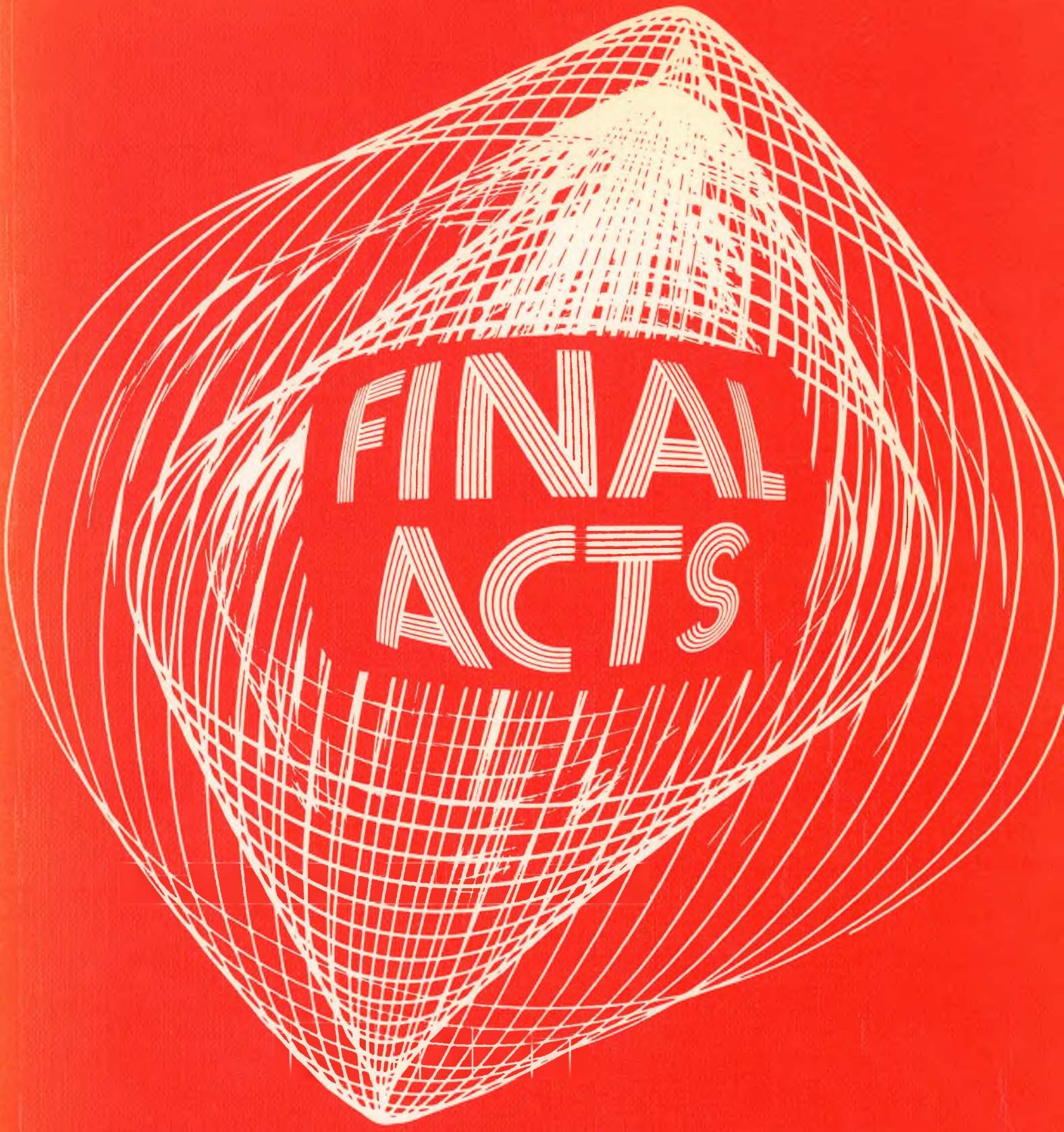
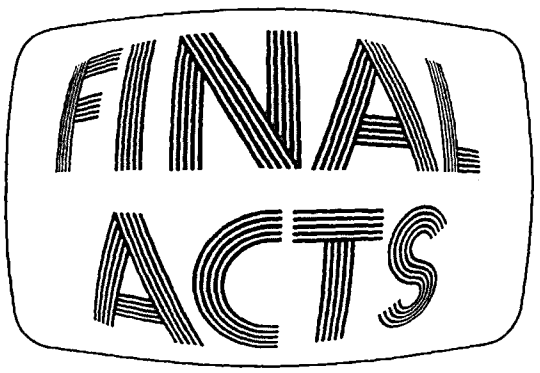


WORLD BROADCASTING-SATELLITE ADMINISTRATIVE RADIO CONFERENCE, GENEVA, 1977

PUBLISHED BY THE INTERNATIONAL TELECOMMUNICATION UNION, GENEVA



OF THE WORLD ADMINISTRATIVE RADIO CONFERENCE FOR THE PLANNING OF THE BROADCASTING-SATELLITE SERVICE IN FREQUENCY BANDS 11.7-12.2 GHz (IN REGIONS 2 AND 3) AND 11.7-12.5 GHz (IN REGION 1)

GENEVA, 1977

PUBLISHED BY THE INTERNATIONAL TELECOMMUNICATION UNION, GENEVA

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FINAL ACTS

of the World Administrative Radio Conference for the Planning of the Broadcasting-Satellite Service in Frequency Bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1), Geneva, 1977

(Figures between parentheses indicate the order in which the statements appear in the Final Protocol)

RESOLUTIONS

RECOMMENDATIONS

FINAL ACTS OF THE WORLD ADMINISTRATIVE RADIO CONFERENCE FOR THE PLANNING OF THE BROADCASTING-SATELLITE SERVICE IN FREQUENCY BANDS 11.7-12.2 GHz (IN REGIONS 2 AND 3) AND 11.7-12.5 GHz (IN REGION 1), GENEVA, 1977

Preamble

1. The World Administrative Radio Conference for the planning of the broadcasting-satellite service in frequency bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1) having been convened at Geneva on 10 January 1977, under Article 54 of the International Telecommunication Convention and in accordance with Resolution No. 27 of the Plenipotentiary Conference, Malaga-Torremolinos, 1973, and Resolution No. Spa2 – 2 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, has been charged:

- to establish the sharing criteria for the bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1) between the broadcasting-satellite service and the other services to which these bands are allocated;
- to plan for the broadcasting-satellite service in the above-mentioned bands;
- to establish procedures to govern the use of these bands by the broadcasting-satellite service and by the other services to which these bands are allocated;
- to consider the results of the work of the Group of Experts on the possible re-arrangement of the Radio Regulations and the Additional Radio Regulations.

2. The delegates of the following Members of the International Telecommunication Union,

Republic of Afghanistan, Algerian Democratic and Popular Republic, Federal Republic of Germany, Kingdom of Saudi Arabia, Argentine Republic, Australia, Austria, State of Bahrain, People's Republic of Bangladesh, Belgium, People's Republic of Benin, Byelorussian Soviet Socialist Republic, Republic of Bolivia, Federative Republic of Brazil, People's Republic of Bulgaria, Republic of Burundi, Canada, Central African Empire, Chile, People's Republic of China, Republic of Cyprus, Vatican City State, Republic of Colombia, State of the Comoros, People's Republic of the Congo, Republic of Korea, Republic of the Ivory Coast, Cuba, Denmark, Arab Republic of Egypt, United Arab Emirates, Ecuador, Spain, United States of America, Ethiopia, Finland, France, Gabon Republic, Ghana, Greece, Republic of Guatemala, Republic of Guinea, Republic of Haiti, Republic of Upper Volta, Hungarian People's Republic, Republic of India, Republic of Indonesia, Iran, Ireland, Iceland, Italy, Japan, Republic of Kenya, State of Kuwait, Lao People's Democratic Republic, Lebanon, Libyan Arab Republic, Principality of Liechtenstein, Luxembourg, Democratic Republic of Madagascar, Malaysia, Republic of Mali, Republic of Malta, Kingdom of Morocco, Mauritius, Islamic Republic of Mauritania, Mexico, Monaco, Mongolian People's Republic, Federal Republic of Nigeria, Norway, New Zealand, Sultanate of Oman, Republic of Uganda, Islamic Republic of Pakistan, Republic of Panama, Papua New Guinea, Republic of Paraguay, Kingdom of the Netherlands, Republic of the Philippines, People's Republic of Poland, Portugal, German Democratic Republic, Democratic People's Republic of Korea, Ukrainian Soviet Socialist Republic, Socialist Republic of Roumania, United Kingdom of Great Britain and Northern Ireland, Republic of Senegal, Republic of Singapore, Democratic Republic of the Sudan, Sweden, Confederation of Switzerland,

United Republic of Tanzania, Republic of the Chad, Czechoslovak Socialist Republic, Thailand, Togolese Republic, Tunisia, Turkey, Union of Soviet Socialist Republics, Oriental Republic of Uruguay, Republic of Venezuela, Yemen Arab Republic, People's Democratic Republic of Yemen, Socialist Federal Republic of Yugoslavia, Republic of Zaire,

- bearing in mind the importance of making the best possible use of the radio-frequency spectrum and the geostationary-satellite orbit as well as the need for an orderly development of the services to which these bands are allocated;
- taking into account the equal rights of all countries, large and small, even those countries which are not represented at the Conference;

have adopted, subject to the approval of the competent authorities of their respective countries, the following provisions and associated Plan (Part I) and the decisions relating to the re-arrangement of the Radio Regulations and the Additional Radio Regulations (Part II):

IN WITNESS WHEREOF, the delegates of the Members of the Union mentioned above have, on behalf of their respective competent authorities, signed these Final Acts in a single copy in the Chinese, English, French, Russian and Spanish languages, in which, in case of dispute, the French text shall prevail. This copy shall remain deposited in the archives of the Union. The Secretary-General shall forward one certified true copy to each Member of the International Telecommunication Union.

Done at Geneva, 13 February 1977

For the Republic of Afghanistan:

K. D. KAMRAN

For Algeria (Algerian Democratic and Popular Republic):

N. BOUHIRED
R. BOUNAB

For the Federal Republic of Germany:

VENHAUS
BINZ
KRATH

For the Kingdom of Saudi Arabia:

ABDULMOHSEN M. SWAILEM
ABDULRAHMAN A. DAGHISTANI
ALI MOHAMED ALBABTAIN
SALEH MOHAMMED AL-SALEEM
M. I. AL-MULHEM

For the Argentine Republic:

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For Australia:

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J. M. DIXON

For Austria:

Dr. ALFRED BÖNISCH

For the State of Bahrain:

MOHAMED REDHA AMIN

For the People's Republic of Bangladesh:

A. M. M. A'ABAD
SHAMS-UD-DOWLA KHAN

For Belgium:

GEWILLIG M.

For the People's Republic of Benin:

BOCCO COFFI NORBERT
AMOUSSOU COMLANVI EVARISTE

For the Byelorussian Soviet Socialist Republic:

V. OULASSIK

For the Republic of Bolivia:

RENE G. OSSORIO B.

For the Federative Republic of Brazil:

Dr. JOÃO CARLOS FAGUNDES ALBERNAZ

For the People's Republic of Bulgaria:

IGNATOV IVAN

For the Republic of Burundi:

NIYOKINDI FIACRE
HUMUZA BERNARD

For Canada:

GABRIEL I. WARREN
G. C. BROOKS

For the Central African Empire:

TOKPAN GILBERT
NIAKPAKO GABRIEL
OUOKO-DELOMBAUT

For Chile:

GONZALO RAMIREZ ZEPEDA

For the People's Republic of China:

LU KE-CHIN
HSU CHUNG-MING

For the Republic of Cyprus:

ROGER MICHAELIDES
MICHAELIDES ANDREAS
ASTREOS PAUL T.

For the Vatican City State:

MAFFEO SABINO
GIUDICI PIER VINCENZO

For the Republic of Colombia:

JAIME AGUILERA
HUMBERTO CHAVES NAVIA
ANTONIO DUARTE
QUIJANO-CABALLERO JOAQUÍN

For the State of the Comoros:

SALIM HAMDAN

For the People's Republic of the Congo:

POUEBA
TATY KOUKA
BATHEAS MOLLOMB

For the Republic of Korea:

CHUNG SUP SHIN

For the Republic of the Ivory Coast:

NOGBOU CHRISTOPHE
KONE OUMAR MAURI
ADJE KADJO I.
YAPO JEAN
BROU YAPO SAMSON
DIABATÉ SÉKOU

For Cuba:

CARLOS MARTÍNEZ ALBUERNE
VICTOR FERNÁNDEZ RODRÍGUEZ
HUGO FERNÁNDEZ MAC BEATH

For Denmark:

IB LØNBERG
P. V. LARSEN
J. A. HEEGAARD
ORLA HANSEN

For the Arab Republic of Egypt:

AHMED HOSNI ANTAR
MOKHTAR TAHA BADR

For the United Arab Emirates:

HALIM J. FANOUS

For Ecuador:

CESAR A. LARA
RODRIGO VALDEZ

For Spain:

VALENTIN QUINTAS
LORENZO CHAMORRO
LUIS GARCIA-CEREZO

For the United States of America:

ROBERT E. LEE
GORDON L. HUFFCUTT
NEAL K. Mc NAUGHTEN

For Ethiopia:

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DIALLO
TOURÉ SIDIKI

For the Republic of Haiti:

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For the Republic of Upper Volta:

SONGRÉ PIERRE CLAVER

For the Hungarian People's Republic:

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Dr. HORVÁTH LAJOS

For the Republic of India:

T. V. SRIRANGAN
S. N. MITRA
V. A. D. RAYALU
Dr. B. S. RAO
S. KRISHNAMURTHY
B. S. NARGAS
K. S. MOHANAVELU

For the Republic of Indonesia:

TH. A. PRATOMO
BRATAHALIM SULAIMAN
SRI SLAMETO
PERANGIN ANGIN REMEDI

For Iran:

SIAMAK NADIMI

For Ireland:

M. GRANT

For Iceland:

G. ARNAR

For Italy:

A. PETTI

For Japan:

HIROSHI KADOTA
MASAKI SEO
SHIRO UESHIMA

For the Republic of Kenya:

C. AMIRA
PETERSON JOHN KINYVA
JAMES PETER KIMANI

For the State of Kuwait:

JAWAD A. AL-MAZEEDI
IBRAHIM ASKAR SAUD

For the Lao People's Democratic Republic:

THAO BO
THONGPHET LUANGPHENGSOUK

For Lebanon:

GHAZAL MAURICE
ASHRAF SINNO

For the Libyan Arab Republic:

MOHAMED SALEH ALSABEY

For the Principality of Liechtenstein:

Comte MARIO VON LEDEBUR

For Luxembourg:

REICHLING CHARLES
RETTEL JEAN

For the Democratic Republic of Madagascar:

RAKOTOARIVELO BENJAMIN
RATIARISON

For Malaysia:

NG EK POH

For the Republic of Mali:

OUMAR SIDIBE

For the Republic of Malta:

EVARIST SALIBA

For the Kingdom of Morocco:

WAKRIM MOHAMED

For Mauritius:

RAMBERT J. M. H. NOËL
St. LAMBERT J. L. HERBERT

For the Islamic Republic of Mauritania:

LÔ MEDOUNE
MANGASSOUBA ALIOU

For Mexico:

JOSÉ J. HERNÁNDEZ G.
LUIS VALENCIA P.

For Monaco:

SOLAMITO CESAR CHARLES
AUVRAY GUSTAVE GABRIEL

For the Mongolian People's Republic:

DUGERSURENGIIN ERDEMBILEG

For the Federal Republic of Nigeria:

INOMA RAPHAEL EJOH NATHAN
NWANKPELE ALPHONSUS IKEM
AKINWUMI JOSHUA AYODELE

For Norway:

P. MORTENSEN
L. GRIMSTVEIT
ARNE BØE
KNUT N. STOKKE
T. ØVENSEN

For New Zealand:

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M. S. AKED
JOHN PATERSON CARTER
T. R. CUDBY

For the Sultanate of Oman:

HAMED YAHYA AL-KINDY

For the Republic of Uganda:

P. A. S. MUKASA

For the Islamic Republic of Pakistan:

KHALID SALEEM
MOHAMMAD ZUBAIR
EHSANUL HAQ
MOHAMMAD YAHIA

For the Republic of Panama:

A. P. VILLAMONTE RAMOS

For Papua New Guinea:

GEORGE HUGH RAILTON

For the Republic of Paraguay:

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For the Republic of the Philippines:

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ESPEJO C. V.

For the People's Republic of Poland:

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For Portugal:

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MARIA TERESA RODRIGUES BANDEIRA
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For the German Democratic Republic:

CZERWINSKI

For the Democratic People's Republic of Korea:

KIM RYE HYON

For the Ukrainian Soviet Socialist Republic:

SAVANTCHOOK

For the Socialist Republic of Roumania:

AIRINEI GHEORGHE

For the United Kingdom of Great Britain and Northern Ireland:

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STEPHEN TEMPLE

For the Republic of the Senegal:

ALIOUNE MBODJI DIONE
MALICK MBAYE

For the Republic of Singapore:

R. G. RAJASINGAM
SEBESTIAN C. H. TAN

For the Democratic Republic of the Sudan:

ABDELWAHAB GAMAL

For Sweden:

CARL-GÖSTA ÅSDAL
GUNNAR MALMGREN

For the Confederation of Switzerland:

C. STEFFEN
E. SCHWARZ
K. BERNATH

For the United Republic of Tanzania:

STEPHEN ODUNGA

For the Republic of the Chad:

HAMID KANTE

For the Czechoslovak Socialist Republic:

JÍRA JIŘÍ

For Thailand:

SUCHART P. SAKORN
KRAISORN PORNSUTEE

For the Togolese Republic:

ASSIONGBOR AMOUZOUGAH

For Tunisia:

SLAHEDDINE BENHAMIDA
SALAH HADIJI

For Turkey:

DOGAN ERDEN
YALÇIN ERTEM
NURGÜN AKYÜZALP
H. HAŞMET ESEN
H. ŞAKIR KÖKER
KEMAL ERGINER

For the Union of Soviet Socialist Republics:

BADALOV A. L.

For the Oriental Republic of Uruguay:

JUAN JOSÉ REAL

For the Republic of Venezuela:

CARLOS J. MARTINEZ G.
LEOPOLDO COOK

For the Yemen Arab Republic:

HUSSAIN AHMED MOGBEL

For the People's Democratic Republic of Yemen:

MOHAMED ALI AZZANI
MOHAMED YAQUOB

For the Socialist Federal Republic of Yugoslavia:

DULOVIĆ LJUBOMIR

For the Republic of Zaire:

MWAMBA KASONGO
YEMBI NSAMPALA

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PART I

Provisions and associated Plan

ARTICLE 1

General Definitions

For the purposes of these Final Acts the following terms shall have the meanings defined below:

Union:	The International Telecommunication Union;
Secretary-General:	The Secretary-General of the Union;
WARC:	World Administrative Radio Conference;
Conference:	World Administrative Radio Conference for the planning of the broadcasting-satellite service in frequency bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1), called in short World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977;
IFRB (Board):	The International Frequency Registration Board;
CCIR:	The International Radio Consultative Committee;
Convention:	The International Telecommunication Convention (Malaga-Torremolinos, 1973);
Radio Regulations:	The Radio Regulations (1976 edition) annexed to the Convention;
Regions 1, 2 and 3:	The geographical areas defined in Nos. 126 to 132 of the Radio Regulations;
Master Register:	The Master International Frequency Register;
IFRB weekly circular:	The publication referred to in No. 497 of the Radio Regulations;
Plan:	The Plan for Regions 1 and 3 and its annexes;
Administration:	Any governmental department or service responsible for discharging the obligations undertaken in the Convention and the Radio Regulations.
Frequency assignment in accordance with the Plan:	Any frequency assignment which appears in the Plan or for which the procedure of Article 4 of the Final Acts has been successfully applied.

ARTICLE 2

Frequency Bands

2.1 The provisions of these Final Acts apply to the broadcasting-satellite service in the frequency bands between 11.7 and 12.5 GHz in Region 1 and between 11.7 and 12.2 GHz in Regions 2 and 3 and to the other services to which these bands are allocated, so far as their relationship to the broadcasting-satellite service in these bands is concerned.

ARTICLE 3

Execution of the Final Acts

3.1 The Members of the Union in Regions 1 and 3 shall adopt, for their broadcasting-satellite space stations operating in the frequency bands referred to in the Final Acts, the characteristics specified in the Plan for those Regions.

3.2 The Members of the Union in Region 2 shall apply the interim provisions contained in Article 12 of the Final Acts. These provisions will govern the broadcasting-satellite service in Region 2 until detailed plans for Region 2, drawn up by a future regional administrative radio conference, have entered into force.

3.3 The Members of the Union shall not change the characteristics specified in the Plan, or establish new broadcasting-satellite space stations or stations in the other services to which these frequency bands are allocated, except as provided for in the Radio Regulations and the appropriate Articles and Annexes of these Final Acts.

ARTICLE 4

Procedure for Modifications to the Plan

4.1 When an administration intends to make a modification[1] to the Plan, i.e. either

- to modify the characteristics of any of its frequency assignments to a space station[2] in the broadcasting-satellite service which are shown in the Plan, or for which the procedure in this Article has been successfully applied, whether or not the station has been brought into use, or
- to include in the Plan a new frequency assignment to a space station in the broadcasting-satellite service, or
- to cancel a frequency assignment to a space station in the broadcasting-satellite service,

the following procedure shall be applied before any notification of the frequency assignment is made to the International Frequency Registration Board (see Article 5 of these Final Acts).

4.2 The term "frequency assignment in accordance with the Plan" used in this and the following articles is defined in Article 1.

---

[1] The intention not to employ energy dispersal consistent with section 3.18 of Annex 8 shall be treated as a modification and thus subject to the appropriate provisions of this Article.

[2] The expression "frequency assignment to a space station", wherever it appears in this Article, shall be understood to refer to a frequency assignment associated with a given orbital position. See Annex 10 for the orbital position limitations.

4.3 *Proposed modifications to a frequency assignment in accordance with the Plan or the inclusion in the Plan of a new frequency assignment*

4.3.1 An administration proposing a modification to the characteristics of a frequency assignment in accordance with the Plan or the inclusion of a new frequency assignment in the Plan shall seek the agreement of those administrations:

4.3.1.1 having a frequency assignment to a space station in the broadcasting-satellite service in the same channel or an adjacent channel, which is in accordance with the Plan or in respect of which modifications to the Plan have been published by the Board in accordance with the provision of this Article; or

4.3.1.2 having a frequency assignment to a space station in the broadcasting-satellite service in Region 2 with the necessary bandwidth, any portion of which falls within the necessary bandwidth of the proposed assignment and which is recorded in the Master Register; or

- which has been coordinated or is being coordinated under the provisions of Resolution No. Spa2 – 3; or
- which appears in a Region 2 plan [1] to be adopted at a future regional administrative radio conference, taking account of modifications which may be introduced subsequently in accordance with the Final Acts of that Conference; or

4.3.1.3 having no frequency assignment in the broadcasting-satellite service in the channel concerned but in whose territory the power flux density value exceeds the prescribed limit as a result of the proposed modification; or

4.3.1.4 having a frequency assignment in the band 11.7-12.2 GHz to a space station in the fixed-satellite service which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. 639AJ of the Radio Regulations; or those of paragraph 7.2.1 of these Final Acts;

which are considered to be affected.

A frequency assignment is considered to be affected when the limits shown in Annex 1 are exceeded.

4.3.2 An administration intending to modify characteristics in the Plan shall send to the Board, not earlier than five years but not later than eighteen months before the date on which the assignment is to be brought into use, the relevant information listed in Annex 2. If the assignment is not brought into use by that date, the modification shall lapse.

4.3.2.1 Where as a result of the intended modification the limits defined in Annex 1 are not exceeded, this fact shall be indicated when submitting to the Board the information required by 4.3.2. The Board shall then publish this information in a special section of its weekly circular.

4.3.2.2 In all other cases the administration shall notify the Board of the names of the administrations whose agreement it considers should be sought in order to arrive at the agreement referred to in 4.3.1 as well as of those with which agreement has already been reached.

4.3.3 The Board shall determine on the basis of Annex 1 the administrations whose frequency assignments are considered to be affected within the meaning of 4.3.1. The Board shall include the names of those administrations with the information received under 4.3.2.2 and shall publish the complete information in a special section of its weekly circular. The Board shall immediately send the results of its calculations to the administration proposing the modification to the Plan.

4.3.4 The Board shall send a telegram to the administrations listed in the special section of the weekly circular drawing their attention to the information it contains and shall send them the results of its calculations.

---

[1] The Region 2 plan adopted at a future regional administrative radio conference shall not degrade the protection afforded to the frequency assignments in the Plan below the limits specified in these Final Acts.

4.3.5 An administration which feels that it should have been included in the list of administrations whose services are considered to be affected may, giving the technical reasons for so doing, request the Board to include its name. The Board shall study this request on the basis of Annex 1 and shall send a copy of the request with an appropriate recommendation to the administration proposing the modification to the Plan.

4.3.6 Any modification to a frequency assignment which is in accordance with the Plan or any inclusion in the Plan of a new frequency assignment which would have the effect of exceeding the limits specified in Annex 1 shall be subject to the agreement of all affected administrations.

4.3.7 The administration seeking agreement or the administration with which agreement is sought may request any additional technical information it considers necessary. The administrations shall inform the Board of such requests.

4.3.8 Comments from administrations on the information published pursuant to 4.3.3 should be sent either directly to the administration proposing the modification or through the Board. In any event the Board shall be informed that comments have been made.

4.3.9 An administration which has not notified its comments either to the administration seeking agreement or to the Board within a period of one hundred and twenty days following the date of the weekly circular referred to in 4.3.2.1 or 4.3.3 shall be understood to have agreed to the proposed modification. This time limit may be extended by eighty days for an administration which has requested additional information under 4.3.7 or for an administration which has requested the assistance of the Board under 4.3.17. In the latter case the Board shall inform the administrations concerned of this request.

4.3.10 If, in seeking agreement, an administration modifies its initial proposal, it shall again apply the provisions of 4.3.2 and the consequent procedure with respect to any other administration whose services might be affected as a result of modifications to the initial proposal.

4.3.11 If no comments have been received on the expiry of the periods specified in 4.3.9, or if agreement has been reached with the administrations which have made comments and with which agreement is necessary, the administration proposing the modification may continue with the appropriate procedure in Article 5 and shall inform the Board, indicating the final characteristics of the frequency assignment together with the names of the administrations with which agreement has been reached.

4.3.12 The agreement of the administrations affected may also be obtained in accordance with this Article, for a specified period.

4.3.13 When the proposed modification to the Plan involves developing countries, administrations shall seek all practicable solutions conducive to the economical development of the broadcasting-satellite systems of these countries.

4.3.14 The Board shall publish in a special section of its weekly circular the information received under 4.3.11 together with the names of any administrations with which the provisions of this Article have been successfully applied. The frequency assignment concerned shall enjoy the same status as those appearing in the Plan and will be considered as a frequency assignment in accordance with the Plan.

4.3.15 When an administration proposing to modify the characteristics of a frequency assignment or to make a new frequency assignment receives notice of disagreement from an administration whose agreement it has sought, it should first endeavour to solve the problem by exploring all possible means of meeting its requirement. If the problem still cannot be solved by such means, the administration whose agreement has been sought should endeavour to overcome the difficulties as far as possible, and shall state the technical reasons for any disagreement if the administration seeking the agreement requests it to do so.

4.3.16 If no agreement is reached between the administrations concerned, the Board shall carry out any study that may be requested by these administrations; the Board shall inform them of the result of the study and shall make such recommendations as it may be able to offer for the solution of the problem.

4.3.17 An administration may at any stage in the procedure described, or before applying it, request the assistance of the Board, particularly in seeking the agreement of another administration.

4.3.18 The relevant provisions of Article 5 of these Final Acts shall be applied when frequency assignments are notified to the Board.

4.4 *Cancellation of frequency assignments*

When a frequency assignment in accordance with the Plan is released, whether or not as a result of a modification, the administration concerned shall immediately so inform the Board. The Board shall publish this information in a special section of its weekly circular.

4.5 *Master copy of the Plan*

4.5.1 The Board shall maintain an up-to-date master copy of the Plan taking account of the application of the procedure specified in this Article. The Board shall prepare a document listing the amendments to be made to the Plan as a result of modifications made in accordance with the procedure in this Article.

4.5.2 The Secretary-General shall be informed by the Board of modifications made to the Plan and shall publish an up-to-date version of the Plan in an appropriate form when justified by the circumstances.

ARTICLE 5

Notification, Examination and Recording in the Master Register of Frequency Assignments to Space Stations in the Broadcasting-Satellite Service in Regions 1 and 3

5.1 *Notification*

5.1.1 Whenever an administration intends to bring into use a frequency assignment to a space station in the broadcasting-satellite service, it shall notify this frequency assignment to the Board. For this purpose, the notifying administration shall apply the following provisions.

