < 60°$
-113 dbW/m^2	$60° < \delta < 90°$

5. This Report and the draft Recommendation in the Annex should be brought to the attention of Committee 5.

G.C. BROOKS
Chairman
Working Group 4B

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

RECOMMENDATION NO.

relating to the criteria to be applied
for sharing between the Satellite Broadcasting Service
and the Terrestrial Broadcasting Service
in the band [614-790 Mc/s]

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 C.C.I.R., S.J.M., Geneva, 1971, indicated a power flux-density limit of

-121 dbW/m^2	$\delta < 20°$
$-121 + 0.4\ (\delta - 20°)$ dbW/m^2	$20° < \delta < 60°$
-105 dbW/m^2	$60° < \delta < 90°$

b) that additional tests carried out by one administration after the C.C.I.R., S.J.M., indicated that the following more conservative power flux-density limits may be necessary to protect the Terrestrial Broadcasting Service

-130 dbW/m^2	$\delta < 20°$
$-130 + 0.4\ (\delta - 20°)$ dbW/m^2	$20° < \delta < 60°$
-114 dbW/m^2	$60° < \delta \leq 90°$

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

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 service (vide C.C.I.R. Recommendation 417-2), by a broadcasting-satellite space station in the band 614-790 MHz shall not exceed :

-127 dbW/m^2	$\delta < 20°$
$-127 + 0.4\ (\delta - 20°)$ dbW/m^2	$20° < \delta < 60°$
-111 dbW/m^2	$60° < \delta < 90°$

2. that this limit may be exceeded subject to the agreement of administrations in whose territory the above limit is exceeded;

3. that the C.C.I.R. urgently study this matter and prepare a Recommendation on power flux-densities to be used in lieu of the above provisional limits;

4. 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.

5. that in its studies the C.C.I.R. should consider the benefits of energy dispersal in the Broadcasting-Satellite Service for television.

SPACE CONFERENCE

Document No. 279-E
6 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 6

THIRD REPORT OF WORKING GROUP 5B

TO COMMITTEE 5 (ALLOCATIONS)

RADIO ASTRONOMY SERVICE

Frequency bands	Paragraph	Frequency bands	Paragraph
1 350-1 400 Mc/s	1	10.48 -10.58 Gc/s	10
1 611.5-1 612.5 Mc/s	2	10.6 -10.68 Gc/s	11
1 660-1 670 Mc/s	3	10.68 -10.7 Gc/s	12
1 720-1 721 Mc/s	4	14.485-14.515 Gc/s	13
2 670-2 695 Mc/s	5	19.3 -19.4 Gc/s	14
4 825-4 835 Mc/s	6	21.9 -22.4 Gc/s	15
4 950-4 990 Mc/s	7	23.6 -24 Gc/s	16
4 990-5 000 Mc/s	8	31.2 -31.3 Gc/s	17
5 750-5 770 Mc/s	9	36.458-36.488 Gc/s	18
		71 -73 Gc/s	19
		86 -92 Gc/s	20
		130 -140 Gc/s	21
		230 -240 Gc/s	22

1. Frequency band : 1 350-1 400 Mc/s

The additional provision ADD 349A appearing in Annex A to the present Report was unanimously agreed.

ARCHIVES U.I.T. GENÈVE

2. Frequency band : 1 611.5-1 612.5 Mc/s

The additional provision ADD 352E appearing in Annex A to the present Report was unanimously agreed.

3. Frequency band : 1 660-1 670 Mc/s

After a long examination of all Proposals in favour of an allocation to the Radio Astronomy Service in this band, the Group unanimously agreed the revised allocations appearing in Annex A to the present Report together with MOD 353A as shown.

4. Frequency band : 1 720-1 721 Mc/s

The additional provision ADD 352E appearing in Annex A to the present Report was unanimously agreed.

5. Frequency band : 2 670-2 690 Mc/s

The additional provision ADD 363A appearing in Annex A to the present Report was unanimously agreed.

6. Frequency band : 4 825-4 835 Mc/s

The additional provision ADD 382B (Proposal G/54/96) appearing in Annex B to the present Report was unanimously agreed. However, the Delegations of Australia, Canada, India and Sweden expressed regret at the choice of the weaker wording "Administrations should bear in mind the needs of the radio astronomy, etc." for this provision.

7. Frequency band : 4 950-4 990 Mc/s

The additional provision ADD 382A (Proposal G/54/95) appearing in Annex B to the present Report was unanimously agreed. However, the Delegations of Australia and Sweden expressed a preference for the stronger language of the Proposal AUS/10/27 whereby "Administrations are urged to provide all practicable protection for such observations, etc.".

8. Frequency band : 4 990-5 000 Mc/s

The Group examined the form of the foot-note provision applying in this band and unanimously agreed on the status quo but that the editorial modification to No. 365 should apply, namely to replace the mention of the specific services by "other services to which this band is allocated". Consequently, MOD 365 would be shown and the attention of Committee 7 (Editorial) invited to the possibility of using ADD 233A (frequency band 37.75-38.25 Mc/s) in place of MOD 365 since the agreed revised text is identical with ADD 233A. The resultant provisions are shown in Annex B to the present Report.

9. Frequency band : 5 750-5 770 Mc/s

9.1 The additional provision ADD 391A (Proposal URS/59/23) was aligned to previous foot-note terminology and agreed by a large majority as shown in Annex B to the present Report.

9.2 The Delegation of the F.R. of Germany reserved the right to revert later to this foot-note, as applying to the band 5 750-5 770 Mc/s, should it still so desire.

10. Frequency band : 10.48-10.58 Gc/s

Proposal F/41/120-125 in part, seeking an exclusive allocation in the band 10.48-10.50 Gc/s and an additional allocation in the band 10.50-10.58 Gc/s to the Radio Astronomy Service were not supported and consequently were not examined.

11. Frequency band : 10.60-10.68 Gc/s

11.1 The various proposals concerning this band were thoroughly examined. The Group agreed, by a large majority, to make an additional allocation to the Radio Astronomy Service in the framed part of the Table on a world-wide basis, as shown in Annex C to the present Report.

11.2 The Delegation of the F.R. of Germany reserved the right to revert to this question later, should it still so desire.

12. Frequency band : 10.68-10.7 Gc/s

12.1 The Group unanimously agreed to the status quo, leaving the exclusive allocation to the Radio Astronomy Service with foot-notes 405A and 405B of the present Radio Regulations.

12.2 The Delegation of the United Kingdom mentioned that it was studying the current validity of foot-note 405A in so far as it was concerned.

13. Frequency band : 14.485-14.515 Gc/s

The additional provision ADD 405BA appearing in Annex C to the present Report was unanimously agreed by the Group.

14. Frequency band : 19.3-19.4 Gc/s

The Group unanimously agreed to the deletion of the exclusive allocation to the Radio Astronomy Service (RR 409D) - see Annex C to the present Report - and requested the Chairman to so inform the Chairmen of Committee 5 and Working Group 5A, inviting their attention to the fact that the remainder of the related Proposals concerning Space and Terrestrial Services had not been considered in Working Group 5B (Document No. 216 refers).

15. Frequency band : 21.9-22.4 Gc/s

15.1 In view of agreements reached in another band, Proposals CAN/14/94 and 95 seeking an exclusive allocation in the band 21.9-22.4 Gc/s were withdrawn.

15.2 In the interests of achieving unanimity Proposal F/41/137 ADD 410A was abandoned in favour of Proposal AUS/10/51 with the deletion of the word "unique".

15.3 The additional provision concerning the band 22.21-22.26 Gc/s thus amended, was unanimously agreed and is reproduced in Annex C to the present Report as ADD 410A.

16. Frequency band : 23.6-24 Gc/s

16.1 The Group agreed by a large majority to delete the allocation to the Radiolocation Service and to make an exclusive allocation to the Radio Astronomy Service with Nos. 407 and 408 of the Radio Regulations remaining, as shown in Annex C to the present Report.

16.2 The Delegations of Bulgaria, Czechoslovakia and the U.S.S.R. explained their continuing need of the allocation to the Radiolocation Service and reserved the right to revert to this matter later, should they still so desire.

17. Frequency band : 31.2-31.3 Gc/s

The Delegation of Australia explained that Proposal AUS/10/53 reflected the conclusions reached by I.U.C.A.F. After examination and amendment, the additional provision ADD 412I appearing in Annex C to the present Report was unanimously agreed.

18. Frequency band : 36.458-36.488 Gc/s

The additional provision ADD 391A (Proposal URS/59/23) amended was unanimously agreed for this band as shown in Annex B to the present Report and applies to the frequency bands 5 750-5 770 Mc/s and 36.458-36.488 Gc/s (paragraph 9.1 of the present Report refers).

19. Frequency band : 71-73 Gc/s

19.1 Proposal J/98/81, in part, received no support and consequently was not examined.

19.2 The Delegation of Japan reserved the right to revert to this subject later, should it still so desire.

20. Frequency band : 86-92 Gc/s

20.1 The Group agreed, by a large majority, the new provisions appearing in Annex D to the present Report.

20.2 The Delegation of the United Kingdom reserved the right to revert to the question of the limits of the band (88-90 Gc/s or 92 Gc/s) at a later date, should it still so desire.

21. Frequency band : 130-140 Gc/s

21.1 The Group agreed, by a large majority, the new provisions appearing in Annex D to the present Report.

21.2 The Delegation of the United Kingdom reserved the right to revert to the question of the limits (132-134 Gc/s) at a later date, should it still so desire.

22. Frequency band : 230-240 Gc/s

The Group unanimously agreed the new provisions appearing in Annex D to the present Report.

B. DESTA
Chairman

Annexes : 4

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X A

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 1 350-1 400 Mc/s band.

ADD 352E Radio astronomy observations on important spectral lines due to the hydroxyl rest frequencies at 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 the radio astronomy service in their future planning of these bands.

Mc/s

	Region 1	Region 2	Region 3
	1 660-1 670		
MOD		METEOROLOGICAL AIDS RADIO ASTRONOMY 353 353A 354 354A 354B	

MOD 353A In view of the successful detection of two 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.

ADD 363A Radio astronomy observations are being carried out in the band 2 670-2 690 Mc/s 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.

ANNEX B

Mc/s

Region 1	Region 2	Region 3
4 700-4 990	FIXED MOBILE 354 382A 382B	

ADD 382A Radio astronomy observations are being carried out in the band 4 950-4 990 Mc/s 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.

ADD 382B Radio astronomy observation on the Formaldehyde line (rest frequency 4 829.649 Mc/s) 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 Mc/s.

Mc/s

Region 1	Region 2	Region 3
4 990-5 000 FIXED MOBILE RADIO ASTRONOMY 365	4 990-5 000 RADIO ASTRONOMY 383A	4 990-5 000 FIXED MOBILE RADIO ASTRONOMY 365

Note to Committee 7 : The texts of ADD 233A /(37.75-38.25 Mc/s), MOD 317 (406-410 Mc/s) and MOD 365 (2 600-2 700 Mc/s and 4 700-5 000 Mc/s) are now the same./

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.

ADD 391A Radio astronomy observations are being carried out in the bands 5 750-5 770 Mc/s and 36.458-36.488 Gc/s 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.

ANNEX C

Gc/s

	Region 1	Region 2	Region 3
MOD	10.6-10.68	FIXED MOBILE RADIO ASTRONOMY Radiolocation	

*

* *

ADD 405BA Radio astronomy observations on the Formaldehyde line (rest frequency 14.489 Gc/s) 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 Gc/s.

	Region 1	Region 2	Region 3
SUP*)	19.3-19.4	409D	

*) Document No. 216 refers

ADD 410A The band 22.21-22.26 Gc/s is also allocated to the radio astronomy service for observations of a spectral line due to water vapour (rest frequency 22.235 Gc/s). Administrations are urged to give all practicable protection in this band for future research in radio astronomy.

Gc/s

	Region 1	Region 2	Region 3
MOD	23.6-24 RADIO ASTRONOMY 407		

NOC 407

MOD 408 In Sweden, the bands 13.4-14 Gc/s, 15.7-17.7 Gc/s and 33.4-36 Gc/s are also allocated to the fixed and mobile services.

*

* *

ADD [412I] Radio astronomy observations in the band 31.2-31.3 Gc/s 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.

[Note to Committee 7 : Committee 5 has not attempted to finalize the foot-note numbering.]

A N N E X D

Gc/s

	Region 1	Region 2	Region 3
ADD	86-92	RADIO ASTRONOMY SPACE RESEARCH (Passive only) / xxx /	

ADD / xxx / All transmissions in this band are prohibited. The use of passive sensors by other radio services is also authorized.

ADD	130-140	RADIO ASTRONOMY SPACE RESEARCH (Passive only) / xxx /	

ADD	230-240	RADIO ASTRONOMY SPACE RESEARCH (Passive only) / xxx /	

/ Note to Committee 7 : Committee 5 has not attempted to finalize the foot-note numbering. /

SPACE CONFERENCE

Document No. 280-E
7 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

FOURTH REPORT OF WORKING GROUP 5B

TO COMMITTEE 5 (ALLOCATIONS)

SPACE RESEARCH SERVICE

Frequency bands :

15 762-15 768 kc/s	235 -267 Mc/s
18 030-18 036 kc/s	410 -420 Mc/s
18 052-18 068 kc/s	449.75-450.25 Mc/s
24 528-24 538 kc/s	1 700-1 710 Mc/s
39.986-40.02 Mc/s	1 750-1 850 Mc/s
40.98-41.015 Mc/s	2 025-2 120 Mc/s
136 -137 Mc/s	2 190-2 220 Mc/s
137 -138 Mc/s	2 200-2 290 Mc/s
138 -143.6 Mc/s	2 290-2 300 Mc/s
143.6 -143.65 Mc/s	7 145-7 235 Mc/s
143.65-144 Mc/s	8 400-8 500 Mc/s

1. Except where stated otherwise below, Working Group 5B unanimously agreed the revised and new provisions concerning the Space Research Service allocations which appear in the Annex to the present Report.

ARCHIVES U.I.T. GENÈVE

2. Frequency bands : 15 762-15 768 kc/s and 18 030-18 036 kc/s

The Delegation of Cuba reserved the right to revert to the deletion of No. 215A at a later date if it still so desired.

3. Frequency band : 136-137 Mc/s

3.1 By a very small majority the Group agreed to leave the status quo. However, strong appeals were made to pursue the objectives of Recommendation No. Spa 7 adopted in 1963, to which foot-note 281A is a cross-reference, namely

"recommends

1. that administrations of all Regions operating, or intending to operate, stations in the Fixed and Mobile Services in the band 136-137 Mc/s take all possible steps to give the required protection to the Space Research Service and to cease the operation of stations of the Fixed and Mobile Services as soon as possible;"

3.2 The Chairman was requested to draw up the draft Report showing the alternative presentations, one with the Fixed and Mobile Services in the framed part of the Table in Regions 1 and 3, with a foot-note indicating the names of those countries for which the Space Research Service is an exclusive allocation (alternative A) and the other with allocations to the Fixed and Mobile Services in Regions 1 and 3 in a foot-note showing the names of the countries not requiring the Fixed and Mobile allocations in the foot-note (alternative B). These alternatives appear in the Annex to the present Report.

3.3 It was also suggested that SPACE RESEARCH (Space-to-Earth) should be shown as an exclusive world-wide allocation in the framed part of the Table and those countries which are still unable to renounce totally the allocations to the Fixed and Mobile Services to be shown in a foot-note, if possible with a new target date for clearance. In this connection, the Group unanimously agreed to modify No. 281B of the Radio Regulations as shown in the Annex to the present Report.

3.4 The Group agreed in principle to the replacement of "(Telemetering and tracking)" by "(Space-to-Earth)" subject to the modification to the definition of the Space Research Service. The Delegation of Algeria reserved the right to revert to this question later as an additional foot-note may be required in this connection according to the final version of the definition of the Space Research Service.

3.5 Several delegations were of the opinion that foot-note 281A and Recommendation No. Spa 7 were inseparable and that their deletion or abrogation, as the case may be, could only be at the time there were no further allocations to the Fixed and Mobile Services in the band 136-137 Mc/s.

3.6 The Group agreed to take a decision on the presentation of this portion of the Table, when the draft Report was presented for approval to Committee 5, (see paragraph 4.1 below).

4. Frequency band : 138-143.6 Mc/s

4.1 The Group provisionally agreed the new provision ADD 283A (Proposal ARG/22/24) as amended and shown in the Annex to the present Report, subject to review in the light of the new definition of the Space Research Service.

4.2 The Group agreed the inclusion of an allocation to the Space Research Service (Space-to-Earth), on a secondary basis, in the framed part of the Table for Regions 2 and 3 as shown in the Annex to the present Report, while the Region 1 allocation would be the subject of a foot-note.

4.3 The Delegations of Bulgaria, Poland, Czechoslovakia and the U.S.S.R. could not agree to an allocation to the Space Research Service and requested the status quo. They reserved the right to revert to this question in Committee 5, should they still so desire.

4.4 The Delegation of the Federal Republic of Germany was unable to agree with the new allocation between 140 Mc/s and 143.6 Mc/s and reserved the right to revert to the question of the limit of the band later, should it still so desire.

5. Frequency band : 143.65-144 Mc/s

5.1 The Group agreed to the additional allocation, on a secondary basis, to the Space Research Service (Space-to-Earth) being inserted for Regions 2 and 3 in the framed part of the Table; while the Region 1 allocation would be the subject of a foot-note.

5.2 The Delegations of the Federal Republic of Germany, Czechoslovakia and the U.S.S.R. reserved the right to revert to this subject later, should they still so desire.

6. Frequency band : 235-267 Mc/s

Proposals ARG/22/28 and 29 seeking authority to use this band in Argentina for the Space Research Service were initially supported. In the detailed examination, efforts were made to accommodate this requirement by amending the proposed foot-note ADD 309C to specify the use being limited to local range support operations. Suggestions were made for meeting the requirement without revision of the Table. Serious question was raised as to protection of the survival craft frequency on 243 Mc/s (No. 309 of the Radio Regulations refers). In the final analysis, there was no continuing support for the Proposals which were not considered further.

7. Frequency band : 410-420 Mc/s

Proposal J/98/59 seeking an additional world-wide allocation to the Space Research Service (Space-to-Earth) ADD 317B was not supported and was withdrawn.

8. Frequency band : 1 700-1 710 Mc/s

8.1 Proposal J/30/11 seeking an exclusive world-wide allocation to the Space Research Service (Space-to-Earth) was not supported and consequently fell.

8.2 Proposal USA/28/71 for the band 1 700-1 710 Mc/s seeking the addition of FIXED and MOBILE in the framed part of the Table for Region 2 and the replacement of "(Telemetering and tracking)" by "(Space-to-Earth)" together with the consequential deletion of foot-note No. 355A, was unanimously adopted. The resultant allocations appear in the Annex to the present Report.

9. Frequency band : 1 750-1 850 Mc/s

9.1 Considerable discussion centred around the band limits proposed in USA/28/76 for MOD 356A for world-wide effect. The replacement of the term "telecommand in conjunction etc." by "earth-to-space" gave no difficulty. Finally, it was unanimously agreed to begin the foot-note with "In Region 2, Australia, Spain, Japan [.....] etc." leaving place for those countries in Regions 1 and 3 desiring the new provision to include their names in the foot-note.

9.2 It was noted that the present band met the requirement for the direction earth-to-space and that the requirement for the reciprocal direction space-to-earth would be accommodated in the band 2 200-2 290 Mc/s. The Group agreed that one foot-note might be drawn up for both bands. A suggested text appears as MOD 356A in the Annex to the present Report, (paragraph 11 below refers).

10. Frequency band : 2 025-2 120 Mc/s

10.1 A long examination was made of Proposals USA/28/77, CAN/14/69 and F/41/103 and 104 in particular concerning the lower limit. Finally, a single foot-note covering separately Region 2 and Australia on the one hand and Regions 1 and 3 on the other, was unanimously agreed as shown in the Annex to the present Report as ADD 356AB.

10.2 The Delegations of France and the Federal Republic of Germany expressed a strong preference for the band 2 096-2 120 Mc/s for Region 1.

10.3 In the discussion the Delegation of Japan rallied to the majority position and did not insist on Proposal J/30/12 for the band 2 110-2 120 Mc/s.

11 Frequency band : 2 190-2 220 Mc/s

11.1 Identical Proposals F/41/104 and HOL/49/63 were examined. Taking into account other similar provisions proposed for the band 2 290-2 300 Mc/s and on a show of hands, only one delegation supported the new provision for the band 2 190-2 220 Mc/s. This proposed provision was not examined further.

12. Frequency band : 2 200-2 290 Mc/s

12.1 A long examination was made of Proposal USA/28/78 seeking the additional allocation to the Space Research Service (Space-to-Earth) in the framed part of the Table on a world-wide basis.

12.2 Finally, the Group unanimously agreed to leave the framed part of the Table status quo and to propose foot-note MOD 356A as amended for adoption by Committee 5. MOD 356A appears in the Annex to the present Report (paragraph 8 above refers).

B. DESTA
Chairman

Annex : 1

A N N E X

kc/s

Region 1	Region 2	Region 3
15 762-15 768		
	FIXED	

18 030-18 036
FIXED

SUP 215A

ADD 221B The band 18 052-18 068 kc/s is allocated, on a secondary basis, to the Space Research Service.

NOC

23 350-24 990
FIXED LAND MOBILE
222 222A

ADD 222A 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.

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 Mc/s is also allocated, on a secondary basis, to the Space Research Service in particular for measurements of the differential Faraday effect.

*

* *

MOD 281B In Cuba, the band 136-137 Mc/s is also allocated to the fixed and mobile services.

ALTERNATIVE A

Mc/s

Region 1	Region 2	Region 3
136-137 FIXED MOBILE SPACE RESEARCH (Space-to-Earth) 281A 281AA	136-137 SPACE RESEARCH (Space-to-Earth) 281A 281B	136-137 FIXED MOBILE SPACE RESEARCH (Space-to-Earth) 281A 281AA

NOC 281A

ADD 281AA In Australia, Denmark, France, Iran, Norway, New Zealand, the F.R. of Germany, the United Kingdom, Sweden [ ] the band 136-137 Mc/s is allocated exclusively to the space research service (Space-to-Earth).

ALTERNATIVE B

Mc/s

Region 1	Region 2	Region 3
136-137 SPACE RESEARCH (Space-to-Earth) 281A 281AA 281B		

NOC 281A

ADD 281AA In Bulgaria, China, Cyprus, Cuba, Spain, Italy, India, Japan, Mexico, Poland, Portugal, Roumania, Czechoslovakia and the U.S.S.R., the band 136-137 Mc/s is also allocated to the fixed and mobile services.

MOD 281B [see above]

Mc/s

	Region 1	Region 2	Region 3
MOD	137-138	METEOROLOGICAL-SATELLITE (Space-to-Earth) SPACE RESEARCH (Space-to-Earth) / SPACE / (Telemetering and tracking) 275A 279A 281C 281E	

MOD 281C In Algeria, Bulgaria, Hungary, Kuwait, Lebanon, Morocco, Poland, the United Arab Republic, Yugoslavia, Roumania, Czechoslovakia and the U.S.S.R., the band 137-138 Mc/s is also allocated to the aeronautical mobile (OR) service.

SUP 281D

MOD 281E In Cuba, Malaysia, Pakistan and the Philippines, the band 137-138 Mc/s is also allocated to the fixed and mobile services.

SUP 281F

Mc/s

	Region 1	Region 2	Region 3
MOD	138-143.6 AERONAUTICAL MOBILE (OR) 275 282 283 /***/	138-143.6 FIXED MOBILE Radiolocation*) Space Research (Space-to-Earth) 283A	138-143.6 FIXED MOBILE Space Research (Space-to-Earth) 278 279A 284

/ *) Note to Committees 5 and 7 : Radiolocation in Region 2 is a permitted service - RR 137b) /

/ *** / In the F.R. of Germany the band 138-140 Mc/s, and in France Israel, Italy, the Netherlands and the United Kingdom the band 138-143.6 Mc/s are 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

Region 1	Region 2	Region 3
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (Space-to-Earth) 275 282 283	143.6-143.65 FIXED MOBILE SPACE RESEARCH (Space-to-Earth) Radiolocation*) 283A	143.6-143.65 FIXED MOBILE SPACE RESEARCH (Space-to-Earth) 278 279A 284
143.65-144 AERONAUTICAL MOBILE (OR) 275 282 283 [***]	143.65-144 FIXED MOBILE Radiolocation*) Space Research (Space-to-Earth)	143.65-144 FIXED MOBILE Space Research (Space-to-Earth) 278 279A 284

[*) Note to Committees 5 and 7 : Radiolocation in Region 2 is a permitted service - RR 137b)]

ADD [***] In [ ] the band 143.65-144 Mc/s is also allocated, on a secondary basis, to the space research service (Space-to-Earth).

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.

[Note to Committees 5 and 7 : ? nomenclature for space telecommand in MOD 319A]

Mc/s

	Region 1	Region 2	Region 3
MOD	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)

SUP 355A

MOD 356A In Region 2, Australia, Japan, [ ], the band 1 750-1 850 Mc/s may also be used for Earth-to-Space transmissions, and in Regions 2 and 3 and in Sweden [ ], 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 [existing or planned] services operating in accordance with the Table, which may be affected.

ADD 356AB 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 and earth sciences satellite services may be authorized [with equality of right to operate with other space services in these bands, subject to agreement among the administrations concerned and those having [existing or planned] services] operating in accordance with the Table, which may be affected.

Mc/s

MOD

Region 1	Region 2	Region 3
2 290-2 300 FIXED SPACE RESEARCH (Space-to-Earth) 356C Mobile	[existing or planned] 2 290-2 300 FIXED MOBILE SPACE RESEARCH (Space-to-Earth)	2 290-2 300 FIXED MOBILE SPACE RESEARCH (Space-to-Earth)

SUP 356B

MOD 392B The band 7 145-7 235 Mc/s 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.

Mc/s

MOD

Region 1	Region 2	Region 3
8 400-8 500 FIXED MOBILE SPACE RESEARCH (Space-to-Earth) 394A 394D		

SUP 394C

SPACE CONFERENCE

Document No. 281-E
6 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

THIRD REPORT OF WORKING GROUP 5E

TO COMMITTEE 5 (ALLOCATIONS)

BROADCASTING-SATELLITE SERVICE

Frequency bands : 25 600-26 100 kc/s
21.2-21.7 Gc/s
41-43 Gc/s
84-86 Gc/s

1. Frequency band : 25 600-26 100 kc/s

1.1 Following initial examination, those delegations seeking an allocation to the Broadcasting-Satellite Service in all or part of this band polarized their preference generally on Proposal G/54/40 with Terrestrial Broadcasting primary and Broadcasting-Satellite secondary in the band 25 600-25 850 kc/s and vice versa in the band 25 850-26 100 kc/s with associated foot-notes concerning re-scheduling progressively the present light use of these bands by the Broadcasting Service. There followed a thorough examination of the Proposal in which more than 40 delegations took the floor.