5.1.2 For any notification under 5.1.1, an individual notice for each frequency assignment shall be drawn up as prescribed in Annex 2, the various sections of which specify the basic characteristics to be provided as appropriate. It is recommended that the notifying administration should also supply any other data it may consider useful.

5.1.3 Each notice must reach the Board not earlier than three years before the date on which the frequency assignment is to be brought into use. In any case, the notice must reach the Board not later than ninety days before that date[1].

5.1.4 Any frequency assignment, the notice of which reaches the Board after the applicable period specified in 5.1.3 shall, where it is to be recorded, bear a remark in the Master Register to indicate that it is not in conformity with 5.1.3.

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[1] Where appropriate, the notifying administration shall initiate the procedure for modifying the Plan in sufficient time to ensure that this limit is observed.

5.1.5 Any notice made under 5.1.1 which does not contain the characteristics specified in Annex 2 shall be returned by the Board immediately by airmail to the notifying administration with the relevant reasons.

5.1.6 Upon receipt of a complete notice, the Board shall include its particulars, with the date of receipt, in its weekly circular which shall contain the particulars of all such notices received since the publication of the previous circular.

5.1.7 The circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.

5.1.8 Complete notices shall be considered by the Board in order of receipt. The Board shall not postpone its finding unless it lacks sufficient data to reach a decision; moreover, the Board shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Board, until it has reached a finding with respect to such earlier notice.

5.2 *Examination and recording*

5.2.1 The Board shall examine each notice:

a) with respect to its conformity with the Convention and the relevant provisions of the Radio Regulations and Annex 1 of these Final Acts (with the exception of those relating to conformity with the Plan);

b) with respect to its conformity with the Plan.

5.2.2 Where the Board reaches a favourable finding with respect to 5.2.1, the frequency assignment of an administration shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d. In relations between administrations all frequency assignments brought into use in conformity with the Plan and recorded in the Master Register shall be considered to have the same status irrespective of the dates entered in Column 2d for such frequency assignments.

5.2.3 Whenever a frequency assignment is recorded in the Master Register, the finding reached by the Board shall be indicated by a symbol in Column 13a.

5.2.4 Where the Board reaches an unfavourable finding with respect to 5.2.1, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to a satisfactory solution of the problem.

5.2.5 Where the notifying administration resubmits the notice and the finding of the Board becomes favourable with respect to 5.2.1, the notice shall be treated as in 5.2.2.

5.2.6 If the notifying administration resubmits the notice without modification and insists on its reconsideration, and if the Board's finding with respect to 5.2.1 remains unfavourable, the notice is returned to the notifying administration in accordance with 5.2.4. In this case, the notifying administration undertakes not to bring into use the frequency assignment until the condition specified in 5.2.5 is fulfilled. The agreement of the administrations affected can also be obtained in accordance with Article 4 for a specified period. In that event the Board shall be notified of the agreement and the frequency assignment shall be recorded in the Master Register with a note indicating that the frequency assignment is valid only for the period specified. The notifying administration using the frequency assignment over a specified period shall not subsequently invoke this fact to justify the continued use of the frequency beyond the period specified unless it obtains the agreement of the administration(s) concerned.

5.2.7 If a frequency assignment notified in advance of bringing into use has received in conformity with 5.1.3 a favourable finding by the Board with respect to the provisions of paragraph 5.2.1, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

5.2.8 When the Board has received confirmation that the frequency assignment has been brought into use, the Board shall remove the symbol in the Master Register.

5.2.9 The date in Column 2c shall be the date of bringing into use notified by the administration concerned. It is given for information only.

5.3 *Cancellation of entries in the Master Register*

5.3.1 If an administration has not confirmed the bringing into use of a frequency assignment under 5.2.8, the Board will make inquiries of the administration not earlier than six months after the expiry of the period specified in 5.1.3. On receipt of the relevant information, the Board will either modify the date of coming into use or cancel the entry.

5.3.2 If the use of any recorded frequency assignment is permanently discontinued, the notifying administration shall so inform the Board within ninety days, whereupon the entry shall be removed from the Master Register.

ARTICLE 6

Coordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments to Terrestrial Stations affecting Broadcasting-Satellite Frequency Assignments in the Bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1) [1, 2]

Section I. Coordination procedure to be applied

6.1.1 Before an administration notifies to the Board a frequency assignment to a terrestrial transmitting station, it shall initiate coordination with any other administration having a frequency assignment to a broadcasting-satellite station in conformity with the Plan if

- the necessary bandwidths of the two transmissions overlap; and
- the power flux density which would be produced by the proposed terrestrial transmitting station exceeds the value derived in accordance with Annex 3 at one or more points on the edge of the service area which is within the coverage area of the broadcasting-satellite station of that administration.

6.1.2 For the purpose of effecting coordination, the administration responsible for the terrestrial station shall send to the administrations concerned, by the fastest possible means, a copy of a diagram drawn to an appropriate scale indicating the location of the terrestrial station and all other data of the proposed frequency assignment and the approximate date on which it is planned to bring the station into use.

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[1] These procedures do not involve any dispensation from the procedures prescribed for terrestrial stations in Article 9 of the Radio Regulations where stations other than those of the broadcasting-satellite service are involved.

[2] The procedures for coordination, notification and recording of assignments to terrestrial stations affecting broadcasting-satellite stations in Region 2 are contained in Article 9 of the Radio Regulations, except that the need for the coordination referred to in No. 492A of the Radio Regulations shall be determined on the basis of Annex 3.

6.1.3 An administration with which coordination is sought shall acknowledge receipt of the coordination data immediately by telegram. If no acknowledgement is received within fifteen days of dispatch, the administration seeking coordination may dispatch a telegram requesting acknowledgement of receipt of the coordination data, to which the receiving administration shall reply. Upon receipt of the coordination data an administration with which coordination is sought shall promptly examine the matter with regard to interference [1] which would be caused to its frequency assignments in conformity with the Plan and shall, within an overall period of sixty days from dispatch of the coordination data, either notify the administration requesting coordination of its agreement to the proposals or, if this is not possible, indicate the reasons therefor and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

6.1.4 No coordination is required when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the level of interference to the service to be rendered by the broadcasting-satellite stations of other administrations, in conformity with the Plan.

6.1.5 An administration seeking coordination may request the Board to endeavour to effect coordination where:

a) an administration with which coordination is sought fails to acknowledge receipt under paragraph 6.1.3 within thirty days of dispatch of the coordination data;

b) an administration which has acknowledged receipt under paragraph 6.1.3 fails to give a decision within ninety days of dispatch of the coordination data;

c) the administration seeking coordination and an administration with which coordination is sought disagree on the acceptable level of interference; or

d) coordination between administrations is not possible for any other reason.

In so doing, it shall furnish the Board with the necessary information to enable it to endeavour to effect such coordination.

6.1.6 Either the administration seeking coordination or an administration with which coordination is sought, or the Board, may request any additional information which they may require to assess the level of interference to the services concerned.

6.1.7 Where the Board receives a request under paragraph 6.1.5 *a)*, it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.

6.1.8 Where the Board receives an acknowledgement following its action under paragraph 6.1.7 or where the Board receives a request under paragraph 6.1.5 *b)*, it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.

6.1.9 Where the Board receives a request under paragraph 6.1.5 *d)*, it shall endeavour to effect coordination in accordance with the provisions of paragraph 6.1.2. Where the Board receives no acknowledgement of its request for coordination within the period specified in paragraph 6.1.3, it shall act in accordance with paragraph 6.1.7.

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[1] The criteria to be employed in evaluating interference levels shall be based on the relevant CCIR Recommendations or, in the absence of such Recommendations, shall be agreed between the administrations concerned.

6.1.10 Where an administration fails to reply within thirty days of dispatch of the Board's telegram sent under paragraph 6.1.7 requesting an acknowledgement or fails to give a decision on the matter within sixty days of dispatch of the Board's telegram of request sent under paragraph 6.1.8, the administration with which coordination was sought shall be considered to have undertaken that no complaint will be made in respect of any harmful interference which may be caused by the terrestrial station being coordinated to the service rendered or to be rendered by its satellite-broadcasting station.

6.1.11 Where necessary, as part of the procedure under paragraph 6.1.5, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.

6.1.12 In the event of continuing disagreement between one administration seeking to effect coordination and one with which coordination has been sought, the administrations concerned may explore the possibility of reaching an agreement on the use of the proposed frequency assignment for a specified period.

Section II. Notification procedure for frequency assignments

6.2.1 Any frequency assignment to a fixed, land or broadcasting station shall be notified to the International Frequency Registration Board if the use of the frequency concerned is capable of causing harmful interference to the service rendered or to be rendered by a broadcasting-satellite station of any other administration, or if it is desired to obtain international recognition of the use of the frequency [1].

6.2.2 For this notification, an individual notice for each frequency assignment shall be drawn up as prescribed in Section A of Appendix 1 to the Radio Regulations, which specifies the basic characteristics to be furnished as required. It is recommended that the notifying administration should also supply the additional data called for in that Appendix, together with such further data as it may consider appropriate.

6.2.3 Whenever practicable, each notice should reach the Board before the date on which the assignment is brought into use. The notice made in accordance with paragraph 6.2.2 must reach the Board not earlier than three years and not later than ninety days before the date on which the assignment is to be brought into use.

6.2.4 Any frequency assignment, the notice of which reaches the Board less than ninety days before it is brought into use, shall, where it is to be recorded, bear a remark in the Master Register to indicate that it is not in conformity with paragraph 6.2.3.

Section III. Procedure for the examination of notices and the recording of frequency assignments in the Master Register

6.3.1 Whatever the means of communication, including telegraph, by which a notice is transmitted to the Board, it shall be considered complete if it contains at least the appropriate basic characteristics specified in Section A of Appendix 1 to the Radio Regulations.

6.3.2 Complete notices shall be considered by the Board in the order of their receipt.

6.3.3 Any notice which is incomplete shall be returned by the Board immediately, by airmail, to the notifying administration with the reasons therefor.

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[1] The attention of administrations is specifically drawn to the provisions of Section I of this Article.

6.3.4 Upon receipt of a complete notice, the Board shall include the particulars thereof, with the date of receipt, in its weekly circular; this circular shall contain the particulars of all such notices received since publication of the previous circular.

6.3.5 The circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.

6.3.6 Complete notices shall be considered by the Board in the order specified in paragraph 6.3.2. The Board cannot postpone the formulation of a finding unless it lacks sufficient data to reach a decision; moreover, the Board shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Board, until it has reached a finding with respect to such earlier notice.

6.3.7 The Board shall examine each notice:

6.3.8 *a)* with respect to its conformity with the Convention, the relevant provisions of the Radio Regulations and the provisions of the Final Acts (with the exception of those relating to the coordination procedure and the probability of harmful interference);

6.3.9 *b)* with respect to its conformity with the provisions of paragraph 6.1.1 relating to coordination of the use of the frequency assignment with the other administrations concerned;

6.3.10 *c)* where appropriate, with respect to the probability of harmful interference to a broadcasting-satellite station whose frequency assignment is in accordance with the Plan.

6.3.11 Depending upon the findings of the Board subsequent to the examination prescribed in paragraphs 6.3.8, 6.3.9 and 6.3.10, further action shall be as follows:

6.3.12 *Finding unfavourable with respect to paragraph 6.3.8*

6.3.13 Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 of the Radio Regulations, it shall be examined immediately with respect to paragraphs 6.3.9 and 6.3.10.

6.3.14 If the finding is favourable with respect to paragraph 6.3.9 or 6.3.10, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

6.3.15 If the finding is unfavourable with respect to paragraph 6.3.9 or 6.3.10, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. In those circumstances the notifying administration shall undertake not to bring into use the frequency assignment until the condition specified in paragraph 6.3.14 can be fulfilled. But the administrations concerned may explore the possibility of reaching an agreement on the use of the proposed frequency assignment for a specified period.

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

6.3.17 If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of paragraph 6.3.16.

6.3.18 If the notifying administration resubmits the notice with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 of the Radio Regulations, it shall be treated in accordance with the provisions of paragraphs 6.3.13 and 6.3.14 or 6.3.15, as appropriate.

6.3.19 If the notifying administration resubmits the notice with modifications which, after re-examination, result in a favourable finding by the Board with respect to paragraph 6.3.8, the notice shall be treated under the provisions of paragraphs 6.3.20 to 6.3.32. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in Column 2d.

6.3.20 *Finding favourable with respect to paragraph 6.3.8*

6.3.21 Where the Board finds that the coordination procedure mentioned in paragraph 6.3.9 has been successfully completed with all administrations whose broadcasting-satellite services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

6.3.22 Where the Board finds that the coordination procedure mentioned in paragraph 6.3.9 has not been applied, and the notifying administration requests the Board to effect the required coordination, the Board shall take the appropriate action necessary and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with paragraph 6.3.21. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of paragraph 6.3.10.

6.3.23 Where the Board finds that the coordination procedure mentioned in paragraph 6.3.9 has not been applied and the notifying administration does not request the Board to effect the required coordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

6.3.24 Where the notifying administration resubmits the notice and the Board finds that the coordination procedure mentioned in paragraph 6.3.9 has been successfully completed with all administrations whose broadcasting-satellite services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

6.3.25 Where the notifying administration resubmits the notice with a request that the Board effect the required coordination, it shall be treated in accordance with the provisions of paragraph 6.3.22. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

6.3.26 Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the coordination, it shall be examined by the Board with respect to the provisions of paragraph 6.3.10. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

6.3.27 *Finding favourable with respect to paragraphs 6.3.8 and 6.3.10*

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

6.3.29 *Finding favourable with respect to paragraph 6.3.8 but unfavourable with respect to paragraph 6.3.10*

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

6.3.31 Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to paragraph 6.3.10, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.

6.3.32 Should the notifying administration resubmit the notice, either unchanged or with modifications which decrease the probability of harmful interference but not sufficiently to permit the provisions of paragraph 6.3.31 to be applied and should that administration insist upon reconsideration of the notice but the Board's finding remain unchanged, the notification shall again be returned to the notifying administration in accordance with paragraph 6.3.30. In those circumstances, the notifying administration shall undertake not to bring into use the proposed frequency assignment until the condition specified in paragraph 6.3.31 can be fulfilled. But the administrations concerned may explore the possibility of reaching an agreement on the use of the frequency assignment for a specified period. In that event the Board shall be notified of the agreement and the frequency assignment shall be recorded in the Master Register with a note indicating that the assignment is valid only for the specified period. The notifying administration using the frequency assignment during a specified period shall not subsequently use this circumstance to justify continued use of the frequency beyond the period specified if it does not obtain the agreement of the administration or the administrations concerned.

6.3.33 *Change in the basic characteristics of assignments already recorded in the Master Register*

6.3.34 A notice of a change in the basic characteristics of an assignment already recorded, as specified in Appendix 1 to the Radio Regulations (except those entered in Columns 3 and 4a of the Master Register), shall be examined by the Board in accordance with paragraphs 6.3.8 and 6.3.9 and, where appropriate, paragraph 6.3.10 and paragraphs 6.3.12 to 6.3.32 inclusive applied. Where the change should be recorded, the original assignment shall be amended according to the notice.

6.3.35 However, in the case of a change in the basic characteristics of an assignment which is in conformity with paragraph 6.3.8, should the Board reach a favourable finding with respect to paragraph 6.3.9 and, if applicable, paragraph 6.3.10, or find that the change does not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date in Column 2d. In addition, the date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.

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

6.3.37 *Recording of frequency assignments notified before being brought into use*

6.3.38 If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to paragraphs 6.3.8 and 6.3.9, and, where appropriate, 6.3.10, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

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

6.3.40 If use by a terrestrial station of an assignment which is not in conformity with the foregoing causes harmful interference to the reception of emissions from a space station in the broadcasting-satellite service using an assignment in conformity with the Plan, the administration having jurisdiction over the terrestrial station shall, on being advised, take immediate measures to eliminate the interference.

ARTICLE 7

Preliminary Procedures, Notification and Recording in the Master International Frequency Register of Frequency Assignments to Stations in the Fixed-Satellite Service in the Frequency Band 11.7-12.2 GHz (in Region 2) when Frequency Assignments to Broadcasting-Satellite Stations in Accordance with the Plan are involved [1]

Section I. Procedure for the advance publication of information on planned fixed-satellite systems

7.1.1 An administration which intends to establish a fixed-satellite system shall, prior to the procedure in accordance with paragraph 7.2.1 where applicable, send to the International Frequency Registration Board, not earlier than five years before the date of bringing into service each satellite network of the planned system, the information listed in Appendix 1B to the Radio Regulations.

7.1.2 Any amendments to the information concerning a planned satellite system sent in accordance with paragraph 7.1.1 shall also be sent to the Board as soon as they become available.

7.1.3 The Board shall publish the information sent under paragraphs 7.1.1 and 7.1.2 in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.

7.1.4 If, after studying the information published under paragraph 7.1.3, any administration is of the opinion that interference, which may be unacceptable, may be caused to its frequency assignments in conformity with the Plan, it shall within ninety days after the date of the weekly circular publishing the information listed in Appendix 1B to the Radio Regulations, send its comments to the administration concerned. A copy of these comments shall also be sent to the Board. If no such comments are received from an administration within the period mentioned above, it may be assumed that that administration has no basic objections to the planned fixed-satellite network(s) of that system of which details have been published.

7.1.5 An administration receiving comments sent in accordance with paragraph 7.1.4 shall endeavour to resolve any difficulties that may arise without considering the possibility of adjustment to broadcasting-satellite stations of other administrations. If no such means can be found, the administration concerned is then free to apply to other administrations concerned in order to solve these difficulties, provided that any modifications which may result to the Plan are in accordance with Article 4.

7.1.6 In their attempts to resolve the difficulties mentioned above, administrations may seek the assistance of the Board.

7.1.7 In complying with the provisions of paragraphs 7.1.5 and 7.1.6, an administration responsible for a planned fixed-satellite system shall, if necessary, defer its commencement of the coordination procedure of paragraph 7.2.1 or, where this is not applicable, the sending of its notices to the Board until one hundred and fifty days after the date of the weekly circular containing the information listed in Appendix 1B to the Radio Regulations on the relevant satellite network. However, in respect of those administrations with which difficulties have been resolved or which have responded favourably, the coordination procedure, where applicable, may be commenced prior to the expiry of the one hundred and fifty days mentioned above.

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[1] These provisions do not replace the procedures prescribed in Article 9A of the Radio Regulations when stations other than those of the broadcasting-satellite service having frequency assignments in conformity with the Plan are involved.

7.1.8 An administration, on behalf of which details of planned fixed-satellite networks in its system have been published in accordance with the provisions of paragraphs 7.1.1 to 7.1.3, shall periodically inform the Board whether or not comments have been received and of the progress made with other administrations in resolving any difficulties. The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so inform all administrations by circular telegram.

Section II. Coordination procedures to be applied in appropriate cases

7.2.1 Before an administration notifies to the Board or brings into use any frequency assignment to a space station in the fixed-satellite service, it shall seek the agreement of any other administration having a frequency assignment in conformity with the Plan, if

- any portion of the necessary bandwidth proposed for the space station in the fixed-satellite service falls within the necessary bandwidth associated with the frequency assignment to the broadcasting-satellite station, and
- the power flux density which would be produced by the proposed fixed-satellite assignment exceeds the value specified in Annex 4.

For this purpose, the administration seeking agreement shall send to any other such administration the information listed in Appendix 1A to the Radio Regulations.

7.2.2 No additional agreement is necessary when an administration proposes to change the characteristics of an existing assignment in such a way as will, in respect of the broadcasting-satellite service of another administration, meet the requirements of paragraph 7.2.1 above, or when this assignment has previously been the subject of an agreement and when the change will not cause any increase in the interference potential specified in that agreement.

7.2.3 An administration seeking coordination under paragraph 7.2.1 shall at the same time send to the Board a copy of the request for coordination together with the information listed in Appendix 1A to the Radio Regulations and the name(s) of the administration(s) whose agreement is sought. The Board shall determine on the basis of Annex 4 which frequency assignments in conformity with the Plan are considered to be affected. The Board shall include the names of those administrations with the information received from the administration seeking coordination and shall publish this information in a special section of its weekly circular, together with a reference to the weekly circular in which details of the satellite system were published in accordance with Section I of this Article. When the weekly circular contains such information, the Board shall so inform all administrations by circular telegram.

7.2.4 An administration believing that it should have been included in the procedure under paragraph 7.2.1 shall have the right to request that it be brought into the procedure.

7.2.5 An administration whose agreement is sought under paragraph 7.2.1 shall acknowledge receipt of the coordination data immediately by telegram. If no acknowledgement is received within thirty days after the date of the weekly circular publishing the information under paragraph 7.2.3, the administration seeking coordination shall dispatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of thirty days. Upon receipt of the coordination data, an administration shall, having regard to the proposed date of bringing into use of the assignment for which agreement was requested, promptly examine the matter with regard to interference [1] which would be caused to the service rendered by its stations in respect of which agreement is sought under paragraph 7.2.1, and shall, within ninety days from the

[1] The criteria to be employed in evaluating interference levels shall be based upon the technical information contained in the Final Acts or upon relevant CCIR Recommendations and shall be agreed between the administrations concerned.

date of the relevant weekly circular, notify its agreement to the requesting administration. If the administration with which coordination is sought does not agree, it shall, within the same period, send to the administration seeking coordination the technical details upon which its disagreement is based, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem. A copy of these comments shall also be sent to the Board.

7.2.6 An administration seeking coordination may request the Board to endeavour to effect coordination in those cases where:

a) an administration whose agreement is sought under paragraph 7.2.1 fails to acknowledge receipt, under paragraph 7.2.5, within sixty days after the date of the weekly circular publishing the information relating to the request for coordination;

b) an administration has acknowledged receipt under paragraph 7.2.5, but fails to give a decision within ninety days from the date of the relevant weekly circular;

c) there is disagreement between the administration seeking coordination and an administration whose agreement is sought as to the acceptable level of interference;

d) agreement between administrations is not possible for any other reason.

In so doing, it shall furnish the Board with the necessary information to enable it to endeavour to effect such coordination.

7.2.7 Either the administration seeking coordination or an administration whose agreement is sought, or the Board, may request additional information which they may require to assess the level of interference to the services concerned.

7.2.8 Where the Board receives a request under paragraph 7.2.6 *a)*, it shall forthwith send a telegram to the administration whose agreement is sought requesting immediate acknowledgement.

7.2.9 Where the Board receives an acknowledgement following its action under paragraph 7.2.8, or where the Board receives a request under paragraph 7.2.6 *b)*, it shall forthwith send a telegram to the administration whose agreement is sought requesting an early decision in the matter.

7.2.10 Where the Board receives a request under paragraph 7.2.6 *d)*, it shall endeavour to effect coordination in accordance with the provisions of paragraph 7.2.1. The Board shall also, where appropriate, act in accordance with paragraph 7.2.3. Where the Board receives no acknowledgement to its request for coordination within the periods specified in paragraph 7.2.5, it shall act in accordance with paragraph 7.2.8.

7.2.11 Where an administration fails to reply within thirty days of dispatch of the Board's telegram requesting an acknowledgement sent under paragraph 7.2.8, or fails to give a decision in the matter within thirty days of dispatch of the Board's telegram of request under paragraph 7.2.9, it shall be deemed that the administration whose agreement was sought has undertaken:

a) that no complaint will be made in respect of any harmful interference which may be caused to the services rendered by its broadcasting-satellite stations by the use of the assignment for which coordination was requested;

b) that its broadcasting-satellite stations will not cause harmful interference to the use of the assignment for which coordination was requested.

7.2.12 Where necessary, as part of the procedure under paragraph 7.2.6, the Board shall assess the level of interference. In any case, the Board shall inform the administrations concerned of the results obtained.

7.2.13 In the event of continuing disagreement between one administration seeking to effect coordination and one whose agreement has been sought, provided that the assistance of the Board has been requested, the administration seeking coordination may, after one hundred and fifty days from the date of the request for coordination, taking into consideration the provisions of paragraph 7.3.4, send its notice concerning the proposed assignment to the Board. In those circumstances the notifying administration shall undertake not to bring the frequency assignment into use until the condition in paragraph 7.4.11.2 can be fulfilled. But the administrations concerned may explore the possibility of reaching an agreement on the use of the proposed frequency assignment for a specified period.

Section III. Notification of frequency assignments

7.3.1 Any frequency assignment to a space station in the fixed-satellite service shall be notified to the Board:

a) if the use of the frequency concerned is capable of causing harmful interference to a frequency assignment of another administration which is in accordance with the Plan [1];

b) if it is desired to obtain international recognition of the use of the frequency.

7.3.2 Similar notice shall be given for any frequency to be used for reception by an Earth station where one or more of the conditions specified in paragraph 7.3.1 are applicable.

7.3.3 For any notification under paragraph 7.3.1 or 7.3.2, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix 1A to the Radio Regulations, the various Sections of which specify the basic characteristics to be furnished according to the case. The notifying administration shall furnish such further data as it considers appropriate.

7.3.4 Each notice must reach the Board not earlier than three years before the date on which the assignment is to be brought into use. The notice must reach the Board in any case not later than ninety days [2] before this date.

7.3.5 Any frequency assignment to an Earth or space station, the notice of which reaches the Board after the applicable period specified in paragraph 7.3.4, shall, where it is to be recorded, bear a mark in the Master Register to indicate that it is not in conformity with paragraph 7.3.4.

Section IV. Procedure for the examination of notices and the recording of frequency assignments in the Master Register

7.4.1 Any notice which does not contain at least those basic characteristics specified in Appendix 1A to the Radio Regulations shall be returned by the Board immediately, by airmail, to the notifying administration with the reasons therefor.

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[1] The attention of administrations is specifically drawn to the application of paragraph 7.2.1 above.

[2] The notifying administration shall take this limit into account when deciding, where appropriate, to initiate the coordination procedure(s).

7.4.2 Upon receipt of a complete notice, the Board shall include the particulars thereof, with the date of receipt, in its weekly circular which shall contain the particulars of all such notices received since the publication of the previous circular.

7.4.3 The circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.

7.4.4 Complete notices shall be considered by the Board in the order of their receipt. The Board shall not postpone the formulation of a finding unless it lacks sufficient data to render a decision in connection therewith; moreover, the Board shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Board, until it has reached a finding with respect to such earlier notice.

7.4.5 The Board shall examine each notice:

7.4.5.1 with respect to its conformity with the Convention, the relevant provisions of the Radio Regulations and the provisions of the Final Acts (with the exception of those relating to the coordination procedures and the probability of harmful interference);

7.4.5.2 where appropriate, with respect to its conformity with the provisions of paragraph 7.2.1, relating to the coordination of the use of the frequency assignment with the other administrations concerned having a frequency assignment in conformity with the Plan;

7.4.5.3 where appropriate, with respect to the probability of harmful interference to the service rendered or to be rendered by a broadcasting-satellite station whose frequency assignment is in conformity with the Plan.

7.4.6 Depending upon the findings of the Board subsequent to the examination prescribed in paragraphs 7.4.5.1, 7.4.5.2 and 7.4.5.3, as appropriate, further action shall be as follows:

7.4.7 *Finding favourable with respect to paragraph 7.4.5.1 in cases where the provisions of paragraph 7.4.5.2 are not applicable*

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

7.4.8 *Finding unfavourable with respect to paragraph 7.4.5.1*

7.4.8.1 Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 of the Radio Regulations and the finding is favourable with respect to paragraphs 7.4.5.2 and 7.4.5.3, as appropriate, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

7.4.8.2 Where the notice includes a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 of the Radio Regulations and the finding is unfavourable with respect to paragraph 7.4.5.2 or 7.4.5.3, as appropriate, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding. In those circumstances the notifying administration shall undertake not to bring into use the frequency assignment until the condition in paragraph 7.4.8.1 can be fulfilled. The agreement of the administrations affected can also be obtained in accordance with this Article for a specified period. In that event the Board shall be notified of the agreement and the frequency assignment shall be recorded in the Master Register with a note indicating that the frequency assignment is valid only for the period specified. The notifying administration using the frequency assignment over a specified period shall not subsequently use this circumstance to justify continued use of the frequency beyond the period specified if it does not obtain the agreement of the administration(s) concerned. The date of receipt by the Board of the original notice shall be entered in Column 2d.

7.4.8.3 Where the notice does not include a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 of the Radio Regulations, it shall be returned immediately by airmail

to the notifying administration with the reasons of the Board for this finding and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

7.4.8.4 If the notifying administration resubmits the notice unchanged, it shall be treated in accordance with the provisions of paragraph 7.4.8.3. If it is resubmitted with a specific reference to the fact that the station will be operated in accordance with the provisions of No. 115 of the Radio Regulations, it shall be treated in accordance with the provisions of paragraph 7.4.8.1 or 7.4.8.2, as appropriate. If it is resubmitted with modifications which, after re-examination, result in a favourable finding by the Board with respect to paragraph 7.4.5.1, it shall be treated as a new notice.