1.2 There was general agreement that the sharing of one and the same channel between the two Services technically was not feasible and was not envisaged. However, it was felt that Committee 4 should be so solicited for an urgent technical study, to establish that time-sharing was possible, as at present between Terrestrial Broadcasting Stations, but even on this point there was a distinct difference of opinion. Some delegations specified that their opposition was based on principle.

ARCHIVES U.I.T. GENÈVE

1.3 By 34 to 22, the Group agreed not to recommend an allocation to the Broadcasting-Satellite Service in this band and, consequently, agreed that there should remain status quo between 25 600 kc/s and 26 100 kc/s.

1.4 The Delegation of the United Kingdom reserved the right to revert to this question at a later date, should it still so desire.

1.5 It was explained that while, in principle, any agreement reached at the Working Group level could be the subject of discussion in Committee 5 when the related report was on the agenda for adoption, it was of assistance to delegations as well as to the Chairman of Committee and of Plenary to be forewarned of remaining difficulties by the recording of a reservation to revert to a given subject.

2. Frequency band : 21.2-21.7 Gc/s

2.1 Proposal J/30/81 was supported by Pakistan. In the examination of the Proposal, it was noted that Working Group 5C had agreed on the use of the band 21.2-22.0 Gc/s by the Earth Exploration-Satellite Service (Earth Resources-Satellite) and were considering the retention of the allocation to the Amateur Service in the band 21.2-21.7 Gc/s. The Group also noted that there were no allocations to the Broadcasting-Satellite Service between 13 Gc/s and 41 Gc/s.

2.2 By a majority of 23 to 6, the Group agreed not to recommend an allocation to the Broadcasting-Satellite Service in this band.

2.3 The Delegation of Japan reserved the right to revert to this subject at a later date, should it still so desire.

3. Frequency band : 41-43 Gc/s

3.1 Proposal J/30/81, with respect to the Broadcasting-Satellite Service, was supported and examined. The Group agreed without opposition, but with many delegations not expressing an opinion, to recommend the adoption of an allocation to the Broadcasting-Satellite Service in the band 41-43 Gc/s as shown in the Annex to the present Report. Some delegations conditioned their support for this allocation to the inclusion of a foot-note along the following lines :

> "It should be noted that future administrative radio conferences may wish to also allocate this band to the Fixed and Mobile Services".

3.2 The Group agreed that the question of the foot-note, which should cover several specified bands above 40 Gc/s, should be taken up by Committee 5 as it applied to this part of the spectrum generally.

4. Frequency band : 84-86 Gc/s

Proposals AUS/10/54 and G/54/126 (in part) both sought an exclusive allocation to the Broadcasting-Satellite Service in this band. The United Kingdom Delegation explained that they attached particular importance to this allocation because, among other reasons, pulse-tone modulation will permit advantageous use of this band in the future and that atmospheric absorption would be at the lowest. The French Delegation expressed a preference for fixing the upper limit at 85 Gc/s because of Radio Astronomy requirements and the Delegation of the United States recalled that Proposals being considered in Working Group 5B were for the allocation in the band 86-92 Gc/s for the Radio Astronomy Service. The Group unanimously agreed to recommend an allocation to the Broadcasting-Satellite Service in the band 84-86 Gc/s as shown in the Annex to the present Report.

R. GALIĆ
Chairman

Annex : 1

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

Gc/s

Region 1	Region 2	Region 3
41-43	BROADCASTING-SATELLITE [***]	

ADD [***] [See paragraph 3 of present Report.]

84-86	BROADCASTING-SATELLITE	

[Note to Committee 5 : See paragraph 3 of the present Report regarding a foot-note.]

SPACE CONFERENCE

Document No. 282-E
5 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

SWEDEN

NEW FOOT-NOTE TO ARTICLE 5
OF THE RADIO REGULATIONS, 430-440 MHz

A new foot-note should be inserted reading :

Ref.		
S/282/25	ADD 322A	In Sweden the bands 430-432 and 438-440 MHz are allocated to the Fixed and Mobile Services.

Reason : To cover the factual situation and as a consequence of NOR/137/19 MOD 322.

ARCHIVES U.I.T. GENÈVE

BLUE PAGES

INTERNATIONAL
TELECOMMUNICATION
UNION

SPACE CONFERENCE

Geneva, 1971

E

Document No. 283-E

5 July 1971

PLENARY MEETING
(FIRST READING)

B. 1

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	249		Nos. 477, 717	
4	267		Nos. 84BH, 84BA, 84BHA, 84BB, 84BC, 84BD, 84BE, 84BF, 84BG, 93, 98A, 125	
4	271		Art. 7—Partial text of Section VII	

François Job
Chairman of the Editorial
Committee

Annex: Pages B1/01-05

ARCHIVES

[ARTICLE 8]

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;

[ARTICLE 15]

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.

[SECTION IIB OF ARTICLE 1]

MOD **84BH** *Spacecraft*

A man-made vehicle which is intended to go beyond the major portion of the earth's atmosphere.

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 **84BHA** *Satellite*

A body which revolves around another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of this body.[1]

ADD **84BHA.1** [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 low-energy corrective forces exerted by a propulsive device in order to achieve and maintain a desired path.

MOD **84BC** *Inclination of an Orbit (of a Satellite)*

The angle between 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** *Altitude of the Perigee*

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 "geostationary satellite orbit".

[SECTION III OF ARTICLE 1]

MOD **93** *Harmful Interference*

The effect of any emission, radiation or induction which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with these Regulations.

ADD **98A** *Equivalent Isotropically Radiated Power (e.i.r.p.)*

The product of the power of an emission as supplied antenna and the antenna gain in a given direction relative t isotropic antenna.

ARTICLE 5

Frequency Allocations [1]
10 kc/s to 40 Gc/s

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.

[ARTICLE 7]

MOD **Section VII. Terrestrial services sharing frequency bands with space services above 1 [Gc/s]**

Choice of Sites and Frequencies

(MOD) **470A** § 18. Sites and frequencies for terrestrial 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 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 equivalent isotropically radiated power exceeding 35 dBW in the frequency bands between 1 and 10 Gc/s, 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.[2]

ADD **470AB** (2) As far as practicable, sites for transmitting [3] 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 [Gc/s], should be selected so that the direc-

---

ADD **470AA.1** [1] For their own protection receiving stations in the fixed or mobile services operating in bands shared with space services (satellite-to-earth) should also avoid directing their antennae towards the geostationary satellite orbit if their sensitivity is sufficiently high so that interference from space station transmissions may be significant.

ADD **470AA.2** [2] Information on this subject is given in the latest version of C.C.I.R. Report No. 393.

ADD **470AB.1** [3] See number **470AA.1**.

tion 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.[4]

ADD **470AC** (3) In the frequency bands above 15 [Gc/s] 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 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

+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.[5]

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 [Gc/s], 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 [Gc/s] shall not exceed +10 dBW.

. . . . . .

ADD **470AB.2** [4] See number **470AA.2**.

ADD **470BA.1** [5] See number **470AA.2**.

SPACE CONFERENCE

Document No. 284-E
5 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

THIRD REPORT OF COMMITTEE 4

The modifications and additions to the provisions of 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 : Article 7, Section [IX], Space Services, Cessation of emissions (previously Document No. 235)

Annex 2 : Resolution relating to the experimental use of radio waves by ionospheric research satellites (previously Document No. 234)

Annex 3 : Recommendation on the co-ordination of earth stations (previously Document No. 265)

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 1

Section [IX]. Space Services

Cessation of emissions

MOD 470V § 24. Space stations shall be fitted with appropriate 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

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X 2

ADD

RESOLUTION [No. ...]

relating to the experimental use of radio waves
by ionospheric research satellites

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

considering

a) the the research of the earth's ionosphere is very important for investigation of the relationship between the sun and the earth and also for effective use of radio-wave transmission via the ionosphere;

b) that successful researches have been made by the use of the satellites such as Alouette 1, 2, ISIS 1 and 2 in which top-side sounding equipment is installed;

c) that ionosphere research satellites similar to the above satellites will successively be used for further investigation into the ionosphere and the space above them;

d) that the top-side sounding equipment is mostly operated in frequency-sweeping pulse mode;

e) that these kinds of satellite are usually operated intermittently during a period of a fraction of each day according to the orbital condition;

f) the operation of the sounder can be accurately commanded at will by the earth station concerned;

resolves

that transmission of radio waves from ionospheric research satellites orbited above the ionosphere may continue to be authorized in the MF and HF bands provided that suitable means as required by the Radio Regulations [470 V] are available for controlling the operation of the satellite and preventing harmful interference to other services concerned.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX 3

ADD

RECOMMENDATION [No. ...]

on 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 with [Fixed and Mobile or Terrestrial 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 in this Appendix do not show numerical values for the parameters of certain Space Radiocommunication Services and Terrestrial Services, sharing frequency bands with equal rights;

invites the C.C.I.R.

to continue as a matter of urgency its study :

- of 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,

- of 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].

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.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 285-E
5 July 1971
Original : English

COMMITTEE 4

DRAFT

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 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.

(Proposed modification does not affect the French version)

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

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 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 3 THz	Decimillimetric waves

Note 1 : "Band Number N" extends from 0.3×10^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 (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

SPACE CONFERENCE

Document No. 286-E
5 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 6

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

1. The draft Resolution annexed to this report has been prepared within Committee 4 and is based upon Documents Nos. US/28 Corr./263(Rev.), G/96/321 and D/5/37.

2. In discussion of the draft proposal there was general support in Committee 4 for the intention of the Resolution, which is to enable consenting Administrations and the I.F.R.B. to use the most recent technical criteria in matters relating to the sharing of Terrestrial and Space Services, and within the Space Service, in place of those criteria in the Radio Regulations.

3. A number of Administrations of the new and developing countries felt that they would have difficulty in complying with the time limits specified in Sections 2, 3 and 4(b) of the draft Resolution.

4. Attention was also drawn to the fact that under the terms of the Convention it is not possible for the Radio Regulations to be actually revised other than by an appropriate Administrative Radio Conference.

5. As an alternative, it was proposed that a Resolution should be prepared inviting the Plenipotentiary Conference to consider this matter, in view of its wider implications which extend beyond space telecommunications, and a common treatment for all types of telecommunications might be desirable.

6. Since the subject is only partly technical but involves also administrative and legal aspects, Committee 6 is invited to examine this matter and to make appropriate proposals to the Plenary Meeting.

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

DRAFT NEW 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;

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 [60] 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 [60] days period shall be deemed to have no opinion, for the time being, on the use of said technical criteria;

4. however, if at a later stage a need arises to apply the relevant technical criteria with respect to cases involving such administration as mentioned in 3. above :

a) and if such administration has initiated the case, the I.F.R.B. shall not take any action until that administration has replied to the inquiry mentioned in 2. above;

b) but if such administration has not initiated the case, the I.F.R.B. shall ask again that administration as in 2. above. In case of no reply within [30] days after receiving acknowledgement of delivery, the I.F.R.B. shall apply the technical criteria defined in the Radio Regulations;

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 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 indicate those administrations mentioned in paragraph 3. 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.

Corrigendum No. 1 to
Document No. 287-E
8 July 1971
Original : English

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

SUMMARY RECORD

OF THE

SIXTH MEETING OF COMMITTEE 4

(TECHNICAL)

Friday, 2 July 1971, at 0930 hrs

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

Corrigendum to page 3 of Document No. 287, third sentence in the third paragraph reads :

"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."

E.F. SANDBACH
Chairman
Committee 4

ARCHIVES
U.I.T.
GENÈVE

SPACE CONFERENCE

Document No. 287-E
6 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

SUMMARY RECORD
OF THE
SIXTH MEETING OF COMMITTEE 4
(TECHNICAL)

Friday, 2 July 1971, at 0930 hrs

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

Subjects discussed	Document No.
1. Approval of summary record of fourth meeting	227
2. Approval of summary record of fifth meeting	243
3. Progress report by Working Group Chairmen	
4. Consideration of any documents from Working Groups	234, 235, 253, 259, 260, Add.1 (Rev.1) to 194, 265, 266, 269
5. Introduction of Document No. 229	
6. First Report from Committee 4	267

ARCHIVES U.I.T. GENEVE

1. Approval of summary record of fourth meeting (Document No. 227)

Approved.

2. Approval of summary record of fifth meeting (Document No. 243)

Approved.

3. Progress report by Working Group Chairmen

4. Consideration of any documents from Working Groups (Document Nos. 234, 235, 253, 259, 260, Add.1 (Rev.1) to 194, 265, 266, 269)

a) Working Group 4E

The Chairman of Working Group 4E said that in the three meetings held by the Working Group since the last meeting of Committee 4, 17 proposals had been examined and 4 draft texts prepared. The only matter outstanding was examination of the proposals relating to Appendices I, IA and IB which the Group had felt would be better discussed after the results of Committee 6's work on these appendices had been received, but it was hoped to complete this work by the end of the following week. Five reports were at present before the Committee for its approval.

Introducing the First Report (Document No. 234), he said that a suggestion that the frequency bands used by ionospheric research satellites be indicated in the frequency allocation table to minimize possible interference had not been supported by the Working Group in view of its difficulty and impracticability and it had been decided instead simply to recommend Committee 4 to draw the attention of Committee 5 to the draft resolution contained in the annex.

Following a general discussion on the need to alter sub-paragraph (f), page 3, in view of the difficulty of administrations other than the satellite operator in identifying the sounder's signals in the event of interference, it was decided to delete the words "it is easy to identify the sounder's signals because" on page 3, sub-paragraph (f), first line, and to insert the words "as required by the Radio Regulations [470 V]" after "means" on the same page, last paragraph, third line.

The document, as amended, was approved. It was agreed to refer Document No. 234 to the attention of Committee 5.

It was agreed to amend the Annex to the Second Report (Document No. 235) as follows : in MOD 470 V, second line, insert the word "their" after "cessation of"; and on the fourth line delete the words "of [Articles 9, 9A and 14]".

The document, as amended, was approved.

Introducing the Third Report (Document No. 253), the Chairman of Working Group 4E said that in preparing the draft resolution the Working Group had, as instructed by Committee 4, only considered its technical aspects. Opinion had been divided in the Working Group on the contents of sub-paragraph 4 b) page 4, and it had been decided to leave the two alternatives in square brackets in the text for discussion in Committee 4.

There was general agreement that the draft resolution as amended be referred to Committee 6 for discussion of the legal and administrative implications since several delegations expressed strong reservations on these aspects. In particular, the delegate of Uganda, supported by the delegates of Syria and Nigeria, wished to point out the administrative difficulties that developing countries without a permanent technical secretariat would face in trying to deal with the questions in the time given. Concern was expressed by many delegates as to whether the present Conference was competent to adopt a resolution proposing alteration of Radio Regulations other than by a World Administrative Conference (in contradiction to Nos. 206 and 267 of the Convention). The delegate of Syria, supported by the delegate of India, said that the Plenipotentiary Conference in 1973 might be the most proper place to make such a decision, and suggested that Committee 6 be recommended to forward the draft resolution to the Plenipotentiary. After a general discussion, it was decided to delete the first alternative, namely the words "[the I.F.R.B. shall apply the technical criteria acceptable to the administration initiating the case,] or".

The delegate of the United Kingdom, supported by the delegates of the Federal Republic of Germany, Syria, Italy and the U.S.A., said that as Committee 6 had perhaps a contribution to make in this matter the draft resolution should merely be forwarded to Committee 6, together with a report of the discussion which had taken place in Committee 4, with a request to consider the best course of action.

It was so agreed.

It was agreed that a small drafting group consisting of the delegates of the United Kingdom, Syria and the Federal Republic of Germany should prepare a text to accompany the draft resolution when forwarded to Committee 6, for approval at the next meeting of Committee 4.

The Chairman of Working Group 4E, introducing the Fourth Report (Document No. 259), thought that the words "operating in bands shared with other services" might be put in square brackets pending the decision of Committee 5 on whether or not amateur space stations were to be permitted to share bands with other services.

The delegate of India suggested that that phrase be deleted. The delegate of New Zealand said that if Committee 5 did not allocate shared bands the situation was covered by other provisions. The delegate of the United States of America pointed out that the deletion of the phrase would mean that Committee 5 did not need to be consulted at all.

The delegate of Mexico asked what forms of control were envisaged and indicated an error in the Spanish text.

The delegate of India, in reply to a query by the representative of the I.F.R.B., suggested that the information provided be included in the I.F.R.B. Weekly Circulars. The representative of the I.F.R.B. said that the proposed insertion of "for inclusion in their Weekly Circular" was a point to be taken up by Committee 6. Eventually the information might be published in the List of Space Stations.

It was agreed to delete the words "operating in bands shared with other services" and to forward the text to Committee 6 for consideration of the form in which the information would be published by the I.F.R.B.

The Chairman of Working Group 4E introduced the Fifth Report (Document No. 260), noting that action was required by Working Groups 4B, 4C and 4D. The representative of the I.F.R.B. said that the Groups concerned were dealing with the points in question.

Document No. 260 was noted.

b) Working Group 4D

Mr. Holden (United Kingdom), speaking on behalf of the Chairman and Acting Chairman of the Working Group, introduced Addendum 1 (Rev.1) to Document No. 194, which incorporated amendments approved at an earlier meeting.

The document was approved.

Mr. Holden said that discussion of Document No. DT/76 (interference calculation) was premature as it had not yet been examined by the Working Group.

c) Working Group 4C

The Chairman of Working Group 4C said that the Group had examined the basic text on co-ordination calculations together with Document Nos. 188 (Rev.), 160 and 166, and had produced three reports (Document Nos. 265, 266 and 269).

Document No. 265

The delegate of France said that in Annex 1 the terms relating to space services should be placed in square brackets until the definitions had been approved.

The Chairman said that all such terms would naturally be adjusted in line with whatever decisions were subsequently taken.

Annexes 1 and 2 to Document No. 265 were approved.

Document No. 266

Annex 1 was approved.

In Annex 2 the delegate of France said that the word "not" should be deleted in the English text, penultimate line of paragraph 2, the French text also needed revision and he would hand a new wording to the Secretariat. The delegate of the United Kingdom said that the use of the word "not" was correct in English but in fact its removal did not change the sense. The delegate of the United Kingdom proposed deletion of the phrase "unlike the procedure described in the annex to Recommendation No. Spa/1" as in his belief it was not strictly accurate.

With those amendments, Annex 2 was approved.

Document No. 269

Document No. 188(Rev.) had given rise to no objections from the technical aspect and there were merely two small amendments to be passed on to Committee 6.

Document No. 269 was noted.

d) Working Group 4B

The Chairman of the Working Group said that Addendum 1 to Document No. 198 had to be reconsidered by the Working Group. The outstanding questions were sharing with broadcasting-satellite services at 800 MHz and 2 500 MHz (the relevant working documents to be discussed that afternoon) and sharing with the maritime mobile service in the 400-600 MHz bands. He anticipated that the Working Group would complete its task that afternoon and a report on all three questions would be submitted to the following meeting of Committee 4.

e) Working Group 4A

The delegate of France read a message from the Chairman of Working Group 4A. The Group had examined terms and definitions submitted to it by the other working groups concerning geosynchronous satellites and the concept of system, network, liaison, path, noise temperature, co-ordination and unacceptable interference. It had not been felt possible to produce a definition of unacceptable levels of interference and that point would therefore be referred to the C.C.I.R. within the framework of its Recommendation No. H (Document No. 223). The other definitions had either been prepared or were still under study, in particular noise temperature in different cases which had been dealt with by Sub-Group A-2 under Mr. Courtemanche of Canada. The following meeting of Working Group 4A would also consider which of the definitions should appear in Article 1 of the Radio Regulations.

In reply to a point raised earlier in the meeting by the delegate of the United States of America on the reference to "unacceptable levels of interference" in Document Nos. 174, 209 and 210, he added that the note in those three documents should read as follows : "the level of unacceptable interference will be determined by agreement between the administrations concerned on the basis of the relevant Recommendations of the C.C.I.R." He hoped that the corresponding amendment in the documents mentioned would be approved at Committee 4's next meeting.

The delegate of the United States of America agreed with that procedure.

5. Introduction of Document No. 229

At the suggestion of the Chairman, the delegate of the United States of America agreed to introduce Document No. 229 in Working Group 4C.

6. First Report from Committee 4 (Document No. 267)

The Chairman introduced the First Report for submission to the Plenary Meeting.

The Report was adopted.

The meeting rose at 1315 hrs.

The Secretary :
I. DOLEZEL

The Chairman :
E.F. SANDBACH

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 288-E
6 July 1971
Original : English

COMMITTEE 5

NOTE FROM THE CHAIRMAN, COMMITTEE 4,

TO THE CHAIRMAN, COMMITTEE 5

Committee 4 examined during its Sixth Meeting Document No. 234 concerning the proposed new Resolution relating to the experimental use of radio waves by ionospheric research satellites and agreed to refer it for any attention necessary by Committee 5. The document was approved with the following amendments (Summary Record of the Sixth Meeting of Committee 4, Document No. 287) :

- on page 3, sub-paragraph f)
  to delete the words "it is easy to identify the sounder's signals because"

- on page 3, last paragraph, third line
  to insert after "means" the words "as recognized by the Radio Regulations [470V] ."

E. SANDBACH
Chairman
Committee 4

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 289-E
6 July 1971
Original : English

COMMITTEE 6

NOTE FROM THE CHAIRMAN, COMMITTEE 4

TO THE CHAIRMAN, COMMITTEE 6

Committee 4 examined during its Sixth Meeting the following Documents which it decided to refer for a consideration in Committee 6. (Summary Record of the Sixth Meeting of Committee 4, Document No. 287) :

1) Document No. 259 concerning the proposed addition of provisions No. 1567 bis to Article 41 is introducing new provisions relating to space stations in the Amateur Service, which should be fitted with appropriate devices for controlling emissions, and in this connection Administrations authorizing such space stations should provide information on these space stations for publication by the I.F.R.B. Committee 6 is asked to consider a preparation of appropriate regulatory provisions.

   Committee 4 agreed to delete in Annex to Document No. 259 the words "operating in bands shared with other services" in order to make these provisions applicable for exclusive bands.

2) Document No. 188(Rev.) concerning draft Resolution J as amended by Document No. 269, item b) was approved by Committee 4 and is referred for further consideration in Committee 6.

E. SANDBACH
Chairman
Committee 4

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 290-E
6 July 1971
Original : Spanish

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

MEMORANDUM FROM THE CHAIRMAN

I attach hereto copy of a letter I have received from the Head of the Delegation of Cuba.

Gunnar PEDERSEN
Chairman of the Conference

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

Geneva, 2 July 1971

Chairman of the
World Administrative Radio Conference for
Space Telecommunications

Dear Sir,

May I ask you to publish, as a document of this Conference, the attached statement by the Delegation of Cuba concerning the presence of certain Delegations at the Conference.

Yours faithfully,

(signed)

Luis SOLÁ VILA
Head of the Delegation of Cuba

Annex : 1

Annex

The Delegation of Cuba to the WARC-ST wishes to state its position with regard to the acceptance of the credentials of certain delegations to this Conference.

The puppet delegation from Taiwan is neither the moral nor the legal representative of the Chinese people. The only legitimate representatives of the Chinese people are those appointed by the Central Government of the People's Republic of China.

The Saigon régime does not represent the heroic people of South Viet-Nam. The only legitimate representatives of the valiant people of Van Troi are those appointed by the Provisional Revolutionary Government of South Viet-Nam.

The Seoul authorities do not represent the Korean people and therefore they have no right to speak or sign the Final Acts on behalf of Korea.

The Delegation of Cuba protests that the German Democratic Republic, the People's Democratic Republic of Korea and Democratic Republic of Viet-Nam were not invited to this Conference.

It is ironical to speak of a "World" Conference when a considerable part of the world is not represented at this meeting. The oft-repeated plea for universality in the United Nations specialized agencies is once again ignored at this Conference.

If this is a technical Conference, why are those countries not represented? The sad truth is that they are not invited for political reasons.

The Delegation of Cuba considers that the representatives of Taiwan, Seoul and Saigon should take their places as representatives of the Territories of the United States of America, which - objectively, morally and legally - is in fact what they are.

SPACE CONFERENCE

Document No. 291-E
6 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

UNITED KINGDOM

PROPOSED NEW FOOT-NOTE RELATING TO
THE PROTECTION OF RADIO ASTRONOMY OBSERVATIONS
IN THE BAND 2 690-2 700 Mc/s

The band 2 690-2 700 Mc/s is allocated exclusively to the Radio Astronomy Service on a world-wide basis. Proposals are under consideration for the allocation of bands extending up to 2 690 Mc/s to the Broadcasting-Satellite Service. In the opinion of the United Kingdom, the use of frequencies just below 2 690 Mc/s for broadcast transmissions from satellites will constitute a serious threat to radio astronomy in the adjacent band, which is one of the most important bands in current use for radio astronomy, and in which there has been large capital investment for equipment in several countries.

If the proposals for the Broadcasting-Satellite Service are approved, the United Kingdom considers that a power flux-density limit for spurious emissions is essential to protect radio astronomy. It is therefore proposed that a foot-note be added, based on the limits as recommended in C.C.I.R. Report No. 224-2 and endorsed in Annex 7-1 of the Report of the S.J.M. However as those limits were derived on the assumption that interfering signals would be incident from a horizontal direction, the radio astronomy antenna was assumed to be effectively isotropic. Protection for radio astronomy from broadcasting-satellite transmissions would imply that no harmful interference would exist with the radio astronomy antenna directed towards the satellite, with a gain of the order of 60 db. Protection in these circumstances may not be technically feasible. As a compromise it is proposed that the power flux-density limit shall be based on the assumption that the radio astronomy antenna will not point within 2° of the satellite direction, the assumed antenna gain then being 30 db, in accordance with Chapter 8 of the S.J.M. report.

ARCHIVES U.I.T. GENÈVE

The proposed foot-note would then read :

"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/m^2/Hz".

This foot-note would be inserted in the appropriate box in the Table containing the broadcasting-satellite allocation.

SPACE CONFERENCE

Document No. 292-E
6 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 2

SUMMARY RECORD

OF THE

FOURTH MEETING OF COMMITTEE 2

(CREDENTIALS)

Friday 2 July 1971, at 1500 hrs

Chairman: Mr. C.J. MARTÍNEZ (Venezuela)

Approval of the summary record of the second meeting (Document No.167(Rev.))