7.4.9 *Finding favourable with respect to paragraph 7.4.5.1 in cases where the provisions of paragraph 7.4.5.2 are applicable*

7.4.9.1 Where the Board finds that the coordination procedures mentioned in paragraph 7.4.5.2 have been successfully completed with all administrations whose frequency assignments in accordance with the Plan may be affected, the frequency assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d.

7.4.9.2 Where the Board finds that the coordination procedure mentioned in paragraph 7.4.5.2 has not been applied, and the notifying administration requests the Board to effect the required coordination, the Board shall take appropriate action and shall inform the administrations concerned of the results obtained. If the Board's efforts are successful, the notice shall be treated in accordance with paragraph 7.4.9.1. If the Board's efforts are unsuccessful, the notice shall be examined by the Board with respect to the provisions of paragraph 7.4.5.3.

7.4.9.3 Where the Board finds that the coordination procedure mentioned in paragraph 7.4.5.2 has not been applied, and the notifying administration does not request the Board to effect the required coordination, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this action and with such suggestions as the Board may be able to offer with a view to the satisfactory solution of the problem.

7.4.9.4 Where the notifying administration resubmits the notice and the Board finds that the coordination procedure mentioned in paragraph 7.4.5.2 has been successfully completed with all administrations whose frequency assignments in conformity with the Plan may be affected, the frequency assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

7.4.9.5 Where the notifying administration resubmits the notice with a request that the Board effect the required coordination under paragraph 7.2.1, it shall be treated in accordance with the provisions of paragraph 7.4.9.2. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

7.4.9.6 Where the notifying administration resubmits the notice and states it has been unsuccessful in effecting the coordination, the Board shall inform the administrations concerned thereof. The notice shall be examined by the Board with respect to the provisions of paragraph 7.4.5.3. However, in any subsequent recording of the assignment, the date of receipt by the Board of the resubmitted notice shall be entered in the Remarks Column.

7.4.10 *Finding favourable with respect to paragraphs 7.4.5.1 and 7.4.5.3*

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

7.4.11 *Finding favourable with respect to paragraph 7.4.5.1, but unfavourable with respect to paragraph 7.4.5.3*

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

7.4.11.2 Should the notifying administration resubmit the notice with modifications which result, after re-examination, in a favourable finding by the Board with respect to paragraph 7.4.5.3, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the original notice shall be entered in Column 2d. The date of receipt by the Board of the resubmitted notice shall be indicated in the Remarks Column.

7.4.11.3 Should the notifying administration resubmit the notice, either unchanged, or with modifications which decrease the probability of harmful interference, but not sufficiently to permit the provisions of paragraph 7.4.11.2 to be applied, and should that administration insist upon reconsideration of the notice, but should the Board's finding remain unchanged, the notification shall again be returned to the notifying administration in accordance with paragraph 7.4.11.1. In those circumstances, the notifying administration shall undertake not to bring into use the proposed frequency assignment until the condition in paragraph 7.4.11.2 can be fulfilled. The agreement of the administrations affected can also be obtained in accordance with this Article for a specified period. In that event the Board shall be notified of the agreement and the frequency assignment shall be recorded in the Master Register with a note in the Remarks Column indicating that the assignment is valid only for the specified period. The notifying administration using the frequency assignment over a specified period shall not subsequently use this circumstance to justify continued use of the frequency beyond the period specified if it does not obtain the agreement of the administration(s) concerned. The date of receipt by the Board of the original notice shall be entered in Column 2d.

7.4.12 *Change in the basic characteristics of assignments already recorded in the Master Register*

7.4.12.1 A notice of a change in the basic characteristics of an assignment in the fixed-satellite service already recorded, as specified in Appendix 1A to the Radio Regulations (except the name of the station or the name of the locality in which it is situated), shall be examined by the Board according to paragraph 7.4.5.1 and, where appropriate, paragraphs 7.4.5.2 and 7.4.5.3, and the provisions of paragraphs 7.4.7 to 7.4.11.3 inclusive shall apply. Where the change should be recorded, the original assignment shall be amended accordingly.

7.4.12.2 However, in the case of a change in the characteristics of an assignment which is in conformity with paragraph 7.4.5.1, should the Board reach a favourable finding with respect to paragraphs 7.4.5.2 and 7.4.5.3, where appropriate, or find that the changes do not increase the probability of harmful interference to frequency assignments in accordance with the Plan, the amended assignment shall retain the original date in Column 2d. The date of receipt by the Board of the notice relating to the change shall be entered in the Remarks Column.

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

7.4.13 *Recording of frequency assignments in the fixed-satellite service notified before being brought into use*

7.4.13.1 If a frequency assignment notified in advance of bringing into use has received a favourable finding by the Board with respect to paragraph 7.4.5.1 and, where appropriate, paragraphs 7.4.5.2 and 7.4.5.3, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

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

7.4.13.3 If the Board does not receive this confirmation within the period referred to in paragraph 7.4.13.2, the entry concerned shall be cancelled. The Board shall advise the administration concerned before taking such action.

Section V. Recording of findings in the Master Register

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

Section VI. Categories of frequency assignments

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

7.6.2 If harmful interference is actually caused to the reception of any broadcasting-satellite station whose frequency assignment is in accordance with the Plan, by the use of a frequency assignment to a space radiocommunication station subsequently recorded in the Master Register in accordance with the provisions of paragraph 7.4.11.3, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

7.6.3 If harmful interference to the reception of any broadcasting-satellite station whose frequency assignment is in accordance with the Plan, is actually caused by the use of a frequency assignment which is not in conformity with paragraph 7.4.5.1, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

Section VII. Review of findings

7.7.1 The review of a finding by the Board may be undertaken:

- at the request of the notifying administration;
- at the request of any other administration interested in the question, but only on the grounds of actual harmful interference;
- on the initiative of the Board itself when it considers this is justified.

7.7.2 The Board, in the light of all the data at its disposal shall review the matter, taking into account paragraph 7.4.5.1 and, where appropriate, paragraphs 7.4.5.2 and 7.4.5.3, and shall render an appropriate finding, informing the notifying administration prior either to the promulgation of its finding or to any recording action.

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

7.7.4 If the finding with regard to the probability of harmful interference remains unfavourable, no change shall be made in the original entry.

Section VIII. Modification, cancellation and review of entries in the Master Register

7.8.1 Where the use of a recorded assignment to a station in the fixed-satellite service is suspended for a period of eighteen months, the notifying administration shall, within this eighteen-month period, inform the Board of the date on which such use was suspended and of the date on which the assignment is to be brought back into regular use.

7.8.2 Whenever it appears to the Board, whether or not as a result of action under paragraph 7.8.1, that a recorded assignment to a space station in the fixed-satellite service has not been in regular use for more than eighteen months, the Board shall inquire of the notifying administration as to when the assignment is to be brought back into regular use.

7.8.3 If no reply is received within six months of action by the Board under paragraph 7.8.2, or if the reply does not confirm that the assignment to a space station in the fixed-satellite service is to be brought back into regular use within this six-month limit, a symbol should be entered against the entry in the Master Register.

7.8.4 In case of permanent discontinuance of the use of any recorded frequency assignment, the notifying administration shall inform the Board within ninety days of such discontinuance, whereupon the entry shall be removed from the Master Register.

7.8.5 Whenever it appears to the Board from the information available that a recorded assignment has not been brought into regular operation in accordance with the notified basic characteristics, or is not being used in accordance with those basic characteristics, the Board shall consult the notifying administration and, subject to its agreement, shall either cancel or suitably modify the entry.

7.8.6 If, in connection with an inquiry by the Board under paragraph 7.8.5 the notifying administration has failed to supply the Board within forty-five days with the necessary or pertinent information, the Board shall make suitable entries in the Remarks Column of the Master Register to indicate the situation.

ARTICLE 8

Miscellaneous Provisions relating to the Procedures

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

8.2 The Board shall thereupon prepare and forward to the administration concerned a report containing its findings and recommendations for the solution of the problem.

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

8.4 If it is requested by any administration, particularly by an administration of a country in need of special assistance, and if the circumstances appear to warrant, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:

a) computation necessary in the application of Annexes 1, 3 and 4;

b) any other assistance of a technical nature for completion of the procedures in these Final Acts.

ARTICLE 9

Power Flux Density Limits between 11.7 and 12.2 GHz to protect Terrestrial Services in Regions 1 and 3 from Interference from Region 2 Broadcasting-Satellite Space Stations

9.1 The power flux density at the Earth's surface in Regions 1 and 3, produced by emissions from a space station in the broadcasting-satellite service in Region 2 for all conditions and for all methods of modulation shall not exceed the values given in Annex 5 on the territory of any country unless the administration of that country so agrees.

ARTICLE 10

Power Flux Density Limits between 11.7 and 12.2 GHz to protect Space Services in Region 2 from Interference from Broadcasting-Satellite Space Stations of Regions 1 and 3

10.1 Broadcasting-satellite space stations of Regions 1 and 3 shall employ transmitting antennae whose side-lobe characteristics fall within the reference antenna pattern given in Figure 6 of Annex 8. Therefore, the power flux density falling on the territory of any administration of Region 2 in the band 11.7-12.2 GHz prior to any modifications to the Plan shall not exceed, under all conditions and methods of modulation, the values produced by broadcasting-satellite stations operating in accordance with the Plan on the date of its entry into force and using the technical characteristics specified in the Plan. The power flux density values shall be calculated using the method described in Annex 11.

10.2 In particular, the power flux densities at a reference test point (longitude 35°W, latitude 8°S) prior to any modifications to the Plan shall not exceed the values shown in Annex 11.

ARTICLE 11

The Plan for the Broadcasting-Satellite Service in the Frequency Bands 11.7-12.2 GHz in Region 3 and 11.7-12.5 GHz in Region 1

11.1 COLUMN HEADINGS OF THE PLAN

Col. 1. *Country symbol and IFRB Serial Number* (Column 1 contains the symbol designating the country or the geographical area taken from Table No. 1 of the Preface to the International Frequency List).

Col. 2. *Nominal orbital position*, in degrees.

Col. 3. *Channel number* (see Table showing channel numbers and corresponding assigned frequencies).

Col. 4. *Boresight* geographical coordinates, in degrees and tenths of a degree.

Col. 5. *Antenna beamwidth*. This column contains two figures corresponding to the major axis and the minor axis respectively of the elliptical cross-section half-power beam, in degrees and tenths of a degree.

Col. 6. *Orientation of the ellipse* determined as follows: in a plane normal to the beam axis, the direction of a major axis of the ellipse is specified as the angle measured anti-clockwise from a line parallel to the equatorial plane to the major axis of the ellipse to the nearest degree.

Col. 7. *Polarization* (1 = direct, 2 = indirect)[1].

Col. 8. *E.i.r.p.* in the direction of maximum radiation in dBW.

Col. 9. *Remarks.*

11.2 NOTES RELATING TO THE PLAN

1. The ΔG of this assignment is ... dB.

2. To be dedicated to the Islamic programme envisaged in the Conference documents.

3. This assignment results from a common requirement of the Administrations of Denmark and Iceland. The service area includes the Faeroe Islands and Iceland. The assignment may after consultations between the two Administrations, be used by either of them.

4. IFB — IFRB. This assignment has been included in the Plan by the Conference.

5. Assignment intended to ensure coverage of Algeria, Libya, Morocco, Mauritania and Tunisia, with the agreement of the countries concerned. If required, this assignment may be used with the characteristics of the beam TUN 150.

6. Assignments appearing in the Plan for Somalia should be coordinated with each country concerned and in particular with Ethiopia.

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[1] See Annex 8, paragraph 3.2.3.

11.3 TABLE SHOWING CORRESPONDENCE BETWEEN CHANNEL NUMBERS AND ASSIGNED FREQUENCIES

Channel No.	Assigned frequency (MHz)	Channel No.	Assigned frequency (MHz)
1	11 727,48	21	12 111,08
2	11 746,66	22	12 130,26
3	11 765,84	23	12 149,44
4	11 785,02	24	12 168,62
5	11 804,20	25	12 187,80
6	11 823,38	26	12 206,98
7	11 842,56	27	12 226,16
8	11 861,74	28	12 245,34
9	11 880,92	29	12 264,52
10	11 900,10	30	12 283,70
11	11 919,28	31	12 302,88
12	11 938,46	32	12 322,06
13	11 957,64	33	12 341,24
14	11 976,82	34	12 360,42
15	11 996,00	35	12 379,60
16	12 015,18	36	12 398,78
17	12 034,36	37	12 417,96
18	12 053,54	38	12 437,14
19	12 072,72	39	12 456,32
20	12 091,90	40	12 475,50

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
AFG 246A	50.0	1	64.5	33.1	1.44	1.40	21	1	63.4	
AUS 005A	98.0	1	133.5	-18.8	2.70	1.40	76	2	64.3	
CAR 338A	122.0	1	149.5	8.0	5.36	0.77	178	1	62.5	
CHN 155A	62.0	1	88.3	31.5	3.38	1.45	162	2	62.9	
CHN 162A	92.0	1	115.9	21.0	2.74	2.42	23	2	63.9	
CHN 163A	80.0	1	116.0	39.2	1.20	0.80	132	1	64.4	
CME 300A	-13.0	1	12.7	6.2	2.54	1.68	87	1	63.4	
F 093A	-19.0	1	2.6	45.9	2.50	0.98	160	1	63.8	
FJI 193A	152.0	1	179.4	-17.9	1.04	0.98	67	1	63.7	
GUI 192A	-37.0	1	-11.0	10.2	1.58	1.04	147	2	63.4	
IND 039A	56.0	1	72.7	11.2	1.26	0.60	107	1	63.1	
IND 044A	68.0	1	79.5	22.3	2.19	1.42	146	1	63.3	
INS 035A	104.0	1	124.3	-3.2	3.34	1.94	82	1	63.2	
J 111A	110.0	1	134.5	31.5	3.52	3.30	68	1	63.2	
LBY 280A	-25.0	1	21.4	26.0	2.50	1.04	119	2	63.5	
MDG 236A	29.0	1	46.6	-18.8	2.72	1.14	65	2	63.3	
NZL 055A	158.0	1	172.3	-39.7	2.88	1.56	47	1	63.3	
PLM 337A	170.0	1	-161.4	7.0	0.60	0.60	0	1	62.4	
POL 132A	-1.0	1	19.3	51.8	1.46	0.64	162	2	64.1	
QAT 247A	17.0	1	51.1	25.3	0.60	0.60	0	1	61.8	1/1.6
SMA 335A	170.0	1	-170.1	-14.2	0.60	0.60	0	2	61.1	1/0.9
SMR 311A	-37.0	1	12.6	43.7	0.60	0.60	0	1	62.4	1/0.8
SWZ 313A	-1.0	1	31.5	-26.5	0.62	0.60	66	1	62.8	1/1.7
THA 142A	74.0	1	100.7	13.2	2.82	1.54	106	2	63.6	
TUR 145A	5.0	1	34.4	38.9	2.68	1.04	168	1	63.7	
URS 064A	23.0	1	45.6	40.8	2.16	0.60	163	2	63.9	
URS 067A	44.0	1	62.4	58.5	3.20	1.52	169	1	66.3	
WAK 334A	140.0	1	166.5	19.2	0.60	0.60	0	1	63.6	
YMS 267A	11.0	1	48.8	15.2	1.76	1.54	176	2	62.8	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
ALG 251A	-25.0	2	4.2	33.2	2.45	1.25	172	1	63.4	
ARS 275A	17.0	2	48.3	24.6	3.84	1.20	138	2	62.7	
AUS 006A	98.0	2	135.4	-30.3	2.00	1.40	44	1	63.2	
AUS 008A	128.0	2	145.9	-21.5	2.90	2.00	120	2	63.7	
BOT 297A	-1.0	2	23.3	-22.2	2.13	1.50	36	2	63.7	
CHN 154A	62.0	2	83.9	40.5	2.75	2.05	177	1	63.2	
CHN 161A	92.0	2	118.1	31.1	2.49	1.69	117	1	64.4	
CKH 052A	158.0	2	-161.0	-19.8	1.02	0.64	132	2	64.6	
CLN 219A	50.0	2	80.6	7.7	1.18	0.60	106	1	63.6	
D 087A	-19.0	2	9.6	49.9	1.62	0.72	147	2	65.5	
FNL 103A	5.0	2	22.5	64.5	1.38	0.76	171	2	67.7	
GNP 304A	-31.0	2	-15.0	12.0	0.90	0.60	172	2	63.1	
GUM 331A	122.0	2	144.5	13.1	0.60	0.60	0	2	63.3	
IND 037A	68.0	2	93.0	25.5	1.46	1.13	40	2	63.9	
IND 045A	56.0	2	76.2	19.5	1.58	1.58	21	2	63.5	
INS 028A	80.0	2	101.5	0.0	3.00	1.20	133	2	63.3	
IRL 211A	-31.0	2	-8.2	53.2	0.84	0.60	162	1	64.2	
KOR 112A	110.0	2	127.5	36.0	1.24	1.02	168	2	63.6	
LAO 284A	74.0	2	103.7	18.1	2.16	0.78	133	1	63.8	
MAU 242A	29.0	2	59.8	-18.9	1.62	1.24	55	1	64.0	
MLA 228A	86.0	2	114.1	3.9	2.34	1.12	45	1	63.6	
MLI 327A	-37.0	2	-2.0	19.0	2.66	1.26	127	1	63.2	
MRL 333A	146.0	2	166.7	7.9	1.50	1.50	177	1	63.3	
NCL 100A	140.0	2	166.0	-21.0	1.14	0.72	146	1	63.7	
PAK 127A	38.0	2	69.6	29.5	2.30	2.16	14	1	63.9	
PNG 131A	110.0	2	147.7	-6.3	2.50	2.18	169	1	64.4	
ROU 136A	-1.0	2	25.0	45.7	1.38	0.66	155	1	63.8	
TCD 143A	-13.0	2	18.1	15.5	3.40	1.72	107	2	64.0	
TGO 226A	-25.0	2	0.8	8.6	1.52	0.60	105	2	63.4	
WAL 102A	140.0	2	-176.8	-14.0	0.74	0.60	29	1	64.4	
YEM 266A	11.0	2	44.3	15.1	1.14	0.70	109	1	62.6	
ZAI 323A	-19.0	2	21.3	-6.8	2.80	1.52	149	1	64.6	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

1	2	3	4		5		6	7	8	9
AFG 245A	50.0	3	70.2	35.5	1.32	1.13	53	1	62.8	
AUS 004A	98.0	3	121.8	-24.9	3.60	1.90	54	2	63.0	
AUS 009A	128.0	3	147.2	-32.0	2.10	1.40	15	1	64.1	
AZR 134A	-31.0	3	-23.4	36.1	2.56	0.70	158	2	63.0	
BEN 233A	-19.0	3	2.2	9.5	1.44	0.68	97	2	63.3	
CHN 157A	62.0	3	102.3	27.8	2.56	1.58	127	2	65.1	
CHN 160A	92.0	3	122.8	45.3	2.50	1.45	150	2	65.1	
COM 207A	29.0	3	44.1	-12.1	0.76	0.60	149	2	63.1	
GAB 260A	-13.0	3	11.8	-0.6	1.43	1.12	64	1	63.3	
GMB 302A	-37.0	3	-15.1	13.4	0.79	0.60	4	2	63.3	
GRC 105A	5.0	3	24.7	38.2	1.78	0.98	156	1	63.3	
IND 043A	56.0	3	77.8	11.1	1.36	1.28	172	1	63.3	
IND 047A	68.0	3	93.3	11.1	1.92	0.60	96	1	63.4	
INS 036A	104.0	3	135.2	-3.8	2.46	2.00	147	1	63.8	
IRN 109A	34.0	3	54.2	32.4	3.82	1.82	149	2	62.8	
J 111B	110.0	3	134.5	31.5	3.52	3.30	68	1	64.2	
LBN 279A	11.0	3	35.8	33.9	0.60	0.60	0	2	61.6	1/1.8
LBR 244A	-31.0	3	-9.3	6.6	1.22	0.70	133	1	63.2	
LBY 321A	-25.0	3	13.1	27.2	2.36	1.12	129	2	63.0	
LIE 253A	-37.0	3	9.5	47.1	0.60	0.60	0	1	62.4	1/0.7
LUX 114A	-19.0	3	6.0	49.8	0.60	0.60	0	1	62.9	1/2.0
MRA 332A	122.0	3	145.9	16.9	1.20	0.60	76	1	63.5	
NHB 128A	140.0	3	168.0	-16.4	1.52	0.68	87	2	62.8	
NRU 309A	134.0	3	167.0	-0.5	0.60	0.60	0	2	62.5	
POR 133A	-31.0	3	-8.0	39.6	0.92	0.60	112	2	63.4	
SMO 057A	158.0	3	-172.3	-13.7	0.60	0.60	0	1	63.6	
SNG 151A	74.0	3	103.8	1.3	0.60	0.60	0	2	63.5	
SOM 312A	23.0	3	45.0	6.4	3.26	1.54	71	1	62.3	
TCH 144A	-1.0	3	17.3	49.3	1.47	0.60	170	2	63.8	
UGA 051A	11.0	3	32.3	1.2	1.46	1.12	60	1	63.2	
URS 061A	23.0	3	24.7	56.6	0.88	0.64	12	2	65.0	
URS 073A	44.0	3	54.3	63.5	1.58	0.66	3	1	66.9	
VTN 325A	86.0	3	105.3	16.1	3.03	1.40	116	2	63.4	
ZMB 314A	-1.0	3	27.5	-13.1	2.38	1.48	39	1	63.7	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

11 785,02 MHz (4)

1	2	3	4		5		6	7	8	9
ALG 252A	-25.0	4	1.6	25.5	3.64	2.16	152	1	62.8	
AND 341A	-37.0	4	1.6	42.5	0.60	0.60	0	2	61.5	1/0.5
ARS 003A	17.0	4	41.1	23.8	3.52	1.68	134	2	62.7	
AUS 007A	128.0	4	145.0	-38.1	1.83	1.39	134	2	63.3	
AUT 016A	-19.0	4	12.2	47.5	1.14	0.63	166	2	64.1	
BUL 020A	-1.0	4	25.0	43.0	1.04	0.60	165	1	63.6	
CHN 156A	62.0	4	97.8	36.3	2.56	1.58	157	1	63.5	
CHN 161B	92.0	4	118.1	31.1	2.49	1.69	117	1	64.4	
CKN 053A	158.0	4	-163.0	-11.2	1.76	0.72	30	2	64.3	
CPV 301A	-31.0	4	-24.0	16.0	0.86	0.70	144	2	62.2	
EGY 026A	-7.0	4	29.7	26.8	2.33	1.72	136	2	63.1	
G 027A	-31.0	4	-3.5	53.8	1.84	0.72	142	1	65.0	
IND 040A	56.0	4	73.0	25.0	1.82	1.48	58	2	63.6	
IND 048A	68.0	4	86.2	25.0	1.56	0.90	120	2	63.7	
INS 028B	80.0	4	101.5	0.0	3.00	1.20	133	2	63.3	
KOR 112B	110.0	4	127.5	36.0	1.24	1.02	168	2	63.6	
LAO 284B	74.0	4	103.7	18.1	2.16	0.78	133	1	63.8	
MAU 243A	29.0	4	56.8	-13.9	1.56	1.38	65	1	63.7	
MLA 228B	86.0	4	114.1	3.9	2.34	1.12	45	1	63.6	
MLI 328A	-37.0	4	-7.6	13.2	1.74	1.24	171	1	63.7	
MLT 147A	-13.0	4	14.3	35.9	0.60	0.60	0	1	61.0	1/0.7
MOZ 307A	-1.0	4	34.0	-18.0	3.57	1.38	55	2	64.2	
OCE 101A	-160.0	4	-145.0	-16.3	4.34	3.54	4	2	63.5	
PAK 283A	38.0	4	74.7	33.9	1.34	1.13	160	1	64.3	
PNG 271A	128.0	4	148.0	-6.7	2.80	2.05	155	1	63.4	
RRW 310A	11.0	4	30.0	-2.1	0.66	0.60	42	2	64.8	
S 138A	5.0	4	16.2	61.0	1.04	0.98	14	2	67.1	
STP 241A	-13.0	4	7.0	0.8	0.60	0.60	0	2	61.4	1/1.3
TON 215A	170.0	4	-174.7	-18.0	1.41	0.68	85	1	63.3	
URS 060A	23.0	4	41.5	57.4	3.08	1.56	153	1	66.7	
ZAI 322A	-19.0	4	22.4	0.0	2.16	1.88	48	1	64.7	

11 804,20 MHz (5)

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AFG 246B	50.0	5	64.5	33.1	1.44	1.40	21	1	63.4	
AUS 005B	98.0	5	133.5	-18.8	2.70	1.40	76	2	64.3	
CAR 338B	122.0	5	149.5	8.0	5.36	0.77	178	1	62.5	
CHN 155B	62.0	5	88.3	31.5	3.38	1.45	162	2	62.9	
CHN 162B	92.0	5	115.9	21.0	2.74	2.42	23	2	64.0	
CHN 164A	80.0	5	112.2	37.4	1.06	0.76	111	1	64.2	
CME 300B	-13.0	5	12.7	6.2	2.54	1.68	87	1	63.5	
F 093B	-19.0	5	2.6	45.9	2.50	0.98	160	1	63.8	
FJI 193B	152.0	5	179.4	-17.9	1.04	0.98	67	1	63.7	
GUI 192B	-37.0	5	-11.0	10.2	1.58	1.04	147	2	63.5	
IND 039B	56.0	5	72.7	11.2	1.26	0.60	107	1	63.1	
IND 044B	68.0	5	79.5	22.3	2.19	1.42	146	1	63.4	
INS 035B	104.0	5	124.3	-3.2	3.34	1.94	82	1	63.2	
J 111C	110.0	5	134.5	31.5	3.52	3.30	68	1	64.2	
LBY 280B	-25.0	5	21.4	26.0	2.50	1.04	119	2	63.5	
MDG 236B	29.0	5	46.6	-18.8	2.72	1.14	65	2	63.4	
NZL 055B	158.0	5	172.3	-39.7	2.88	1.56	47	1	63.4	
PLM 337B	170.0	5	-161.4	7.0	0.60	0.60	0	1	62.4	
POL 132B	-1.0	5	19.3	51.8	1.46	0.64	162	2	64.2	
QAT 247B	17.0	5	51.1	25.3	0.60	0.60	0	1	61.8	1/1.6
SMA 335B	170.0	5	-170.1	-14.2	0.60	0.60	0	2	61.2	1/0.9
SMR 311B	-37.0	5	12.6	43.7	0.60	0.60	0	1	62.5	1/0.8
SWZ 313B	-1.0	5	31.5	-26.5	0.62	0.60	66	1	62.8	1/1.7
THA 142B	74.0	5	100.7	13.2	2.82	1.54	106	2	63.7	
TUR 145B	5.0	5	34.4	38.9	2.68	1.04	168	1	63.8	
URS 064B	23.0	5	45.6	40.8	2.16	0.60	163	2	63.9	
URS 067B	44.0	5	62.4	58.5	3.20	1.52	169	1	66.4	
WAK 334B	140.0	5	166.5	19.2	0.60	0.60	0	1	63.6	
YMS 267B	11.0	5	48.8	15.2	1.76	1.54	176	2	62.9	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

11 823,38 MHz (6)

1	2	3	4		5		6	7	8	9
ALG 251B	-25.0	6	4.2	33.2	2.45	1.25	172	1	63.4	
ARS 275B	17.0	6	48.3	24.6	3.84	1.20	138	2	62.8	
AUS 006B	98.0	6	135.4	-30.3	2.00	1.40	44	1	63.3	
AUS 008B	128.0	6	145.9	-21.5	2.90	2.00	120	2	63.7	
BOT 297B	-1.0	6	23.3	-22.2	2.13	1.50	36	2	63.8	
CHN 154B	62.0	6	83.9	40.5	2.75	2.05	177	1	63.3	
CHN 161C	92.0	6	118.1	31.1	2.49	1.69	117	1	64.5	
CKH 052B	158.0	6	-161.0	-19.8	1.02	0.64	132	2	64.6	
CLN 219B	50.0	6	80.6	7.7	1.18	0.60	106	1	63.6	
D 087B	-19.0	6	9.6	49.9	1.62	0.72	147	2	65.6	
FNL 103B	5.0	6	22.5	64.5	1.38	0.76	171	2	67.8	
GNP 304B	-31.0	6	-15.0	12.0	0.90	0.60	172	2	63.2	
GUM 331B	122.0	6	144.5	13.1	0.60	0.60	0	2	63.4	
IND 037B	68.0	6	93.0	25.5	1.46	1.13	40	2	64.0	
IND 045B	56.0	6	76.2	19.5	1.58	1.58	21	2	63.6	
INS 028C	80.0	6	101.5	0.0	3.00	1.20	133	2	63.3	
IRL 211B	-31.0	6	-8.2	53.2	0.84	0.60	162	1	64.3	
KOR 112C	110.0	6	127.5	36.0	1.24	1.02	168	2	63.6	
LAO 284C	74.0	6	103.7	18.1	2.16	0.78	133	1	63.8	
MAU 242B	29.0	6	59.8	-18.9	1.62	1.24	55	1	64.0	
MLA 228C	86.0	6	114.1	3.9	2.34	1.12	45	1	63.6	
MLI 327B	-37.0	6	-2.0	19.0	2.66	1.26	127	1	63.2	
MRL 333B	146.0	6	166.7	7.9	1.50	1.50	177	1	63.3	
NCL 100B	140.0	6	166.0	-21.0	1.14	0.72	146	1	63.8	
PAK 127B	38.0	6	69.6	29.5	2.30	2.16	14	1	64.0	
PNG 131B	110.0	6	147.7	-6.3	2.50	2.18	169	1	64.4	
ROU 136B	-1.0	6	25.0	45.7	1.38	0.66	155	1	63.9	
TCD 143B	-13.0	6	18.1	15.5	3.40	1.72	107	2	64.0	
TGO 226B	-25.0	6	0.8	8.6	1.52	0.60	105	2	63.4	
WAL 102B	140.0	6	-176.8	-14.0	0.74	0.60	29	1	64.4	
YEM 266B	11.0	6	44.3	15.1	1.14	0.70	109	1	62.7	
ZAI 323B	-19.0	6	21.3	-6.8	2.80	1.52	149	1	64.7	

11 842,56 MHz (7)

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AFG 245B	50.0	7	70.2	35.5	1.32	1.13	53	1	62.9	
AUS 004B	98.0	7	121.8	-24.9	3.60	1.90	54	2	63.1	
AUS 009B	128.0	7	147.2	-32.0	2.10	1.40	15	1	64.1	
AZR 134B	-31.0	7	-23.4	36.1	2.56	0.70	158	2	63.1	
BEN 233B	-19.0	7	2.2	9.5	1.44	0.68	97	2	63.3	
CHN 157B	62.0	7	102.3	27.8	2.56	1.58	127	2	65.1	
CHN 160B	92.0	7	122.8	45.3	2.50	1.45	150	2	65.1	
COM 207B	29.0	7	44.1	-12.1	0.76	0.60	149	2	63.1	
GAB 260B	-13.0	7	11.8	-0.6	1.43	1.12	64	1	63.4	
GMB 302B	-37.0	7	-15.1	13.4	0.79	0.60	4	2	63.4	
GRC 105B	5.0	7	24.7	38.2	1.78	0.98	156	1	63.4	
IND 043B	56.0	7	77.8	11.1	1.36	1.28	172	1	63.4	
IND 047B	68.0	7	93.3	11.1	1.92	0.60	96	1	63.5	
INS 036B	104.0	7	135.2	-3.8	2.46	2.00	147	1	63.8	
IRN 109B	34.0	7	54.2	32.4	3.82	1.82	149	2	62.8	
J 111D	110.0	7	134.5	31.5	3.52	3.30	68	1	64.2	
LBN 279B	11.0	7	35.8	33.9	0.60	0.60	0	2	61.7	1/1.8
LBR 244B	-31.0	7	-9.3	6.6	1.22	0.70	133	1	63.3	
LBY 321B	-25.0	7	13.1	27.2	2.36	1.12	129	2	63.1	
LIE 253B	-37.0	7	9.5	47.1	0.60	0.60	0	1	62.5	1/0.7
LUX 114B	-19.0	7	6.0	49.8	0.60	0.60	0	1	63.0	1/2.0
MRA 332B	122.0	7	145.9	16.9	1.20	0.60	76	1	63.5	
NHB 128B	140.0	7	168.0	-16.4	1.52	0.68	87	2	62.9	
NRU 309B	134.0	7	167.0	-0.5	0.60	0.60	0	2	62.6	
POR 133B	-31.0	7	-8.0	39.6	0.92	0.60	112	2	63.4	
SMO 057B	158.0	7	-172.3	-13.7	0.60	0.60	0	1	63.7	
SNG 151B	74.0	7	103.8	1.3	0.60	0.60	0	2	63.6	
SOM 312B	23.0	7	45.0	6.4	3.26	1.54	71	1	62.4	
TCH 144B	-1.0	7	17.3	49.3	1.47	0.60	170	2	63.9	
UGA 051B	11.0	7	32.3	1.2	1.46	1.12	60	1	63.3	
URS 061B	23.0	7	24.7	56.6	0.88	0.64	12	2	65.1	
URS 072A	44.0	7	70.1	61.5	2.38	0.66	173	1	67.1	
VTN 325B	86.0	7	105.3	16.1	3.03	1.40	116	2	63.5	
ZMB 314B	-1.0	7	27.5	-13.1	2.38	1.48	39	1	63.8	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

11 861,74 MHz (8)

1	2	3	4		5		6	7	8	9
ALG 252B	-25.0	8	1.6	25.5	3.64	2.16	152	1	62.8	
AND 341B	-37.0	8	1.6	42.5	0.60	0.60	0	2	61.5	1/0.5
ARS 003B	17.0	8	41.1	23.8	3.52	1.68	134	2	62.8	
AUS 007B	128.0	8	145.0	-38.1	1.83	1.39	134	2	63.4	
AUT 016B	-19.0	8	12.2	47.5	1.14	0.63	166	2	64.2	
BUL 020B	-1.0	8	25.0	43.0	1.04	0.60	165	1	63.7	
CHN 156B	62.0	8	97.8	36.3	2.56	1.58	157	1	63.5	
CHN 173A	92.0	8	115.7	27.4	1.14	0.94	99	1	64.0	
CKN 053B	158.0	8	-163.0	-11.2	1.76	0.72	30	2	64.3	
CPV 301B	-31.0	8	-24.0	16.0	0.86	0.70	144	2	62.2	
EGY 026B	-7.0	8	29.7	26.8	2.33	1.72	136	2	63.2	
G 027B	-31.0	8	-3.5	53.8	1.84	0.72	142	1	65.1	
IND 040B	56.0	8	73.0	25.0	1.82	1.48	58	2	63.7	
IND 048B	68.0	8	86.2	25.0	1.56	0.90	120	2	63.7	
INS 028D	80.0	8	101.5	0.0	3.00	1.20	133	2	63.4	
KOR 112D	110.0	8	127.5	36.0	1.24	1.02	168	2	63.7	
LAO 284D	74.0	8	103.7	18.1	2.16	0.78	133	1	63.8	
MAU 243B	29.0	8	56.8	-13.9	1.56	1.38	65	1	63.8	
MLA 228D	86.0	8	114.1	3.9	2.34	1.12	45	1	63.7	
MLI 328B	-37.0	8	-7.6	13.2	1.74	1.24	171	1	63.8	
MLT 147B	-13.0	8	14.3	35.9	0.60	0.60	0	1	61.0	1/0.7
MOZ 307B	-1.0	8	34.0	-18.0	3.57	1.38	55	2	64.2	
OCE 101B	-160.0	8	-145.0	-16.3	4.34	3.54	4	2	63.6	
PAK 283B	38.0	8	74.7	33.9	1.34	1.13	160	1	64.3	
PNG 271B	128.0	8	148.0	-6.7	2.80	2.05	155	1	63.4	
RRW 310B	11.0	8	30.0	-2.1	0.66	0.60	42	2	64.9	
S 138B	5.0	8	16.2	61.0	1.04	0.98	14	2	67.1	
STP 241B	-13.0	8	7.0	0.8	0.60	0.60	0	2	61.5	1/1.3
TON 215B	170.0	8	-174.7	-18.0	1.41	0.68	85	1	63.3	
URS 060B	23.0	8	41.5	57.4	3.08	1.56	153	1	66.8	
ZAI 322B	-19.0	8	22.4	0.0	2.16	1.88	48	1	64.8	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4		5		6	7	8	9

11 880,92 MHz (9)

1	2	3	4		5		6	7	8	9
AFG 246C	50.0	9	64.5	33.1	1.44	1.40	21	1	63.4	
AUS 005C	98.0	9	133.5	-18.8	2.70	1.40	76	2	64.4	
CAR 338C	122.0	9	149.5	8.0	5.36	0.77	178	1	62.6	
CHN 155C	62.0	9	88.3	31.5	3.38	1.45	162	2	63.0	
CHN 162C	92.0	9	115.9	21.0	2.74	2.42	23	2	64.0	
CHN 165A	80.0	9	111.4	41.8	1.58	1.20	15	1	63.6	
CME 300C	-13.0	9	12.7	6.2	2.54	1.68	87	1	63.5	
F 093C	-19.0	9	2.6	45.9	2.50	0.98	160	1	63.9	
FJI 193C	152.0	9	179.4	-17.9	1.04	0.98	67	1	63.8	
GUI 192C	-37.0	9	-11.0	10.2	1.58	1.04	147	2	63.5	
IND 039C	56.0	9	72.7	11.2	1.26	0.60	107	1	63.2	
IND 044C	68.0	9	79.5	22.3	2.19	1.42	146	1	63.5	
INS 035C	104.0	9	124.3	-3.2	3.34	1.94	82	1	63.3	
J 111E	110.0	9	134.5	31.5	3.52	3.30	68	1	64.3	
LBY 280C	-25.0	9	21.4	26.0	2.50	1.04	119	2	63.6	
MDG 236C	29.0	9	46.6	-18.8	2.72	1.14	65	2	63.4	
NZL 055C	158.0	9	172.3	-39.7	2.88	1.56	47	1	63.4	
PLM 337C	170.0	9	-161.4	7.0	0.60	0.60	0	1	62.5	
POL 132C	-1.0	9	19.3	51.8	1.46	0.64	162	2	64.2	
QAT 247C	17.0	9	51.1	25.3	0.60	0.60	0	1	61.9	1/1.6
SMA 335C	170.0	9	-170.1	-14.2	0.60	0.60	0	2	61.3	1/0.9
SMR 311C	-37.0	9	12.6	43.7	0.60	0.60	0	1	62.5	1/0.8
SWZ 313C	-1.0	9	31.5	-26.5	0.62	0.60	66	1	62.9	1/1.7
THA 142C	74.0	9	100.7	13.2	2.82	1.54	106	2	63.7	
TUR 145C	5.0	9	34.4	38.9	2.68	1.04	168	1	63.8	
URS 064C	23.0	9	45.6	40.8	2.16	0.60	163	2	64.0	
URS 067C	44.0	9	62.4	58.5	3.20	1.52	169	1	66.4	
WAK 334C	140.0	9	166.5	19.2	0.60	0.60	0	1	63.7	
YMS 267C	11.0	9	48.8	15.2	1.76	1.54	176	2	62.9	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
ALG 251C	-25.0	10	4.2	33.2	2.45	1.25	172	1	63.5	
ARS 275C	17.0	10	48.3	24.6	3.84	1.20	138	2	62.9	
AUS 006C	98.0	10	135.4	-30.3	2.00	1.40	44	1	63.3	
AUS 008C	128.0	10	145.9	-21.5	2.90	2.00	120	2	63.8	
BOT 297C	-1.0	10	23.3	-22.2	2.13	1.50	36	2	63.9	
CHN 154C	62.0	10	83.9	40.5	2.75	2.05	177	1	63.3	
CHN 171A	92.0	10	117.2	32.0	1.20	0.74	126	1	64.2	
CHN 187A	80.0	10	106.6	26.7	1.14	0.94	179	2	64.0	
CKH 052C	158.0	10	-161.0	-19.8	1.02	0.64	132	2	64.7	
CLN 219C	50.0	10	80.6	7.7	1.18	0.60	106	1	63.7	
D 087C	-19.0	10	9.6	49.9	1.62	0.72	147	2	65.6	
FNL 103C	5.0	10	22.5	64.5	1.38	0.76	171	2	67.9	
GNP 304C	-31.0	10	-15.0	12.0	0.90	0.60	172	2	63.2	
GUM 331C	122.0	10	144.5	13.1	0.60	0.60	0	2	63.4	
IND 037C	68.0	10	93.0	25.5	1.46	1.13	40	2	64.0	
IND 045C	56.0	10	76.2	19.5	1.58	1.58	21	2	63.6	
IRL 211C	-31.0	10	-8.2	53.2	0.84	0.60	162	1	64.4	
KOR 112E	110.0	10	127.5	36.0	1.24	1.02	168	2	63.7	
LAO 284E	74.0	10	103.7	18.1	2.16	0.78	133	1	63.9	
MAU 242C	29.0	10	59.8	-18.9	1.62	1.24	55	1	64.1	
MLI 327C	-37.0	10	-2.0	19.0	2.66	1.26	127	1	63.2	
MRL 333C	146.0	10	166.7	7.9	1.50	1.50	177	1	63.4	
NCL 100C	140.0	10	166.0	-21.0	1.14	0.72	146	1	63.8	
PAK 127C	38.0	10	69.6	29.5	2.30	2.16	14	1	64.0	
PNG 131C	110.0	10	147.7	-6.3	2.50	2.18	169	1	64.5	
ROU 136C	-1.0	10	25.0	45.7	1.38	0.66	155	1	63.9	
TCD 143C	-13.0	10	18.1	15.5	3.40	1.72	107	2	64.1	
TGO 226C	-25.0	10	0.8	8.6	1.52	0.60	105	2	63.5	
WAL 102C	140.0	10	-176.8	-14.0	0.74	0.60	29	1	64.5	
YEM 266C	11.0	10	44.3	15.1	1.14	0.70	109	1	62.7	
ZAI 323C	-19.0	10	21.3	-6.8	2.80	1.52	149	1	64.7	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

11 919,28 MHz (11)

1	2	3	4		5		6	7	8	9
AFG 245C	50.0	11	70.2	35.5	1.32	1.13	53	1	62.9	
AUS 004C	98.0	11	121.8	-24.9	3.60	1.90	54	2	63.1	
AUS 009C	128.0	11	147.2	-32.0	2.10	1.40	15	1	64.2	
AZR 134C	-31.0	11	-23.4	36.1	2.56	0.70	158	2	63.1	
BEN 233C	-19.0	11	2.2	9.5	1.44	0.68	97	2	63.4	
CHN 157C	62.0	11	102.3	27.8	2.56	1.58	127	2	65.2	
CHN 160C	92.0	11	122.8	45.3	2.50	1.45	150	2	65.2	
COM 207C	29.0	11	44.1	-12.1	0.76	0.60	149	2	63.2	
GAB 260C	-13.0	11	11.8	-0.6	1.43	1.12	64	1	63.4	
GMB 302C	-37.0	11	-15.1	13.4	0.79	0.60	4	2	63.4	
GRC 105C	5.0	11	24.7	38.2	1.78	0.98	156	1	63.4	
IND 043C	56.0	11	77.8	11.1	1.36	1.28	172	1	63.5	
IND 047C	68.0	11	93.3	11.1	1.92	0.60	96	1	63.5	
INS 036C	104.0	11	135.2	-3.8	2.46	2.00	147	1	63.9	
IRN 109C	34.0	11	54.2	32.4	3.82	1.82	149	2	62.9	
J 111F	110.0	11	134.5	31.5	3.52	3.30	68	1	64.3	
LBN 279C	11.0	11	35.8	33.9	0.60	0.60	0	2	61.7	1/1.8
LBR 244C	-31.0	11	-9.3	6.6	1.22	0.70	133	1	63.3	
LBY 321C	-25.0	11	13.1	27.2	2.36	1.12	129	2	63.1	
LIE 253C	-37.0	11	9.5	47.1	0.60	0.60	0	1	62.5	1/0.7
LUX 114C	-19.0	11	6.0	49.8	0.60	0.60	0	1	63.0	1/2.0
MRA 332C	122.0	11	145.9	16.9	1.20	0.60	76	1	63.6	
NHB 128C	140.0	11	168.0	-16.4	1.52	0.68	87	2	63.0	
NRU 309C	134.0	11	167.0	-0.5	0.60	0.60	0	2	62.6	
POR 133C	-31.0	11	-8.0	39.6	0.92	0.60	112	2	63.5	
SMO 057C	158.0	11	-172.3	-13.7	0.60	0.60	0	1	63.8	
SNG 151C	74.0	11	103.8	1.3	0.60	0.60	0	2	63.7	
SOM 312C	23.0	11	45.0	6.4	3.26	1.54	71	1	62.4	
TCH 144C	-1.0	11	17.3	49.3	1.47	0.60	170	2	63.9	
UGA 051C	11.0	11	32.3	1.2	1.46	1.12	60	1	63.3	
URS 061C	23.0	11	24.7	56.6	0.88	0.64	12	2	65.1	
VTN 325C	86.0	11	105.3	16.1	3.03	1.40	116	2	63.5	
ZMB 314C	-1.0	11	27.5	-13.1	2.38	1.48	39	1	63.8	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
ALG 252C	-25.0	12	1.6	25.5	3.64	2.16	152	1	62.9	
AND 341C	-37.0	12	1.6	42.5	0.60	0.60	0	2	61.6	1/0.5
ARS 003C	17.0	12	41.1	23.8	3.52	1.68	134	2	62.8	
AUS 007C	128.0	12	145.0	-38.1	1.83	1.39	134	2	63.4	
AUT 016C	-19.0	12	12.2	47.5	1.14	0.63	166	2	64.2	
BRU 330A	74.0	12	114.7	4.4	0.60	0.60	0	1	62.5	1/1.3
BUL 020C	-1.0	12	25.0	43.0	1.04	0.60	165	1	63.8	
CHN 156C	62.0	12	97.8	36.3	2.56	1.58	157	1	63.6	
CHN 170A	92.0	12	119.5	33.0	1.34	0.64	155	1	64.4	
CHN 178A	80.0	12	111.5	27.4	1.22	0.86	130	2	64.4	
CKN 053C	158.0	12	-163.0	-11.2	1.76	0.72	30	2	64.4	
CPV 301C	-31.0	12	-24.0	16.0	0.86	0.70	144	2	62.3	
DNK 089A	5.0	12	12.3	57.1	1.20	0.60	177	2	64.3	
EGY 026C	-7.0	12	29.7	26.8	2.33	1.72	136	2	63.2	
G 027C	-31.0	12	-3.5	53.8	1.84	0.72	142	1	65.1	
IND 040C	56.0	12	73.0	25.0	1.82	1.48	58	2	63.8	
IND 048C	68.0	12	86.2	25.0	1.56	0.90	120	2	63.8	
KOR 112F	110.0	12	127.5	36.0	1.24	1.02	168	2	63.7	
MAU 243C	29.0	12	56.8	-13.9	1.56	1.38	65	1	63.8	
MLD 306A	44.0	12	73.1	6.0	0.96	0.60	90	1	63.7	
MLI 328C	-37.0	12	-7.6	13.2	1.74	1.24	171	1	63.8	
MLT 147C	-13.0	12	14.3	35.9	0.60	0.60	0	1	61.1	1/0.7
MOZ 307C	-1.0	12	34.0	-18.0	3.57	1.38	55	2	64.3	
OCE 101C	-160.0	12	-145.0	-16.3	4.34	3.54	4	2	63.6	
PAK 210A	38.0	12	72.1	30.8	1.16	0.72	90	1	63.5	
PNG 271C	128.0	12	148.0	-6.7	2.80	2.05	155	1	63.5	
RRW 310C	11.0	12	30.0	-2.1	0.66	0.60	42	2	64.9	
STP 241C	-13.0	12	7.0	0.8	0.60	0.60	0	2	61.5	1/1.3
TON 215C	170.0	12	-174.7	-18.0	1.41	0.68	85	1	63.4	
URS 060C	23.0	12	41.5	57.4	3.08	1.56	153	1	66.9	
URS 069A	44.0	12	70.8	38.5	1.36	0.74	161	2	64.1	
ZAI 322C	-19.0	12	22.4	0.0	2.16	1.88	48	1	64.8	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AFG 246D	50.0	13	64.5	33.1	1.44	1.40	21	1	63.4	
AUS 005D	98.0	13	133.5	-18.8	2.70	1.40	76	2	64.4	
CAR 338D	122.0	13	149.5	8.0	5.36	0.77	178	1	62.6	
CHN 155D	62.0	13	88.3	31.5	3.38	1.45	162	2	63.0	
CHN 180A	92.0	13	113.7	12.9	3.76	2.18	72	2	63.6	
CME 300D	-13.0	13	12.7	6.2	2.54	1.68	87	1	63.6	
F 093D	-19.0	13	2.6	45.9	2.50	0.98	160	1	64.0	
GUI 192D	-37.0	13	-11.0	10.2	1.58	1.04	147	2	63.6	
IND 039D	56.0	13	72.7	11.2	1.26	0.60	107	1	63.3	
IND 044D	68.0	13	79.5	22.3	2.19	1.42	146	1	63.5	
INS 035D	104.0	13	124.3	-3.2	3.34	1.94	82	1	63.4	
J 111G	110.0	13	134.5	31.5	3.52	3.30	68	1	64.3	
LBY 280D	-25.0	13	21.4	26.0	2.50	1.04	119	2	63.6	
MDG 236D	29.0	13	46.6	-18.8	2.72	1.14	65	2	63.5	
NZL 055D	158.0	13	172.3	-39.7	2.88	1.56	47	1	63.5	
NZL 287A	128.0	13	173.0	-41.0	3.30	1.28	48	1	64.8	
PLM 337D	170.0	13	-161.4	7.0	0.60	0.60	0	1	62.6	
POL 132D	-1.0	13	19.3	51.8	1.46	0.64	162	2	64.3	
QAT 247D	17.0	13	51.1	25.3	0.60	0.60	0	1	62.0	1/1.6
SMA 335D	170.0	13	-170.1	-14.2	0.60	0.60	0	2	61.3	1/0.9
SMR 311D	-37.0	13	12.6	43.7	0.60	0.60	0	1	62.6	1/0.8
SWZ 313D	-1.0	13	31.5	-26.5	0.62	0.60	66	1	63.0	1/1.7
THA 142D	74.0	13	100.7	13.2	2.82	1.54	106	2	63.8	
TUR 145D	5.0	13	34.4	38.9	2.68	1.04	168	1	63.9	
URS 064D	23.0	13	45.6	40.8	2.16	0.60	163	2	64.1	
URS 067D	44.0	13	62.4	58.5	3.20	1.52	169	1	66.5	
WAK 334D	140.0	13	166.5	19.2	0.60	0.60	0	1	63.7	
YMS 267D	11.0	13	48.8	15.2	1.76	1.54	176	2	63.0	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

11 976,82 MHz (14)

1	2	3	4		5		6	7	8	9
ALG 251D	-25.0	14	4.2	33.2	2.45	1.25	172	1	63.6	
ARS 275D	17.0	14	48.3	24.6	3.84	1.20	138	2	63.0	
AUS 006D	98.0	14	135.4	-30.3	2.00	1.40	44	1	63.4	
AUS 008D	128.0	14	145.9	-21.5	2.90	2.00	120	2	63.9	
BOT 297D	-1.0	14	23.3	-22.2	2.13	1.50	36	2	63.9	
BRU 330B	74.0	14	114.7	4.4	0.60	0.60	0	1	62.6	1/1.3
CHN 154D	62.0	14	83.9	40.5	2.75	2.05	177	1	63.4	
CHN 172A	92.0	14	120.4	29.1	0.96	0.84	123	1	64.3	
CHN 181A	80.0	14	108.5	23.8	1.41	1.08	153	2	64.1	
CKH 052D	158.0	14	-161.0	-19.8	1.02	0.64	132	2	64.8	
CLN 219D	50.0	14	80.6	7.7	1.18	0.60	106	1	63.8	
D 087D	-19.0	14	9.6	49.9	1.62	0.72	147	2	65.7	
GNP 304D	-31.0	14	-15.0	12.0	0.90	0.60	172	2	63.3	
GUM 331D	122.0	14	144.5	13.1	0.60	0.60	0	2	63.5	
IND 037D	68.0	14	93.0	25.5	1.46	1.13	40	2	64.1	
IND 045D	56.0	14	76.2	19.5	1.58	1.58	21	2	63.7	
IRL 211D	-31.0	14	-8.2	53.2	0.84	0.60	162	1	64.4	
KRE 286A	110.0	14	127.0	39.1	1.30	1.10	31	2	64.0	
MAU 242D	29.0	14	59.8	-18.9	1.62	1.24	55	1	64.1	
MLI 327D	-37.0	14	-2.0	19.0	2.66	1.26	127	1	63.2	
MRL 333D	146.0	14	166.7	7.9	1.50	1.50	177	1	63.5	
NCL 100D	140.0	14	166.0	-21.0	1.14	0.72	146	1	63.9	
NOR 120A	5.0	14	13.1	64.1	1.84	0.88	10	2	65.0	
PAK 210B	38.0	14	72.1	30.8	1.16	0.72	90	1	63.6	
PNG 131D	110.0	14	147.7	-6.3	2.50	2.18	169	1	64.6	
ROU 136D	-1.0	14	25.0	45.7	1.38	0.66	155	1	64.0	
TCD 143D	-13.0	14	18.1	15.5	3.40	1.72	107	2	64.1	
TGO 226D	-25.0	14	0.8	8.6	1.52	0.60	105	2	63.5	
WAL 102D	140.0	14	-176.8	-14.0	0.74	0.60	29	1	64.6	
YEM 266D	11.0	14	44.3	15.1	1.14	0.70	109	1	62.8	
ZAI 323D	-19.0	14	21.3	-6.8	2.80	1.52	149	1	64.8	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AFG 245D	50.0	15	70.2	35.5	1.32	1.13	53	1	63.0	
AUS 004D	98.0	15	121.8	-24.9	3.60	1.90	54	2	63.2	
AUS 009D	128.0	15	147.2	-32.0	2.10	1.40	15	1	64.2	
AZR 134D	-31.0	15	-23.4	36.1	2.56	0.70	158	2	63.2	
BEN 233D	-19.0	15	2.2	9.5	1.44	0.68	97	2	63.4	
BGD 220A	74.0	15	90.3	23.6	1.46	0.84	135	1	63.7	
CHN 158A	80.0	15	111.8	38.0	2.60	1.74	124	1	64.9	
CHN 174A	92.0	15	118.1	25.9	1.02	0.84	82	2	64.1	
COM 207D	29.0	15	44.1	-12.1	0.76	0.60	149	2	63.3	
GAB 260D	-13.0	15	11.8	-0.6	1.43	1.12	64	1	63.5	
GMB 302D	-37.0	15	-15.1	13.4	0.79	0.60	4	2	63.5	
GRC 105D	5.0	15	24.7	38.2	1.78	0.98	156	1	63.5	
IND 043D	56.0	15	77.8	11.1	1.36	1.28	172	1	63.5	
IND 047D	68.0	15	93.3	11.1	1.92	0.60	96	1	63.6	
INS 036D	104.0	15	135.2	-3.8	2.46	2.00	147	1	63.9	
IRN 109D	34.0	15	54.2	32.4	3.82	1.82	149	2	63.0	
J 111H	110.0	15	134.5	31.5	3.52	3.30	68	1	64.4	
LBN 279D	11.0	15	35.8	33.9	0.60	0.60	0	2	61.8	1/1.8
LBR 244D	-31.0	15	-9.3	6.6	1.22	0.70	133	1	63.4	
LBY 321D	-25.0	15	13.1	27.2	2.36	1.12	129	2	63.2	
LIE 253D	-37.0	15	9.5	47.1	0.60	0.60	0	1	62.6	1/0.7
LUX 114D	-19.0	15	6.0	49.8	0.60	0.60	0	1	63.1	1/2.0
MRA 332D	122.0	15	145.9	16.9	1.20	0.60	76	1	63.6	
NHB 128D	140.0	15	168.0	-16.4	1.52	0.68	87	2	63.0	
NRU 309D	134.0	15	167.0	-0.5	0.60	0.60	0	2	62.7	
POR 133D	-31.0	15	-8.0	39.6	0.92	0.60	112	2	63.6	
SMO 057D	158.0	15	-172.3	-13.7	0.60	0.60	0	1	63.8	
SNG 151D	74.0	15	103.8	1.3	0.60	0.60	0	2	63.7	
SOM 312D	23.0	15	45.0	6.4	3.26	1.54	71	1	62.5	
TCH 144D	-1.0	15	17.3	49.3	1.47	0.60	170	2	64.0	
UGA 051D	11.0	15	32.3	1.2	1.46	1.12	60	1	63.4	
URS 061D	23.0	15	24.7	56.6	0.88	0.64	12	2	65.2	
VTN 325D	86.0	15	105.3	16.1	3.03	1.40	116	2	63.6	
ZMB 314D	-1.0	15	27.5	-13.1	2.38	1.48	39	1	63.9	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