Summary record of the second meeting (Document No. 167(Rev.))

The Delegate of the People's Republic of Bulgaria noted that the annexes were inconsistent, some referring to Taiwan, others to Taipei or Formosa.

The Delegate of the U.S.S.R. agreed that there should be uniformity in that respect, not only in the summary record but also in the Report to the Plenary Meeting. He pointed out that in the U.S.S.R. statement in Annex 1 to Document No. 167(Rev.) "Formosa" should be replaced by "Taiwan".

Subject to those changes, the summary record was approved and the Chairman said that a corrigendum would be issued.

The meeting rose at 1510 hrs.

The Secretary :

W.W. SCOTT

The Chairman :

C.J. MARTÍNEZ

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 293-E(Rev.)
8 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 5

UNITED KINGDOM/SWEDEN/NORWAY

PROPOSED AMENDMENTS TO ARTICLE 5

OF THE RADIO REGULATIONS

In view of the difficulty in reaching agreement on proposals in Document Nos. 108 and 244 for frequencies in the region of 400-600 MHz for the Maritime Mobile-Satellite Service, the United Kingdom and Sweden would be prepared to withdraw the proposals in Document Nos. 108 and 244 in favour of the alternative proposal attached.

In seeking agreement to the allocation of two 2 MHz bands, on a secondary basis, the United Kingdom and Sweden have borne in mind the needs of the Maritime Mobile Service set out in the draft Resolution agreed by Working Group 5D-3. It has to be acknowledged that a Maritime-Satellite Service for public correspondence services probably will be developed first in the band 1 535-1 660 MHz. If, however, it becomes evident that the difficulties facing small ships are too great or an early introduction in the above-mentioned band meets with difficulties, it would then be open to administrations to take steps to meet this need. It would be most desirable for administrations to be given an indication by this Conference where the needs of this world-wide service might be met, so that administrations could bear this in mind in their frequency planning.

ARCHIVES U.I.T. GENÈVE

Ref.

MHz

	Region 1	Region 2	Region 3
G-S/293/1	450-453	FIXED MOBILE 318 319A	
	453-455	FIXED MOBILE ADD Maritime Mobile-Satellite (Space-to-earth) 318	
	455-460	FIXED MOBILE 318	

MHz

	Region 1	Region 2	Region 3
G-S/293/2	606-611 BROADCASTING 326 329 330 330A 332	470-611 BROADCASTING 332	610-611 FIXED MOBILE BROADCASTING 332 338 339

MHz

G-S/293/2 (cont.)

Region 1	Region 2	Region 3
611-613 BROADCASTING ADD Maritime Mobile-Satellite (Earth-to-space) 326 329 330A 332 332A	611-613 BROADCASTING ADD Maritime Mobile-Satellite (Earth-to-space) 332 332A	611-613 FIXED MOBILE BROADCASTING ADD Maritime Mobile-Satellite (Earth-to-space) 332 332A 338 339
613-790 BROADCASTING 326 329 330A 331 332	613-890 BROADCASTING 332	613-890 FIXED MOBILE BROADCASTING 332 338 339

G-S/293/3 ADD 332A The Maritime Mobile-Satellite Service (see Resolution No. ...) shall not cause harmful interference to Radio Astronomy Services operating in accordance with the provisions of RR 332. The introduction of a Maritime Mobile-Satellite Service shall be subject to agreement between administrations concerned and affected.

ARCHIVES U.I.T. GENÈVE

SPACE CONFERENCE

Document No. 293-E
6 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

WORKING GROUP 5D

UNITED KINGDOM/SWEDEN

PROPOSED AMENDMENTS TO ARTICLE 5

OF THE RADIO REGULATIONS

In view of the difficulty in reaching agreement on proposals in Document Nos. 108 and 244 for frequencies in the region of 400-600 MHz for the Maritime Mobile-Satellite Service, the United Kingdom and Sweden would be prepared to withdraw the proposals in Document Nos. 108 and 244 in favour of the alternative proposal attached.

In seeking agreement to the allocation of two 2 MHz bands, on a secondary basis, the United Kingdom and Sweden have borne in mind the needs of the Maritime Mobile Service set out in the draft Resolution agreed by Working Group 5D-3. It has to be acknowledged that a Maritime-Satellite Service for public correspondence services probably will be developed first in the band 1 535-1 660 MHz. If, however, it becomes evident that the difficulties facing small ships are too great or an early introduction in the above-mentioned band meets with difficulties, it would then be open to administrations to take steps to meet this need. It would be most desirable for administrations to be given an indication by this Conference where the needs of this world-wide service might be met, so that administrations could bear this in mind in their frequency planning.

ARCHIVES U.I.T. GENÈVE

Ref.

MHz

	Region 1	Region 2	Region 3
G-S/293/1	450-454	FIXED MOBILE 318 319A	
	454-456	FIXED MOBILE ADD Maritime Mobile-Satellite (Space-to-earth) 318	
	456-460	FIXED MOBILE 318	

MHz

	Region 1	Region 2	Region 3
G-S/293/2	606-611 BROADCASTING 326 329 330 330A 332	470-611 BROADCASTING 332	610-611 FIXED MOBILE BROADCASTING 332 338 339

Ref.

MHz

	Region 1	Region 2	Region 3
G-S/293/2 (cont.)	611-613 BROADCASTING ADD Maritime Mobile-Satellite (Earth-to-space) 326 329 330A 332 332A	611-613 BROADCASTING ADD Maritime Mobile-Satellite (Earth-to-space) 332 332A	611-613 FIXED MOBILE BROADCASTING ADD Maritime Mobile-Satellite (Earth-to-space) 332 332A 338 339
	613-790 BROADCASTING 326 329 330A 331 332	613-890 BROADCASTING 332	613-890 FIXED MOBILE BROADCASTING 332 338 339

G-S/293/3 ADD 332A

The Maritime Mobile-Satellite Service (see Resolution No. ...) shall not cause harmful interference to Radio Astronomy Services operating in accordance with the provisions of RR 332. The introduction of a Maritime Mobile-Satellite Service shall be subject to agreement between administrations concerned and affected. In the meantime, administrations are urged to avoid introducing Broadcasting Services with significant effective radiated powers or broadcasting transmissions intended to be received in coastal areas as far as practicable.

Corrigendum No. 2 to
Document No. 294-E
8 July 1971
Original : English

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

Page 1

The title should read :

DRAFT
NEW APPENDIX 28
CONCERNING 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

Page 3

The title should read :

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

Page 3

Delete the first two paragraphs within square brackets and replace by the following :

The co-ordination area (see 103D) is determined by calculating in all azimuthal from the earth station the co-ordination distances (see 103B), and drawing to scale on an appropriate map the co-ordination contour (see 103C).

ARCHIVES U.I.T. GENÈVE

Page 3

Last paragraph should be replaced by :

Where an earth station is intended to operate with a variety of classes 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 ... etc.

Page 4

First paragraph, second last line should read :

... Appendix for ~~each~~ [some] ...

Page 5

First line should read :

2. ~~Maximum~~ Permissible values of interference

Page 5

Delete the word maximum wherever it occurs in connection with permissible interference.

Page 5

The definition of B should read :

B = reference bandwidth (in Hz) (bandwidth, of concern to the interfered with system, over which the interference power can be averaged);

Page 7

Under the definition of G_t' should read :

... pertinent direction.
If it is a terrestrial staion, P_t' and G_t' are combined in the main beam equivalent isotropically radiated power E, for the values given in Table II shall be used.

When G_t' is the ...

(Delete also the last sentence with the parentheses.)

Page 18

The definition of ΔG should read as follows :

ΔG = When the earth station is transmitting station, this is the difference (in dB) between the maximum gain of terrestrial station antennae gain in the frequency band under investigation (see Table IA) and the value of 42 dB;

When the earth station is a receiving station, $\Delta G = 0$ when the terrestrial station is a line-of-sight radio relay station; and $\Delta G = 10$ when the terrestrial station is a transhorizon radio relay station.

(Alternatively : When the earth station is a receiving station the values of ΔG given in Table II should be used.)

Page 73

The first formula should read :

$$C_1 = G_r - P_r(p) - 20 \log f/4 - F(p) = S - 20 \log f/4 - F(p)$$

Page 73

Last paragraph, first line should read :

... and C_2 for ~~each~~ [some] bands ...

Page 74

Last paragraph under 3) should read :

... and C_4 for ~~each~~ [some] bands ...

Page 82

Second paragraph of 3.1 should read :

... may be considered not to cause more than a permissible level of ~~negligible~~ interference ...

SPACE CONFERENCE

Corrigendum No. 1 to
Document No. 294-E
8 July 1971
Original : English

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

The enclosed 4 pages should replace the corresponding pages of Document No. 294.

Annexes : 4 pages : 51, 53, 69, 75

ARCHIVES U.I.T. GENÈVE

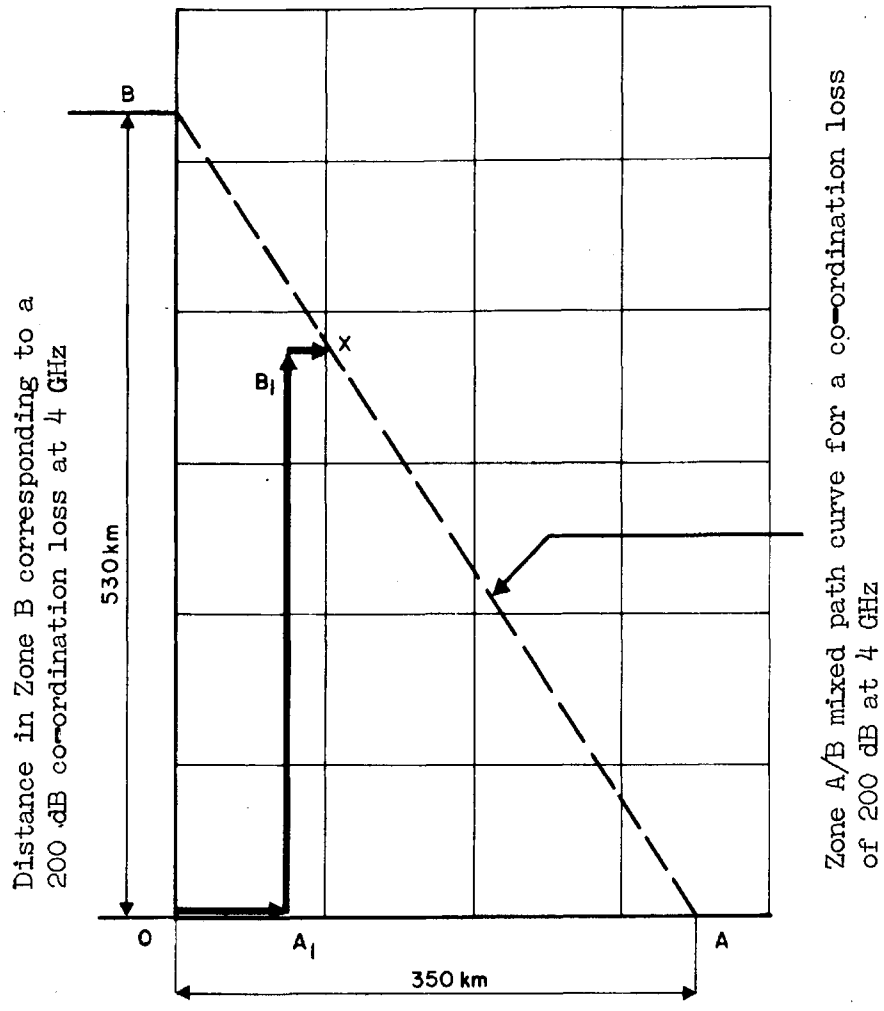


Figure 13a

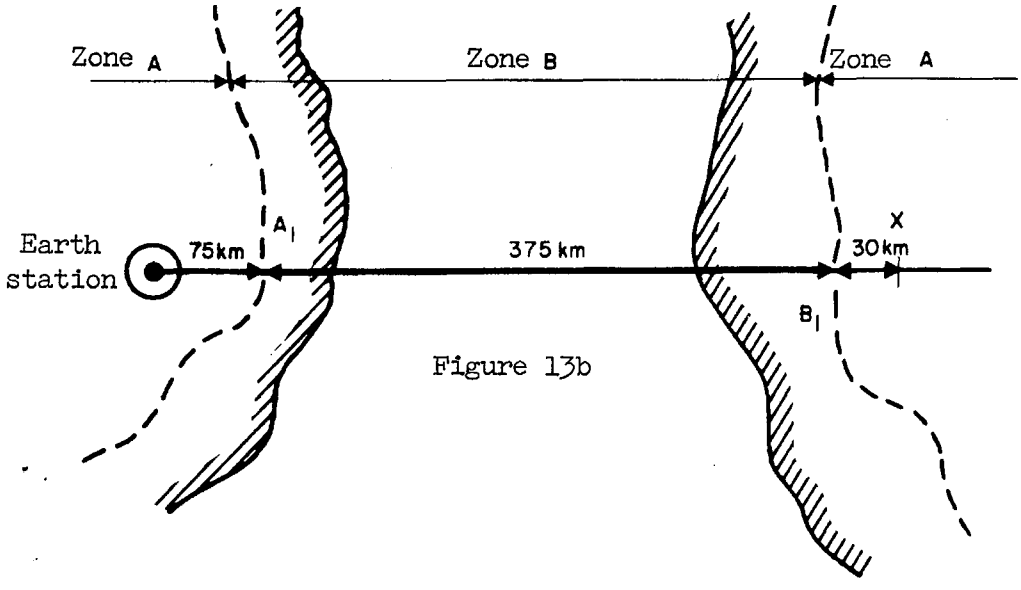


Figure 13b

Figure 13 - Example of co-ordination distance calculation for a mixed path

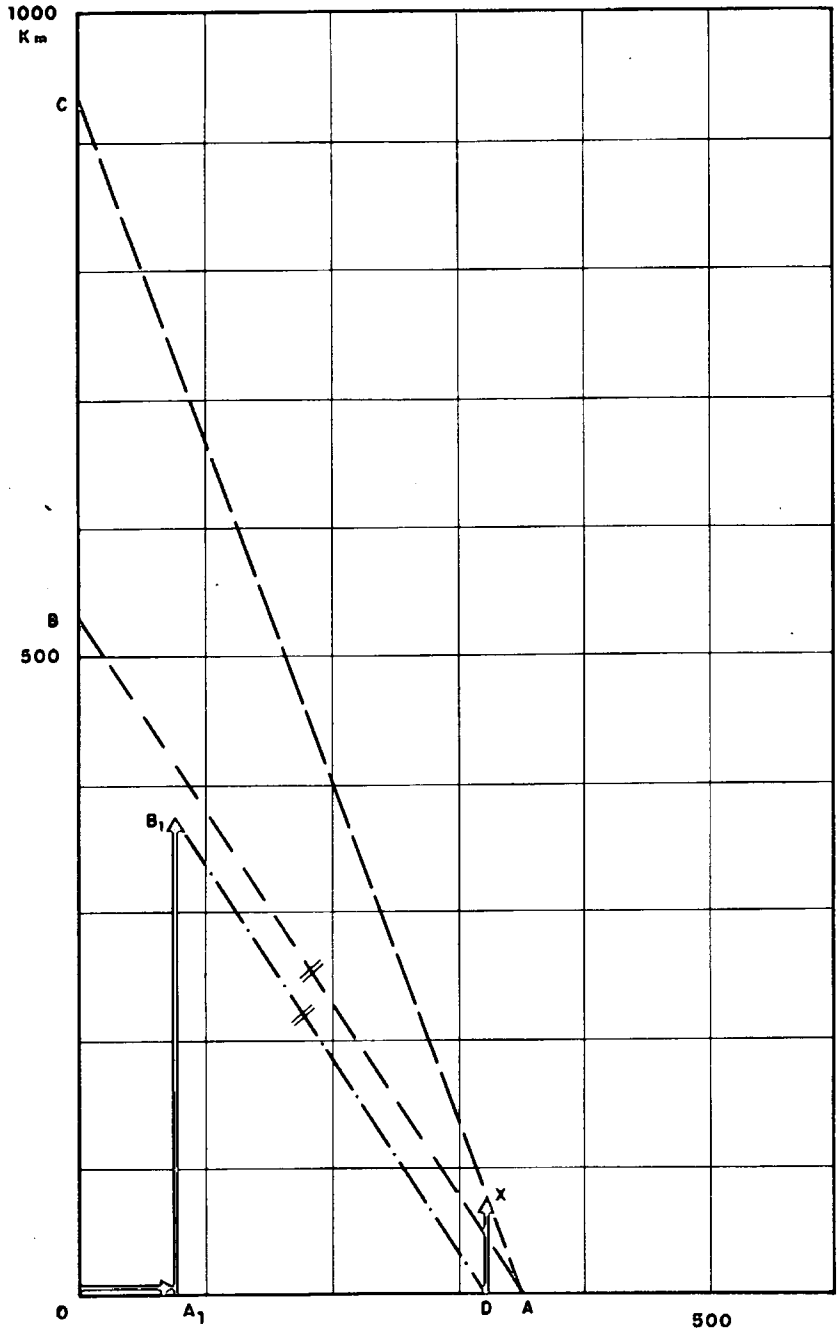


Figure 14b

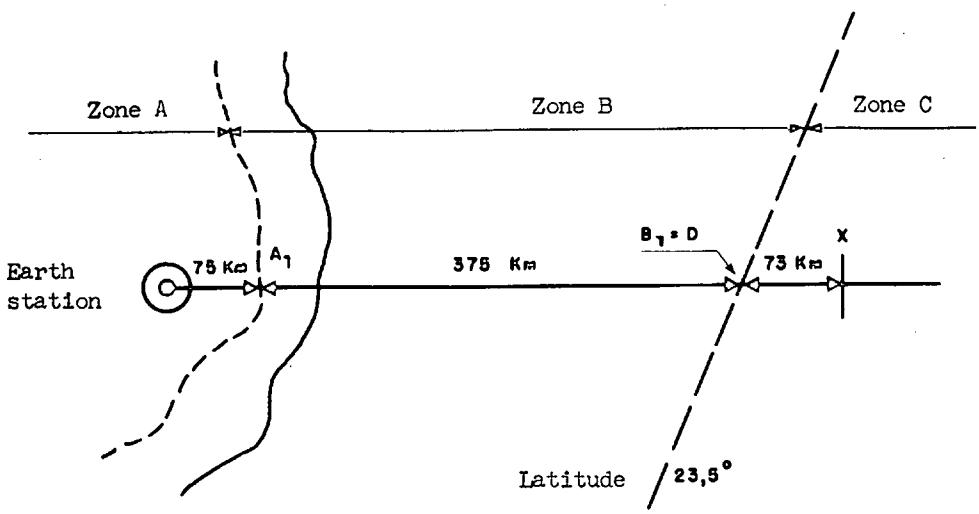


Figure 14a

Figure 14 - Example of determination of co-ordination distance for mixed paths involving Zones A, B and C

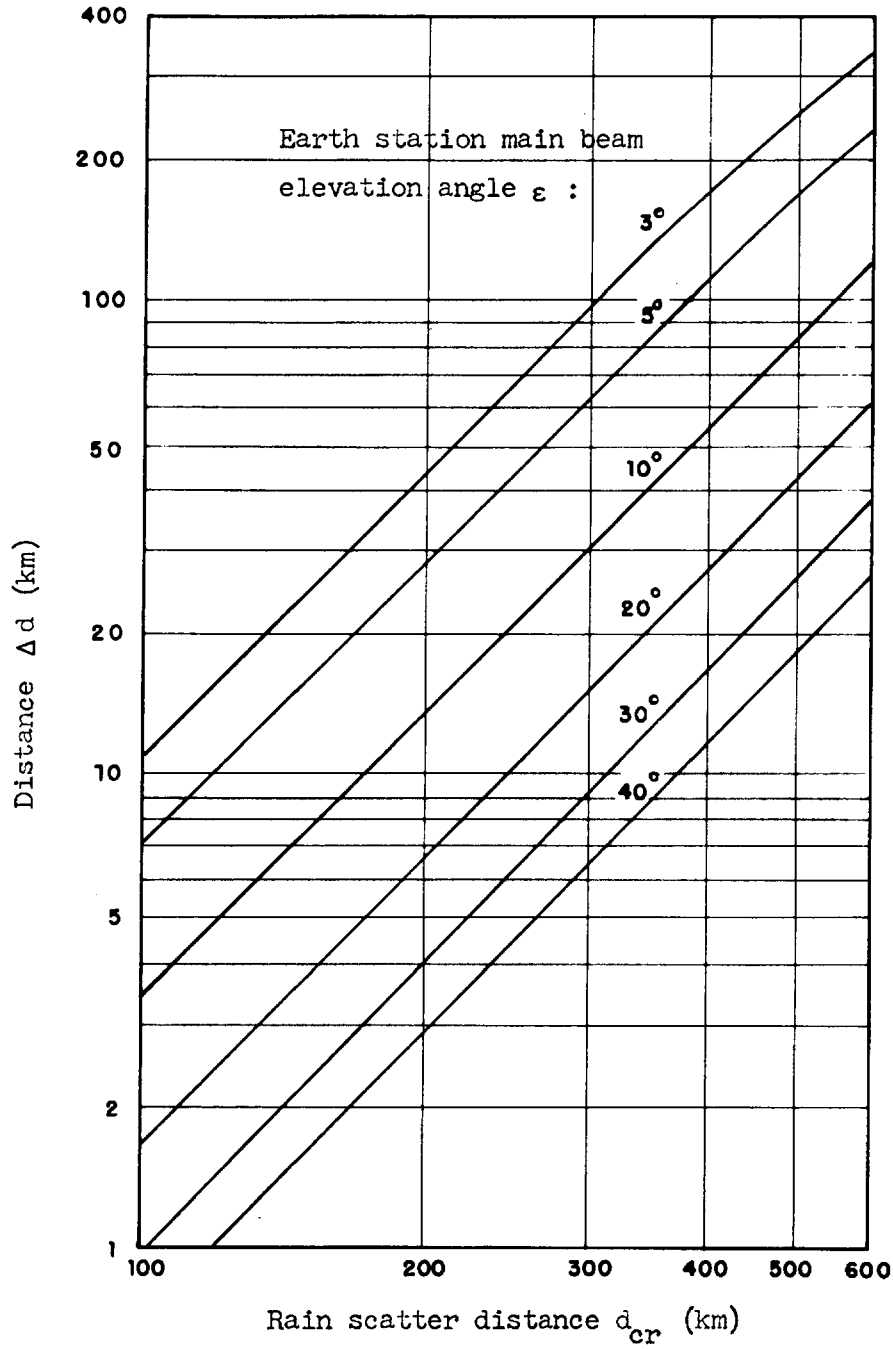


Figure 22 - The distance Δd as a function of rain scatter distance d_{cr} and earth station main beam elevation angle ε.

TABLE III

Earth station transmission

Frequency Band (GHz)	C_1 (dB)	C_2 (dB)	Reference Bandwidth (kHz)
5.925-6.425	176	134	4

TABLE IV

Earth station reception

Frequency Band (GHz)	Type of Service	C_3 (dB)	C_4 (dB)
3.7-4.2	COMSAT - A	199	157
"	COMSAT - N	224	178
	Space Research	-	-
	ERS		

Notes : A = Analogue modulation

N = Digital modulation

/To be completed as far as practicable for each allocated shared frequency band/

Document No. 294-E
6 July 1971
Original : French
English
Spanish

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

COMMITTEE 4

REPORT BY THE CHAIRMAN OF WORKING GROUP 4C

DRAFT NEW APPENDIX 28 CONCERNING THE PROCEDURE FOR CALCULATING CO-ORDINATION DISTANCE BETWEEN EARTH STATIONS AND TERRESTRIAL STATIONS SHARING THE SAME FREQUENCY BAND IN THE RANGE 1-40 GHz

During its meetings Working Group 4C examined Document Nos. Corr. USA/28/261, Corr. No. 1 to Corr. USA/28/261 and F/88/316. These documents, together with Document No. C.C.I.R./64/Chapter 8, were taken as a basis for the draft New Appendix 28 which is proposed as a substitution for Recommendation No. Spa 1 contained in the present Radio Regulations.

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

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

1. Objectives

The co-ordination distance is the distance from an earth station within which a terrestrial station sharing the same frequency band may cause or be subject to more than a permissible level of interference.

Co-ordination distances are calculated in all azimuthal directions from the earth station, and drawn to scale on an appropriate map. The line joining the points defined by the ranges of the respective co-ordination distances from the earth station defines the co-ordination contour. The co-ordination contour encloses the co-ordination area around the earth station.

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 types of emission, in the determination of the co-ordination contour, the earth station parameters to be used 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 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 the procedure in a simplified manner, which will assist a user in following the necessary steps to produce co-ordination contours. The simplified presentation is given in Annex A to this Appendix for each allocated frequency band.

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 recourse to more precise calculations being necessary) 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. Maximum permissible values of interference

The maximum 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 an interfered-with station, from each source of interference, is given by the general formula below :

$$P_r(p) = 10 \log (kT_rB) + J + M(p) - W \qquad (1)$$

where

$$M(p) = M(p_o/n) = M_o(p_o) \qquad (1a)$$

with

k = Boltzmann's constant ($1.38 \cdot 10^{-23}$ joule per °K);

T_r = thermal noise temperature of the receiving system (°K);

B = reference bandwidth (in Hz) (bandwidth over which the interference power can be averaged);

J [1] = ratio (in dB) of the maximum permissible interfering power to the thermal noise power in the receiving system, long term (for 20% of the time);

p_o = percentage of the time during which the interference from all sources may exceed the permissible maximum value;

n = number of expected entries of interference, assumed to be uncorrelated;

p = percentage of the time during which the interference from one source may exceed the permissible maximum value; since the entries are not likely to occur simultaneously : $p = p_o/n$;

$M_o(p_o)$ [2] = ratio (in dB) between the maximum permissible interference powers during p_o% and 20% of the time respectively, for all entries of interference;

$M(p)$ = ratio (in dB) between the maximum 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 [3] = equivalence factor (in dB) relating the effect of interference to that of thermal noise of equal power in the reference bandwidth.

Tables I and II list values for the above parameters.