1	2	3	4		5		6	7	8	9
ALG 252D	-25.0	16	1.6	25.5	3.64	2.16	152	1	63.0	
AND 341D	-37.0	16	1.6	42.5	0.60	0.60	0	2	61.6	1/0.5
ARS 003D	17.0	16	41.1	23.8	3.52	1.68	134	2	62.8	
AUS 007D	128.0	16	145.0	-38.1	1.83	1.39	134	2	63.5	
AUT 016D	-19.0	16	12.2	47.5	1.14	0.63	166	2	64.3	
BUL 020D	-1.0	16	25.0	43.0	1.04	0.60	165	1	63.8	
CHN 169A	92.0	16	118.5	36.4	1.16	0.76	11	1	64.7	
CHN 186A	62.0	16	102.5	30.2	1.91	1.23	147	2	65.5	
CKN 053D	158.0	16	-163.0	-11.2	1.76	0.72	30	2	64.5	
CPV 301D	-31.0	16	-24.0	16.0	0.86	0.70	144	2	62.4	
DNK 089B	5.0	16	12.3	57.1	1.20	0.60	177	2	64.4	
EGY 026D	-7.0	16	29.7	26.8	2.33	1.72	136	2	63.3	
G 027D	-31.0	16	-3.5	53.8	1.84	0.72	142	1	65.2	
IND 040D	56.0	16	73.0	25.0	1.82	1.48	58	2	63.8	
IND 048D	68.0	16	86.2	25.0	1.56	0.90	120	2	65.5	
KRE 286B	110.0	16	127.0	39.1	1.30	1.10	31	2	64.0	
MAU 243D	29.0	16	56.8	-13.9	1.56	1.38	65	1	63.9	
MLA 227A	86.0	16	102.1	4.1	1.62	0.82	135	1	63.2	2
MLD 306B	44.0	16	73.1	6.0	0.96	0.60	90	1	63.7	
MLI 328D	-37.0	16	-7.6	13.2	1.74	1.24	171	1	63.9	
MLT 147D	-13.0	16	14.3	35.9	0.60	0.60	0	1	61.2	1/0.7
MOZ 307D	-1.0	16	34.0	-18.0	3.57	1.38	55	2	64.4	
OCE 101D	-160.0	16	-145.0	-16.3	4.34	3.54	4	2	63.7	
PHL 285A	98.0	16	121.3	11.1	3.46	1.76	99	2	63.7	
RRW 310D	11.0	16	30.0	-2.1	0.66	0.60	42	2	65.0	
STP 241D	-13.0	16	7.0	0.8	0.60	0.60	0	2	61.6	1/1.3
TON 215D	170.0	16	-174.7	-18.0	1.41	0.68	85	1	63.5	
URS 060D	23.0	16	41.5	57.4	3.08	1.56	153	1	66.9	
URS 069B	44.0	16	70.8	38.5	1.36	0.74	161	2	64.1	
ZAI 322D	-19.0	16	22.4	0.0	2.16	1.88	48	1	64.9	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AUS 005E	98.0	17	133.5	-18.8	2.70	1.40	76	2	64.5	
BRM 298A	74.0	17	97.1	19.1	3.58	1.48	104	2	63.9	
CAR 338E	122.0	17	149.5	8.0	5.36	0.77	178	1	62.7	
CHN 167A	92.0	17	124.3	43.7	1.98	0.72	156	2	64.7	
CHN 182A	80.0	17	108.7	35.1	1.42	0.88	109	1	64.2	
CME 300E	-13.0	17	12.7	6.2	2.54	1.68	87	1	63.6	
F 093E	-19.0	17	2.6	45.9	2.50	0.98	160	1	64.0	
GUI 192E	-37.0	17	-11.0	10.2	1.58	1.04	147	2	63.7	
IND 038A	56.0	17	75.9	33.4	1.52	1.08	33	1	64.3	
IND 046A	68.0	17	84.7	20.5	1.60	0.86	30	1	63.6	
INS 032A	80.0	17	112.3	-0.3	2.66	2.32	109	2	64.0	
LBY 280E	-25.0	17	21.4	26.0	2.50	1.04	119	2	63.7	
MDG 236E	29.0	17	46.6	-18.8	2.72	1.14	65	2	63.5	
NPL 122A	50.0	17	83.7	28.3	1.72	0.60	163	2	64.6	
NZL 287B	128.0	17	173.0	-41.0	3.30	1.28	48	1	64.8	
PLM 337E	170.0	17	-161.4	7.0	0.60	0.60	0	1	62.6	
POL 132E	-1.0	17	19.3	51.8	1.46	0.64	162	2	64.3	
QAT 247E	17.0	17	51.1	25.3	0.60	0.60	0	1	62.0	1/1.6 2
SMA 335E	170.0	17	-170.1	-14.2	0.60	0.60	0	2	61.4	1/0.9
SMR 311E	-37.0	17	12.6	43.7	0.60	0.60	0	1	62.7	1/0.8
SWZ 313E	-1.0	17	31.5	-26.5	0.62	0.60	66	1	63.0	1/1.7
TUR 145E	5.0	17	34.4	38.9	2.68	1.04	168	1	63.9	
URS 064E	23.0	17	45.6	40.8	2.16	0.60	163	2	64.1	
WAK 334E	140.0	17	166.5	19.2	0.60	0.60	0	1	63.8	
YMS 267E	11.0	17	48.8	15.2	1.76	1.54	176	2	63.0	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
ALG 251E	-25.0	18	4.2	33.2	2.45	1.25	172	1	63.6	
ARS 275E	17.0	18	48.3	24.6	3.84	1.20	138	2	63.0	
AUS 006E	98.0	18	135.4	-30.3	2.00	1.40	44	1	63.4	
AUS 008E	128.0	18	145.9	-21.5	2.90	2.00	120	2	63.9	
BGD 220B	74.0	18	90.3	23.6	1.46	0.84	135	1	63.7	
BOT 297E	-1.0	18	23.3	-22.2	2.13	1.50	36	2	64.0	
CBG 299A	68.0	18	105.0	12.7	1.01	0.90	110	1	64.3	
CHN 159A	80.0	18	109.4	27.3	2.14	1.72	107	2	64.5	
CHN 185A	62.0	18	95.7	35.4	2.10	1.14	156	1	63.4	
D 087F	-19.0	18	9.6	49.9	1.62	0.72	147	2	65.7	
GNP 304E	-31.0	18	-15.0	12.0	0.90	0.60	172	2	63.3	
GUM 331E	122.0	18	144.5	13.1	0.60	0.60	0	2	63.5	
IND 041A	56.0	18	78.4	16.0	2.08	1.38	35	2	63.8	
IND 042A	68.0	18	79.3	27.7	2.14	1.16	147	2	63.8	
INS 030A	80.0	18	112.3	-8.1	3.14	1.46	169	1	64.2	
IRL 211E	-31.0	18	-8.2	53.2	0.84	0.60	162	1	64.5	
KRE 286C	110.0	18	127.0	39.1	1.30	1.10	31	2	64.0	
MAU 242E	29.0	18	59.8	-18.9	1.62	1.24	55	1	64.2	
MLA 227B	86.0	18	102.1	4.1	1.62	0.82	135	1	63.3	
MLI 327E	-37.0	18	-2.0	19.0	2.66	1.26	127	1	63.2	
MRL 333E	146.0	18	166.7	7.9	1.50	1.50	177	1	63.5	
NOR 120B	5.0	18	13.1	64.1	1.84	0.88	10	2	65.0	
PAK 281A	38.0	18	65.2	27.9	1.52	1.42	28	1	63.0	
PHL 285B	98.0	18	121.3	11.1	3.46	1.76	99	2	63.7	
ROU 136E	-1.0	18	25.0	45.7	1.38	0.66	155	1	64.0	
TCD 143E	-13.0	18	18.1	15.5	3.40	1.72	107	2	64.2	
TGO 226E	-25.0	18	0.8	8.6	1.52	0.60	105	2	63.6	
URS 070A	44.0	18	73.9	41.0	1.34	0.84	5	2	64.5	
YEM 266E	11.0	18	44.3	15.1	1.14	0.70	109	1	62.8	
ZAI 323E	-19.0	18	21.3	-6.8	2.80	1.52	149	1	64.9	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AUS 004E	98.0	19	121.8	-24.9	3.60	1.90	54	2	63.2	
AUS 009E	128.0	19	147.2	-32.0	2.10	1.40	15	1	64.3	
AZR 134E	-31.0	19	-23.4	36.1	2.56	0.70	158	2	63.2	
BEN 233E	-19.0	19	2.2	9.5	1.44	0.68	97	2	63.5	
BRM 298B	74.0	19	97.1	19.1	3.58	1.48	104	2	63.9	
CHN 158B	80.0	19	111.8	38.0	2.60	1.74	124	1	64.9	
CHN 179A	92.0	19	112.2	21.9	1.84	1.22	37	2	63.8	
GAB 260E	-13.0	19	11.8	-0.6	1.43	1.12	64	1	63.6	
GMB 302E	-37.0	19	-15.1	13.4	0.79	0.60	4	2	63.5	
GRC 105E	5.0	19	24.7	38.2	1.78	0.98	156	1	63.5	
IND 038B	56.0	19	75.9	33.4	1.52	1.08	33	1	64.3	
IND 046B	68.0	19	84.7	20.5	1.60	0.86	30	1	63.6	
INS 032B	80.0	19	112.3	-0.3	2.66	2.32	109	2	64.1	
INS 036E	104.0	19	135.2	-3.8	2.46	2.00	147	1	64.0	2
IRN 109E	34.0	19	54.2	32.4	3.82	1.82	149	2	63.0	
LBN 279E	11.0	19	35.8	33.9	0.60	0.60	0	2	61.8	1/1.8
LBY 321E	-25.0	19	13.1	27.2	2.36	1.12	129	2	63.3	
LIE 253E	-37.0	19	9.5	47.1	0.60	0.60	0	1	62.6	1/0.7
LUX 114E	-19.0	19	6.0	49.8	0.60	0.60	0	1	63.1	1/2.0
MRA 332E	122.0	19	145.9	16.9	1.20	0.60	76	1	63.7	
NIU 054A	158.0	19	-169.8	-19.0	0.60	0.60	0	2	64.1	
NPL 122B	50.0	19	83.7	28.3	1.72	0.60	163	2	64.6	
POR 133E	-31.0	19	-8.0	39.6	0.92	0.60	112	2	63.6	
SOM 312E	23.0	19	45.0	6.4	3.26	1.54	71	1	62.6	
TCH 144E	-1.0	19	17.3	49.3	1.47	0.60	170	2	64.0	
UGA 051E	11.0	19	32.3	1.2	1.46	1.12	60	1	63.4	
URS 061E	23.0	19	24.7	56.6	0.88	0.64	12	2	65.2	
URS 077A	110.0	19	112.7	57.3	2.67	1.75	2	1	64.1	
ZMB 314E	-1.0	19	27.5	-13.1	2.38	1.48	39	1	63.9	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
ALG 252E	-25.0	20	1.6	25.5	3.64	2.16	152	1	63.0	
AND 341E	-37.0	20	1.6	42.5	0.60	0.60	0	2	61.7	1/0.5
ARS 003E	17.0	20	41.1	23.8	3.52	1.68	134	2	62.9	
AUS 007E	128.0	20	145.0	-38.1	1.83	1.39	134	2	63.5	
AUT 016E	-19.0	20	12.2	47.5	1.14	0.63	166	2	64.3	
BGD 220C	74.0	20	90.3	23.6	1.46	0.84	135	1	63.7	
BUL 020E	-1.0	20	25.0	43.0	1.04	0.60	165	1	63.9	
CBG 299B	68.0	20	105.0	12.7	1.01	0.90	110	1	64.3	
CHN 159B	80.0	20	109.4	27.3	2.14	1.72	107	2	64.6	
CHN 184A	62.0	20	101.0	37.9	2.78	0.82	144	1	63.7	
CPV 301E	-31.0	20	-24.0	16.0	0.86	0.70	144	2	62.4	
DNK 089C	5.0	20	12.3	57.1	1.20	0.60	177	2	64.4	
EGY 026E	-7.0	20	29.7	26.8	2.33	1.72	136	2	63.3	
G 027E	-31.0	20	-3.5	53.8	1.84	0.72	142	1	65.2	
IND 041B	56.0	20	78.4	16.0	2.08	1.38	35	2	63.8	
IND 042B	68.0	20	79.3	27.7	2.14	1.16	147	2	63.8	
INS 030B	80.0	20	112.3	-8.1	3.14	1.46	169	1	64.2	
KRE 286D	110.0	20	127.0	39.1	1.30	1.10	31	2	64.0	
MLA 227C	86.0	20	102.1	4.1	1.62	0.82	135	1	63.3	
MLI 328E	-37.0	20	-7.6	13.2	1.74	1.24	171	1	63.9	
MOZ 307E	-1.0	20	34.0	-18.0	3.57	1.38	55	2	64.4	
PAK 282A	38.0	20	68.5	25.8	1.32	0.62	133	1	63.3	
PHL 285C	98.0	20	121.3	11.1	3.46	1.76	99	2	63.7	
RRW 310E	11.0	20	30.0	-2.1	0.66	0.60	42	2	65.0	
STP 241E	-13.0	20	7.0	0.8	0.60	0.60	0	2	61.7	1/1.3
TKL 058A	158.0	20	-171.8	-8.9	0.70	0.60	35	1	63.8	
URS 065A	23.0	20	32.4	63.1	1.18	0.60	175	1	66.6	
URS 066A	44.0	20	64.3	44.6	4.56	2.48	169	2	65.4	
URS 079A	140.0	20	138.0	53.6	3.16	2.12	62	2	67.7	
ZAI 322E	-19.0	20	22.4	0.0	2.16	1.88	48	1	64.9	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AFI 099A	23.0	21	42.5	11.6	0.60	0.60	0	1	62.5	
AUS 005F	98.0	21	133.5	-18.8	2.70	1.40	76	2	64.5	
BEL 018A	-19.0	21	4.6	50.6	0.82	0.60	167	1	64.2	
BLR 062A	23.0	21	27.8	52.6	1.08	0.72	1	2	64.8	
BRM 298C	74.0	21	97.1	19.1	3.58	1.48	104	2	63.9	
CHN 175A	92.0	21	121.4	23.8	1.14	0.82	64	2	64.3	
CHN 176A	80.0	21	113.7	33.9	1.20	0.80	141	1	64.3	
CYP 086A	5.0	21	33.3	35.1	0.60	0.60	0	1	63.6	
DDR 216A	-1.0	21	12.6	52.1	0.83	0.63	172	2	64.2	
HVO 107A	-31.0	21	-1.5	12.2	1.45	1.14	29	1	64.0	
IFB 021A	5.0	21	24.5	-28.0	3.13	1.68	27	2	64.1	4
IND 038C	56.0	21	75.9	33.4	1.52	1.08	33	1	64.4	
IND 046C	68.0	21	84.7	20.5	1.60	0.86	30	1	63.7	
INS 032C	80.0	21	112.3	-0.3	2.66	2.32	109	2	64.1	
ISL 049A	-31.0	21	-19.0	64.9	1.00	0.60	177	2	65.8	
KEN 249A	11.0	21	37.9	1.1	2.29	1.56	94	1	63.7	
MCO 116A	-37.0	21	7.4	43.7	0.60	0.60	0	1	62.4	1/0.5
MRC 209A	-25.0	21	-9.0	29.2	2.72	1.47	43	2	63.3	
NPL 122C	50.0	21	83.7	28.3	1.72	0.60	163	2	64.6	
NZL 287C	128.0	21	173.0	-41.0	3.30	1.28	48	1	64.9	
SEN 222A	-37.0	21	-14.4	13.8	1.46	1.04	139	2	63.6	
UAE 274A	17.0	21	53.6	24.2	0.98	0.80	162	1	63.2	2
YUG 148A	-7.0	21	18.4	43.7	1.68	0.66	154	1	65.2	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

1	2	3	4		5		6	7	8	9
ALB 296A	-7.0	22	19.8	41.3	0.68	0.60	146	2	63.8	
AUS 006F	98.0	22	135.4	-30.3	2.00	1.40	44	1	63.5	
AUS 008F	128.0	22	145.9	-21.5	2.90	2.00	120	2	64.0	
BDI 270A	11.0	22	29.9	-3.1	0.71	0.60	80	2	63.4	
BGD 220D	74.0	22	90.3	23.6	1.46	0.84	135	1	63.8	
CBG 299C	68.0	22	105.0	12.7	1.01	0.90	110	1	64.3	
CHN 159C	80.0	22	109.4	27.3	2.14	1.72	107	2	64.6	
CHN 168A	92.0	22	124.8	48.1	2.68	0.92	157	2	65.4	
CHN 183A	62.0	22	104.8	39.0	1.48	0.60	142	1	63.8	
COG 235A	-13.0	22	14.6	-0.7	2.02	1.18	59	2	63.8	
CTI 237A	-31.0	22	-5.6	7.5	1.60	1.22	108	2	63.7	
ETH 092A	23.0	22	39.7	9.1	3.50	2.40	124	2	63.4	
FNL 104A	5.0	22	17.0	61.5	2.00	1.00	10	2	67.7	
HNG 106A	-1.0	22	19.5	47.2	0.92	0.60	176	1	64.0	
IFB 135A	-1.0	22	29.6	-18.8	1.46	1.36	37	2	64.2	4
IND 041C	56.0	22	78.4	16.0	2.08	1.38	35	2	63.8	
IND 042C	68.0	22	79.3	27.7	2.14	1.16	147	2	63.8	
INS 030C	80.0	22	112.3	-8.1	3.14	1.46	169	1	64.2	
KRE 286E	110.0	22	127.0	39.1	1.30	1.10	31	2	64.1	
KWT 113A	17.0	22	47.6	29.2	0.68	0.60	145	2	63.1	
MLA 227D	86.0	22	102.1	4.1	1.62	0.82	135	1	63.3	
MTN 223A	-37.0	22	-12.2	18.5	2.62	1.87	150	1	62.8	
NIG 119A	-19.0	22	7.8	9.4	2.16	2.02	45	1	63.9	
PAK 281B	38.0	22	65.2	27.9	1.52	1.42	28	1	63.1	
PHL 285D	98.0	22	121.3	11.1	3.46	1.76	99	2	63.7	
REU 097A	29.0	22	55.6	-19.2	1.56	0.78	96	1	63.9	
SDN 231A	-7.0	22	28.9	12.7	2.26	1.96	159	1	63.5	
SUI 140A	-19.0	22	8.2	46.6	0.98	0.70	171	2	64.1	
SYR 229A	11.0	22	38.3	34.9	1.04	0.90	7	1	63.2	
TUN 150A	-25.0	22	9.5	33.5	1.88	0.72	135	1	63.8	
URS 070B	44.0	22	73.9	41.0	1.34	0.84	5	2	64.6	
URS 081A	140.0	22	168.5	65.5	1.96	0.60	168	1	68.1	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AGL 295A	-13.0	23	16.5	-12.0	3.09	2.26	84	1	64.1	
ARS 340A	17.0	23	52.3	24.8	2.68	0.70	143	1	63.2	
AUS 004F	98.0	23	121.8	-24.9	3.60	1.90	54	2	63.3	
AUS 009F	128.0	23	147.2	-32.0	2.10	1.40	15	1	64.3	
BRM 298D	74.0	23	97.1	19.1	3.58	1.48	104	2	64.0	
CHN 158C	80.0	23	111.8	38.0	2.60	1.74	124	1	65.0	
CNR 130A	-31.0	23	-15.7	28.4	1.54	0.60	5	2	62.8	
CVA 085A	-37.0	23	10.8	41.5	2.00	0.60	138	1	63.6	1/1.5
E 129A	-31.0	23	-3.1	39.9	2.10	1.14	154	2	63.9	
GHA 108A	-25.0	23	-1.2	7.9	1.48	1.06	102	1	63.6	
GNE 303A	-19.0	23	10.3	1.5	0.68	0.60	10	2	63.8	
HOL 213A	-19.0	23	5.4	52.0	0.76	0.60	171	1	64.4	
IND 038D	56.0	23	75.9	33.4	1.52	1.08	33	1	64.4	
IND 046D	68.0	23	84.7	20.5	1.60	0.86	30	1	63.7	
INS 032D	80.0	23	112.3	-0.3	2.66	2.32	109	2	64.1	
ISL 050A	5.0	23	-19.5	61.0	2.20	0.80	4	1	66.3	3
JOR 224A	11.0	23	35.8	31.4	0.84	0.78	114	2	63.1	
NIU 054B	158.0	23	-169.8	-19.0	0.60	0.60	0	2	64.1	
SDN 230A	-7.0	23	29.2	7.5	2.34	1.12	148	2	64.4	
SRL 259A	-31.0	23	-11.8	8.6	0.78	0.68	114	1	63.4	
TGK 225A	11.0	23	34.6	-6.2	2.41	1.72	129	1	63.7	
URS 061F	23.0	23	24.7	56.6	0.88	0.64	12	2	65.3	
URS 064F	23.0	23	45.6	40.8	2.16	0.60	163	1	64.2	
URS 077B	110.0	23	112.7	57.3	2.67	1.75	2	1	66.1	
YUG 149A	-7.0	23	18.4	43.7	1.68	0.66	154	1	65.2	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

1	2	3	4		5		6	7	8	9
AUS 007F	128.0	24	145.0	-38.1	1.83	1.39	134	2	63.6	
BGD 220E	74.0	24	90.3	23.6	1.46	0.84	135	1	63.8	
CAF 258A	-13.0	24	21.0	6.3	2.25	1.68	31	2	64.3	
CBG 299D	68.0	24	105.0	12.7	1.01	0.90	110	1	64.3	
CHN 166A	92.0	24	121.1	41.7	1.52	0.78	154	2	64.5	
CHN 177A	80.0	24	111.8	30.8	1.42	0.82	160	2	64.7	
CHN 188A	62.0	24	101.5	25.1	1.86	1.08	132	2	65.0	
DNK 090A	5.0	24	17.0	61.5	2.00	1.00	10	2	67.5	
I 082A	-19.0	24	12.3	41.3	2.38	0.98	137	2	64.1	
IND 041D	56.0	24	78.4	16.0	2.08	1.38	35	2	63.9	
IND 042D	68.0	24	79.3	27.7	2.14	1.16	147	2	63.9	
INS 030D	80.0	24	112.3	-8.1	3.14	1.46	169	1	64.3	
IRQ 256A	11.0	24	43.6	32.8	1.88	0.96	143	1	63.3	2
LSO 305A	5.0	24	27.8	-29.8	0.66	0.60	36	1	64.2	
MLA 227E	86.0	24	102.1	4.1	1.62	0.82	135	1	63.4	
MTN 288A	-37.0	24	-7.8	23.4	1.63	1.10	141	1	63.0	
MWI 308A	-1.0	24	34.1	-13.0	1.54	0.60	87	2	64.2	
MYT 098A	29.0	24	45.1	-12.8	0.60	0.60	0	1	63.4	
NGR 115A	-25.0	24	8.3	16.8	2.54	2.08	44	2	64.5	
OMA 123A	17.0	24	55.6	21.0	1.88	1.02	100	2	63.3	
PAK 282B	38.0	24	68.5	25.8	1.32	0.62	133	1	63.4	
PHL 285E	98.0	24	121.3	11.1	3.46	1.76	99	2	63.8	
SDN 232A	-7.0	24	30.4	19.0	2.44	1.52	176	1	63.3	
TKL 058B	158.0	24	-171.8	-8.9	0.70	0.60	35	1	63.9	
URS 066B	44.0	24	64.3	44.6	4.56	2.48	169	2	65.4	
URS 079B	140.0	24	138.0	53.6	3.16	2.12	62	2	67.8	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AFI 099B	23.0	25	42.5	11.6	0.60	0.60	0	1	62.6	
BEL 018B	-19.0	25	4.6	50.6	0.82	0.60	167	1	64.1	
BLR 062B	23.0	25	27.8	52.6	1.08	0.72	1	2	64.9	
CYP 086B	5.0	25	33.3	35.1	0.60	0.60	0	1	63.6	
DDR 216B	-1.0	25	12.6	52.1	0.83	0.63	172	2	64.3	
HVO 107B	-31.0	25	-1.5	12.2	1.45	1.14	29	1	64.0	
IFB 021B	5.0	25	24.5	-28.0	3.13	1.68	27	2	64.1	4
ISL 049B	-31.0	25	-19.0	64.9	1.00	0.60	177	2	65.9	
ISR 110A	-13.0	25	34.9	31.4	0.94	0.60	117	2	63.8	
KEN 249B	11.0	25	37.9	1.1	2.29	1.56	94	1	63.8	
MCO 116B	-37.0	25	7.4	43.7	0.60	0.60	0	1	62.5	1/0.5
MNG 248A	74.0	25	102.2	46.6	3.60	1.13	169	1	64.1	
MRC 209B	-25.0	25	-9.0	29.2	2.72	1.47	43	2	63.3	
NMB 025A	-19.0	25	17.5	-21.6	2.66	1.90	48	2	64.7	
SEN 222B	-37.0	25	-14.4	13.8	1.46	1.04	139	2	63.7	
UAE 274B	17.0	25	53.6	24.2	0.98	0.80	162	1	63.2	
URS 078A	110.0	25	108.2	53.4	2.16	0.78	10	1	65.0	
YUG 148B	-7.0	25	18.4	43.7	1.68	0.66	154	1	65.3	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

12 206,98 MHz (26)

1	2	3	4		5		6	7	8	9
ALB 296B	-7.0	26	19.8	41.3	0.68	0.60	146	2	63.8	
BDI 270B	11.0	26	29.9	-3.1	0.71	0.60	80	2	63.4	
COG 235B	-13.0	26	14.6	-0.7	2.02	1.18	59	2	63.8	
CTI 237B	-31.0	26	-5.6	7.5	1.60	1.22	108	2	63.7	
ETH 092B	23.0	26	39.7	9.1	3.50	2.40	124	2	63.5	
FNL 104B	5.0	26	17.0	61.5	2.00	1.00	10	2	67.5	
HNG 106B	-1.0	26	19.5	47.2	0.92	0.60	176	1	64.0	
IFB 135B	-1.0	26	29.6	-18.8	1.46	1.36	37	2	64.2	4
KWT 113B	17.0	26	47.6	29.2	0.68	0.60	145	2	63.1	
MTN 223B	-37.0	26	-12.2	18.5	2.62	1.87	150	1	62.9	
NIG 119B	-19.0	26	7.8	9.4	2.16	2.02	45	1	63.9	
REU 097B	29.0	26	55.6	-19.2	1.56	0.78	96	1	64.0	
SDN 231B	-7.0	26	28.9	12.7	2.26	1.96	159	1	63.5	
SUI 140B	-19.0	26	8.2	46.6	0.98	0.70	171	2	64.1	
SYR 229B	11.0	26	38.3	34.9	1.04	0.90	7	1	63.3	
TUN 150B	-25.0	26	9.5	33.5	1.88	0.72	135	1	63.9	
URS 068A	44.0	26	59.0	38.8	2.24	1.00	164	2	64.0	
URS 074A	74.0	26	88.8	57.6	3.08	1.68	162	2	67.9	
URS 080A	140.0	26	155.3	55.4	2.90	2.36	35	1	67.9	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4		5		6	7	8	9
AGL 295B	-13.0	27	16.5	-12.0	3.09	2.26	84	1	64.2	
BHR 255A	17.0	27	50.5	26.1	0.60	0.60	0	1	60.8	1/0.7
CNR 130B	-31.0	27	-15.7	28.4	1.54	0.60	5	2	62.8	
CVA 083A	-37.0	27	12.4	41.8	0.60	0.60	0	1	65.2	
DNK 091A	5.0	27	-19.5	61.0	2.20	0.80	4	1	66.2	3
E 129B	-31.0	27	-3.1	39.9	2.10	1.14	154	2	64.0	
GHA 108B	-25.0	27	-1.2	7.9	1.48	1.06	102	1	63.7	
GNE 303B	-19.0	27	10.3	1.5	0.68	0.60	10	2	63.8	
HOL 213B	-19.0	27	5.4	52.0	0.76	0.60	171	1	64.5	
JOR 224B	11.0	27	35.8	31.4	0.84	0.78	114	2	63.1	
SDN 230B	-7.0	27	29.2	7.5	2.34	1.12	148	2	64.5	
SRL 259B	-31.0	27	-11.8	8.6	0.78	0.68	114	1	63.5	
TGK 225B	11.0	27	34.6	-6.2	2.41	1.72	129	1	63.8	
URS 059A	23.0	27	36.0	47.0	3.70	1.43	153	2	65.2	
URS 077C	110.0	27	112.7	57.3	2.67	1.75	2	1	67.2	
YUG 149B	-7.0	27	18.4	43.7	1.68	0.66	154	1	65.3	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
CAF 258B	-13.0	28	21.0	6.3	2.25	1.68	31	2	64.3	
I 082B	-19.0	28	12.3	41.3	2.38	0.98	137	2	64.2	
IRQ 256B	11.0	28	43.6	32.8	1.88	0.96	143	1	63.4	
LSO 305B	5.0	28	27.8	-29.8	0.66	0.60	36	1	64.2	
MTN 288B	-37.0	28	-7.8	23.4	1.63	1.10	141	1	63.0	
MWI 308B	-1.0	28	34.1	-13.0	1.54	0.60	87	2	64.3	
MYT 098B	29.0	28	45.1	-12.8	0.60	0.60	0	1	63.5	
NGR 115B	-25.0	28	8.3	16.8	2.54	2.08	44	2	64.5	
NOR 121A	5.0	28	17.0	61.5	2.00	1.00	10	2	66.8	
OMA 123B	17.0	28	55.6	21.0	1.88	1.02	100	2	63.3	
SDN 232B	-7.0	28	30.4	19.0	2.44	1.52	176	1	63.3	
URS 066C	44.0	28	64.3	44.6	4.56	2.48	169	2	65.5	
URS 076A	74.0	28	98.0	63.2	1.84	0.69	170	2	68.1	
URS 079C	140.0	28	138.0	53.6	3.16	2.12	62	2	67.8	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

1	2	3	4		5		6	7	8	9
AFI 099C	23.0	29	42.5	11.6	0.60	0.60	0	1	62.6	
BEL 018C	-19.0	29	4.6	50.6	0.82	0.60	167	1	63.5	
CYP 086C	5.0	29	33.3	35.1	0.60	0.60	0	1	63.7	
DDR 216C	-1.0	29	12.6	52.1	0.83	0.63	172	2	64.3	
HVO 107C	-31.0	29	-1.5	12.2	1.45	1.14	29	1	64.1	
IFB 021C	5.0	29	24.5	-28.0	3.13	1.68	27	2	64.2	4
ISL 049C	-31.0	29	-19.0	64.9	1.00	0.60	177	2	65.9	
ISR 110B	-13.0	29	34.9	31.4	0.94	0.60	117	2	63.9	
KEN 249C	11.0	29	37.9	1.1	2.29	1.56	94	1	63.8	
MCO 116C	-37.0	29	7.4	43.7	0.60	0.60	0	1	62.5	1/0.5
MNG 248B	74.0	29	102.2	46.6	3.60	1.13	169	1	64.2	
MRC 209C	-25.0	29	-9.0	29.2	2.72	1.47	43	2	63.4	
NMB 025B	-19.0	29	17.5	-21.6	2.66	1.90	48	2	64.8	
SEN 222C	-37.0	29	-14.4	13.8	1.46	1.04	139	2	63.7	
UAE 274C	17.0	29	53.6	24.2	0.98	0.80	162	1	63.3	
UKR 063A	23.0	29	31.2	48.4	2.32	0.96	172	2	64.6	
YUG 148C	-7.0	29	18.4	43.7	1.68	0.66	154	1	65.3	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
ALB 296C	-7.0	30	19.8	41.3	0.68	0.60	146	2	63.9	
BDI 270C	11.0	30	29.9	-3.1	0.71	0.60	80	2	63.5	
COG 235C	-13.0	30	14.6	-0.7	2.02	1.18	59	2	63.9	
CTI 237C	-31.0	30	-5.6	7.5	1.60	1.22	108	2	63.8	
ETH 092C	23.0	30	39.7	9.1	3.50	2.40	124	2	63.6	
HNG 106C	-1.0	30	19.5	47.2	0.92	0.60	176	1	64.1	
IFB 135C	-1.0	30	29.6	-18.8	1.46	1.36	37	2	64.3	4
KWT 113C	17.0	30	47.6	29.2	0.68	0.60	145	2	63.2	
MTN 223C	-37.0	30	-12.2	18.5	2.62	1.87	150	1	62.9	
NIG 119C	-19.0	30	7.8	9.4	2.16	2.02	45	1	64.0	
REU 097C	29.0	30	55.6	-19.2	1.56	0.78	96	1	64.1	
S 139A	5.0	30	17.0	61.5	2.00	1.00	10	2	67.1	
SDN 231C	-7.0	30	28.9	12.7	2.26	1.96	159	1	63.6	
SUI 140C	-19.0	30	8.2	46.6	0.98	0.70	171	2	64.2	
SYR 229C	11.0	30	38.3	34.9	1.04	0.90	7	1	63.3	
TUN 150C	-25.0	30	9.5	33.5	1.88	0.72	135	1	63.9	
URS 068B	44.0	30	59.0	38.8	2.24	1.00	164	2	64.1	
URS 074B	74.0	30	88.8	57.6	3.08	1.68	162	2	68.0	
URS 080B	140.0	30	155.3	55.4	2.90	2.36	35	1	67.9	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AGL 295C	-13.0	31	16.5	-12.0	3.09	2.26	84	1	64.2	
BHR 255B	17.0	31	50.5	26.1	0.60	0.60	0	1	60.9	1/0.7
CNR 130C	-31.0	31	-15.7	28.4	1.54	0.60	5	2	62.9	
CVA 083B	-37.0	31	12.4	41.8	0.60	0.60	0	1	65.3	
E 129C	-31.0	31	-3.1	39.9	2.10	1.14	154	2	64.0	
GHA 108C	-25.0	31	-1.2	7.9	1.48	1.06	102	1	63.7	
GNE 303C	-19.0	31	10.3	1.5	0.68	0.60	10	2	63.9	
HOL 213C	-19.0	31	5.4	52.0	0.76	0.60	171	1	64.6	
ISL 050B	5.0	31	-19.5	61.0	2.20	0.80	4	1	66.4	3
JOR 224C	11.0	31	35.8	31.4	0.84	0.78	114	2	63.2	
SDN 230C	-7.0	31	29.2	7.5	2.34	1.12	148	2	64.5	
SRL 259C	-31.0	31	-11.8	8.6	0.78	0.68	114	1	63.6	
TGK 225C	11.0	31	34.6	-6.2	2.41	1.72	129	1	63.8	
URS 059B	23.0	31	36.0	47.0	3.70	1.43	153	2	65.2	
URS 077D	110.0	31	112.7	57.3	2.67	1.75	2	1	67.2	
YUG 149C	-7.0	31	18.4	43.7	1.68	0.66	154	1	65.4	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

12 322,06 MHz (32)

1	2	3	4		5		6	7	8	9
CAF 258C	-13.0	32	21.0	6.3	2.25	1.68	31	2	64.4	
I 082C	-19.0	32	12.3	41.3	2.38	0.98	137	2	64.2	
IRQ 256C	11.0	32	43.6	32.8	1.88	0.96	143	1	63.4	
LSO 305C	5.0	32	27.8	-29.8	0.66	0.60	36	1	64.3	
MTN 288C	-37.0	32	-7.8	23.4	1.63	1.10	141	1	63.1	
MWI 308C	-1.0	32	34.1	-13.0	1.54	0.60	87	2	64.4	
MYT 098C	29.0	32	45.1	-12.8	0.60	0.60	0	1	63.5	
NGR 115C	-25.0	32	8.3	16.8	2.54	2.08	44	2	64.6	
NOR 121B	5.0	32	17.0	61.5	2.00	1.00	10	2	66.9	
OMA 123C	17.0	32	55.6	21.0	1.88	1.02	100	2	63.4	
SDN 232C	-7.0	32	30.4	19.0	2.44	1.52	176	1	63.4	
URS 066D	44.0	32	64.3	44.6	4.56	2.48	169	2	65.5	
URS 075A	74.0	32	94.0	51.7	1.52	0.60	172	2	65.1	
URS 079D	140.0	32	138.0	53.6	3.16	2.12	62	2	67.9	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AFI 099D	23.0	33	42.5	11.6	0.60	0.60	0	1	62.7	
BEL 018D	-19.0	33	4.6	50.6	0.82	0.60	167	1	63.9	
CYP 086D	5.0	33	33.3	35.1	0.60	0.60	0	1	63.7	
DDR 216D	-1.0	33	12.6	52.1	0.83	0.63	172	2	64.4	
HVO 107D	-31.0	33	-1.5	12.2	1.45	1.14	29	1	64.1	
IFB 021D	5.0	33	24.5	-28.0	3.13	1.68	27	2	64.2	4
ISL 049D	-31.0	33	-19.0	64.9	1.00	0.60	177	2	66.0	
ISR 110C	-13.0	33	34.9	31.4	0.94	0.60	117	2	63.9	
KEN 249D	11.0	33	37.9	1.1	2.29	1.56	94	1	63.9	
MCO 116D	-37.0	33	7.4	43.7	0.60	0.60	0	1	62.6	1/0.5
MNG 248C	74.0	33	102.2	46.6	3.60	1.13	169	1	64.2	
MRC 209D	-25.0	33	-9.0	29.2	2.72	1.47	43	2	63.4	
NMB 025C	-19.0	33	17.5	-21.6	2.66	1.90	48	2	64.8	
SEN 222D	-37.0	33	-14.4	13.8	1.46	1.04	139	2	63.8	
UAE 274D	17.0	33	53.6	24.2	0.98	0.80	162	1	63.3	
UKR 063B	23.0	33	31.2	48.4	2.32	0.96	172	2	64.7	
YUG 148D	-7.0	33	18.4	43.7	1.68	0.66	154	1	65.4	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4	5	6	7	8	9

1	2	3	4		5		6	7	8	9
ALB 296D	-7.0	34	19.8	41.3	0.68	0.60	146	2	63.9	
BDI 270D	11.0	34	29.9	-3.1	0.71	0.60	80	2	63.5	
COG 235D	-13.0	34	14.6	-0.7	2.02	1.18	59	2	63.9	
CTI 237D	-31.0	34	-5.6	7.5	1.60	1.22	108	2	63.9	
ETH 092D	23.0	34	39.7	9.1	3.50	2.40	124	2	63.6	
HNG 106D	-1.0	34	19.5	47.2	0.92	0.60	176	1	64.1	
IFB 135D	-1.0	34	29.6	-18.8	1.46	1.36	37	2	64.3	4
KWT 113D	17.0	34	47.6	29.2	0.68	0.60	145	2	63.2	
MTN 223D	-37.0	34	-12.2	18.5	2.62	1.87	150	1	63.0	
NIG 119D	-19.0	34	7.8	9.4	2.16	2.02	45	1	64.1	
REU 097D	29.0	34	55.6	-19.2	1.56	0.78	96	1	64.1	
S 138C	5.0	34	16.2	61.0	1.04	0.98	14	2	67.4	
SDN 231D	-7.0	34	28.9	12.7	2.26	1.96	159	1	63.6	
SUI 140D	-19.0	34	8.2	46.6	0.98	0.70	171	2	64.3	
SYR 229D	11.0	34	38.3	34.9	1.04	0.90	7	1	63.4	
TUN 150D	-25.0	34	9.5	33.5	1.88	0.72	135	1	64.0	
URS 071A	44.0	34	63.1	42.0	2.64	0.84	170	2	64.4	
URS 074C	74.0	34	88.8	57.6	3.08	1.68	162	2	68.0	
URS 080C	140.0	34	155.3	55.4	2.90	2.36	35	1	68.0	

12 379,60 MHz (35)

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AGL 295D	-13.0	35	16.5	-12.0	3.09	2.26	84	1	64.3	
BHR 255C	17.0	35	50.5	26.1	0.60	0.60	0	1	61.0	1/0.7
CNR 130D	-31.0	35	-15.7	28.4	1.54	0.60	5	2	63.0	
CVA 083C	-37.0	35	12.4	41.8	0.60	0.60	0	1	65.3	
DNK 091B	5.0	35	-19.5	61.0	2.20	0.80	4	1	66.3	3
E 129D	-31.0	35	-3.1	39.9	2.10	1.14	154	2	64.1	
GHA 108D	-25.0	35	-1.2	7.9	1.48	1.06	102	1	63.8	
GNE 303D	-19.0	35	10.3	1.5	0.68	0.60	10	2	63.9	
HOL 213D	-19.0	35	5.4	52.0	0.76	0.60	171	1	64.6	
JOR 224D	11.0	35	35.8	31.4	0.84	0.78	114	2	63.2	
SDN 230D	-7.0	35	29.2	7.5	2.34	1.12	148	2	64.6	
SRL 259D	-31.0	35	-11.8	8.6	0.78	0.68	114	1	63.6	
TGK 225D	11.0	35	34.6	-6.2	2.41	1.72	129	1	63.9	
URS 059C	23.0	35	36.0	47.0	3.70	1.43	153	2	65.3	
URS 077E	110.0	35	112.7	57.3	2.67	1.75	2	1	67.3	
YUG 149D	-7.0	35	18.4	43.7	1.68	0.66	154	1	65.4	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

12 398,78 MHz (36)

1	2	3	4		5		6	7	8	9
CAF 258D	-13.0	36	21.0	6.3	2.25	1.68	31	2	64.4	
DNK 090B	5.0	36	17.0	61.5	2.00	1.00	10	2	68.2	
I 082D	-19.0	36	12.3	41.3	2.38	0.98	137	2	64.3	
IRQ 256D	11.0	36	43.6	32.8	1.88	0.96	143	1	63.5	
LSO 305D	5.0	36	27.8	-29.8	0.66	0.60	36	1	64.3	
MTN 288D	-37.0	36	-7.8	23.4	1.63	1.10	141	1	63.1	
MWI 308D	-1.0	36	34.1	-13.0	1.54	0.60	87	2	64.4	
MYT 098D	29.0	36	45.1	-12.8	0.60	0.60	0	1	63.6	
NGR 115D	-25.0	36	8.3	16.8	2.54	2.08	44	2	64.7	
OMA 123D	17.0	36	55.6	21.0	1.88	1.02	100	2	63.4	
SDN 232D	-7.0	36	30.4	19.0	2.44	1.52	176	1	63.4	
URS 066E	44.0	36	64.3	44.6	4.56	2.48	169	2	65.6	
URS 079E	140.0	36	138.0	53.6	3.16	2.12	62	2	68.0	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4		5		6	7	8	9

1	2	3	4		5		6	7	8	9
AFI 099E	23.0	37	42.5	11.6	0.60	0.60	0	1	62.7	
BEL 018E	-19.0	37	4.6	50.6	0.82	0.60	167	1	64.4	
CYP 086E	5.0	37	33.3	35.1	0.60	0.60	0	1	63.8	
DDR 216E	-1.0	37	12.6	52.1	0.83	0.63	172	2	64.4	
HVO 107E	-31.0	37	-1.5	12.2	1.45	1.14	29	1	64.2	
IFB 021E	5.0	37	24.5	-28.0	3.13	1.68	27	2	64.3	4
ISL 049E	-31.0	37	-19.0	64.9	1.00	0.60	177	2	66.0	
ISR 110D	-13.0	37	34.9	31.4	0.94	0.60	117	2	64.0	
KEN 249E	11.0	37	37.9	1.1	2.29	1.56	94	1	63.9	
MCO 116E	-37.0	37	7.4	43.7	0.60	0.60	0	1	62.6	1/0.5
MNG 248D	74.0	37	102.2	46.6	3.60	1.13	169	1	64.3	
MRC 209E	-25.0	37	-9.0	29.2	2.72	1.47	43	2	63.5	
NMB 025D	-19.0	37	17.5	-21.6	2.66	1.90	48	2	64.9	
SEN 222E	-37.0	37	-14.4	13.8	1.46	1.04	139	2	63.9	
UAE 274E	17.0	37	53.6	24.2	0.98	0.80	162	1	63.4	
UKR 063C	23.0	37	31.2	48.4	2.32	0.96	172	2	64.7	
YUG 148E	-7.0	37	18.4	43.7	1.68	0.66	154	1	65.4	

Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
1	2	3	4		5		6	7	8	9

1	2	3	4		5		6	7	8	9
ALB 296E	-7.0	38	19.8	41.3	0.68	0.60	146	2	64.0	
BDI 270E	11.0	38	29.9	-3.1	0.71	0.60	80	2	63.6	
COG 235E	-13.0	38	14.6	-0.7	2.02	1.18	59	2	64.0	
CTI 237E	-31.0	38	-5.6	7.5	1.60	1.22	108	2	63.9	
ETH 092E	23.0	38	39.7	9.1	3.50	2.40	124	2	63.7	
HNG 106E	-1.0	38	19.5	47.2	0.92	0.60	176	1	64.2	
IFB 135E	-1.0	38	29.6	-18.8	1.46	1.36	37	2	64.4	4
KWT 113E	17.0	38	47.6	29.2	0.68	0.60	145	2	63.3	
MTN 223E	-37.0	38	-12.2	18.5	2.62	1.87	150	1	63.0	
NIG 119E	-19.0	38	7.8	9.4	2.16	2.02	45	1	64.1	
NOR 120C	5.0	38	13.1	64.1	1.84	0.88	10	2	67.0	
REU 097E	29.0	38	55.6	-19.2	1.56	0.78	96	1	64.2	
SDN 231E	-7.0	38	28.9	12.7	2.26	1.96	159	1	63.7	
SUI 140E	-19.0	38	8.2	46.6	0.98	0.70	171	2	64.3	
SYR 339A	11.0	38	37.6	34.2	1.32	0.88	74	1	63.4	2
TUN 272A	-25.0	38	2.5	32.0	3.59	1.75	175	1	61.9	5
URS 071B	44.0	38	63.1	42.0	2.64	0.84	170	2	64.5	
URS 074D	74.0	38	88.8	57.6	3.08	1.68	162	2	68.1	
URS 080D	140.0	38	155.3	55.4	2.90	2.36	35	1	68.1	

1	2	3	4		5		6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight		Antenna beamwidth		Orientation of the ellipse	Polarization	E.i.r.p.	Remarks
AGL 295E	-13.0	39	16.5	-12.0	3.09	2.26	84	1	64.4	
BHR 255D	17.0	39	50.5	26.1	0.60	0.60	0	1	61.0	1/0.7
CNR 130E	-31.0	39	-15.7	28.4	1.54	0.60	5	2	63.0	
CVA 083D	-37.0	39	12.4	41.8	0.60	0.60	0	1	65.4	
E 129E	-31.0	39	-3.1	39.9	2.10	1.14	154	2	64.2	
GHA 108E	-25.0	39	-1.2	7.9	1.48	1.06	102	1	63.8	
GNE 303E	-19.0	39	10.3	1.5	0.68	0.60	10	2	64.0	
HOL 213E	-19.0	39	5.4	52.0	0.76	0.60	171	1	64.7	
ISL 050C	5.0	39	-19.5	61.0	2.20	0.80	4	1	66.5	3
JOR 224E	11.0	39	35.8	31.4	0.84	0.78	114	2	63.3	
MNG 248E	74.0	39	102.2	46.6	3.60	1.13	169	1	64.3	
SDN 230E	-7.0	39	29.2	7.5	2.34	1.12	148	2	64.6	
SRL 259E	-31.0	39	-11.8	8.6	0.78	0.68	114	1	63.7	
TGK 225E	11.0	39	34.6	-6.2	2.41	1.72	129	1	63.9	
URS 059D	23.0	39	36.0	47.0	3.70	1.43	153	2	65.3	
URS 077F	110.0	39	112.7	57.3	2.67	1.75	2	1	67.4	
YUG 149E	-7.0	39	18.4	43.7	1.68	0.66	154	1	65.5	

1	2	3	4	5	6	7	8	9
Country symbol and IFRB Serial Number	Nominal orbital position	Channel number	Boresight	Antenna beamwidth	Orientation of the ellipse	Polarization	E.i.r.p.	Remarks

1	2	3	4		5		6	7	8	9
CAF 258E	-13.0	40	21.0	6.3	2.25	1.68	31	2	64.5	
I 082E	-19.0	40	12.3	41.3	2.38	0.98	137	2	64.3	
IRQ 256E	11.0	40	43.6	32.8	1.88	0.96	143	1	63.5	
LSO 305E	5.0	40	27.8	-29.8	0.66	0.60	36	1	64.4	
MTN 288E	-37.0	40	-7.8	23.4	1.63	1.10	141	1	63.2	
MWI 308E	-1.0	40	34.1	-13.0	1.54	0.60	87	2	64.5	
MYT 098E	29.0	40	45.1	-12.8	0.60	0.60	0	1	63.6	
NGR 115E	-25.0	40	8.3	16.8	2.54	2.08	44	2	64.7	
OMA 123E	17.0	40	55.6	21.0	1.88	1.02	100	2	63.5	
S 139B	5.0	40	17.0	61.5	2.00	1.00	10	2	68.2	
SDN 232E	-7.0	40	30.4	19.0	2.44	1.52	176	1	63.5	
URS 066F	44.0	40	64.3	44.6	4.56	2.48	169	2	65.6	
URS 079F	140.0	40	138.0	53.6	3.16	2.12	62	2	68.0	

ARTICLE 12

Provisions governing the Broadcasting-Satellite Service in Region 2 pending the Establishment of a detailed Plan

12.1 In accordance with the principles set forth in Annex 6, the following interim provisions shall apply pending the establishment of a detailed plan for the broadcasting-satellite service for Region 2 in the frequency band 11.7-12.2 GHz under the terms of paragraphs 12.9-12.12 below.

12.2 Space stations in the broadcasting-satellite service shall be located in the following portions of the orbit:

- 75°W to 100°W longitude (however, for service to Canada, the USA and Mexico, the relevant portion shall be only between 75°W and 95°W longitude);
- 140°W to 170°W longitude.

12.2.1 Space stations in the broadcasting-satellite service may also be located in the remaining portions of the orbit, in which case they shall be operated in accordance with the provisions of No. 139 of the Radio Regulations. As an exception, it is accepted that, for Greenland, a position in the geostationary satellite orbit between 55°W and 60°W may be used for the broadcasting-satellite service as a primary service. The administrations concerned should make every effort to allow for the sharing of this portion of the orbital arc by a broadcasting satellite for Greenland and space stations in the fixed-satellite service of other administrations in Region 2.

12.3 Space stations in the fixed-satellite service shall be located in portions of the orbit other than those referred to in paragraph 12.2 above. Such space stations may also be located in the portions of the orbit referred to in paragraph 12.2 above; they shall then be operated in accordance with the provisions of No. 139 of the Radio Regulations.

12.3.1 Space stations in the broadcasting-satellite service located in the portions of the orbit referred to in paragraph 12.2 and space stations in the fixed-satellite service located in the remaining portions of the orbit shall be operated in such a way that no unacceptable interference is caused by stations of one service to stations of other services. The level of unacceptable interference shall be determined by agreement between the administrations concerned, taking the latest CCIR Recommendations and Annexes 8 and 9 of the Final Acts as a guide. Notwithstanding the above, broadcasting-satellite space stations may be located up to the edge of the portion of the orbit referred to in paragraph 12.2, provided that such stations are operated in accordance with the relevant technical characteristics for Region 2 outlined in Annex 8.

12.4 Prior to the regional administrative radio conference, referred to in paragraph 12.9 below, systems in the broadcasting-satellite service shall be regarded as experimental and shall be operated in accordance with the sharing criteria and technical characteristics contained in Annexes 8 and 9.

12.5 Administrations may implement systems which utilize values for the technical characteristics different from the values in Annex 8 of the Final Acts, provided that such action does not result in interference to operational or planned systems of other administrations in excess of that determined in accordance with Annex 9.

12.6 Systems in the fixed-satellite service shall be introduced in accordance with the relevant provisions of the Radio Regulations, particularly with those of Article 9A and, where appropriate, with the provisions of Article 7 of these Final Acts.

12.7 Space systems in the frequency band 11.7-12.2 GHz shall use, to the maximum extent technically and economically practicable, available techniques in order to make the most efficient use of the geostationary orbit and the frequency spectrum. Examples of such techniques are described in Annex 7.

12.8 The provisions of Resolution No. Spa2 – 3 shall continue to apply to the broadcasting-satellite service in the frequency band 11.7-12.2 GHz in Region 2 until such time as a detailed plan may be adopted for the broadcasting-satellite service.

12.9 A regional administrative radio conference is to be held not later than 1982 for the purpose of carrying out detailed planning for the broadcasting-satellite and fixed-satellite services, in accordance with the following terms.

12.9.1 The said regional administrative radio conference shall draw up a detailed plan for the orbit/spectrum resource available for the broadcasting-satellite service in the 11.7-12.2 GHz band. The plan shall provide for the detailed assignment of the orbital positions and frequency channels available, ensuring that the broadcasting-satellite service requirements submitted by the various administrations are met in an equitable manner satisfactory to all the countries concerned. It should be laid down as a matter of principle that each administration in the Region should be guaranteed a minimum number of channels (4) for the operation of the broadcasting-satellite service. Above this minimum, the special characteristics of the countries (size, time zones, language differences, etc.) shall be taken into account.

12.9.2 Planning shall be based on individual reception, but each administration may use the reception system which best meets its requirements, namely, individual or community reception, or both. Account shall also be taken of the decisions of the 1977 and 1979 World Administrative Radio Conferences and of the latest CCIR Recommendations in the case of parameters covered by its studies and research.

12.9.3 When planning the broadcasting-satellite service, it shall be borne in mind that systems should be designed with a view to reducing to a minimum technical differences and incompatibilities with the systems of other Regions.

12.9.4 The conference shall also take into account the need to make equitable provision for the requirements of the fixed-satellite service to which this frequency band is also allocated in Region 2.

12.10 All administrations in Region 2 shall submit their broadcasting-satellite service requirements to the IFRB not later than one year before the start of the regional administrative radio conference responsible for planning this service in Region 2. Each administration may update these requirements as it considers necessary. "Requirements" are understood to include the number and boundaries of service areas and the number of channels requested for each of them. Six months before the deadline for submitting requirements, the IFRB shall remind administrations of the need to submit them by means of a circular-letter and/or telegram.

12.11 No systems existing or planned prior to the implementation of any detailed plan such as that referred to above shall cause interference to any systems operating in accordance with such a plan.

12.12 Existing or previously planned broadcasting-satellite systems will not necessarily be taken into account in the establishment of the detailed plan for the broadcasting-satellite service in the 11.7-12.2 GHz band in Region 2. Consequently, the installation or planning of such systems by an administration prior to the establishment of the said plan shall not confer upon that system any rights or recognition.

ARTICLE 13

Approval of the Final Acts

13.1 Members shall notify their approval of these Final Acts, as promptly as possible, to the Secretary-General, who shall at once inform the other Members of the Union. The act of approval shall constitute the agreement of Members to comply with the decisions jointly reached at the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

13.2 These Final Acts shall be regarded as including a world agreement and associated Plan for Regions 1 and 3 in accordance with *resolves* 1 of Resolution No. Spa2–2 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, which requires the stations in the broadcasting-satellite service to be established and operated in accordance with such agreements and associated plans.

ARTICLE 14

Interference

14.1 The Members of the Union shall endeavour to agree on the action required to reduce harmful interference which might be caused by the application of these provisions and the associated Plan.

ARTICLE 15

Entry into Force of the Final Acts

15.1 These Final Acts shall enter into force on 1 January 1979 at 0001 hours GMT.

ARTICLE 16

Period of Validity of the Provisions and Associated Plan

16.1 The provisions and associated Plan have been prepared in order to meet the requirements of the broadcasting-satellite service in the bands concerned for a period of at least fifteen years from the date of the entry into force of these Final Acts.

16.2 In any event, the provisions and associated Plan shall remain in force until their revision by a competent administrative radio conference convened in accordance with the relevant provisions of the Convention in force.

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PART II

Re-arrangement of the Radio Regulations and the Additional Radio Regulations

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, acting within its terms of reference relating to the re-arrangement of the Radio Regulations and the Additional Radio Regulations, decided:

a) Publication of the "Re-arrangement of the Radio Regulations"

to instruct the Secretary-General to draw up and distribute the final text of the "Re-arrangement of the Radio Regulations" as endorsed in principle by this Conference. This edition shall be published by September 1977 and its main aim will be to serve as a basis for administrations in submitting their proposals to the World Administrative Radio Conference in 1979 (see Resolution No. Sat – 10);

b) Presentation of the new edition

the presentation of the new edition should conform to the following pattern:

Title:

Re-arrangement
of the
Radio Regulations

Contents:

- Table of contents (blue pages)
- Resolution No. Sat – 10 adopted by the Conference
- Preface explaining how to use the publication
- Text of the re-arrangement
- Appendices, Resolutions and Recommendations
- Separate booklet containing the references whose inclusion was approved by the Conference.

In preparing this new edition, the Secretary-General shall take into account the Report by Committee 7 "Re-arrangement of the Radio Regulations" as approved by the Conference;

c) to instruct the Secretary-General to bring Resolution No. Sat – 10 to the notice of administrations and the appropriate organs of the Union.