1), 2), 3) see following 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 1000 pWp (C.C.I.R. Recommendation 357-1) and the mean thermal noise power in a single hop may be assumed to be 25 pWp. 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 communication-satellite system, the total allowable interference power is also 1000 pWp (C.C.I.R. Recommendation 356-2), but the thermal noise contribution of the down path is not likely to exceed 7000 pWp; hence $J \geq -8.5$ 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_0 (p_0) (in dB) is the "interference margin" between the long term and the short term $(p_0\%)$ allowable interference powers. For analogue radio-relay and communication-satellite systems in bands between 1 and 15 GHz, this is the ratio (in db) between 50 000 and 1 000 pWp (17 dB). In the case of digital systems, $M_0(p_0)$ 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 an 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 :

$$W = 10 \log \frac{\text{Interfering power in the receiving system after demodulation}}{\text{Thermal noise power in the receiving system after demodulation}} \times \frac{\text{Thermal noise power at the receiver input in the reference bandwidth}}{\text{Interfering power at the radio frequency in the reference bandwidth}}$$

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 character 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 co-ordination distance associated with propagation by rain scatter 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 :

$$L_o\ (0.01) = P_t' + G_t' + G_r - P_r(p) - F(p) - 20 \log (f/4) \qquad (2)$$

where

P_t' *) = 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; in the case of a terrestrial station, the maximum antenna gain is to be used. When G_t' is the main beam gain it is denoted G_t'max. (In the case of terrestrial stations, see Table IA)

*) Primes refer to the parameters associated with the interfering station.

G_r = gain (in dB relative to isotropic) of the receiving antenna of the interfered-with station. If the interfered-with 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 IA.)

F(p) = correction factor in dB to relate the effective percentage of the time p to 0.01%, 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 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 exceed for no more than 10% of the time, whichever is the greater.

---

*) 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).

3.2 Antenna gain at the earth station horizon for stationary 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 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 synchronous altitude 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 θ (α) is added to the plot of Figure 3, , which shows 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 α_o (=210°) with a horizon elevation θ = 4°.

If this is done for all azimuths (in suitable increments, e.g., 5°), a relationship φ (α) results. The relationship φ (α) may be used to derive a function for the horizon antenna gain, G (α), 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 (D/λ) exceeds 100, the following equation should be used :

$$G(\varphi) = 32 - 25 \log_{10} \varphi \text{ (dB)} \qquad (1° \leq \varphi \leq 48°)$$

$$= -10 \text{ dB} \qquad (48° < \varphi \leq 180°)$$

The application of the 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 acute angle between the main beam of the earth station antenna and a 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 co-ordination distance, propagation mode (a)

To obtain the co-ordination distance for Zone A it is necessary to subtract from $L_o(0.01)$ a correction ΔL which accounts for the difference in basic transmission loss over paths that have different horizon elevation angles at the earth station. ΔL is computed in two steps. First a correction ΔL_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_o 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 :

$$L_c = L_o(0.01) - \Delta L \qquad (3)$$

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

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_0 (0.01) is 200 dB, and that the horizon elevation angle is zero degrees. This results in identical values of 200 dB for L_c in any zone (which would, of course, not be the case if the horizon elevation angle were greater than 0.2 degrees). The procedure is as follows :

i) Determine the distance entirely in Zone A that would give the coordination 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 coordination 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 the two points 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 A_1;

v) 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 B_1 to the point of intersection of the mixed path curve as indicated by X. This distance is found to be 30 km;

vii) the coordination 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

$$OA_1 + B_1X = OA \left(1 - \frac{A_1B_1}{OB}\right) ;$$

from where :

$$B_1X = OA \left(1 - \frac{A_1B_1}{OB}\right) - OA_1 .$$

Hence,

$$B_1X = 350 \left(1 - \frac{375}{530}\right) - 75 = 27 \text{ km}$$

Three Zones

In some special cases the mixed path involves all three radio-climatic 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 given direction. Here an earth station is situated in Zone A at a distance of 75 km in a given azimuthal direction from Zone 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 coordination 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 coordination 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,

$$DX = 930 \left(1 - \frac{75}{350} - \frac{375}{530}\right) = 73 \text{ km}$$

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 co-ordination distance 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 is used instead of the horizon angle, 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 irrespectively of the actual Zone involved.

This procedure yields a distance for propagation mode (b), to be labelled d_b.

When considering moving 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 mechanism :

i) Draw two straight lines from the earth station at azimuthal angles of $\pm 5°$ 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 $\pm 5°$ relative to the azimuthal direction of the main beam;

iv) outside the preceding sector $\pm 5°$ the co-ordination contour for the great circle propagation mechanism is the one obtained for propagation mode (a).

The distances obtained after application of the procedures set forth in Sections 3.4 to 3.7 are, for reference purposes, to be labelled d_{ab}.

4. Determination of co-ordination distance for scattering from hydrometeors ("rain scatter", Propagation Mode c.)

The determination of co-ordination distance for the rain scatter propagation mechanism 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 :

$$L_1 \ (0.01) = P_t' + \Delta G - P_r(p) - F_1(p,f) \qquad (4)$$

where :

ΔG = difference (in dB) between the maximum gain of terrestrial station antennae in the frequency band under investigation (see Table IA) and the value of 42 dB;

$F_1(p,f)$ = correction factor (in dB) to relate the effective percentage of the time p to 0.01%, in the frequency band under consideration; Figure 16.

All other parameters have been defined in Section 2. For terrestrial stations, values of P_t' 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-climate 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_{cr}.

Figures 19 to 21 show corresponding curves for rain-climates 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.

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; 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_c, 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 calculations of 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_a or d_b) for the propagation mode under consideration shall be 100 km.

In the calculations of 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. (see Figure 23)

7. Parameters for calculation

The values of parameters necessary for the determination of the co-ordination contour are given in Tables I and IA 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 Tables I and 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_o 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 also given in Tables I and IA, and in Table II, respectively.

TABLE I

Parameters required for the determination of co-ordination distance for a transmitting earth station

Type of Terrestrial Station		Line-of-sight Radio-Relay Station				Transhorizon Radio-Relay Station (TH)	
Frequency (GHz)		1-10	10-15		15-40	1-10	
Type of modulating signal of terrestrial station		A	A		N	A	
Interference parameters and criteria	p_o(%)	0.01	0.01		0.003	0.01	
	n	2	2		1	1	
	p (%)	0.005	0.005		0.003	0.01	
	J (dB)	16	16		0	9	
	($M_o(p_o)$ (dB)	17	17		30	17	
	W (dB)	0	0		0	0	
Terrestrial station parameters	B (Hz)	4.10^3	4.10^3		10^6	4.10^3	
	G_r (dB)	45 (1)	50 (1)		50 (1)	52 (1)	
	T_r (°K)	750	1500		3200	500	
S (dBW)		176	178		153.5	191	
$P_r(p)_{in}$ (dbW) B		-131	-128		-103.5	-139	

TABLE IA

Terrestrial station maximum antenna gain and sensitivity factor

Allocated frequency bands	GHz 2	4	6	7-8	10-15	15-40	TH 2
$G^{(2)}$ (db)	37	42	45	47	50	50	52
S (dbW)	168	173	176	178	178	153.5	191
$P_r(p)$ (dbW) in B	-131	-131	-131	-131	-128	-103	-139

(1) This value is frequency dependent. Use values from Table IA above for specific allocated frequency bands.

(2) Feeder losses are not included in these values.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

TABLE II

Parameters required for the determination of co-ordination distance for a receiving earth station

Type of earth station		Communication satellite					Space research: Near-earth	Space research: Deep space and manned	Earth re-sources	MET-SAT	Tele-metry and Com-mand (1)	Broad-cast-ing
Frequency (GHz)		1-10		10-15		15-40	1-10	1-10	3-9	1-15		
Type of modulating signal	Earth station	A	N	A	N	N	—	—	—	—		
	Terrestrial station	A	A	A	A	N	A	A	A	A		
Interference parameters and criteria	p_o (%)	0.03	0.003	0.03	0.003	0.003	0.1	0.001	0.2			
	n	3	3	2	1	1	2	1	2			
	p (%)	0.01	0.001	0.015	0.003	0.003	0.05	0.001	0.1			
	J (dB)	- 8	0	- 8	0	0	—		—			
	M_o (p_o) (dB)	17	5(2)	17	5(2)	5(2)	—	—	—			
	W (dB)	4	0	4	0	0	—	—	—			
Terrestrial station: E (dBW) in B	Line-of-sight	55	55	55	55	35(3)	25(4)	25(4)	55			
	Transhorizon	91.5	91.5	—	—	—	61.5(4)	61.5(4)	—			
Terrestrial station; P_t (dBW) in B	Line-of-sight	13	13	10	10	5	-17(4)	-17(4)	13			
	Transhorizon	40	40				10(4)	10(4)	-			
Station subject to interference	B (Hz)	10^6	10^6	10^6	10^6	10^6	1	1	10^6			
P_r (p) (dBW)		—	—	—	—	—	−220	−220	−153			

A = Analogue
N = Digital

(1) Parameters associated with these services may vary over a rather wide range. Further study is required before representative values become available.
(2) See note (2) in section 2. $M_p(p_o)$ may assume values between 5 and 40 dB, depending on frequency, rain-climate and system design.
(3) This is based on 55 dBW per emission and an r.f. bandwidth not less than 100 MHz.
(4) These values are estimates for 1 Hz bandwidth and lie 30 dB below total power assumed per emission.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

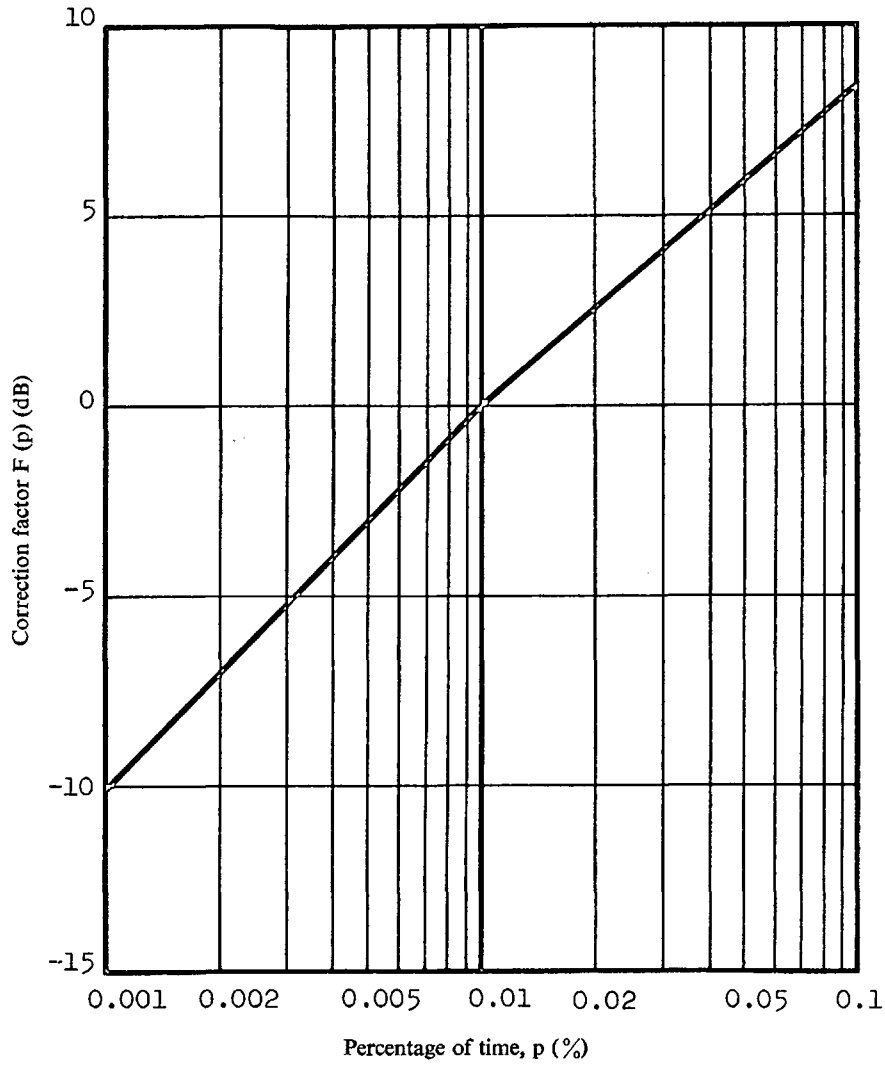


FIGURE 1

Correction factor F (p) for percentages of the time p other than 0.01 %

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

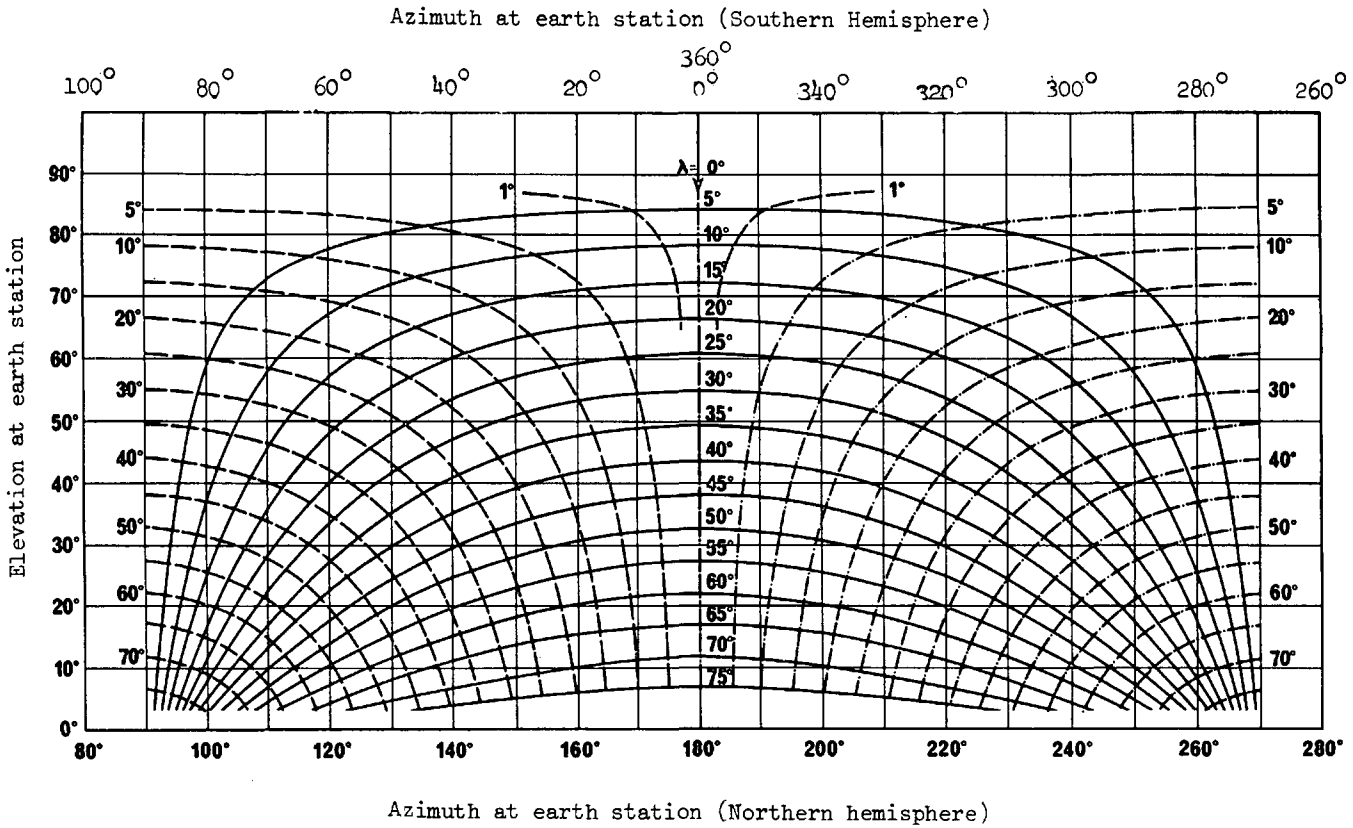


FIGURE 2

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.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

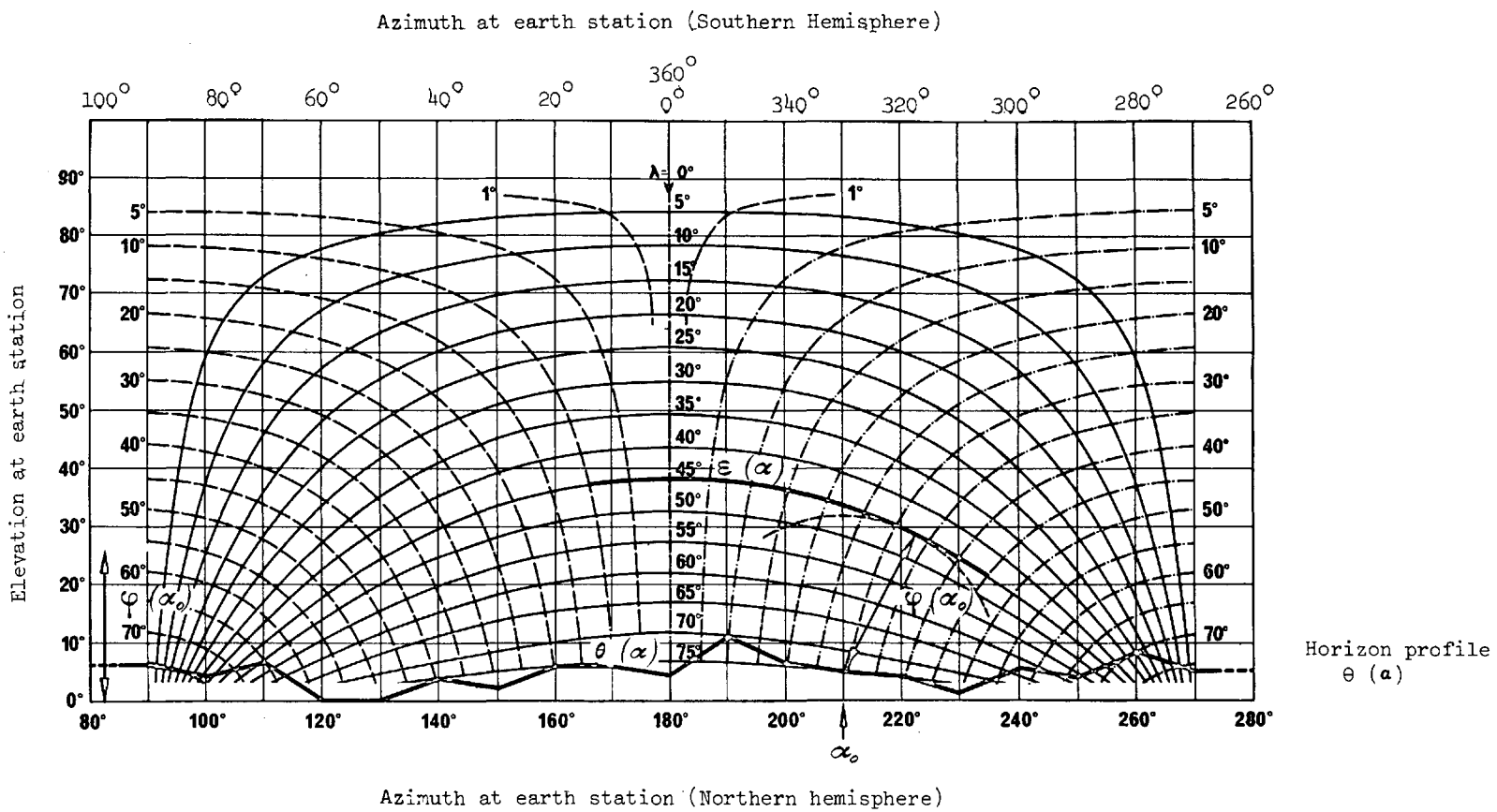


FIGURE 3

Example of derivation of ϕ

——— 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 O relative to the earth station.