ANNEX 1

Limits for determining whether a Service of an Administration is considered to be affected by a proposed Modification to the Plan (Article 4, paragraph 4.3.1)[1]

1. *Limits on the change in the wanted-to-interfering signal ratio with respect to frequency assignments in accordance with the Plan*

With respect to paragraph 4.3.1.1, an administration shall be considered as being affected if the effect of the proposed modification to the Plan would result in the wanted-to-interfering signal ratio at any point within the service area associated with any of its frequency assignments in the Plan falling below either 30 dB or the value resulting from the frequency assignments in the Plan at the date of entry into force of the Final Acts, whichever is the lower.

Note: In performing the calculation, the effect at the receiver input of all the co-channel and adjacent channel signals is expressed in terms of one equivalent co-channel interfering signal. This value is usually expressed in decibels.

2. *Limits on the change in the power flux density to protect the broadcasting-satellite service in the band 11.7-12.2 GHz in Region 2*

With respect to paragraph 4.3.1.2 an administration in Region 2 shall be considered as being affected if the proposed modification to the Plan would result in exceeding the following power flux densities at any point in the service area affected:

-147 dBW/m^2/27 MHz	$0° \leqslant \theta < 0.48°$
$-139 + 25 \log \theta$ dBW/m^2/27 MHz	$0.48° \leqslant \theta < 27.25°$
-103 dBW/m^2/27 MHz	$\theta \geqslant 27.25°$

where θ is the difference in degrees between the longitudes of the broadcasting-satellite space station in Region 1 or 3 and the broadcasting-satellite space station affected in Region 2.

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[1] The limits specified in this Annex relate to the power flux densities which would be obtained assuming free space propagation conditions.

3. *Limits on the change in the power flux density to protect the terrestrial services of other administrations*

With respect to paragraph 4.3.1.3, an administration in Region 1 or 3 shall be considered as being affected if the consequence of the proposed modification to the Plan is to increase the power flux density arriving on any part of the territory of that administration by more than 0.25 dB over that resulting from the frequency assignments in the Plan at the time of entry into force of the Final Acts.

The same administration shall be considered as not being affected if the value of the power flux density anywhere in its territory does not exceed the limits expressed in Annex 5.

An administration in Region 2 shall be considered as being affected if the proposed modification to the Plan would result in exceeding a power flux density, for any angle of arrival, at any point on its territories, of -125 dBW/m^2/4 kHz when the broadcasting-satellite station uses circular polarization and -128 dBW/m^2/4 kHz when the broadcasting-satellite station uses linear polarization.

4. *Limits on the change in the power flux density to protect the fixed-satellite service in the band 11.7-12.2 GHz in Region 2*

With respect to paragraph 4.3.1.4, an administration in Region 2 shall be considered as being affected if the proposed modification to the Plan would result in an increase in the power flux density on its territory of 0.25 dB or more above that resulting from the frequency assignments in the Plan at the time of entry into force of the Final Acts.

However, where an assignment in the Plan or its subsequent modification gives a power flux density of less than -138 dBW/m^2/27 MHz anywhere in the territory of an administration of Region 2, tthat administration shall be considered as not affected.

ANNEX 2

Basic Characteristics to be furnished in Notices relating to Space Stations in the Broadcasting-Satellite Service

1. Country and IFRB number.

2. Nominal orbital position (in degrees from the Greenwich meridian).

3. Assigned frequency or channel number.

4. Date of bringing into use.

5. Identity of the space station.

6. Service area (if necessary, the service area may be defined by a number of "test points").

7. Geographical coordinates of the intersection of the antenna beam axis with the Earth.

8. Rain-climatic zone.

9. Class of station.

10. Class of emission and necessary bandwidth.

11. Power supplied to the antenna (watts).

12. Antenna characteristics:
- gain of the antenna referred to an isotropic radiator;
- shape of the beam (elliptical or circular);
  - major axis (degrees) at –3 dB points;
  - minor axis (degrees) at –3 dB points;
- orientation of the ellipse;
- ΔG (difference between the maximum gain and the gain in the direction of the point in the service area at which the power flux density is at a minimum);
- pointing accuracy;
- type of polarization;
- sense of polarization;
- radiation pattern and cross-polar characteristics.

13. Station keeping accuracy.

14. Modulation characteristics:
- type of modulation;
- pre-emphasis characteristics;
- TV system;
- sound broadcasting characteristics;
- frequency deviation;
- composition of the baseband;
- type of multiplexing of the video and sound signals;
- energy dispersal characteristics.

15. Minimum angle of elevation in the service area.

16. Type of reception (individual or community).

17. Hours of operation (GMT).

18. Coordination.

19. Agreements.

20. Other information.

21. Operating administration or company.

ANNEX 3

Method for Determining the limiting interfering Power Flux Density at the Edge of a Broadcasting-Satellite Service Area in the Band 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1) and for Predicting the Power Flux Density produced there by a Terrestrial Station

1. *General*

1.1 This Annex describes a method of assessing the interference potential from terrestrial transmitters to broadcasting-satellite receivers in the band 11.7-12.2 GHz (12.5 GHz in Region 1).

1.2 The method is in two parts:

a) the calculation of the maximum permissible interfering power flux density at the edge of the broadcasting-satellite service area concerned;

b) the calculation of the likely power flux density produced at any point on the edge of the service area by the terrestrial transmitter of another administration.

1.3 The interference potential of the terrestrial transmitters must be considered case by case; the power flux density produced by each terrestrial transmitter is compared to the limiting power flux density at any point on the edge of the service area of a broadcasting-satellite station of another administration. If, for a given transmitter, the value of the power flux density produced is lower than the value of the limiting power flux density at any point on the edge of the service area, the interference caused to the broadcasting-satellite service by this transmitter is considered to be lower than the permissible value and no coordination is required between administrations before the terrestrial service is brought into use. Where this is not the case, coordination and further, more precise calculations derived from a mutually agreed basis are necessary.

1.4 It is emphasized that, should the calculation described in this Annex indicate that the maximum permissible power flux density is exceeded, it does not necessarily preclude the introduction of the terrestrial service since the calculations are necessarily based on worst-case assumptions for:

a) the nature of the terrain of the interference path;

b) the off-beam discrimination of the broadcasting-satellite receiving installations;

c) the necessary protection ratios for the broadcasting-satellite service;

d) the type of reception in the broadcasting-satellite service, i.e., assuming individual reception, this being more critical than community reception for the angles of elevation concerned;

e) the value of power flux density to be protected in the broadcasting-satellite service;

f) the propagation conditions between the terrestrial station and the broadcasting-satellite service area.

2. *Limit of power flux density*

2.1 *General*

The limiting power flux density not to be exceeded at the edge of the service area in order to protect the broadcasting-satellite service of an administration is given by the formula:

$$F = F_o - R + D + P \qquad (1)$$

where F = the maximum permissible interfering power flux density (dBW/m^2) in the broadcasting-satellite necessary bandwidth

F_o = the wanted power flux density (dBW/m^2) at the edge of the service area

R = the protection ratio (dB) between the wanted and interfering signals

D = angular discrimination (dB) provided by the radiation pattern of the satellite broadcasting receiver antenna

P = polarization discrimination (dB) between the wanted and interfering signals

2.2 *Wanted power flux density (F_o)*

The value of F_o is equal to

a) -103 dBW/m^2 for service areas in Regions 1 and 3

b) -105 dBW/m^2 for service areas in Region 2

2.3 *Protection ratio (R)*

2.3.1 The single entry protection ratio against all types of terrestrial transmissions, with the exception of amplitude-modulation multichannel television systems, is 35 dB for carrier frequency differences between the wanted and interfering signals of up to ± 10 MHz, decreasing linearly from 35 dB to 0 dB for carrier frequency differences between 10 MHz and 35 MHz, and is 0 dB for frequency differences in excess of 35 MHz (see Figure 1).

2.3.2 The carrier frequency difference should be determined by reference to the frequency assignments in the broadcasting-satellite Plan or, in the case of assignments not contained within a plan, by reference to the description of the characteristics of the proposed or operational system. For amplitude-modulation multichannel television systems which produce peaks of high power flux density spread over a wide range of their necessary bandwidth, the protection ratio R is 35 dB and is independent of the carrier frequency difference.

2.3.3 A signal from a terrestrial station should be considered only if its necessary bandwidth overlaps the necessary bandwidth of the broadcasting-satellite assignment.

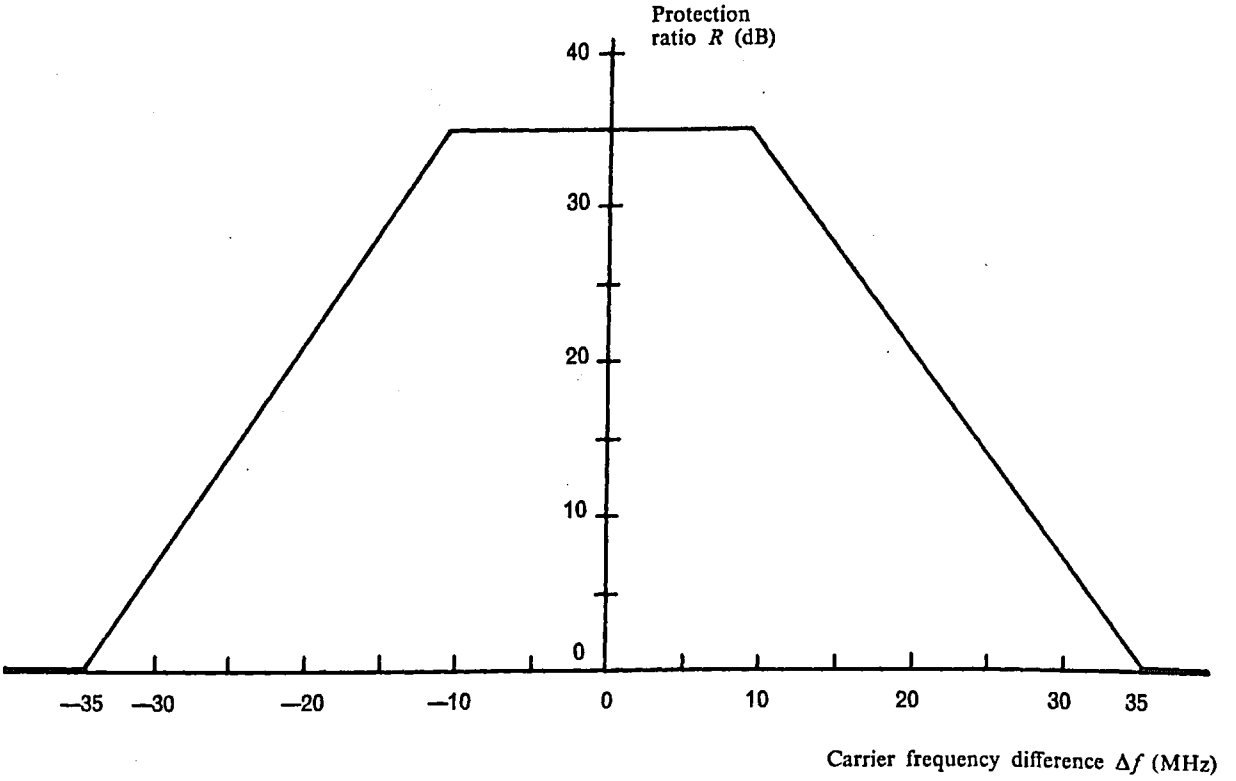

FIGURE 1

Protection ratio R (dB) for a broadcasting-satellite signal against a single entry of interference from a terrestrial service (except for AM multichannel TV systems)

2.4 *Angular discrimination (D)*

2.4.1 *Broadcasting-satellite service areas in Regions 1 and 3*

Where the angle of elevation φ selected for the proposed or operational broadcasting-satellite system for the broadcasting-satellite service area concerned is equal to or greater than 19°, the value of D to be assumed in expression (1) is 33 dB. When φ is less than 19°, D should be derived from the expression (2.a) below.

Note: If more than one value of φ is specified for a particular service area, the appropriate value of φ should be used for each section of the edge of the service area under consideration.

$$\begin{aligned} &D = 0 \text{ for } 0 \leqslant \varphi \leqslant 0.5^\circ \\ &D = 3\,\varphi^2 \text{ for } 0.5^\circ < \varphi \leqslant 1.41^\circ \\ &D = 3 + 20 \log_{10} \varphi \text{ for } 1.41^\circ < \varphi \leqslant 2.52^\circ \\ &D = 1 + 25 \log_{10} \varphi \text{ for } 2.52^\circ < \varphi \leqslant 19^\circ \end{aligned} \qquad (2.a)$$

Note: For the graphical determination of D see Figure 2.

2.4.2 *Broadcasting-satellite service areas in Region 2*

Where the angle of elevation φ, selected for the proposed or operational broadcasting-satellite system for the broadcasting-satellite service area concerned is equal to or greater than 27°, the value of D to be assumed in expression (1) is 38 dB. When φ is less than 27°, D should be derived from the expression (2.b) below.

Note: If more than one value of φ is specified for a particular service area, the appropriate value of φ should be used for each section of the edge of the service area under consideration.

$$\begin{aligned} &D = 0 \text{ for } 0 \leqslant \varphi \leqslant 0.45° \\ &D = 3.7\,\varphi^2 \text{ for } 0.45° < \varphi \leqslant 1.27° \\ &D = 3.9 + 20 \log_{10} \varphi \text{ for } 1.27° < \varphi \leqslant 2.27° \\ &D = 2.1 + 25 \log_{10} \varphi \text{ for } 2.27° < \varphi \leqslant 27° \end{aligned} \qquad (2.b)$$

Note: For the graphical determination of D see Figure 2.

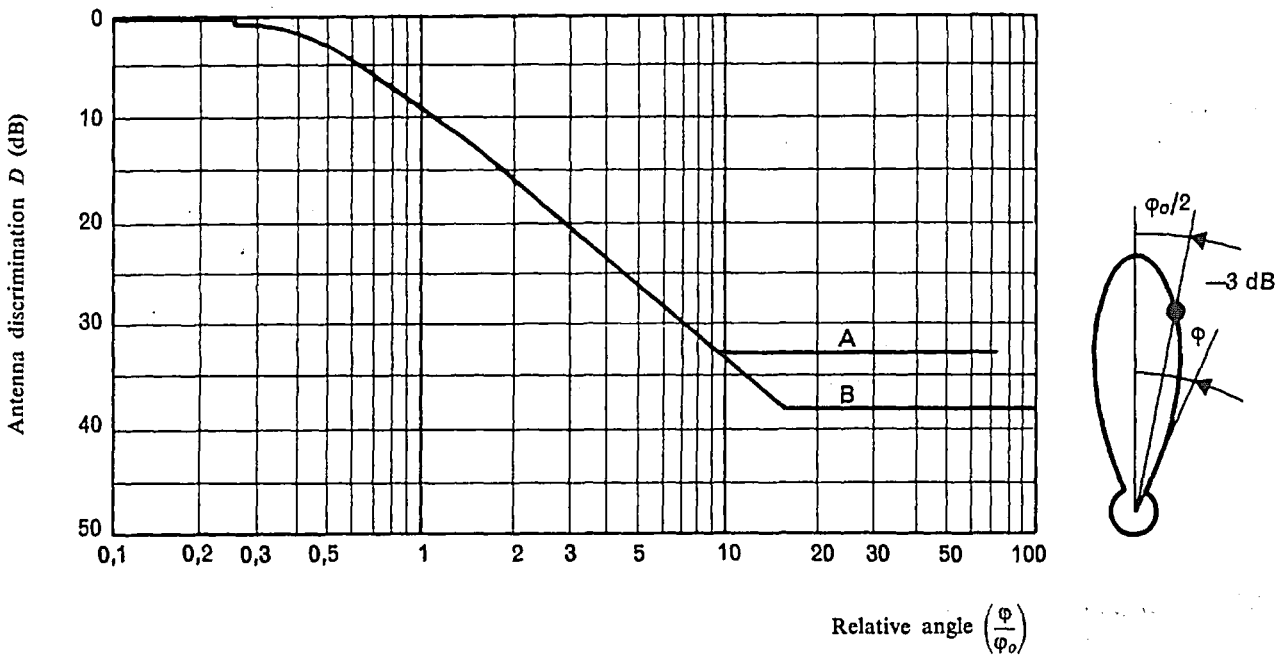

FIGURE 2

Discrimination D (dB) of broadcasting-satellite receiver antenna as a function of satellite elevation angle

For service areas in Regions 1 and 3, $\varphi_0 = 2°$ and Curve A applies

For service areas in Region 2, $\varphi_0 = 1.8°$ and Curve B applies

2.5 *Polarization discrimination (P)*

The value of P is equal to:

a) 3 dB when the interfering terrestrial service uses linear polarization and the broadcasting-satellite service uses circular polarization or vice versa.

b) 0 dB when the interfering terrestrial service and the broadcasting-satellite service both use circular or both use linear polarization.

3. *Power flux density produced by a terrestrial station (F_p)*

The power flux density F_p (in dBW/m^2) produced at any point on the edge of the service area by the terrestrial station is determined from the following formula:

$$F_p = E - A + 43 \quad (3)$$

where E = the equivalent isotropically radiated power (dBW) of the terrestrial station in the direction of the point on the edge of the service area concerned

A = the total path loss in dB.

3.1 *Evaluation of path loss A for a terrestrial station at a distance greater than 100 km from the edge of the service area of the broadcasting satellite*

For path lengths greater than 100 km, A is given by:

$$A = 137.6 + 0.2324\, d_t + 0.0814\, d_m \quad (4)$$

where d_t and d_m are the overland and oversea path lengths respectively, in km.

3.2 *Evaluation of path loss A for a terrestrial station at a distance equal to or less than 100 km from the edge of the service area of the broadcasting satellite*

For path lengths equal to or less than 100 km, A is calculated using equations (4) and (5) and the lower value obtained is substituted in formula (3) to calculate the power flux density produced at the point on the edge of the service area:

$$A = 109.5 + 20 \log (d_t + d_m) \quad (5)$$

The variation in A for different path lengths and percentage of oversea path is shown in Figure 3.

3.3 *Distance beyond which the method need not be applied*

The method need not be applied and coordination is unnecessary when the distance between the terrestrial station and the service area of the broadcasting satellite is greater than:

a) 400 km in the case of all overland paths, or

b) 1 200 km in the case of all oversea or mixed paths.

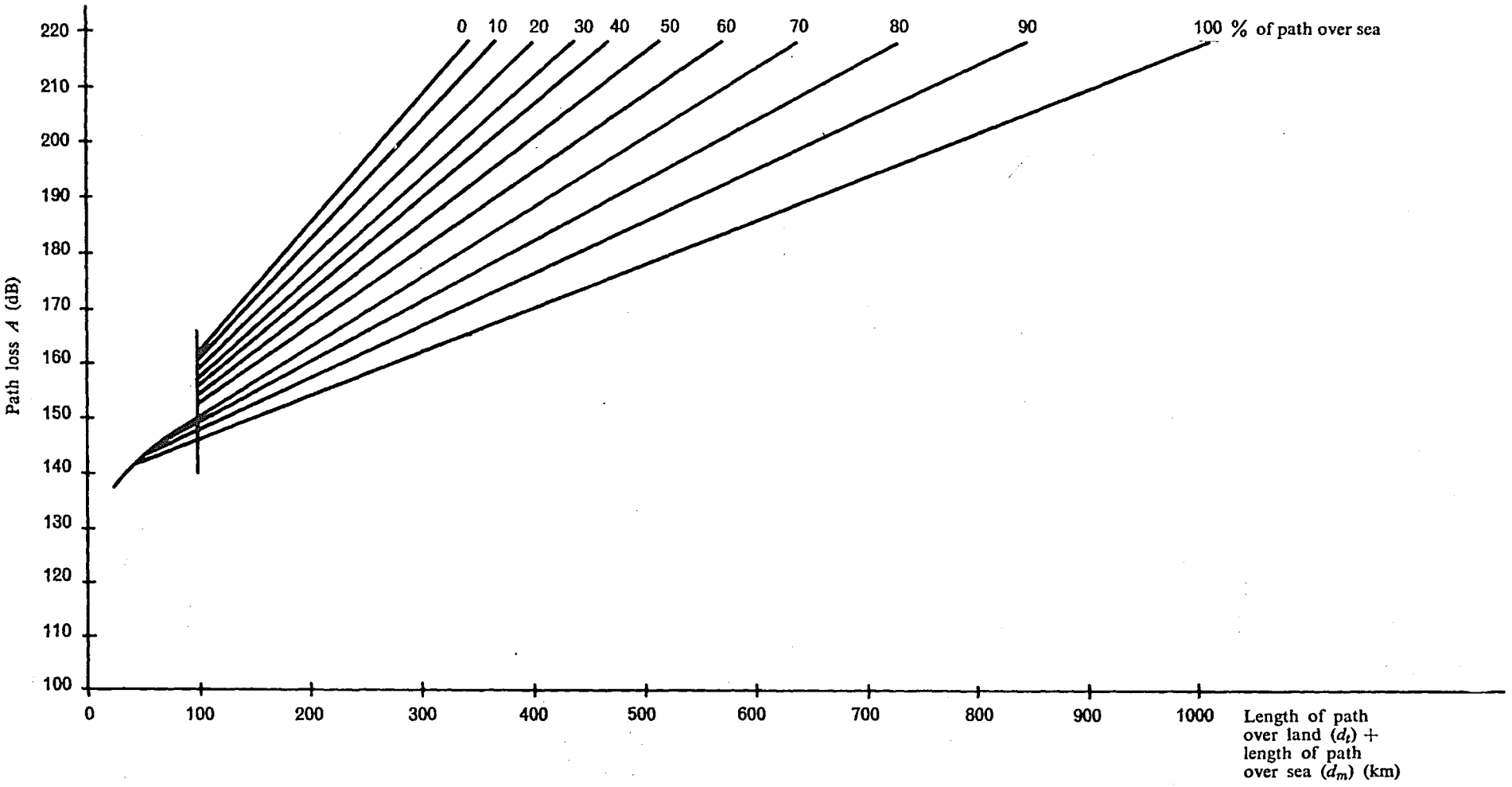

FIGURE 3

Total path loss A (dB) versus total path length ($d_t + d_m$)(km)and percentage of oversea path

ANNEX 4

Need for Coordination of a Fixed-Satellite Space Station or a Broadcasting-Satellite Space Station in Region 2 with respect to the Plan (Article 7)

With respect to paragraph 7.2.1, coordination of a space station in the fixed-satellite service or the broadcasting-satellite service of Region 2 is required when, under assumed free space propagation conditions, the power flux density on the territory of an administration in Region 1 or Region 3 exceeds the value derived from the following expressions:

-147 dBW/m^2/27 MHz for $0 \leqslant \theta < 0.44°$

$-138 + 25 \log \theta$ dBW/m^2/27 MHz for $0.44° \leqslant \theta < 19.1°$

-106 dBW/m^2/27 MHz for $19.1° \leqslant \theta$

θ = the difference in degrees between the longitude of the interfering broadcasting-satellite or fixed-satellite in Region 2 and the longitude of the affected broadcasting-satellite space station in Regions 1 and 3.

ANNEX 5

Power Flux Density Limits between 11.7 and 12.2 GHz to protect the terrestrial services in Regions 1 and 3 from Interference from Region 2 Broadcasting-Satellite Space Stations (Article 9)

The power flux density limits are as follows:

1) for all the territories of administrations in Regions 1 and 3:

-125 dBW/m^2/4 kHz	for broadcasting-satellite space stations using circular polarization;
-128 dBW/m^2/4 kHz	for broadcasting-satellite space stations using linear polarization;

for all angles of arrival; and

2) for territories of administrations in Region 3 and those in the western part of Region 1, West of longitude 30°E:

-132 dBW/m^2/5 MHz	for angles of arrival between 0° and 10° above the horizontal plane;
$-132 + 4.2(\gamma - 10)$ dBW/m^2/5 MHz	for angles of arrival γ (in degrees) between 10° and 15° above the horizontal plane;
-111 dBW/m^2/5 MHz	for angles of arrival between 15° and 90° above the horizontal plane.

ANNEX 6

Planning Principles in Region 2

The following principles have been applied in drawing up the provisions governing the introduction of space services in the frequency band 11.7-12.2 GHz in Region 2:

1. *Equality for allocated services in Region 2*

Under Article 5 of the Radio Regulations, the 11.7-12.2 GHz band is allocated to broadcasting-satellite, fixed-satellite and terrestrial services on an equal, primary basis. Each administration in Region 2 has the right to decide for itself which of these services are to be implemented within its own territory.

2. *Equal rights for services in the various Regions*

In accordance with No. 117 of the Radio Regulations, the principle of equal rights for different services in the same category to operate in all the Regions is recognized, provided that no harmful interference is caused to services in the other Regions.

3. *Recognition of national requirements*

All administrations in Region 2 shall take into consideration the national requirements which have been presented or will be presented in the future.

4. *Equitable rights of access to the geostationary orbit spectrum resource*

Subject to the provisions of the Convention, the Radio Regulations and the resolutions in force, it is recognized that all administrations have the right of access to the geostationary orbit spectrum resource in order to fulfil their requirements.

5. *Flexible planning approach*[1]

The plan adopted for Region 2 must be sufficiently flexible to allow for future technical developments, the identification of future requirements, changes in existing or stated requirements, requirements by administrations not represented at the Conference, further information on propagation data and various system design approaches. The plan may be modified only by a competent administrative radio conference.

6. *Efficient use of the geostationary orbit and the spectrum*

The plan for Region 2 shall use, to the maximum extent technically and economically practicable, the techniques available so as to make the most efficient use of the geostationary orbit and the frequency spectrum to fulfil the requirements both of the Region as a whole and of the individual administrations.

7. *Consultations among administrations*

Administrations planning to bring into operation systems in the 11.7-12.2 GHz band, shall consult all the other administrations affected or concerned.

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[1] Paragraph 5 does not imply recognition of systems existing prior to the implementation of the plan.

8. *Reception*

The plan for Region 2 shall have as a basis individual reception, although each administration may choose the reception system that it finds most suited to its requirements, namely, individual or community reception, or both.

ANNEX 7

Use of the spectrum/orbit resource

Since the equal sharing of the spectrum/orbit resource between the broadcasting-satellite service and the fixed-satellite service in Region 2 is inherently difficult and may impose some restrictions on both services, it is important that the technical parameters be chosen, and the techniques for efficient use of the spectrum/orbit resource be applied in such a way that both space services will benefit as much as possible.

The following techniques are among those identified as leading to a more efficient use of the spectrum/orbit resource and should therefore be applied to the maximum extent technically and economically practicable consistent with the capability of systems to fulfil the requirements for which they were designed.

1. *Clustering*

Extensive analyses have shown that orbit utilization is improved when satellites are grouped according to the sensitivity to interference and the potential for generating interference of the system of which they are a part. In most cases, this means that space stations of similar characteristics should be grouped in the same part of the orbit.

2. *Cross-polarization*

The proper use of cross-polarization can significantly improve the use of the spectrum/orbit resource by providing additional isolation between potentially interfering systems.

3. *Crossed-beam geometry*

The principle of crossed-beam geometry is that adjacent satellites should not serve adjacent service areas. In that way, discrimination from both the satellite and the earth station antennae can be used to achieve maximum isolation between systems.

4. *Paired service areas*

The principle of crossed-beam geometry can be extended: if service areas are far enough apart, then the satellite antenna discrimination alone may be sufficient to permit satellites serving these widely separated service areas to be co-located in the orbit, leading to practical doubling of the orbit capacity;

5. *Frequency interleaving*

The mutual interference between channels in different systems is usually a maximum when the two carrier frequencies coincide. When channelling design is such that frequencies are interleaved, or, more generally, such that coincidence of carrier frequencies is avoided, mutual interference can in many cases be greatly reduced.

6. *Minimum space station spacings*

It is obvious that, for maximum orbit utilization, space stations should be placed as close to each other as is consistent with keeping the mutual interference to acceptable levels.

7. *Space station antenna discrimination*

The discrimination in the side-lobes of the space station antenna determines how much isolation exists between beams serving non-overlapping or non-adjacent service areas. To achieve maximum isolation, every effort should be made to improve the discrimination by technological advances in antenna design.

8. *Earth station antenna discrimination*

The side-lobe discrimination of the earth station antenna determines how much isolation is obtained from satellite spacing. To achieve maximum isolation, every effort should be made to improve the discrimination by taking advantage of technological advances in antenna design.

9. *Minimizing e.i.r.p. differences*

The interference caused by relatively high-power space stations (space stations in the broadcasting-satellite service or certain types of space stations in the fixed-satellite service) to the earth station receivers of relatively low-power satellite systems is directly proportional to the difference between their e.i.r.p. Sharing among such systems is greatly facilitated if this difference is kept as small as is consistent with the requirements.

10. *Realistic quality and reliability objectives*

The quality and reliability objectives have a significant effect on the use of the spectrum/orbit resource. If the objectives are set unnecessarily high, the capacity of the orbit is reduced. Quality and reliability objectives should be set no higher than are absolutely necessary.