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

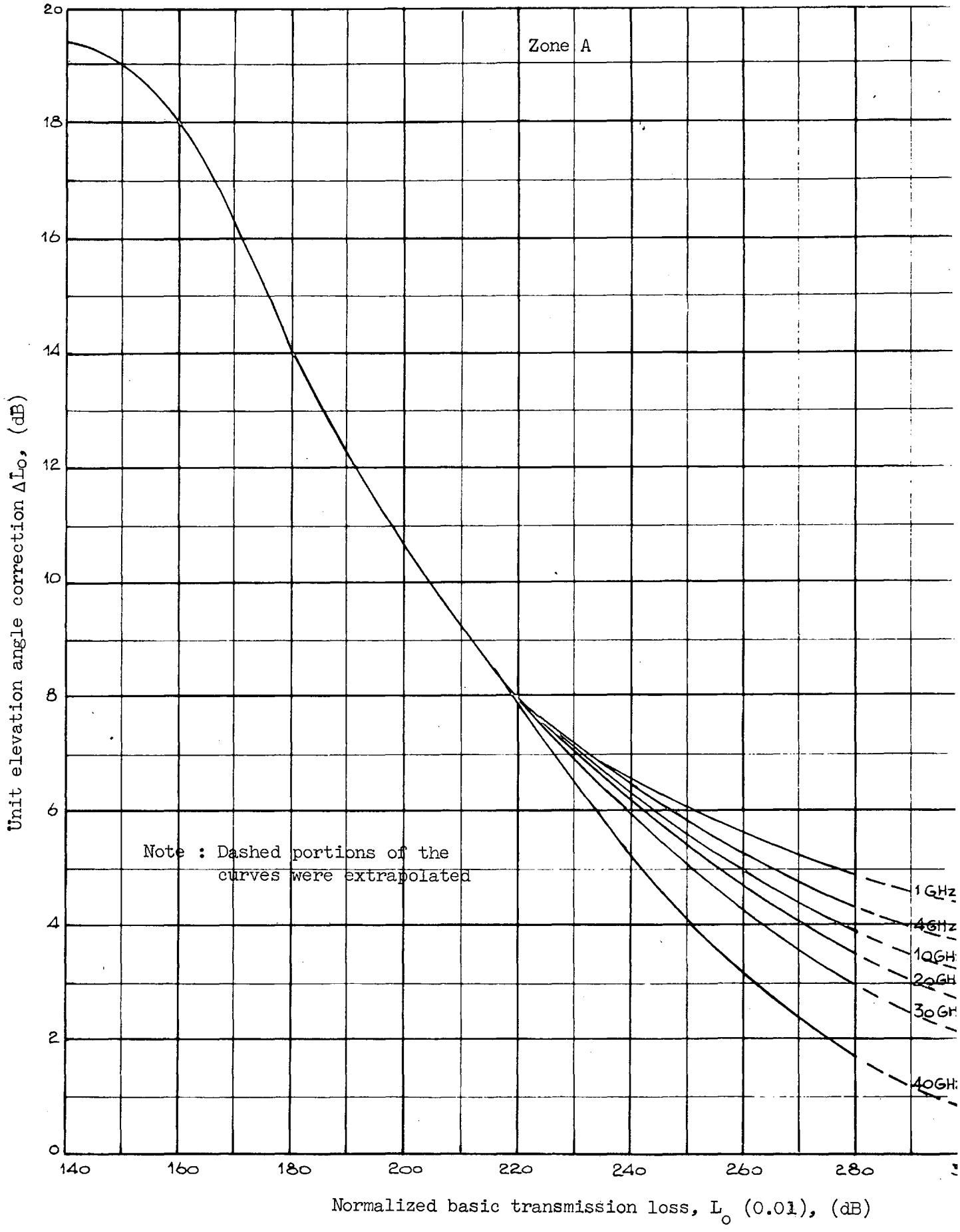


Figure 4 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone A

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

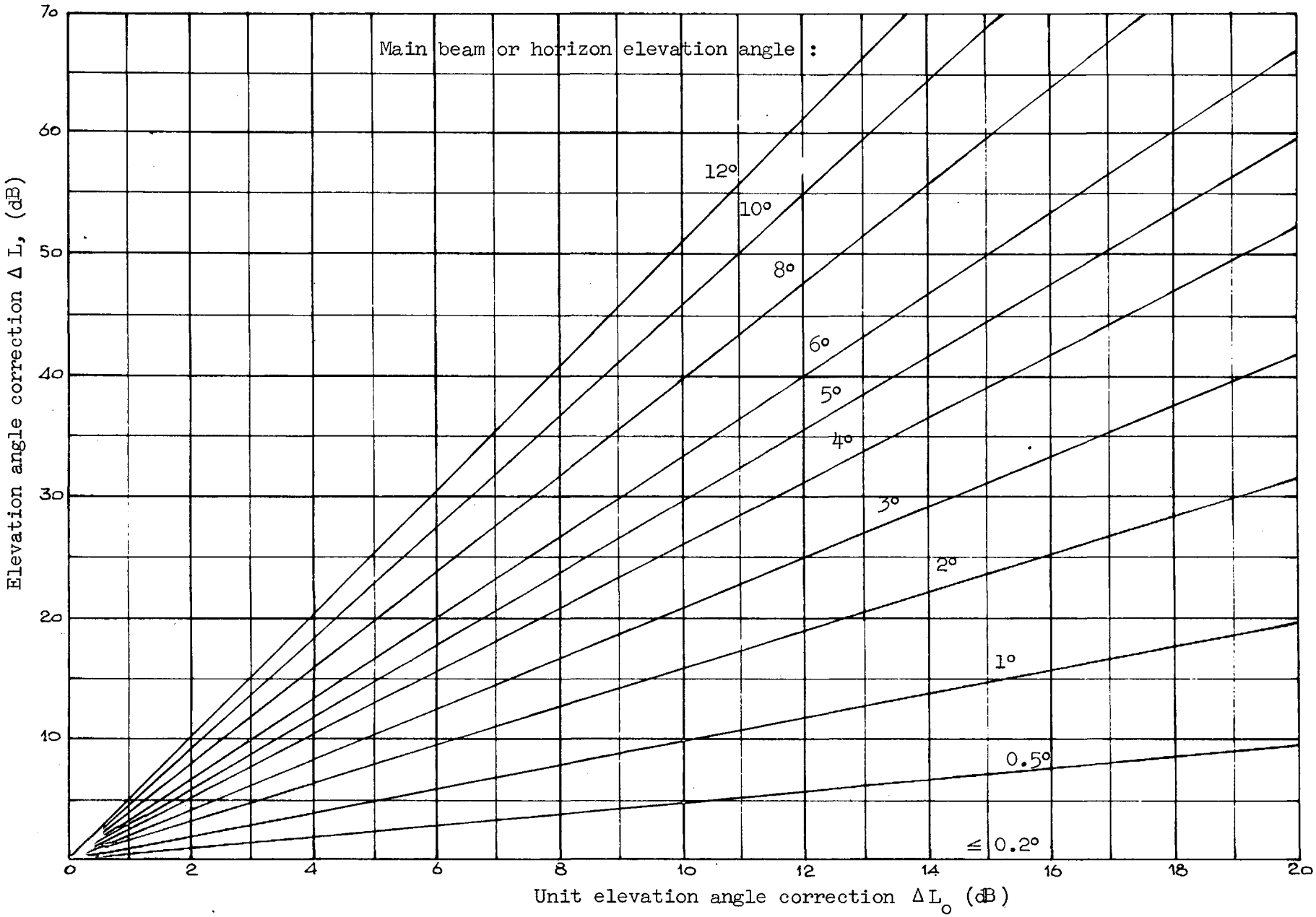


Figure 5 - Elevation angle correction, Zone A

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

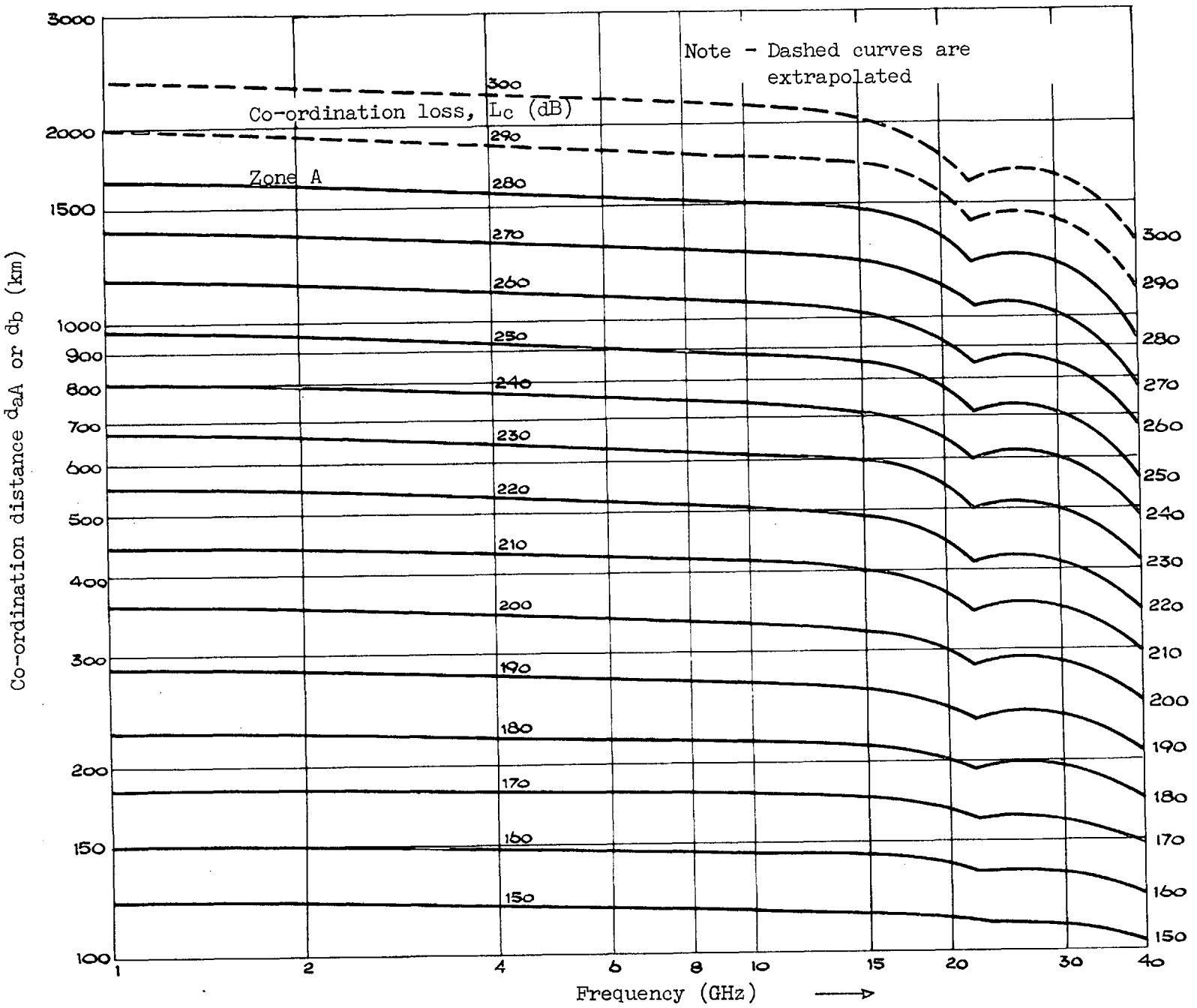


Figure 6 - Co-ordination distance d_{aA} or d_b as a function of frequency and co-ordination loss, Zone A

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

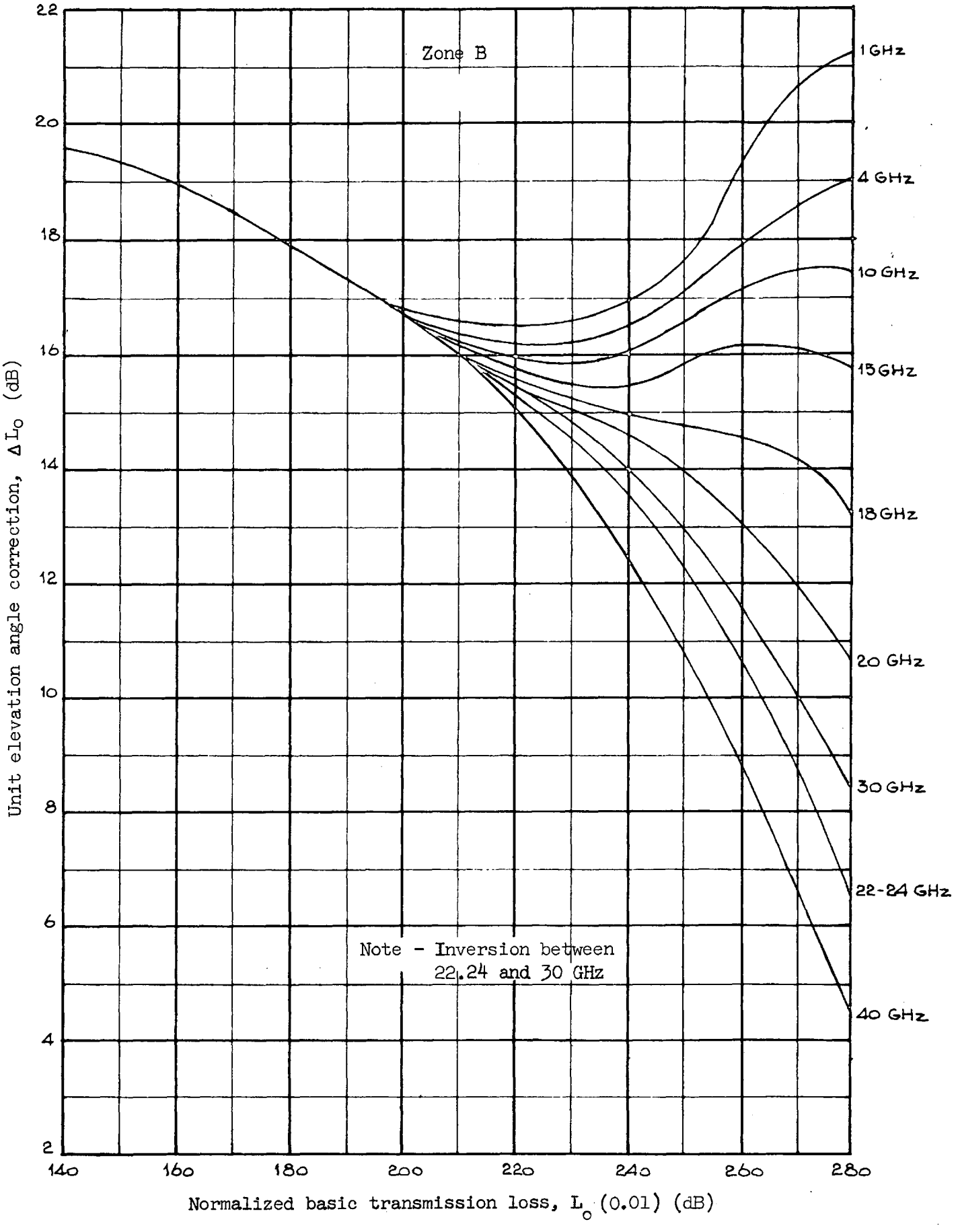


Figure 7 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone B

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

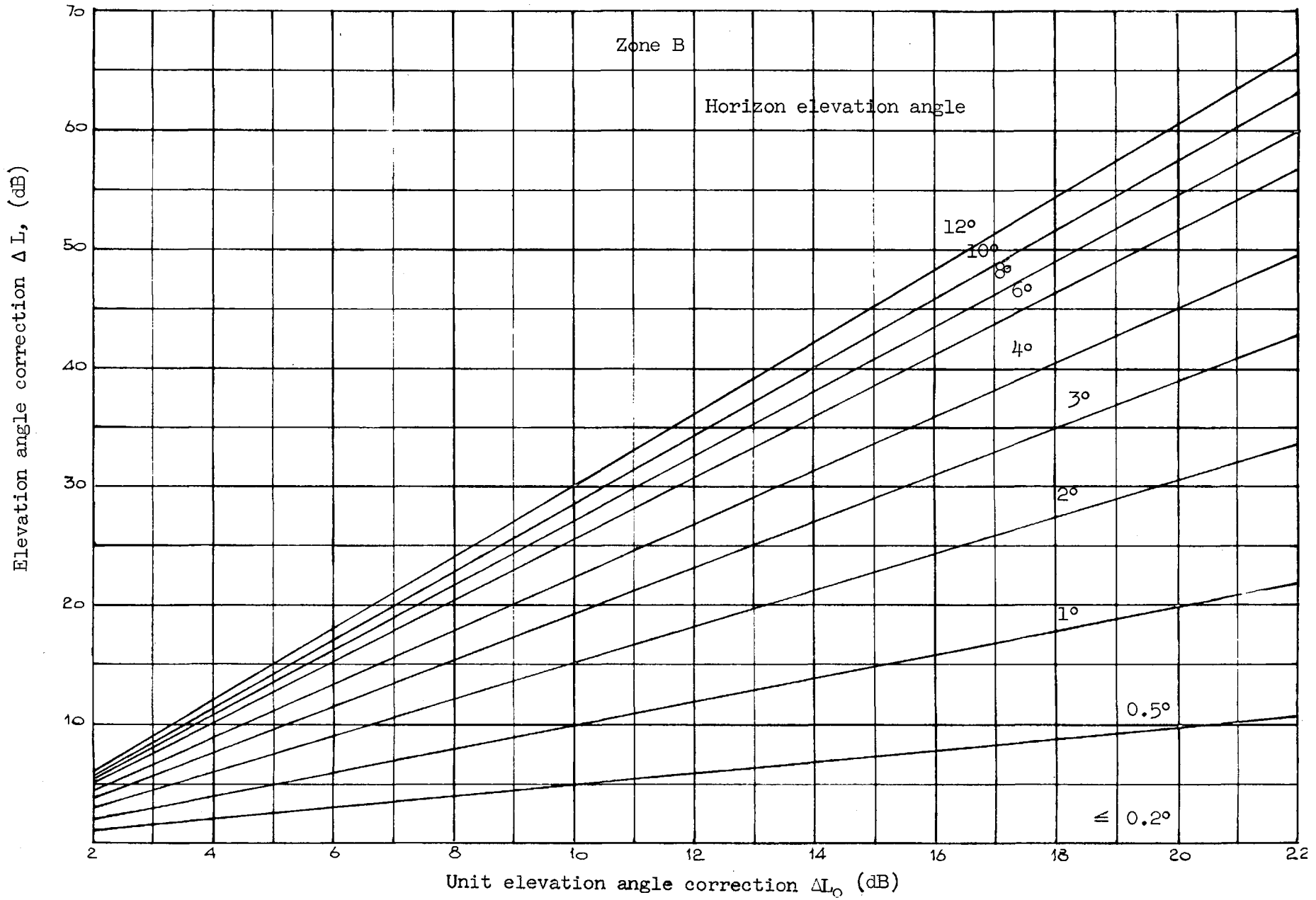


Figure 8 - Elevation angle correction, Zone B

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

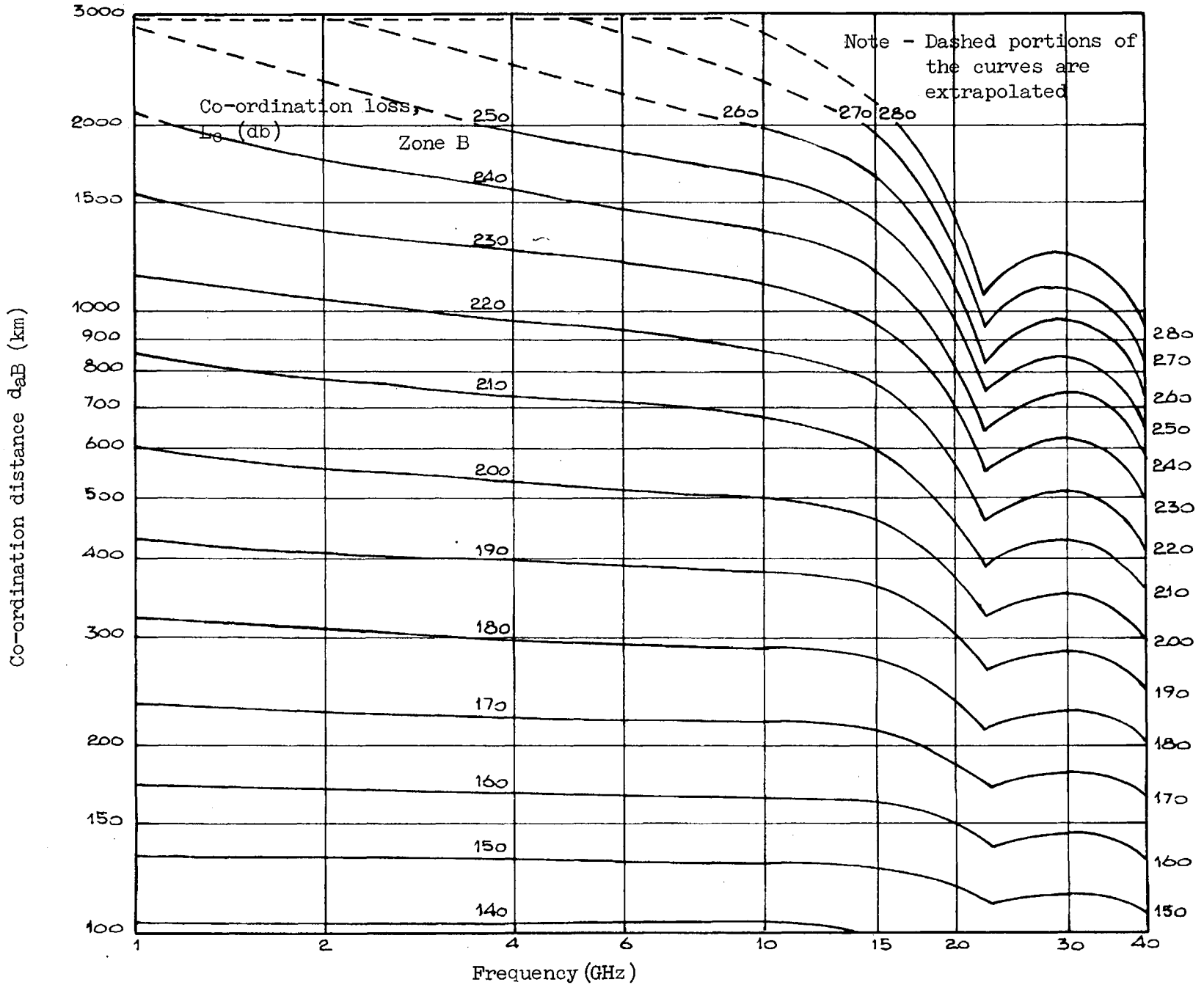


Figure 9 - Co-ordination distance d_{aB} as a function of frequency and co-ordination loss, Zone B

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

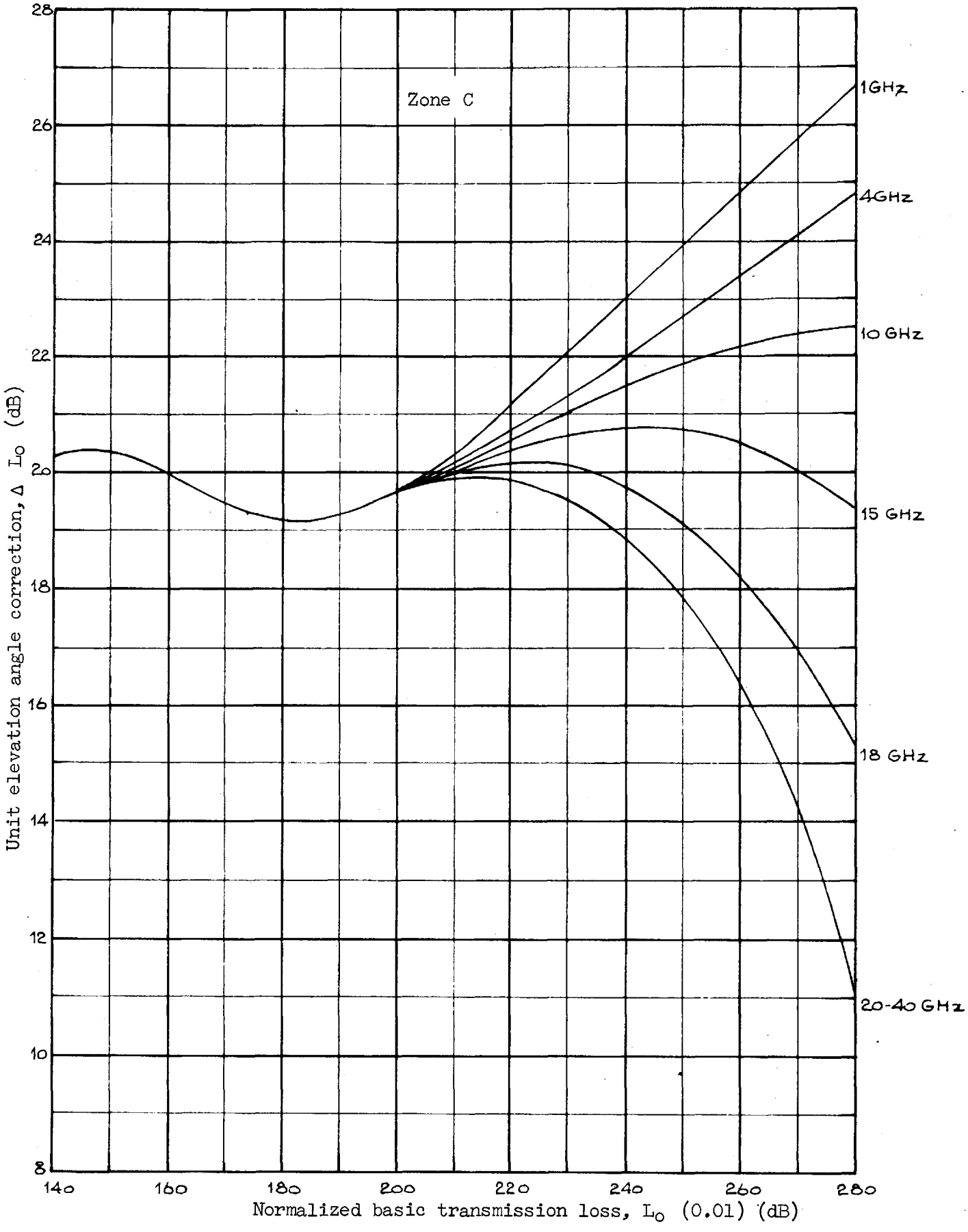


Figure 10 - Unit elevation angle correction as a function of normalized basic transmission loss and frequency, Zone C

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

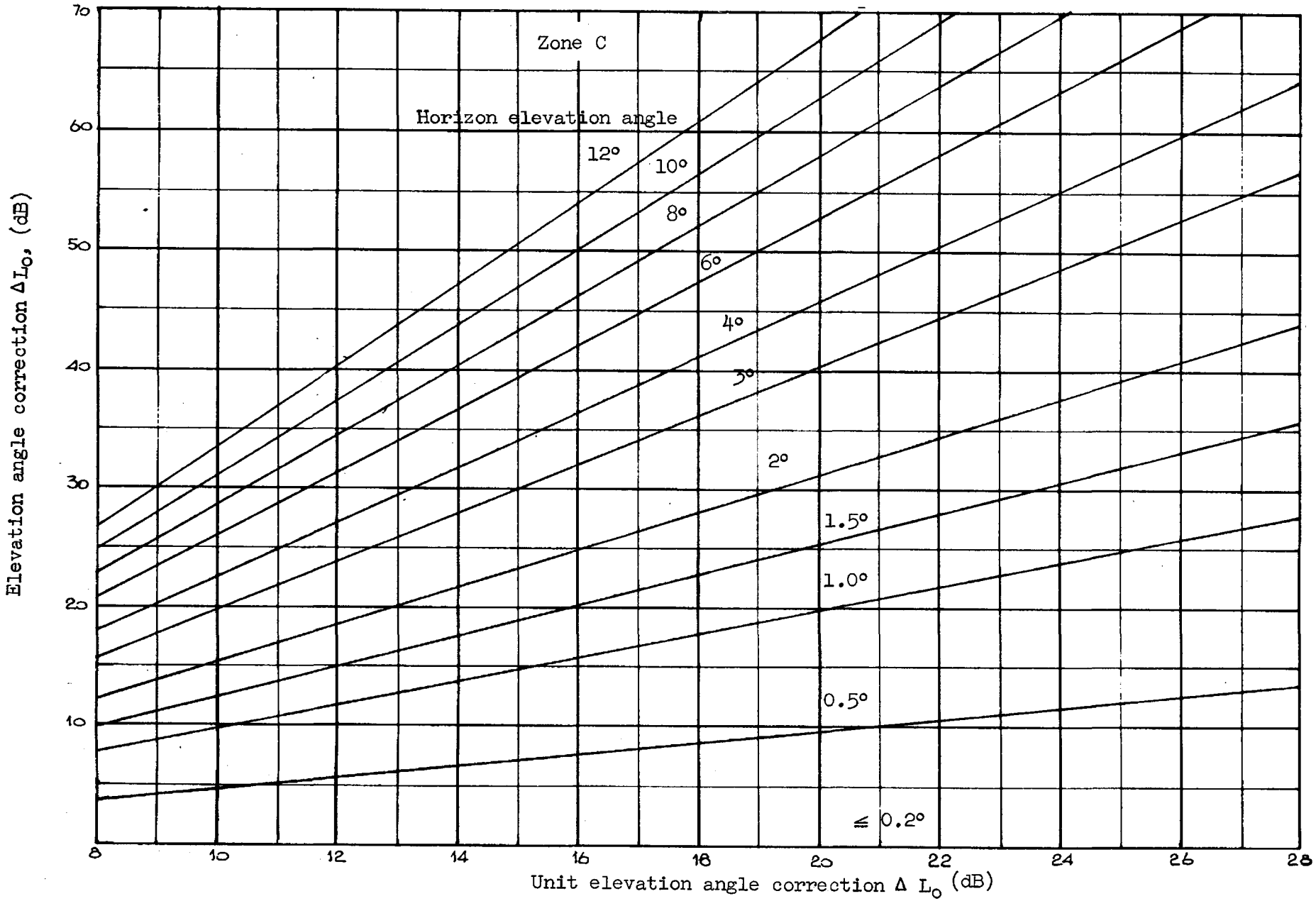


Figure 11 - elevation angle correction, Zone C

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

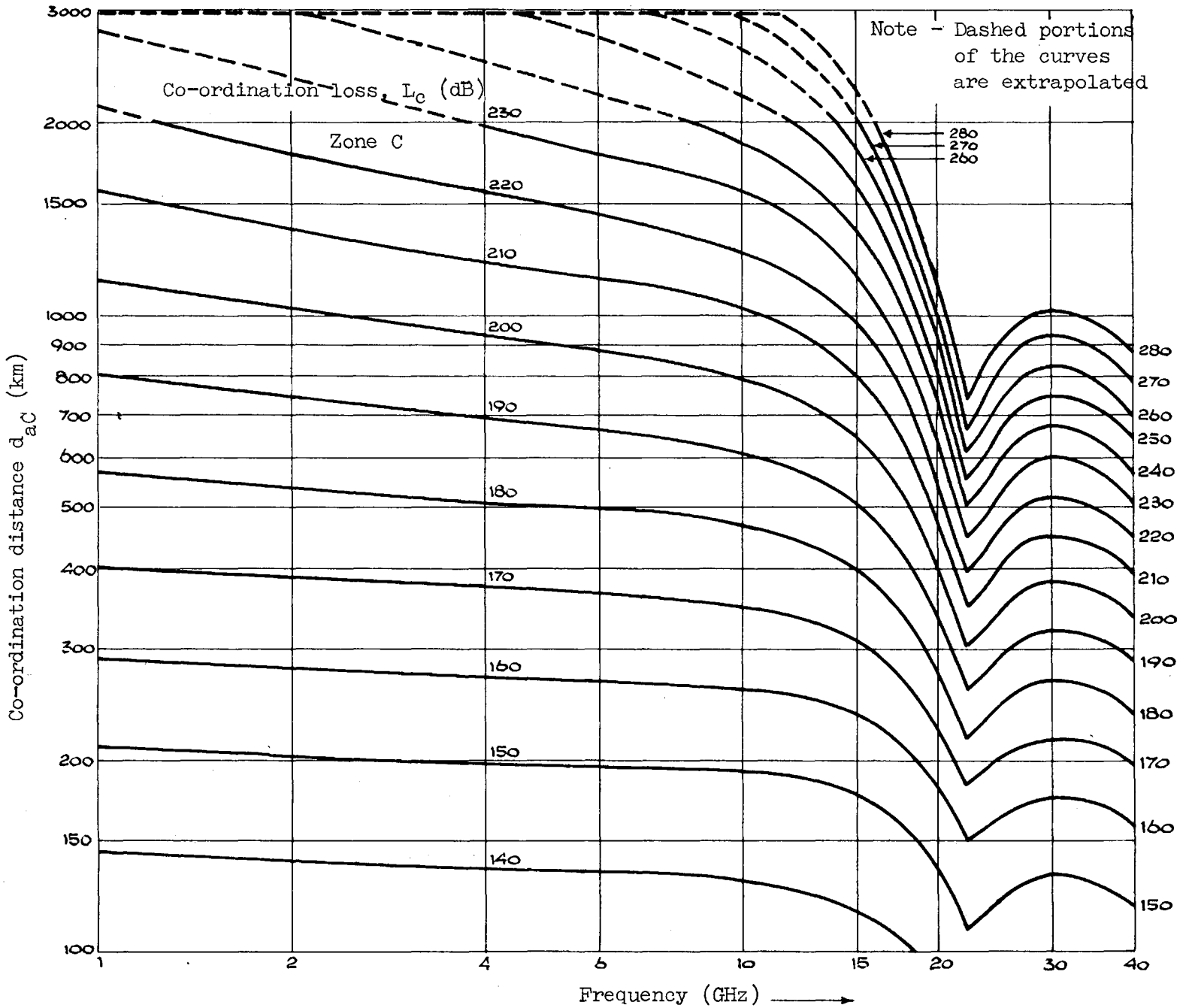


Figure 12 - Co-ordination distance d_{aC} as a function of frequency and co-ordination loss, Zone C

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

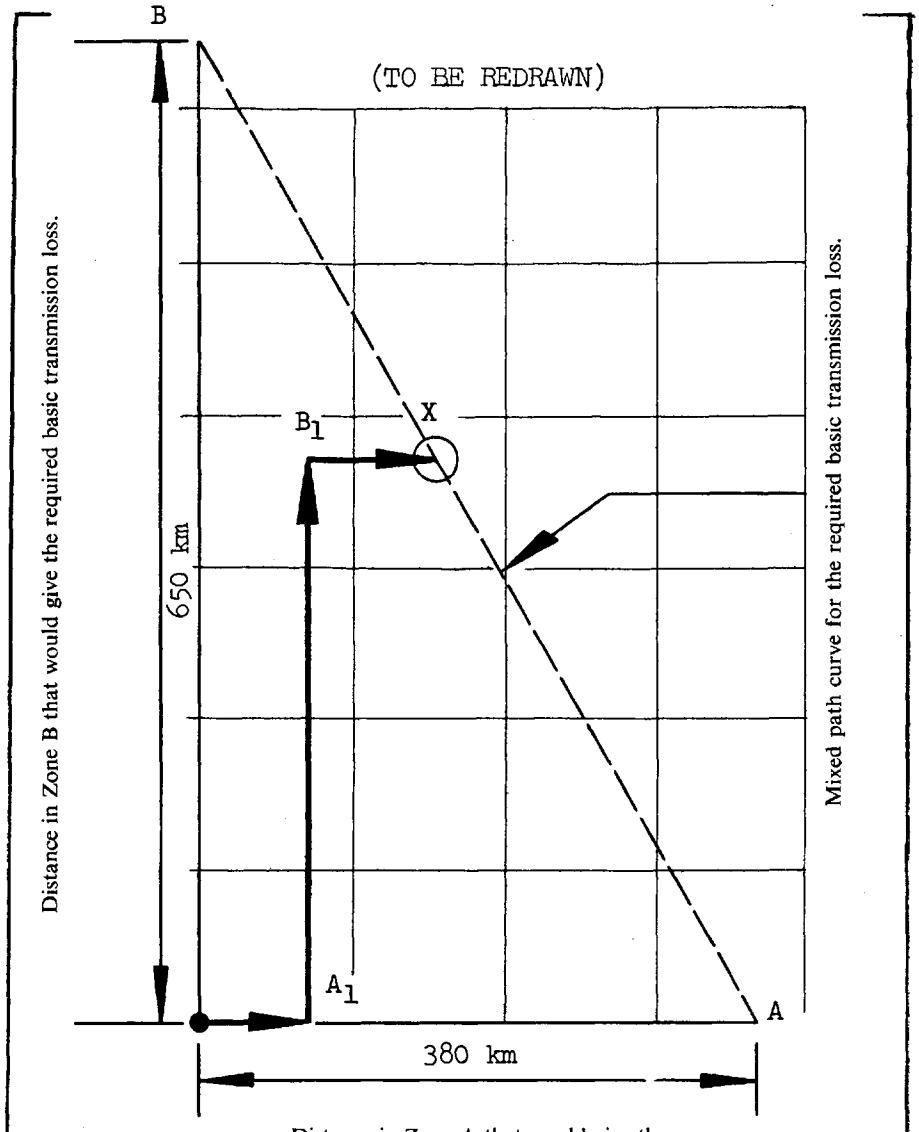


FIGURE 13 a

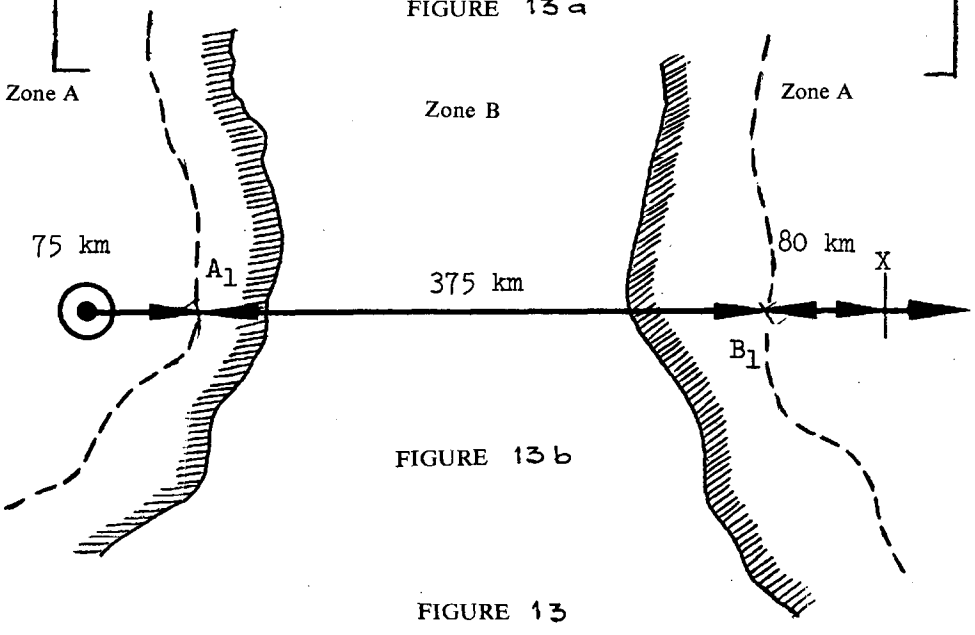


FIGURE 13 b

FIGURE 13

Example of coordination distance calculation for a mixed path

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

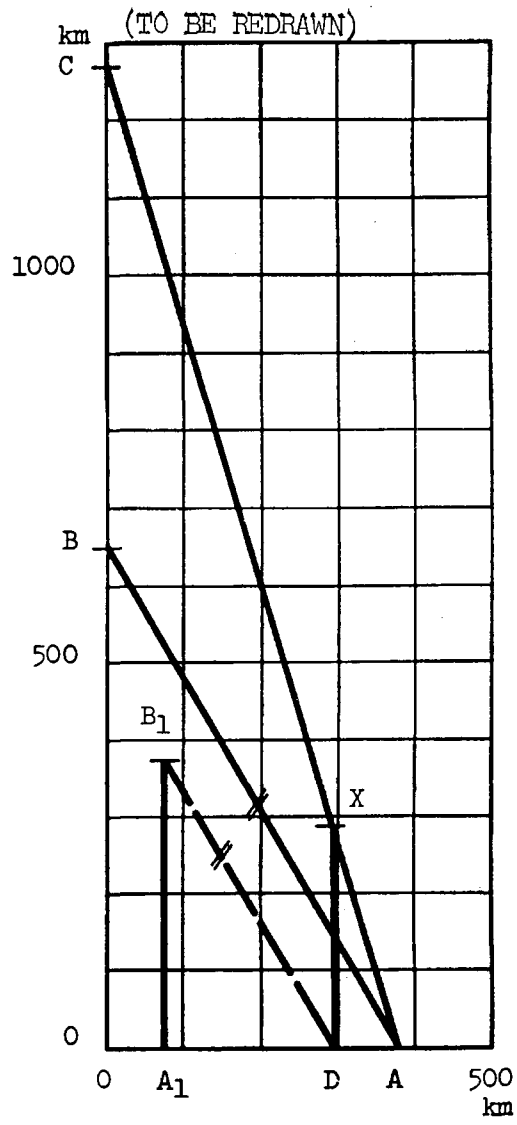


FIGURE 14 b

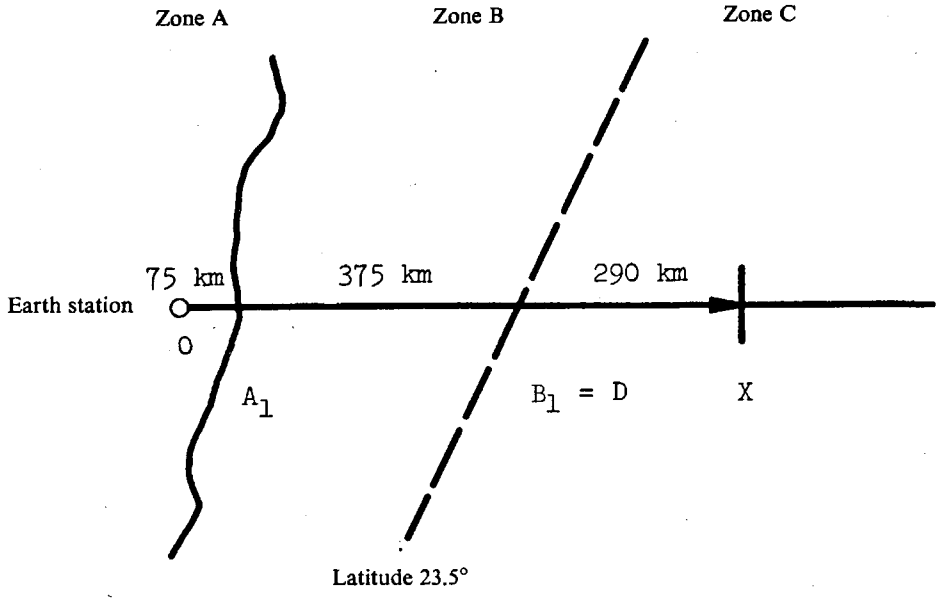


FIGURE 14 a

FIGURE 14

Example of determination of coordination distance for mixed paths involving Zones A, B and C

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

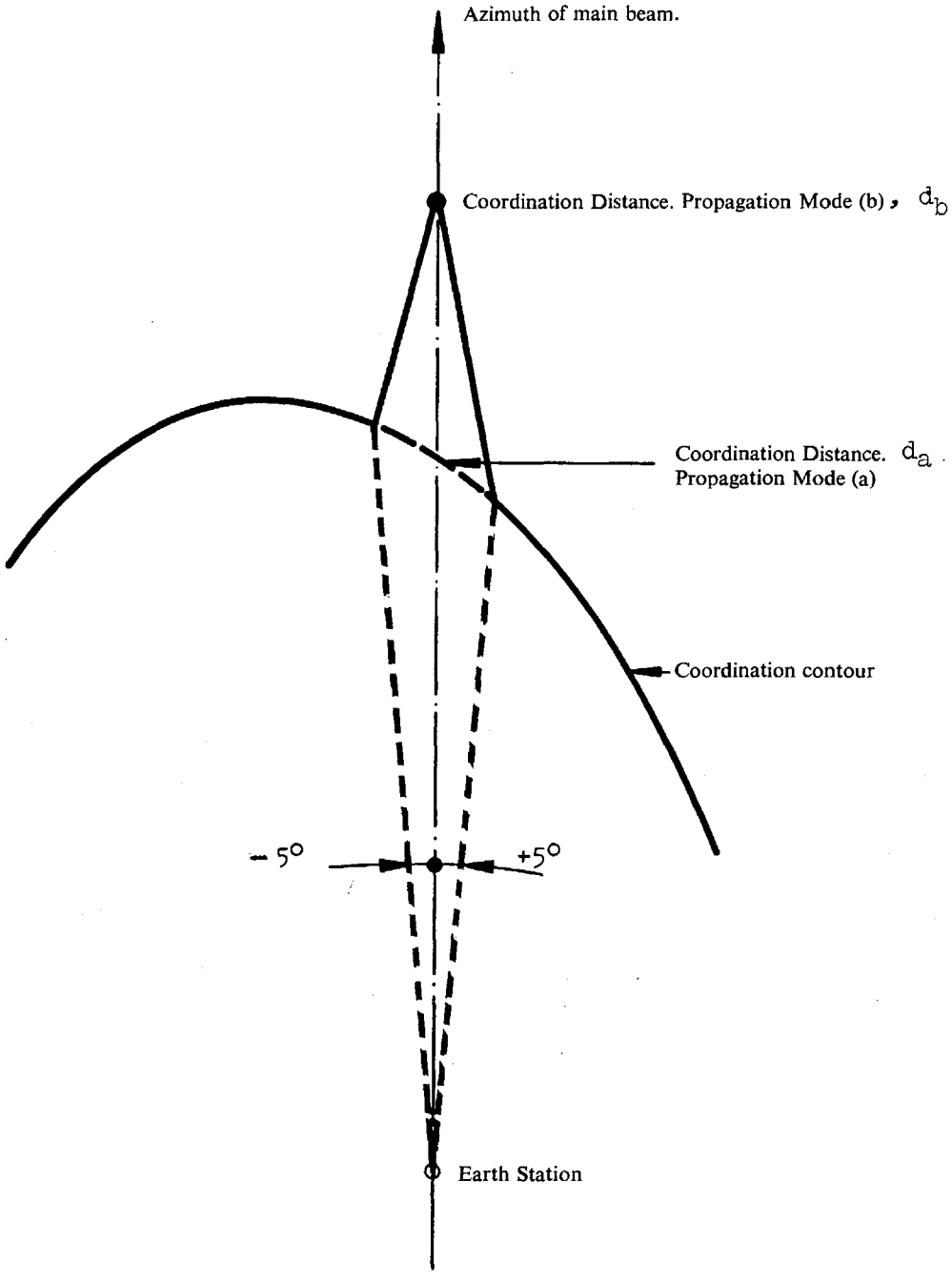
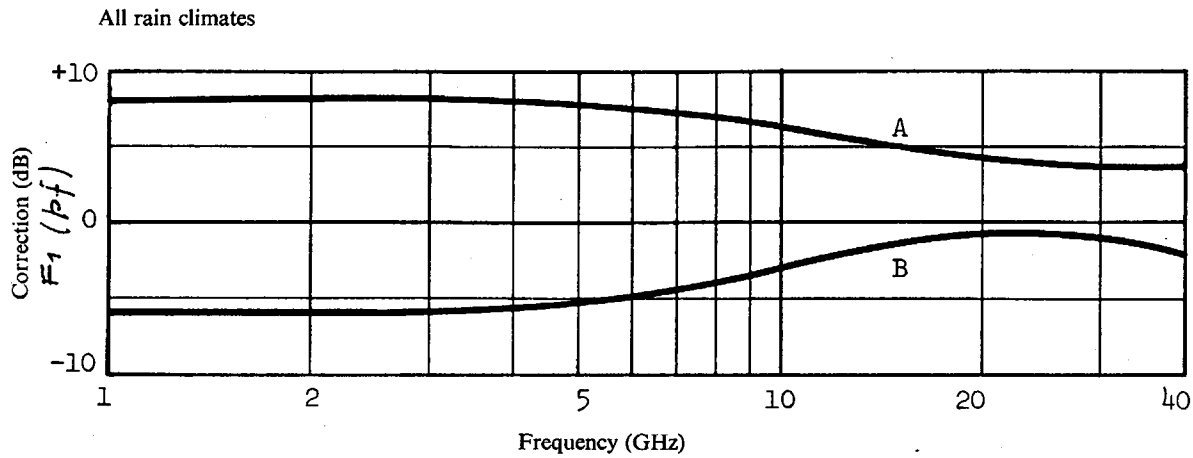


FIGURE 15

Example of the determination of the coordination distance in the case where the elevation of the earth station main beam is less than 12°

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT



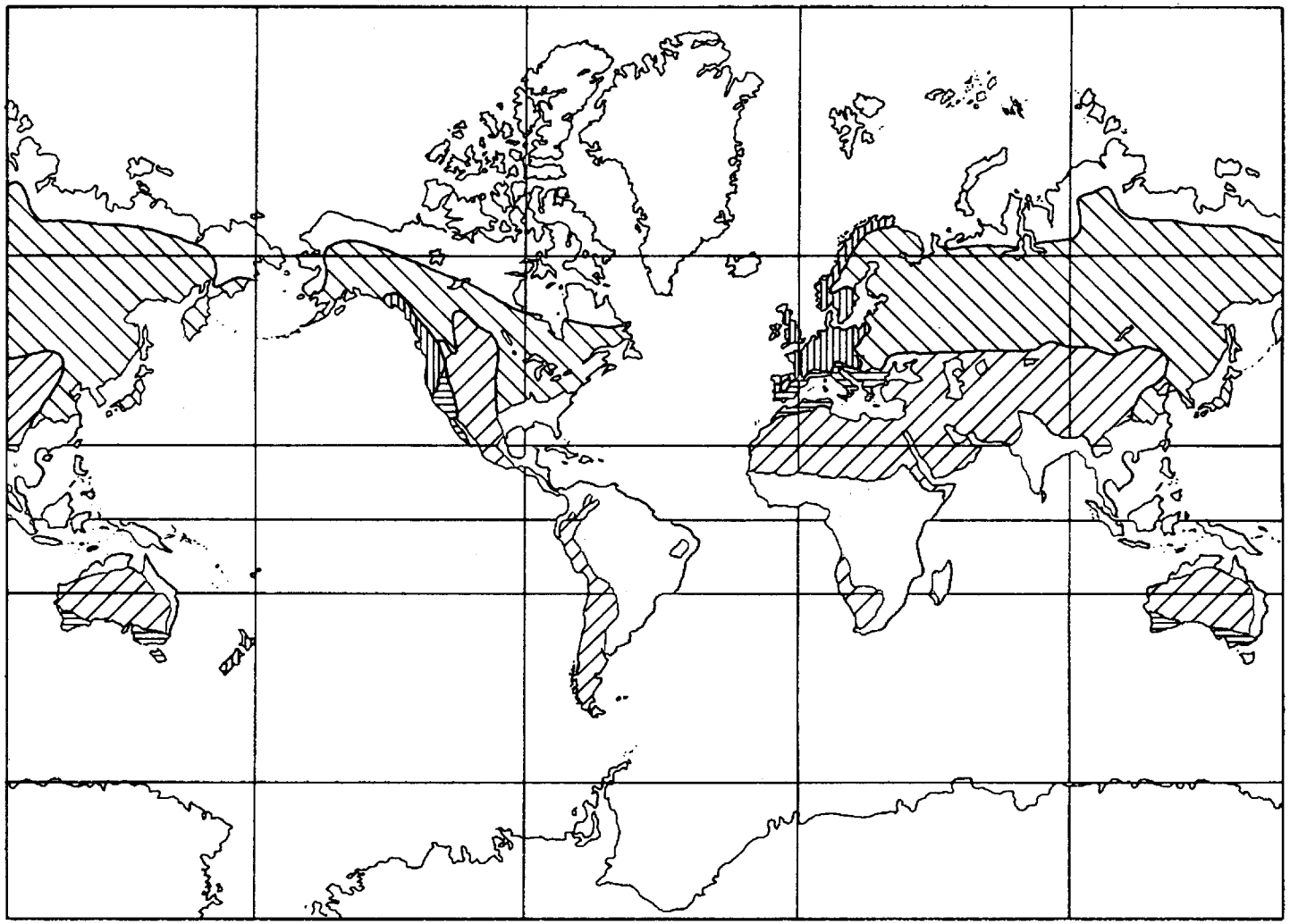
A: Correction for 0.1% of the time
B: Correction for 0.001% of the time

FIGURE 16

Correction factor to relate the effective percentage of time to 0.01%, as a function of frequency for rain scatter

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT



1
2
3
4
5

FIGURE 17

Rain climates of the world

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

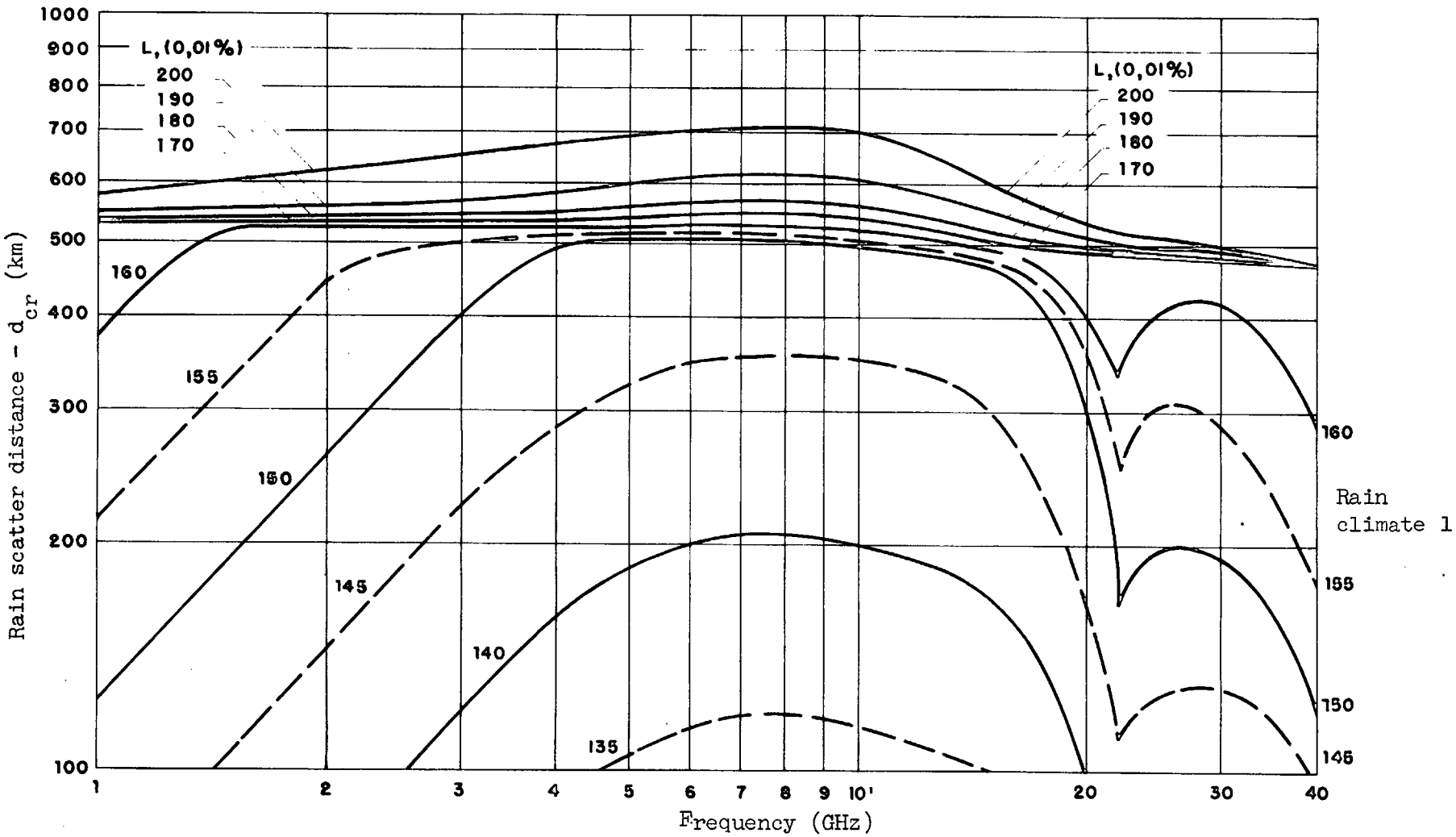


Figure 18 - Rain scatter distance as a function of frequency and normalized co-ordination loss - Rain Climate

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

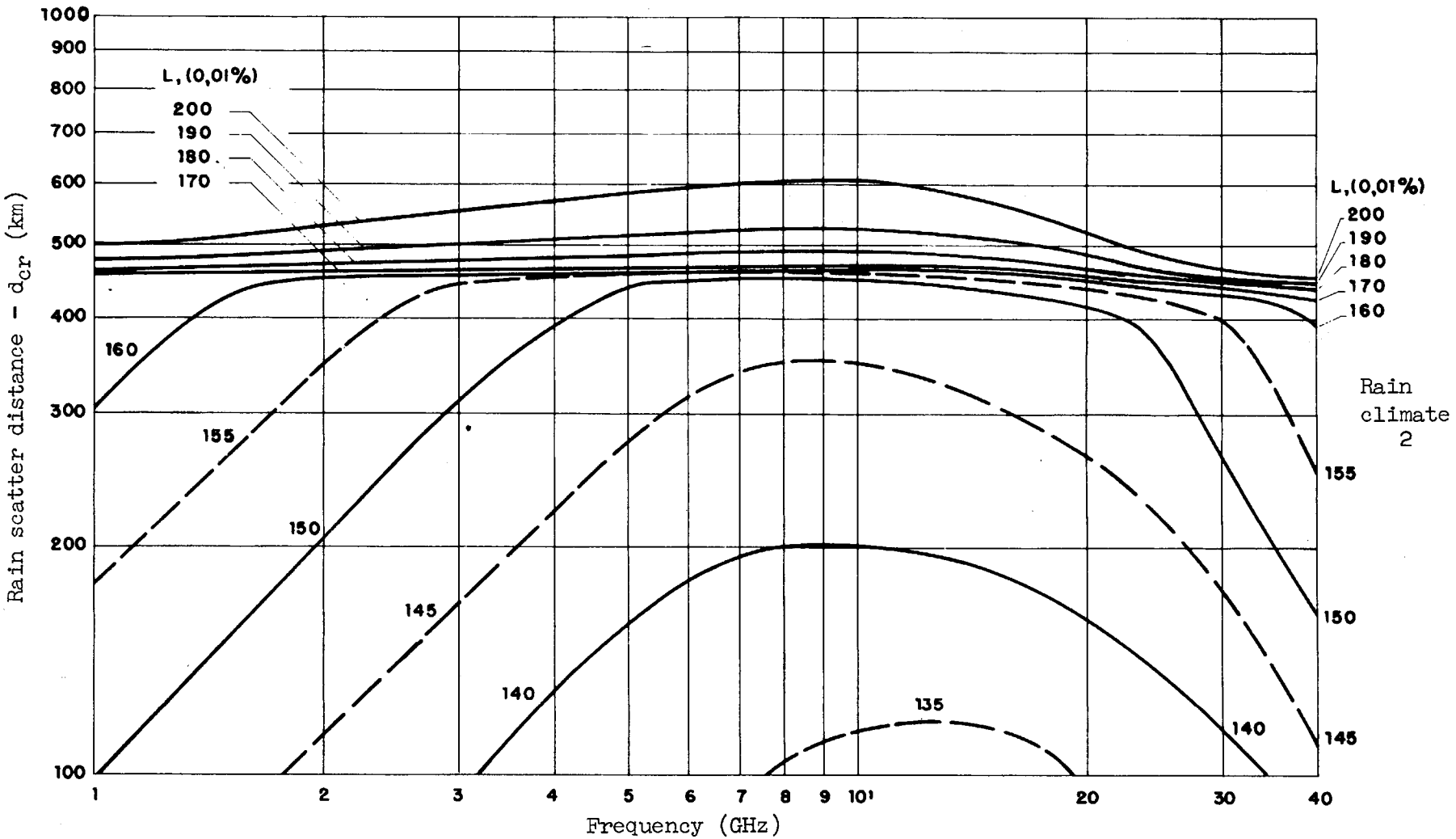


Figure 19 - Rain scatter distance as a function of frequency and normalized co-ordination loss
Rain Climate 2

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

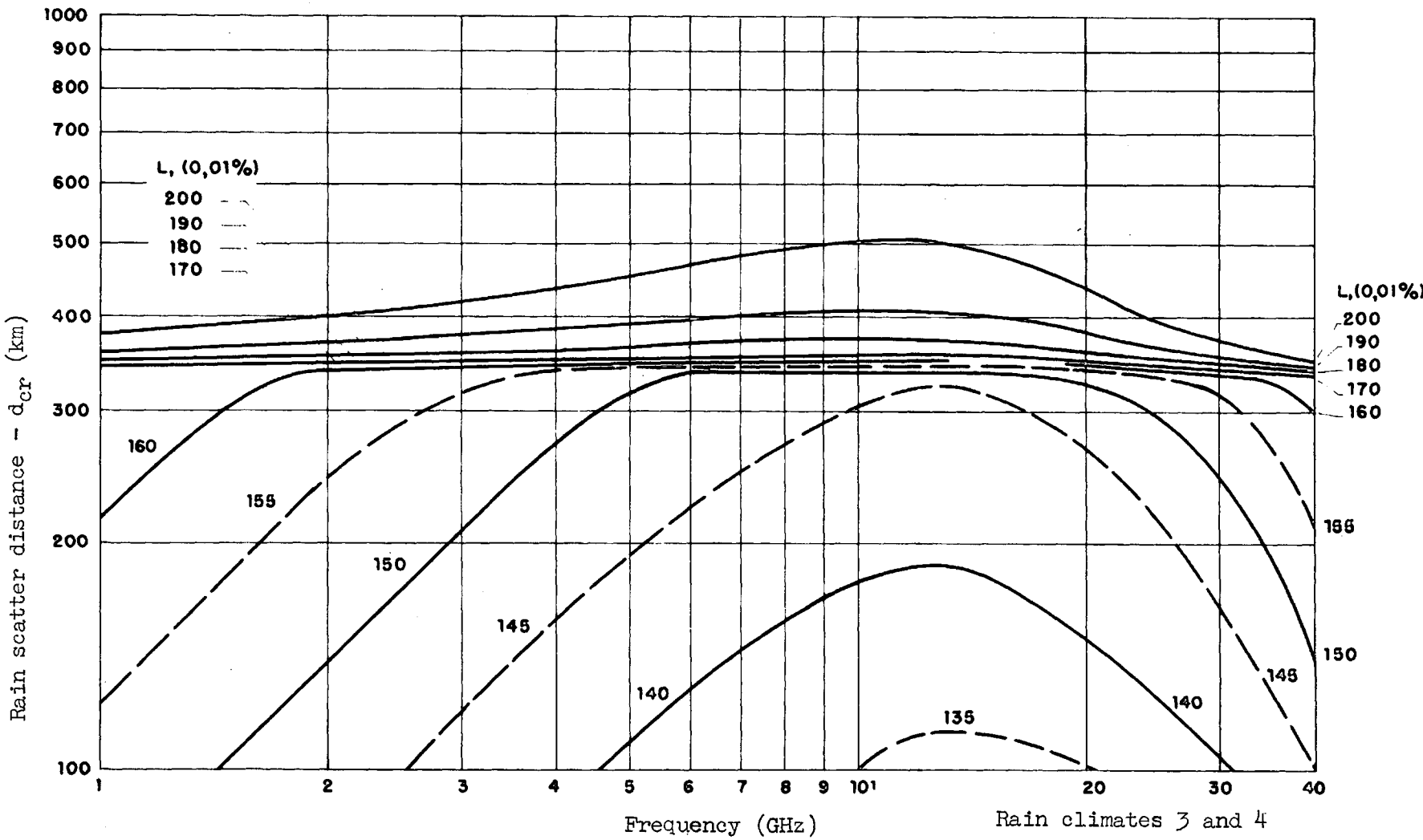


Figure 20 - Rain scatter distance as a function of frequency and normalized transmission loss
Rain Climates 3 and 4

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

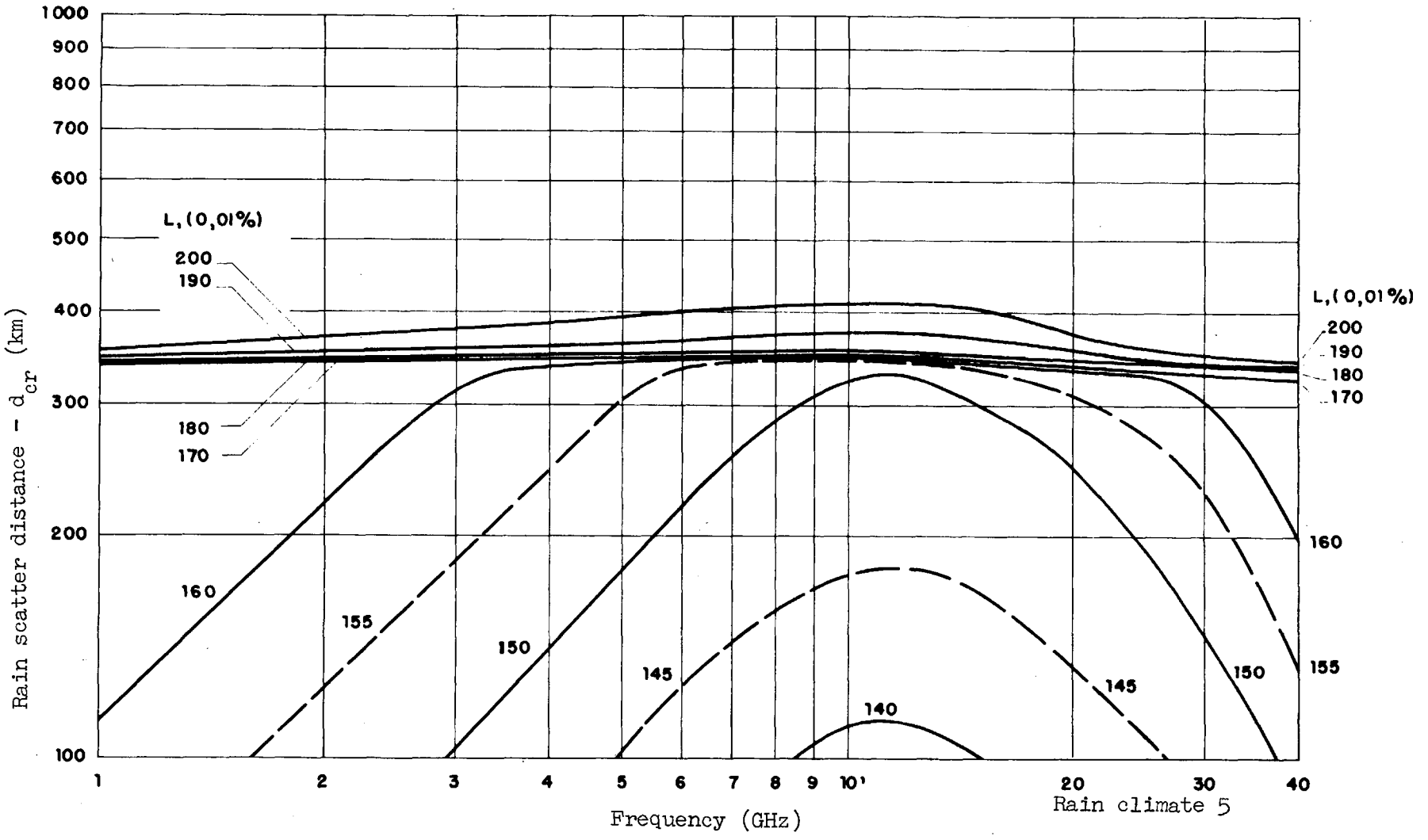


Figure 21 - Rain scatter distance as a function of frequency and normalized transmission loss
Rain Climate 5

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

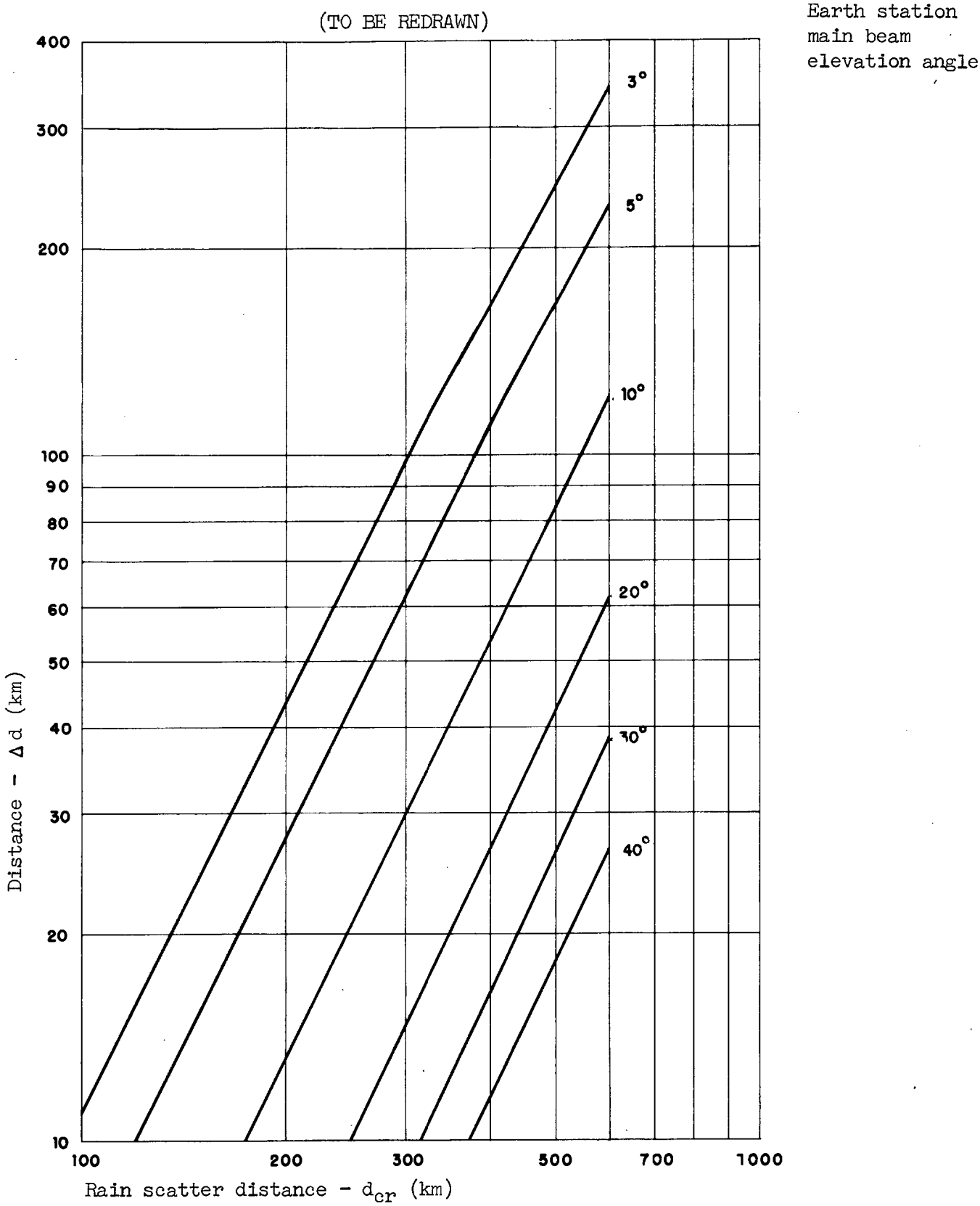
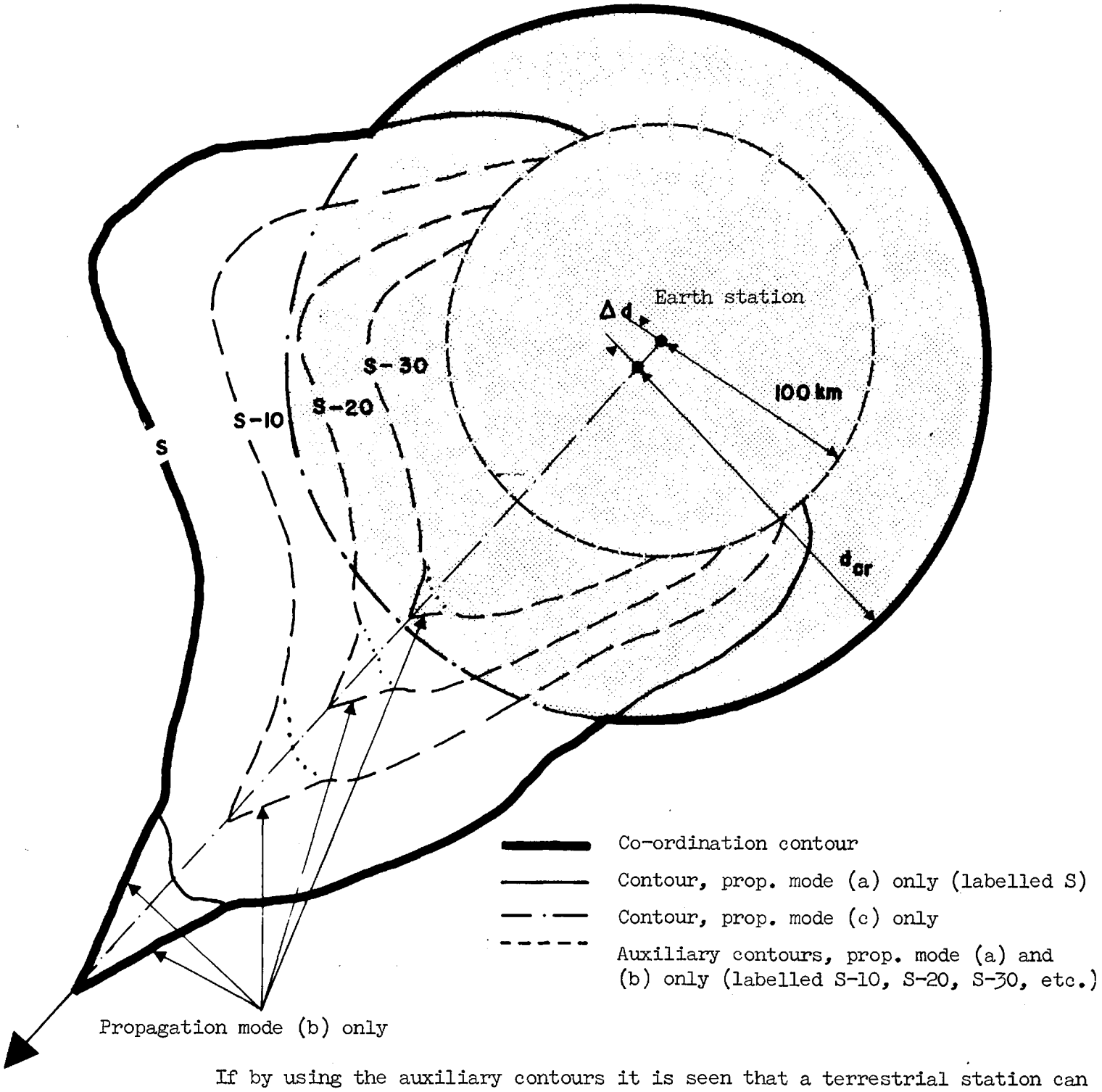


Figure 22 - The distance Δ d

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT



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

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX A TO APPENDIX 28

CALCULATION OF CO-ORDINATION DISTANCE IN ALLOCATED FREQUENCY BANDS

1. Article 9A requires co-ordination distances to be calculated only in the particular frequency bands given in Article 5 and listed in Tables I and II 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) :

$$C_2 = - P_{r(p)} - F_1(p_1 f) + \Delta G$$

The normalized basic transmission loss L_o (0.01) and the normalized transmission loss $L_1(0.01)$ are given by :

$$L_o(0.01) = P_t' + G_t' + C_1$$

$$L_1(0.01) = P_t' + C_2$$

The values of C_1 and C_2 for each band allocated for earth station transmission are given in Table III, together with the bandwidth unit (B) which is used in calculating P_t'.

Earth station reception

3. In the bands used for earth station reception (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) :

$$C_4 = P_t' - (10 \log kB + J - W) - F_1(p_1 f) + \Delta G$$

The normalized basic transmission loss $L_o(0.01)$ and the normalized transmission loss $L_1(0.01)$ are given by :

$$L_o(0.01) = G_r + C_3 - 10 \log T_r - M(p)$$

$$L_1(0.01) = C_4 - 10 \log T_r - M(p)$$

The values of C_3 and C_4 for each band allocated for earth station reception are given in Table IV.

Flow diagrams

4. The procedure for calculating co-ordination distance is illustrated by the flow diagrams given in Figures 1 and 2. The steps required to determine co-ordination distances for a transmitting earth station are shown in Figure 1, and those for a receiving earth station are shown in Figure 2. The symbols used in these diagrams are defined in the main text of Appendix 28.

TABLE III

Earth station transmission

Frequency Band (GHz)	C_1 (dB)	C_2 (dB)	Reference Bandwidth (kHz)
5.925-6.425	176	134	4

TABLE IV

Earth station reception

Frequency Band (GHz)	Type of Service	C_3 (dB)	C_4 (dB)
3.7-4.2	COMSAT - A	199	157
"	COMSAT - N	224	178
	Space Research	-	-
	ERS		

Notes : A = Analogue modulation

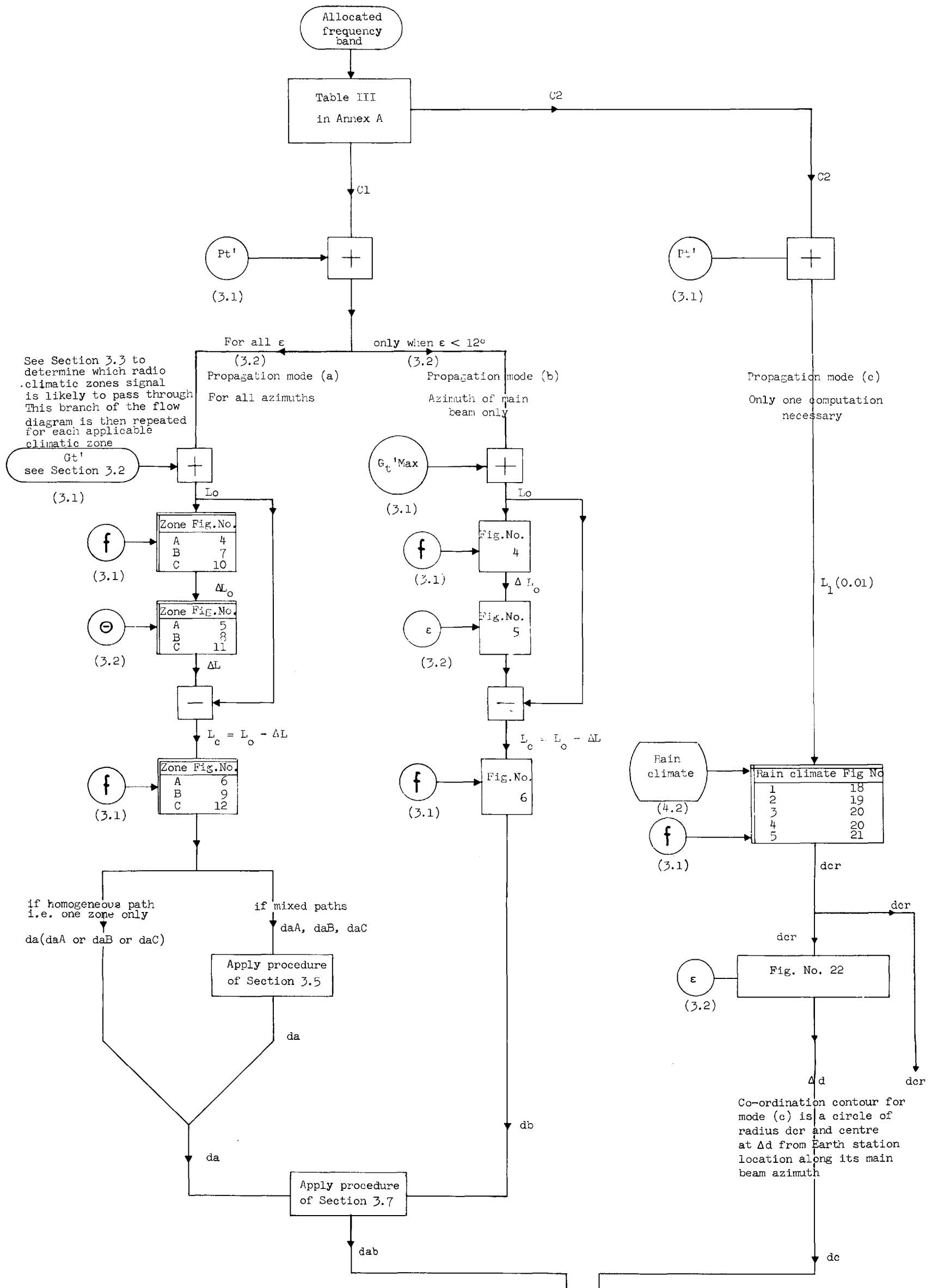
N = Digital modulation

[To be completed as far as practicable for each allocated shared frequency band]

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

1. FLOW DIAGRAM TO PRODUCE CO-ORDINATION DISTANCE CONTOUR FOR EARTH STATION TRANSMITTING



Notes : 1) The number in brackets near each symbol refers to the section in Appendix 28 where the symbol is defined

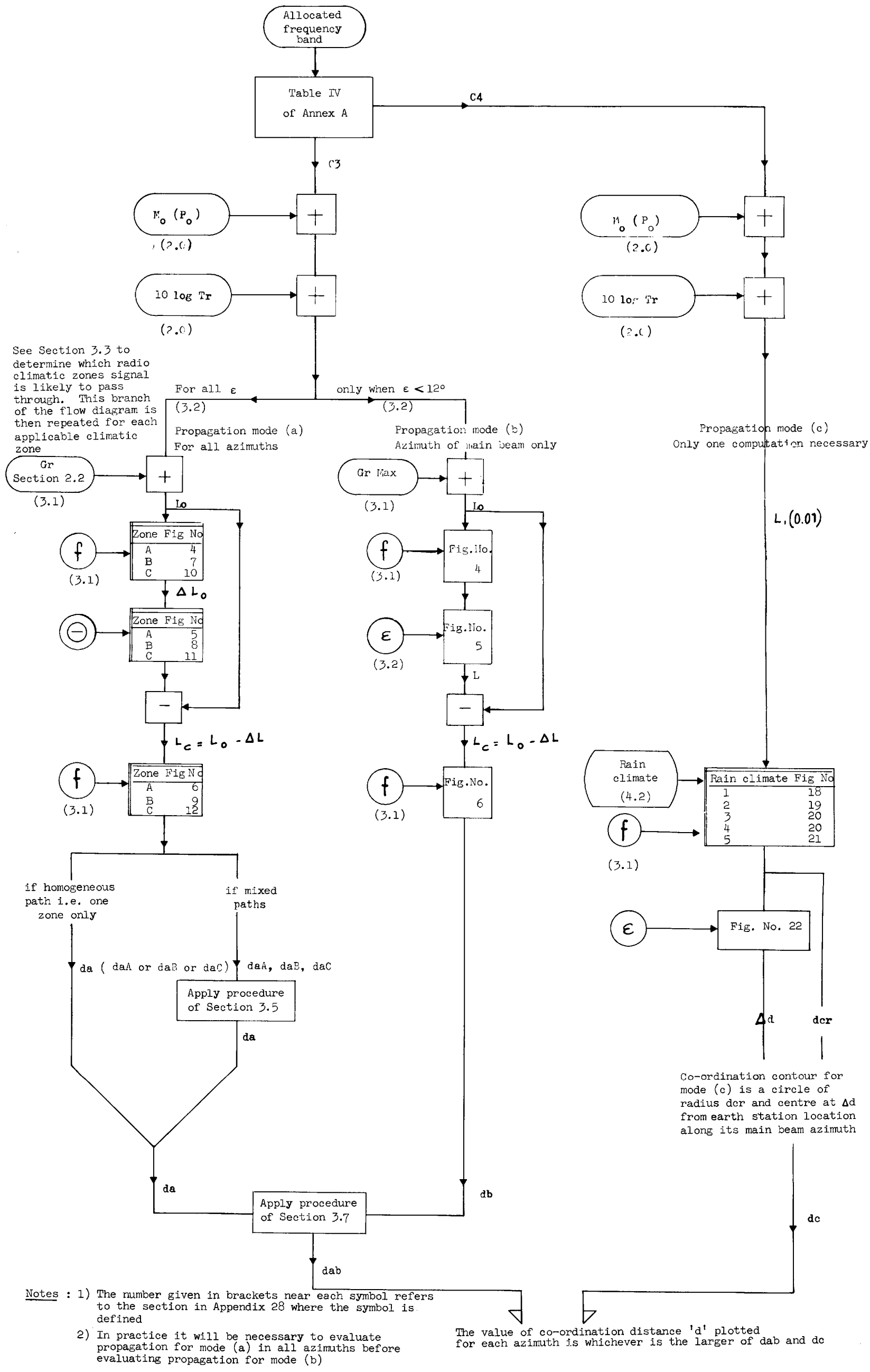
2) In practice it will be necessary to evaluate propagation mode (a) for all azimuths before evaluating propagation for mode (b)

The value of co-ordination distance 'd' plotted for each azimuth is whichever is the larger of dab and dc

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

2. FLOW DIAGRAM TO PRODUCE CO-ORDINATION DISTANCE CONTOUR FOR EARTH STATION RECEIVING



Notes : 1) The number given in brackets near each symbol refers to the section in Appendix 28 where the symbol is defined

2) In practice it will be necessary to evaluate propagation for mode (a) in all azimuths before evaluating propagation for mode (b)

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

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 contours 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) 5, 10, 15, 20 db etc. lower than the value (given in Tables I and Ia 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 to 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 23 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 co-ordination 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 to cause negligible 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

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 295-E
6 July 1971
Original : French

COMMITTEE 4

FOURTH REPORT OF WORKING GROUP 4A

1. Working Group 4A examined the use made of the terms "system", "network", "link" and "path", especially in Document No. 194. A set of terms and definitions, set out in paragraph 1 of the Annex, is proposed by the Group for insertion in Article 1, Section IIA, after the definition of "satellite system".

It is to be noted that, according to the definitions proposed, a satellite circuit between two earth stations comprises two "satellite links", established in opposite directions, between these stations.

2. The Group proposes that the term "geosynchronous satellite", with the definition given in paragraph 2 of the Annex, be added in Section IIB of Article 1, just before the term "geostationary satellite".

3. It also proposes that the term and definition concerning noise temperature as set out in paragraph 3 of the Annex be added in Article 1, Section III. /It was not thought possible or necessary to define the term "system noise temperature", which is generally well understood; however, it would be useful to have a clear definition prepared by the C.C.I.R. This could be the subject of a section within the "omnibus" Recommendation to the C.C.I.R./

4. It further proposes that the terms and definitions concerning co-ordination as given in paragraph 4 of the Annex be added in Article 1, Section III.

5. The Group considered the concept of "acceptable (or unacceptable) interference" but did not consider it possible to formulate a definition at this stage. The Group proposes that this concept be studied by the C.C.I.R. jointly with that of "harmful interference" within the framework of Recommendation (H) (Document No. 223).

It is recommended that, at the present conference, the term "unacceptable interference" be used with the following 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."

M. THUE
Chairman
Working Group 4A

Annex : 1

ARCHIVES U.I.T. GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

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

Earth satellite whose period of revolution is equal to the period of rotation of the earth about its axis.

3. Term and definition to be added in Section III

ADD 103A Equivalent satellite-link noise temperature

The system noise temperature of a satellite link excluding interference coming from links using other satellites and terrestrial systems.

4. Terms and definitions to be added in Section III

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 an allowable amount 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.

Note *) - These terms are used, with the meaning given in the above definitions, for co-ordination between earth stations and fixed and mobile terrestrial stations.

BLUE PAGES

INTERNATIONAL
TELECOMMUNICATION
UNION

SPACE CONFERENCE

Geneva, 1971

E

Document No. 296-E

6 July 1971

PLENARY MEETING
(FIRST READING)

B. 2

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
7		1	Preamble,	
		4	Final Protocol	
4	284	5	No. 470V,	
		6	Res. A,	
		7	Rec. AA	

François JOB
Chairman of the Editorial
Committee

Annex: Pages B2/01-08

ARCHIVES
U.I.T.
GENÈVE

PARTIAL REVISION OF THE RADIO REGULATIONS (GENEVA, 1959)

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 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, Geneva, 1959. Particulars of the revisions of the Radio Regulations are given in Annexes 1 to [redacted] hereto.

The revised provisions of the Radio Regulations, Geneva, 1959, shall form an integral part of the Radio Regulations which are annexed to the International Telecommunication Convention. They shall come into force on ..... , 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, Geneva, 1959, hereby declare that, should an Administration make reservations concerning the application of one or more of the revised provisions of the Radio Regulations, Geneva, 1959, 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, Geneva, 1959, by the World Administrative Radio Conference for Space Telecommunications, 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, Geneva, 1959, 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, [redacted] July, 1971.

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:

MOD [ARTICLE 7]

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]

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 investigation 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 transmission of radio waves from ionospheric research satellites in orbit above the ionosphere may continue to be authorized in the MF and HF bands provided that suitable means are available for controlling the transmission from the satellite 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 with terrestrial 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 in this Appendix do not show numerical values for the 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 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];

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] or above 40 G[c/s], which may be the subject of a C.C.I.R. Recommendation.

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 297-E
9 July 1971
Original : French

COMMITTEE 5

SUMMARY RECORD

OF THE

FOURTH MEETING OF COMMITTEE 5

(ALLOCATIONS)

Tuesday, 6 July 1971, at 1500 hrs

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

Subjects discussed :	Document No. :
1. Proposal by Iraq (40-275 Gc/s)	230 and Add. No. 1
2. Adoption of the following Reports :	
First Report WG 5B	177(Rev.)
Second Report WG 5B	187(Rev.)
3. Adoption of the following Reports :	
Note from WG 5C to Committee 5	231(Rev.)
First Report WG 5C	181(Rev.2)
Second Report WG 5C	236(Rev.) and related Documents 214 and 197
Third Report WG 5C	237(Rev.)
Fourth Report WG 5C	238(Rev.) and related Document 232(Rev.)
4. Other documents concerning Committee 5	126, 268, 218 and Corr., 251 and 255

ARCHIVES U.I.T. GENÈVE

1. Proposals by Iraq (40-275 Gc/s) (Document No. 230 and Add. No. 1)

The Delegate of Iraq introduced Document No. 230 and Addendum No. 1. He pointed out that, according to its terms of reference, Committee 5 was required, in considering the Table of Frequency Allocations, to take account of the needs of the Radiocommunication and Radio Astronomy Services. He emphasized the importance of setting aside certain frequency bands without actually allocating them with a view to catering for future needs, as yet unforeseen, and to having bands available for allocation to services not yet in existence. He reviewed the bands allocated in Addendum 1 to the Earth-to-Space and Space-to-Earth Services and to the Space-to-Space Services. His delegation proposed that no frequency bands should be allocated beyond 150 Gc/s.

The Delegate of Syria agreed and said that future radio conferences might wish to make allocations different from those envisaged by the current Conference.

The Chairman put the Iraq proposal to the vote. In view of the result (8 votes for and 18 against, with 46 abstentions) and pursuant to the provisions of No. 723.4 of the Convention, the Chairman stated that the matter would be reconsidered at a later meeting of the Committee and that abstentions would not be counted in the vote.

2. Adoption of the following Reports :
First Report of Working Group 5B (Document No. 177(Rev.))
Second Report of Working Group 5B (Document No. 187(Rev.))

First Report of Working Group 5B (Document No. 177(Rev.))

The Chairman of Working Group 5B said that the value "10 Mc/s" should be added after "5 Mc/s" in the second line of paragraph 1.1, page 1 of Document No. 177(Rev.).

The Chairman then invited delegates to consider the document paragraph by paragraph.

1. Radio Astronomy Service

Paragraph 1.1

Adopted, subject to the addition indicated by the Chairman.

Paragraph 1.2

There being no objection, it was decided that the foot-notes in Document No. 22, Corrigendum No. 2 would be inserted in the Radio Regulations to meet the wishes of the Argentine Delegation.

Paragraph 1.3

Sub-paragraphs 1.3.1 and 1.3.2

The Delegate of India referred to the part played by radio astronomy in space research and the need to provide effective protection for that service against interference from satellite emissions. A radio-telescope set up in India was operating in the 322-328.6 Mc/s band and that band should also be available for radio astronomy requirements. For those reasons it would be desirable if the proposals submitted by his Administration could be adopted (cf IND/35/4 and 5).

The Delegate of Syria agreed.

The Delegate of the United Kingdom said that the question raised by India had also been discussed by Working Group 5D and it would be advisable to await the findings of that Group before proceeding any further. The problem went beyond the national scope and could not be studied until the decision adopted by Working Group 5D on the Mobile-Satellite Service was known.

The Indian proposal was put to the vote. There were 5 votes for, 22 against and 47 abstentions.

The Chairman announced that the question would be reconsidered in the light of the Report subsequently submitted to the Committee by Working Group 5D.

The Delegate of India added that, if the proposals were not subsequently adopted by the Committee, he would call for the insertion of a foot-note 310A worded as follows :

"In India, the band 322-328.6 Mc/s is also allocated to the Radio Astronomy Service."

The Chairman of Working Group 5D said that his Group's terms of reference did not include radio astronomy but bore only on the protection of the band 275-328.6 Mc/s as a whole.

On the suggestion of the Delegate of Australia, it was decided that the Secretariat would make the necessary drafting changes to bring the wording of foot-note MOD 310 (see Annex A) into line with the terminology used in the Radio Regulations.

The interventions of the Delegate of India led to an exchange of views among the Delegates of New Zealand, Sweden and Denmark and the Chairman, as a result of which it was decided that the question would be examined by Working Group 5D when it considered the band 240-400 Mc/s as a whole, with a view to making it available to space techniques for the requirements of the Mobile Service.

Paragraph 1.4

Adopted. In view of the foregoing, Annex A was also adopted.

Paragraph 1.5 and Annex B

Adopted.

2. Space research service

The Delegate of Japan pointed out that the figure "six" in the fifth line should be replaced by the figure "seven".

It was decided to amend the text accordingly.

In view of the foregoing, the text of point 2 and Annex C were adopted.

Subject to the questions remaining in abeyance, examination of Document No. 177(Rev.) was completed.

Second Report of Working Group 5B (Document No. 187(Rev.))

The Chairman of Working Group 5B said that foot-note 285A should be included in the Report, since it had been deleted only with respect to Regions 2 and 3 in Annex C.

1. Frequency band 21 850-21 870 kc/s

The Delegate of the U.S.S.R., referring to the reservations mentioned in sub-paragraph 1.2, stated that the frequency band in question was used by the Aeronautical Fixed Service and the Aeronautical Mobile (R) Service too extensively for 20 kc/s or more of that band to be relinquished to radio astronomy. However, following the Chairman's proposal, he supported the insertion of a foot-note to the effect that, having regard to the proposed utilization, the Administrations of the countries concerned (Bulgaria, Czechoslovakia and the U.S.S.R.) would take all practicable measures to protect radio astronomical observations against harmful interference.

The Delegates of Hungary, Roumania, Poland and the Ukraine requested that their countries should also be mentioned in the foot-note.

The Delegate of Italy stated that the question of including a foot-note had already been discussed by the Working Group. In view of the propagation characteristics of the frequency band in question, it was pointless to allocate it exclusively to radio astronomy if some countries used the same band for other services. It would therefore be preferable not to insert the proposed foot-note.

The Observer for I.A.T.A. made the following statement : "The I.A.T.A. recognizes that the Radio Astronomy Service needs an exclusive allocation of frequencies in the band 21 850-21 870 kc/s. In this connection, however, I.A.T.A. points out that the transfer of a band in this part of the spectrum at the expense of the Aeronautical Mobile (R) Service and the Aeronautical Fixed Service will tend to increase the load on the rest of the HF bands allocated to those services when it becomes necessary to meet future needs for long-distance control channels required by aircraft operators as recognized by I.C.A.O."

In the light of that statement it was decided to adopt paragraph 1 and Annex A, subject to the insertion of a foot-note whose text will be communicated in writing.

2. Frequency band : 150.05-153 Mc/s

Paragraph 2 and Annex B were adopted.

3. Frequency band : 173-174 Mc/s

The Delegate of Brazil said that his country's name should be included in the foot-note proposed by Argentina, the text of which was discussed and accepted.

It was so decided.

Paragraph 3 was adopted on the understanding that the foot-note concerning Brazil would refer only to the 170 Mc/s band.

4. Frequency band : 602-608 Mc/s

Paragraph 4 and Annex C were adopted with the insertion of a foot-note concerning Argentina.

5. Frequency band : 608-614 Mc/s in Region 3

6. Frequency band : 608-614 Mc/s world-wide

It was decided to postpone the examination of the above two paragraphs until the Committee had all the necessary information about this part of the spectrum.

Consideration of Document No. 187(Rev.) was suspended.

3. Adoption of the following Reports :

Note from Working Group 5C	(Document No. 231(Rev.2))
First Report of Working Group 5C	(Document No. 181(Rev.2))
Second Report of Working Group 5C	(Document No. 236(Rev.) and related Documents Nos. 214 and 197)
Third Report of Working Group 5C	(Document No. 237(Rev.))
Fourth Report of Working Group 5C	(Document No. 238(Rev.) and related Document No. 232)

Note from Working Group 5C (Document No. 231(Rev.2))

The Committee took note of the document.

First Report of Working Group 5C (Document No. 181(Rev.2))

Paragraphs 1 to 4 of the document were adopted.

Serious differences of opinion exist, however, concerning the proposals for the introduction of space techniques in the bands listed in paragraphs 5 and 6.

Paragraph 5 : frequency band 420-450 Mc/s

By 31 votes to 25, with 9 abstentions, the Committee rejected the proposal for the introduction of space techniques in this band.

After a very long discussion it was decided not to hold a substantive discussion of the proposed foot-note ADD 320A.

Paragraph 6 : Frequency bands 1 215-1 300 kc/s, etc. to 10 000-10 500 kc/s

The Working Group's decision against the use of space techniques by the Amateur Service in these frequency bands was approved by 46 votes to 18, with 7 abstentions.

Consideration of Document No. 181(Rev.2) was completed and the Report adopted.

Second Report of Working Group 5C (Documents No.236(Rev.), No.214 and No.197)

The Chairman of Working Group 5C said that the last sentence of paragraph 1.1 in the French text beginning : "Par ailleurs le Groupe ..... etc." should be deleted.

The Delegate of Cuba, referring to the reservations he had previously made in Document No.231, said that the limitations imposed in foot-note 324C in respect of the band 460-470 Mc/s were unacceptable.

The Delegates of Uganda, Chile, Syria and Pakistan also opposed the insertion of foot-note 324C in Appendix C.

It was, however, decided to maintain the foot-note by 38 votes to 16, with 19 abstentions.

Following the vote, the Delegates of Syria, Cuba, Uganda, Kenya, Tanzania, Malaysia, Chile and Pakistan reserved the right to raise the question again in plenary.

Subject to the corrections indicated and the reservations made during the discussion, the report was adopted on the understanding that certain points could be reopened in plenary.

Note by Working Group 5C and Document submitted by France (Documents Nos. 214 and 197)

The Delegate of France, introducing his proposal, which was supported by the Delegate of Greece, said that the frequency band requested for the earth resources survey by satellite would be exclusively for the operation of geodesy research satellites.

After a brief discussion, it was decided to resume consideration of this band at a later stage.

Third Report of Working Group 5C (Document No. 237(Rev.))

Paragraph 1.1 - Frequency band 1 670-1 690 Mc/s

The Delegate of Cuba, supported by the Delegates of Chile, Peru, Venezuela, Colombia and Argentina asked that the Fixed and Mobile Services should be restored for Region 2.

It was so decided. The allocation will therefore be world-wide.

With this amendment, paragraph 1.1 and Appendix A were adopted.

Paragraph 1.2 - Frequency band 1 690-1 700 Mc/s

The Delegate of Austria requested the insertion of a foot-note 354B, to be communicated in writing, indicating that the band was reserved, on a primary basis, for the Fixed and Mobile Services, except the Aeronautical Mobile Service.

The Delegate of the United States thought that primary status might lead to difficulties of co-ordination.

The Delegate of Austria asked for time to think over the matter, while reserving the right to reopen the question.

With this reservation, paragraph 1.2 and Appendix B were adopted.

Paragraph 1.3 - Frequency band 1 790-2 290 Mc/s

The Delegate of Chile said that he was unable to accept foot-note 356AB for the reasons he had already stated on a number of occasions.

The Delegate of Cuba was also opposed to the insertion of footnote 356AB

The Delegate of the United Arab Republic was opposed to the application of foot-notes 356AB and 356AC to Region 1.

After a discussion, it was decided to postpone the examination of Appendices C and D.

Fourth Report of Working Group 5C (Document No. 238(Rev.))

The Chairman of Working Group 5C, introducing the document, pointed out that, in the French text only, "397A" in the first line of paragraph 2.2 should read "379A", and that "Appendix 3" in the third line should be replaced by "Appendix D".

Paragraph 1.1 - Frequency band 8 025-8 400 Mc/s

Following a discussion concerning a proposed amendment submitted by the Delegate of Australia and supported by the Delegate of New Zealand with regard to Region 3, the Committee voted by 11 votes to 3, with 33 abstentions, in favour of maintaining that part of Appendix A as it appeared in the document.

In view of the number of abstentions, it was decided to postpone a final decision on this question.

The Delegates of Cuba, Venezuela and Chile opposed the allocations proposed in Appendix A in respect of Region 2.

It was suggested that the band should be allocated world-wide on a primary basis to the Fixed and Mobile Communication-Satellite Services and world-wide on a secondary basis to the Earth Exploration-Satellite Service.

Since, however, all the data required for a full discussion were not available, it was decided to postpone consideration of paragraph 1.1 and Appendix A.

Paragraph 1.2 - Frequency band 21.2-22 Gc/s

Consideration of paragraph 1.2 and Appendix B was postponed.

Paragraph 1.3 - Frequency bands 51-52 and 65-66 Gc/s

Paragraph 1.3 and Appendix C were adopted.

Paragraph 2 - Proposals concerning standard frequency and time signals

Consideration of paragraph 2.1 was postponed.

Paragraph 2.2 - Frequency bands 4 200-4 400 and 6 425-7 250 Mc/s

Following a discussion in which the Delegates of the United States, United Kingdom, Cuba and Canada took part, it was decided, by 22 votes to 9, with 3 abstentions, to maintain Appendix D without amendment.

Paragraph 3 - Miscellaneous

At the request of the Delegate of the U.S.S.R, the Chairman proposed that the attention of the plenary meeting should be drawn to the Nos. of the Radio Regulations relating to the amateur service mentioned in this paragraph.

It was so decided.

Proposal for amendment of Article 5 of the Radio Regulations (Document No. 232(Rev.))

The Delegate of the United States introduced the proposal contained in the document, which was supported by the Delegate of the United Kingdom, and made a number of corrections.

The Delegate of India said that the United States proposal had now become an independent proposal and was no longer associated with the Canadian proposal, which had already been approved. In those circumstances, he was opposed to it.

The proposal was rejected by 18 votes to 13, with 3 abstentions.

4. Other documents concerning Committee 5 (Documents Nos. 126, 268, 218 and Corrigendum, 251 and 255).

The Chairman drew the Committee's attention to the documents listed above which would be particularly useful when studying questions relating to the Table of Frequency Allocations and the presentation of that Table.

The meeting rose at 2005 hrs.

The Chairman :

H.A. KIEFFER

Document No. 298-E
7 July 1971
Original : French
English
Spanish

SPACE CONFERENCE

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

PLENARY MEETING

FIRST REPORT OF COMMITTEE 5

(ALLOCATIONS)

Article 1 : Terms and Definitions
Section II - Radio Systems, Services and Stations
Section IIA - Space Systems, Services and Stations

The revised and new Terms and Definitions appearing in the Annex to the present Report were adopted by Committee 5.

H.A. KIEFFER
Chairman

Annex : 1

ARCHIVES
U.I.T.
GENÈVE

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X

Article 1. Terms and Definitions
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 intended for communication with another station(s) using 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(1) 84AA.1 In these Regulations, unless otherwise stated, any radiocommunication service relates to Terrestrial Radiocommunication.

ADD(2) 84AB.1 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 statellites are used, including in some cases satellite to satellite links; these links 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 technical system used so requires also 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 re-transmitted by space stations are intended for direct reception(1) by the general public.

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.

84AP.1(1) In the Broadcasting-Satellite Service, the term "direct reception" shall encompass both individual reception and community reception.

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 84APA 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, including, in certain cases, transmission or re-transmission 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 earth-based 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 84ACA 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 84ACB 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

WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS – GENEVA – 1971

Document No. 299-E
7 July 1971
Original : English

COMMITTEE 5

FIFTH REPORT OF WORKING GROUP 5B

TO COMMITTEE 5 (ALLOCATIONS)

- Space Research Service

. Frequency bands :

13.25-13.4 Gc/s	58.2-59.0 Gc/s
13.4 -14.0 Gc/s	64 -65 Gc/s
14.0 -14.2 Gc/s	65 -66 Gc/s
14.4 -15.0 Gc/s	86 -92 Gc/s
14.4 -15.25 Gc/s	101 -102 Gc/s
15.25-15.35 Gc/s	130 -140 Gc/s .
51 -52 Gc/s	182 -185 Gc/s
52 -54.25 Gc/s	230 -240 Gc/s

- Radio Astronomy Service

Frequency band : 115.16-115.38 Gc/s

- Draft Recommendation No. [ ] relating to the Protection of Radio Astronomy Observations on the Shielded Area of the Moon

- Draft Recommendation No. [ ] relating to the future provision of a band near 10 Mc/s for the Radio Astronomy Service.

1. Space Research Service

With the exception of the bands covered by paragraph 2 below, all revised and new provisions appearing in Annex A to the present Report were unanimously agreed by Working Group 5B.

ARCHIVES U.I.T. GENÈVE

2. Frequency bands : 13.25-13.4 Gc/s
13.4 -14 Gc/s
14 -14.2 Gc/s
14.4 -15.25 Gc/s

2.1 For all of these bands the Group agreed by a large majority to include foot-notes similar to No. MOD 356A but adding "on a secondary basis" as shown in Annex A to the present Report as ADD 405BA and ADD 405BAA.

2.2 For the band 14.4-15.25 Gc/s, the Delegation of France expressed strong reservations with respect to the application of the proposed new provisions for Region 1 and reserved the right to revert to this question later, should it still so desire.

3. Frequency band : 15.25-15.35 Gc/s

The Group unanimously agreed to delete Space Research from the framed part of the Table and to submit the new provision which appears in the Annex A to the present Report for adoption in Committee 5.

4. Frequency bands : 86- 92 Gc/s
130-140 Gc/s
230-240 Gc/s

Although the new allocations to the Space Research Service (Passive only) in most of the proposed bands above 40 Gc/s were unanimously agreed as shown in Annex A to the present Report, the following delegations reserved the right to revert to the subject later should they still so desire :

band 86- 92 Gc/s - United Kingdom
band 130-140 Gc/s - France and the United Kingdom
band 230-240 Gc/s - France

5. Radio Astronomy Service - Frequency band 115.16-115.38 Gc/s

On the basis of a submission by the Delegation of the United States (Document No. 222), Working Group 5B unanimously agreed on the new foot-note which appears in Annex B to the present Report.

6. Draft Recommendation [ ] relating to the Protection of Radio Astronomy Observations on the Shielded Area of the Moon

6.1 Proposal USA/28/264, together with related Corrigendum No. 3 to Document No. 28, was supported and examined. The Delegation of the United States subscribed to the suggestion that a Recommendation was more appropriate than a Resolution as suggested in the Proposal and welcomed the setting up of a small Working Group under the chairmanship of Mr. K.J. Kerling of the Netherlands, to study the text in detail.

6.2 The draft Recommendation contained in the Report of Sub-Working Group 5B-1 (Document No. 233) after slight editorial amendment was unanimously agreed as reproduced in Annex C to the present Report.

6.3 Working Group 5B warmly thanked Mr. Kerling for the expeditious manner in which he had brought the work of Sub-Working Group 5B-1 to a successful conclusion.

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

7.1 Proposal CAN/205/170 was supported by the United States of America and examined. Some delegations explained the heavy use of the band 10-15 Mc/s and that they were unable to accept the draft Recommendation.

7.2 Working Group 5B agreed by a large majority to recommend the draft Recommendation reproduced in Annex D to the present Report for adoption by Committee 5.

7.3 The Delegation of the U.S.S.R. reserved the right to revert to this question later should it still so desire.

B. DESTA
Chairman

Annexes : 4

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

A N N E X A

ADD 405BA The band 13.25-14.2 Gc/s 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 or planned] in accordance with the Table, which may be affected.

ADD 405BAA The band 14.4-15.25 Gc/s 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 or planned] in accordance with the Table, which may be affected.

Gc/s

	Region 1	Region 2	Region 3
MOD	15.25-15.35	FIXED MOBILE	

SUP 409A

SUP 409B

Gc/s

Region 1	Region 2	Region 3
51-52		
	/METEOROLOGICAL-SATELLITE/ SPACE RESEARCH	
52-54.25		
	SPACE RESEARCH (Passive only)	

58.2-59
SPACE RESEARCH (Passive only)

64-65
SPACE RESEARCH (Passive only)
65-66
/METEOROLOGICAL-SATELLITE/ SPACE RESEARCH /EARTH SCIENCES-SATELLITE/

86-92
RADIO ASTRONOMY SPACE RESEARCH (Passive only) /412I/

ADD /412I/ All transmissions in this band are prohibited. The use of passive sensors by other radio services is also authorized.

Gc/s

Region 1	Region 2	Region 3
101-102	SPACE RESEARCH (Passive only) [412I]	
130-140	RADIO ASTRONOMY SPACE RESEARCH (Passive only) [412I]	
182-185	SPACE RESEARCH (Passive only) [412I]	
230-240	RADIO ASTRONOMY SPACE RESEARCH (Passive only) [412I]	

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX B

/xxx/ 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.

/ Note to Committee 7 : Foot-note to Table for world-wide application. /

PAGE INTENTIONALLY LEFT BLANK

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

ANNEX C

DRAFT RECOMMENDATION

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 moon 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 potentially 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.

ANNEX D

DRAFT RECOMMENDATION No. [J]

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 Mc/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, as a result of the growth in the use of cables and of communication satellites for long distance communication, a reduction in the use, for this purpose, of frequencies just above 10 Mc/s may be anticipated.

f) 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

Document No. 300-E
10 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
7 + Corr.1,2	Sweden	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
22+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

ARCHIVES U.I.T. GENÈVE

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. 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

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	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

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)	PL
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 (1 535-1 660 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	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

No.	Origin	Title	Destination
109(Rev.)	Secretariat	Assignment of proposals	PL
110	Chile	Proposed amendment concerning the aeronautical mobile service	PL
111 + 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
116	Secretariat	Committee structure	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	Com. 5
121	Brazil	Draft Recommendation H	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	Marconi International 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	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

No.	Origin	Title	Destination
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 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 broadcasting 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 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
163	WG 4B	Article 7 Proposed partial text of Section VIII	WG 4B
164	U.S.A. & Canada	Prop., RR Art. 5	Com. 5

No.	Origin	Title	Destination
165(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

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	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

No.	Origin	Title	Destination
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
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.	Origin	Title	Destination
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 by ionospheric research satellites	Com. 4
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

No.	Origin	Title	Destination
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	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	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
274	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 flux-density 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 calculating 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