ANNEX 8

Technical Data used in establishing the Provisions and Associated Plan and which should be used for their Application

1. DEFINITIONS

1.1 *Service area*

The area on the surface of the Earth in which the administration responsible for the service has the right to demand that the agreed protection conditions be provided.

Note: In the definition of service area, it is made clear that within the service area the agreed protection conditions can be demanded. This is the area where there should be at least the wanted power flux density and protection against interference based on the agreed protection ratio for the agreed percentage of time should be achieved.

1.2 *Coverage area*

The area on the surface of the Earth delineated by a contour of a constant given value of power flux density which would permit the wanted quality of reception in the absence of interference.

Note 1: In accordance with the provisions of No. 428A of the Radio Regulations, the coverage area must be the smallest area which encompasses the service area.

Note 2: The coverage area, which will normally encompass the entire service area, will result from the intersection of the antenna beam (elliptical or circular) with the surface of the Earth, and will be defined by a given value of power flux density. For example, in the case of a Region 1 or 3 country with a service planned for individual reception, it would be the area delineated by the contour corresponding to a level of -103 dBW/m^2 for 99% of the worst month. There will usually be an area outside the service area but within the coverage area in which the power flux density will be at least equivalent to the minimum specified value; however, protection against interference will not be provided in this area.

1.3 *Beam area*

The area delineated by the intersection of the half-power beam of the satellite transmitting antenna with the surface of the Earth.

Note: The beam area is simply that area on the Earth's surface corresponding to the -3 dB points on the satellite antenna radiation pattern. In many cases the beam area would almost coincide with the coverage area, the discrepancy being accounted for by the permanent difference in path lengths from the satellite throughout the beam area, and also by the permanent variations, if any, in propagation factors across the area. However, for a service area where the maximum dimension as seen from the satellite position is less than 0.6° (the agreed minimum practicable satellite antenna half-power beamwidth), there could be a significant difference between the beam area and the coverage area.

1.4 *Nominal orbital position*

The longitude of a position in the geostationary satellite orbit associated with a frequency assignment to a space station in a space radiocommunication service. The position is given in degrees from the Greenwich meridian.

2. RADIO PROPAGATION FACTORS

2.1 The propagation loss on the space to Earth path is equal to the free space path loss plus the attenuation exceeded for not more than 1% of the worst month; the latter being given in Figure 1 for the five rain-climatic zones shown in Figure 2.

2.2 In using the curves of Figure 1, the difference between clear weather attenuation and the attenuation for 99% of the worst month should be limited to a maximum of 2 dB by appropriate choice of angle of elevation.

2.3 In planning the broadcasting-satellite service, for emissions applying circular polarization, the level of the depolarized component relative to the level of the co-polar component should be taken as:

for rain-climatic zones 1 and 2: -27 dB

for rain-climatic zones 3, 4 and 5: -30 dB

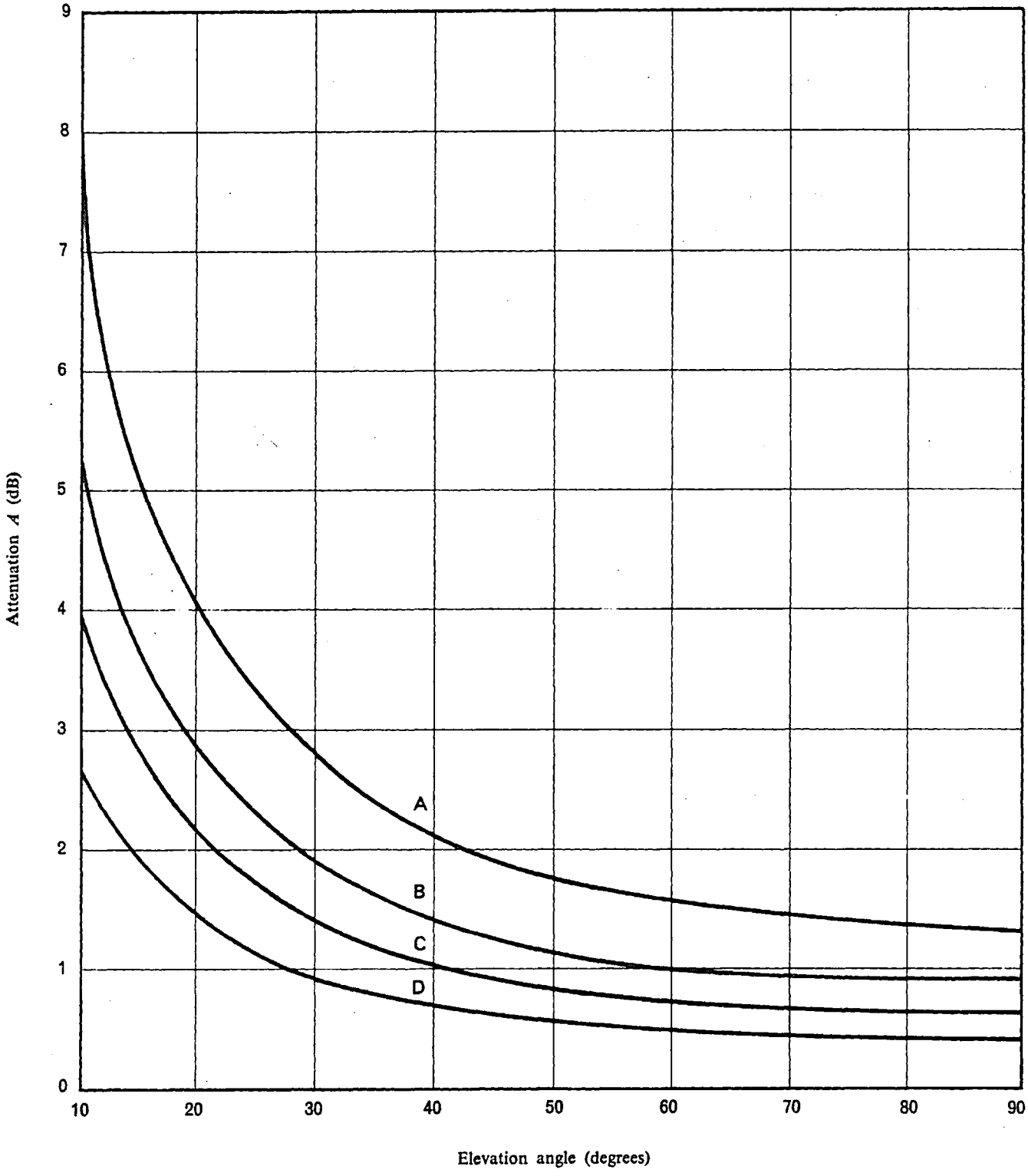


FIGURE 1

Predicted attenuation values exceeded for not more than 1% of the worst month (0.25% of the time) at 12 GHz in the rain-climatic zones indicated in Figure 2.

A: Rain-climatic zone 1 C: Rain-climatic zones 3 and 4

B: Rain-climatic zone 2 D: Rain-climatic zone 5

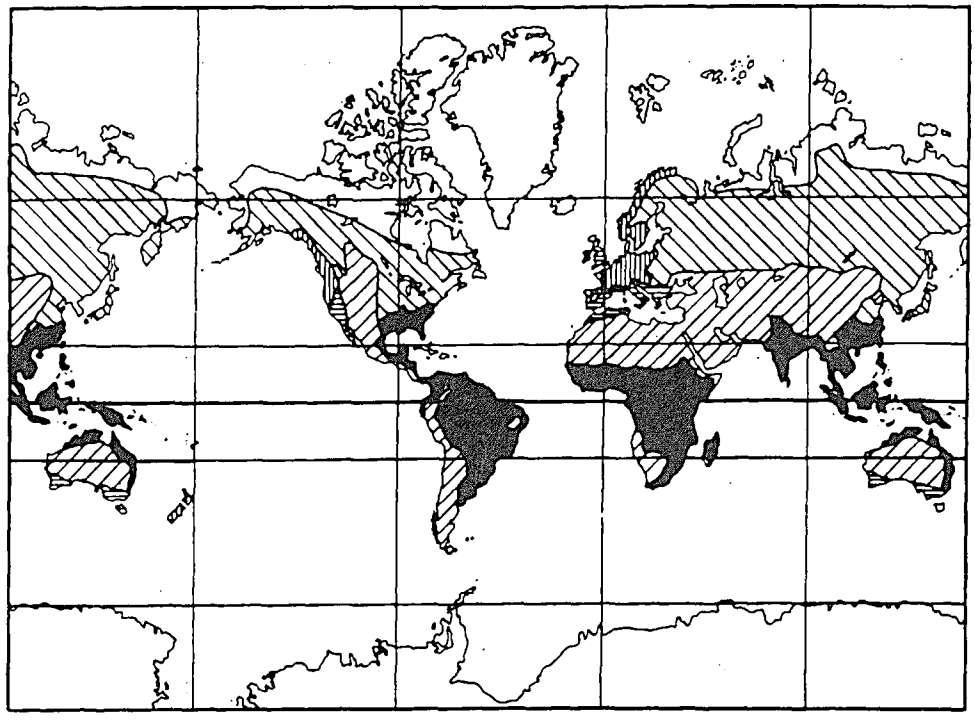


FIGURE 2

Rain-climatic zones

It should be noted that extensive measurements of attenuation due to rainfall have not been carried out in the tropical countries, especially in the African region.

3. BASIC TECHNICAL CHARACTERISTICS

3.1 *Type of modulation*

Planning of the broadcasting-satellite service is based on the use of a signal consisting of a video signal with an associated carrier, frequency-modulated by a sound signal, both frequency-modulating a carrier in the 12 GHz band, with a pre-emphasis characteristic in accordance with Figure 3 (from CCIR Recommendation 405).

This does not preclude the use of other modulating signals having different characteristics (e.g. modulation with sound channels frequency-multiplexed within the bandwidth of a television channel, digital modulation of sound and television signals, or other pre-emphasis characteristics), provided that the use of such characteristics does not cause greater interference than that caused by the system considered in the Plan.

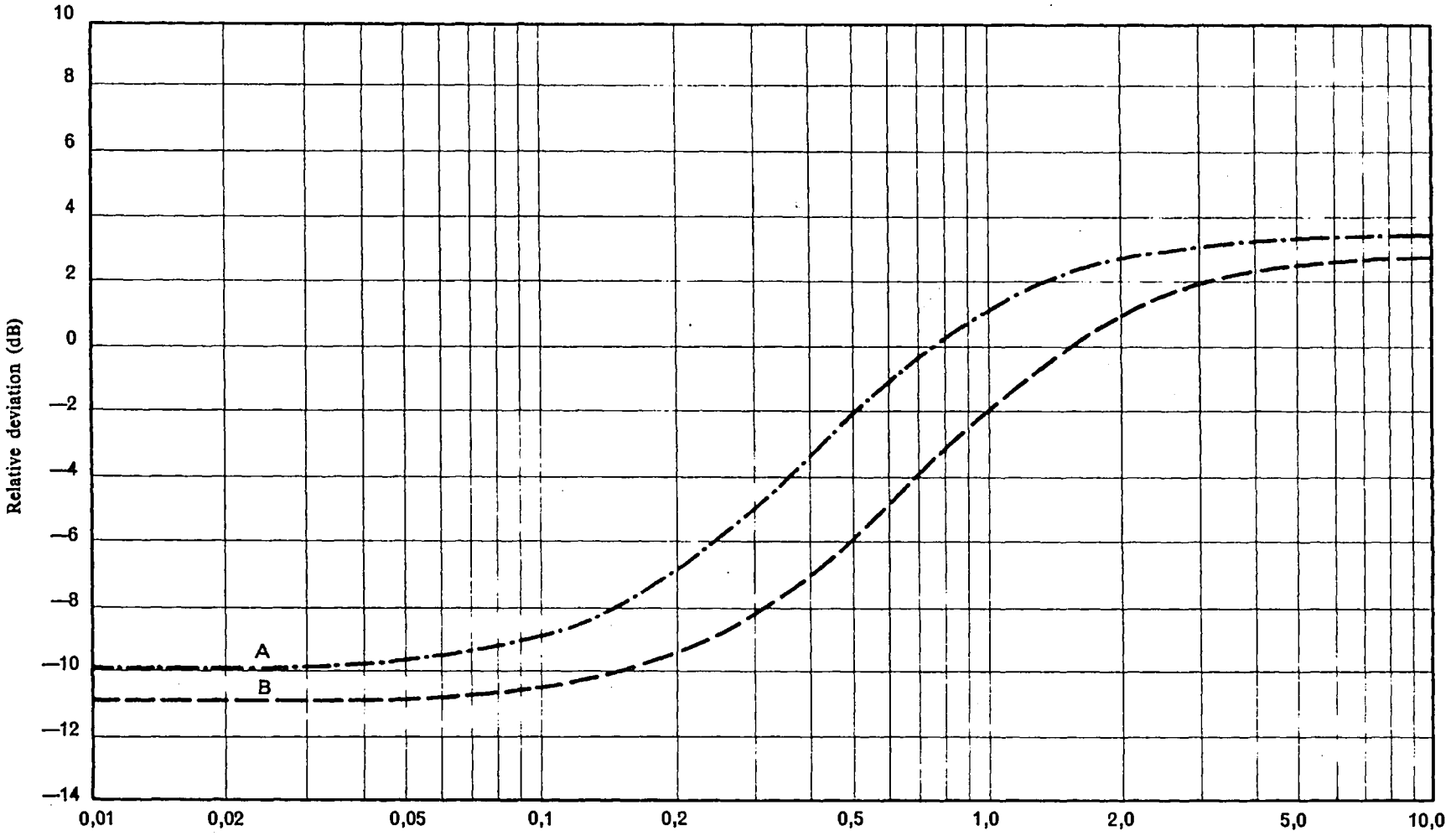


FIGURE 3

Pre-emphasis characteristic for television on 525- and 625-line systems

Curve A: 525-line system

Curve B: 625-line system

3.2 *Polarization*

3.2.1 For the planning of the broadcasting-satellite service, circular polarization shall be used in Regions 1, 2 and 3[1].

3.2.2 If possible, the polarization of different beams intended to serve the same area should be the same.

3.2.3 The terms "direct" and "indirect" used in the Plan to indicate the direction of rotation of circularly polarized waves correspond to right-hand (clockwise) and left-hand (anti-clockwise) polarization respectively according to the following definitions:

Direct polarization (right-hand or clockwise polarization)

An elliptically or circularly-polarized wave, in which the electric field-intensity vector, observed in any *fixed plane,* normal to the direction of propagation, whilst looking in (i.e., not against) the direction of propagation, rotates *with time* in a *right-hand* or clockwise direction.

Note: For circularly-polarized plane waves, the ends of the electric vectors drawn from any points along a straight line normal to the plane of the wave front, form, *at any instant,* a *left-hand* helix.

Indirect polarization (left-hand or anti-clockwise polarization)

An elliptically or circularly-polarized wave, in which the electric field-intensity vector, observed in any *fixed-plane,* normal to the direction of propagation, whilst looking in (i.e., not against) the direction of propagation, rotates *with time* in a *left-hand* or anti-clockwise direction.

Note: For circularly-polarized plane waves, the ends of the electric vectors drawn from any points along a straight line normal to the plane of the wave front, form, *at any instant,* a *right-hand* helix.

3.3 *Carrier-to-noise ratio*

For the purpose of planning the broadcasting-satellite service, the carrier-to-noise ratio is equal to 14 dB for 99% of the worst month.

The reduction in quality in the down-link due to thermal noise in the up-link is taken as equivalent to a degradation in the down-link carrier-to-noise ratio not exceeding 0.5 dB for 99% of the worst month.

---

[1]The Administration of the United States of America expressed concern regarding the adoption of circular polarization for Region 2 and indicated that the very probable adoption of linear polarization by the fixed-satellite service would preclude the use of cross-polarization to facilitate sharing between the two space services and would affect orbit and spectrum utilization within the Region.

The administration of Iran expressed a reservation regarding the adoption of circular polarization for planning the broadcasting-satellite service in Region 3 and stated its intention to use linear polarization.

3.4 *Protection ratio between two FM television signals*

For planning in Regions 1 and 3 the following protection ratios have been adopted for the purpose of calculating equivalent protection margin[1]:

−31 dB for co-channel signals

−15 dB for adjacent channel signals.

3.5 *Channel spacing*

3.5.1 *Channel spacing in the Plan*

The spacing between the assigned frequencies of two adjacent channels is 19.18 MHz. The Plan gives the assigned frequencies for each channel.

3.5.2 *Grouping of channels in the same beam*

Planning in Region 1 has been carried out by trying to group all the channels radiated within a single antenna beam within a frequency range of 400 MHz, in order to simplify receiver construction.

3.5.3 *Spacing between channels feeding a common antenna*

Owing to technical difficulties in the output circuit of a satellite transmitter, spacing between the assigned frequencies of two channels feeding a common antenna must be greater than 40 MHz.

3.6 *Figure of merit (G/T) of a receiving installation in the broadcasting-satellite service*

In planning the broadcasting-satellite service, the value of the figure of merit (G/T) used is:

6 dB/K for individual reception;

14 dB/K for community reception.

The values are calculated from the following formula which allows for pointing error, polarization effects, and ageing:

$$G/T = \frac{\alpha\,\beta\,G_r}{\alpha\,T_a + (1-\alpha)\,T_0 + (n-1)\,T_0}$$

---

[1] The equivalent protection margin M is given in dB by the formula

$$M = -10 \log \left[10^{-M_1/10} + 10^{-M_2/10} + 10^{-M_3/10} \right]$$

where M_1 is the value in dB of the protection margin for the same channel. This is defined in the following expression where the powers are evaluated at the receiver input:

$$\frac{\text{wanted power}}{\text{sum of the co-channel interfering powers}}\ (\text{dB}) - \text{co-channel protection ratio (dB)}$$

M_2 and M_3 are the values in dB of the upper and lower adjacent channel protection margins.

The definition of the adjacent-channel protection margin is similar to that for the co-channel case exept that the adjacent-channel protection ratio and the sum of the interfering powers due to transmissions in the adjacent channel are considered.

where

α : the total coupling losses, expressed as a power ratio;

β : the total losses due to the pointing error, polarization effects and ageing, expressed as a power ratio;

G_r: the effective gain of the receiving antenna, expressed as a power ratio and taking account of the method of feeding and the efficiency;

T_a: the effective temperature of the antenna;

T_0: the reference temperature = 290 K;

n : the overall noise factor of the receiver, expressed as a power ratio.

See also CCIR Report 473-1 (Annex 1).

3.7 *Receiving antenna*

3.7.1 *Minimum diameter of receiving antenna*

For planning the broadcasting-satellite service the minimum diameter of receiving antenna considered is such that the half-power beamwidth, φ_o, is:

a) for individual reception: 2° in Regions 1 and 3, 1.8° in Region 2;

b) for community reception: 1° in all Regions.

3.7.2 *Receiving antenna reference patterns*

The co-polar and cross-polar reference patterns of receiving antennae are given in Figures 4 and 5.

a) The relative antenna gain (dB) is given by the curves in Figure 4 for:

- individual reception in Regions 1 and 3:
  - Curve A for the co-polar component; and
  - Curve B for the cross-polar component;
- community reception:
  - in all Regions, Curve A′ up to the intersection with Curve C, then Curve C, for the co-polar component;
  - in Regions 1 and 3, Curve B for the cross-polar component.

b) For Region 2, the relative antenna gain (dB) is given by the curves in Figure 5 for:

- individual reception, for which use should be made of:
  - Curve A for the co-polar component,
  - Curve B for the cross-polar component;
- community reception for which Curve B should be used for the cross-polar component (the co-polar component being given in Figure 4).

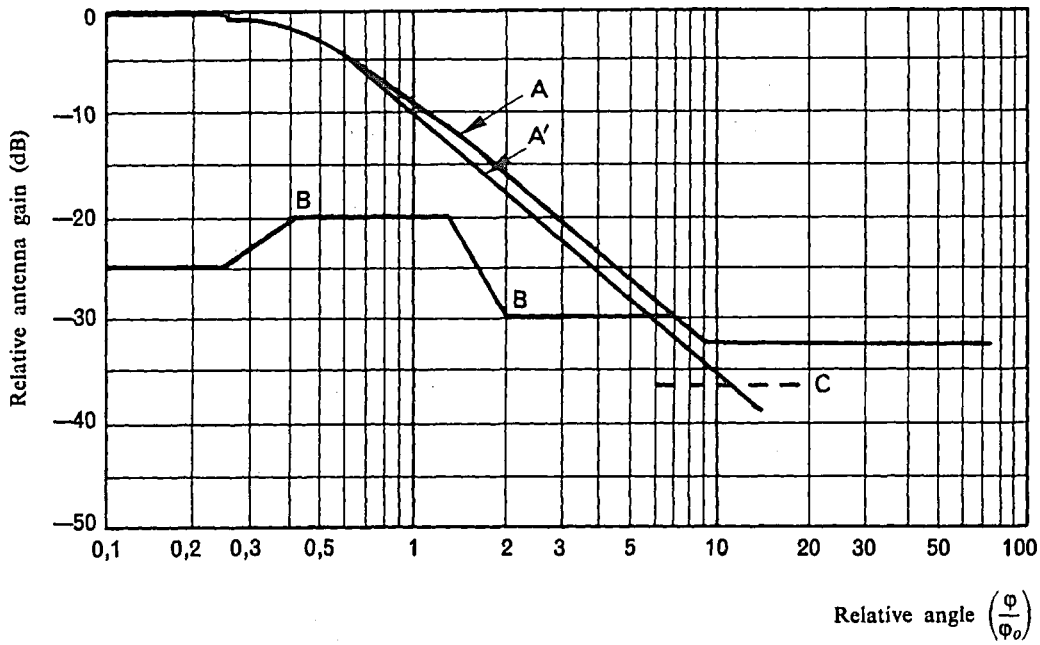


FIGURE 4

Co-polar and cross-polar reference patterns for receiving antenna

Curve A: Co-polar component for individual reception without side-lobe suppression

0	for $0 \leqslant \varphi \leqslant 0.25\ \varphi_o$
$-12\left(\frac{\varphi}{\varphi_o}\right)^2$	for $0.25\ \varphi_o < \varphi \leqslant 0.707\ \varphi_o$
$-\left[9.0 + 20 \log_{10}\left(\frac{\varphi}{\varphi_o}\right)\right]$	for $0.707\ \varphi_o < \varphi \leqslant 1.26\ \varphi_o$
$-\left[8.5 + 25 \log_{10}\left(\frac{\varphi}{\varphi_o}\right)\right]$	for $1.26\ \varphi_o < \varphi \leqslant 9.55\ \varphi_o$
-33	for $9.55\ \varphi_o < \varphi$

Curve A': Co-polar component for community reception without side-lobe suppression

0	for $0 \leqslant \varphi \leqslant 0.25\ \varphi_o$
$-12\left(\frac{\varphi}{\varphi_o}\right)^2$	for $0.25\ \varphi_o < \varphi \leqslant 0.86\ \varphi_o$
$-\left[10.5 + 25 \log_{10}\left(\frac{\varphi}{\varphi_o}\right)\right]$	for $0.86\ \varphi_o < \varphi$ up to intersection with Curve C (then Curve C)

Curve B: Cross-polar component for both types of reception

-25	for $0 \leqslant \varphi \leqslant 0.25\ \varphi_o$
$-\left(30 + 40 \log_{10}\left\lvert\frac{\varphi}{\varphi_o} - 1\right\rvert\right)$	for $0.25\ \varphi_o < \varphi \leqslant 0.44\ \varphi_o$

-20 for $0.44\,\varphi_o < \varphi \leqslant 1.4\,\varphi_o$

$-\left(30 + 25\log_{10}\left|\frac{\varphi}{\varphi_o} - 1\right|\right)$ for $1.4\,\varphi_o < \varphi \leqslant 2\,\varphi_o$

-30 until intersection with co-polar component curve; then as for co-polar component

Curve C: Minus the on-axis gain

Note: for values of φ_o see 3.7.1.

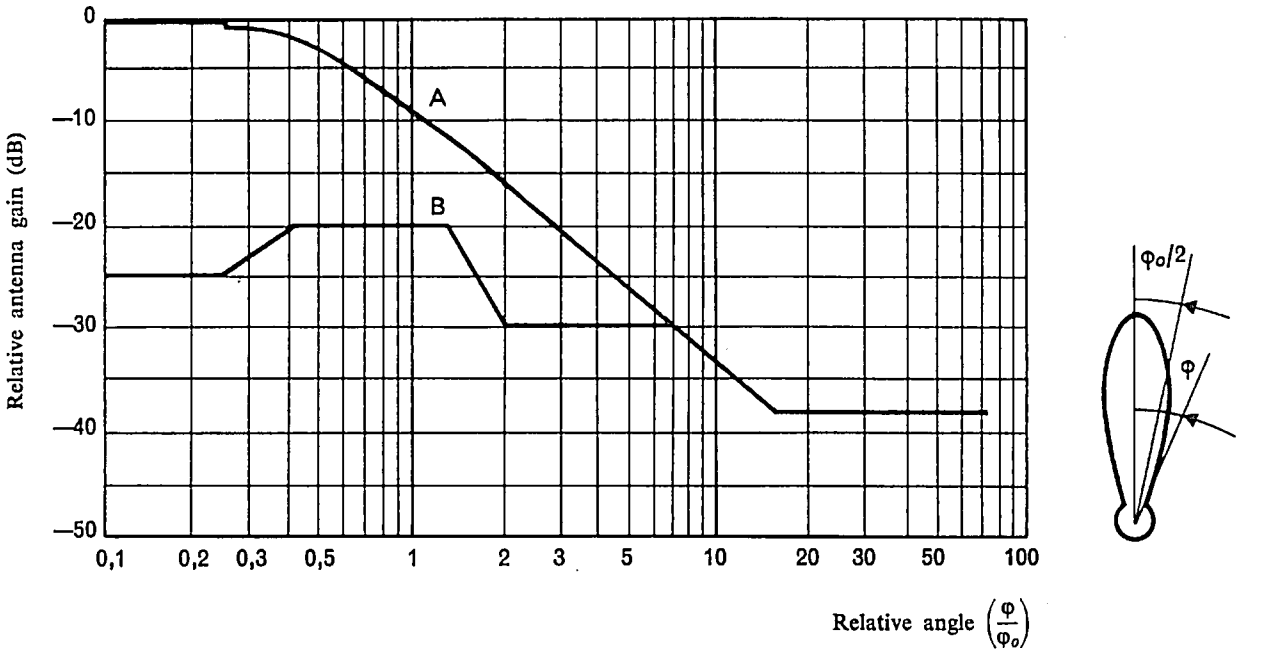


FIGURE 5

Reference patterns for co-polar and cross-polar components for receiving antennae for individual reception in Region 2

Curve A: Co-polar component without side-lobe suppression

0 for $0 \leqslant \varphi \leqslant 0.25\,\varphi_o$

$-12\left(\frac{\varphi}{\varphi_o}\right)^2$ for $0.25\,\varphi_o < \varphi \leqslant 0.707\,\varphi_o$

$-\left[9.0 + 20\log_{10}\left(\frac{\varphi}{\varphi_o}\right)\right]$ for $0.707\,\varphi_o < \varphi \leqslant 1.26\,\varphi_o$

$-\left[8.5 + 25\log_{10}\left(\frac{\varphi}{\varphi_o}\right)\right]$ for $1.26\,\varphi_o < \varphi \leqslant 15.14\,\varphi_o$

-38 dB for $\varphi > 15.14\,\varphi_o$

Curve B: Cross-polar component

-25 for $0 \leqslant \varphi \leqslant 0.25\,\varphi_o$

$-\left(30 + 40 \log_{10} \left| \frac{\varphi}{\varphi_o} - 1 \right| \right)$ for $0.25\,\varphi_o < \varphi \leqslant 0.44\,\varphi_o$

-20 for $0.44\,\varphi_o < \varphi \leqslant 1.4\,\varphi_o$

$-\left(30 + 25 \log_{10} \left| \frac{\varphi}{\varphi_o} - 1 \right| \right)$ for $1.4\,\varphi_o < \varphi \leqslant 2\,\varphi_o$

-30 until intersection with co-polar component curve; then as for co-polar component

Note: for values of φ_o see 3.7.1.

3.8 *Necessary bandwidth*

The necessary bandwidths considered are as follows for:

- 625-line systems: 27 MHz;
- 525-line systems in Region 3: 27 MHz;
- 525-line system M of Region 2: 18 MHz and 23 MHz.

3.9 *Guard bands*

3.9.1 A guard band is defined as the portion of the frequency spectrum between the edge of the allocated band and the edge of the necessary bandwidth of the emission in the nearest channel.

3.9.2 For the planning of the broadcasting-satellite service, the guard bands necessary to protect the services in adjacent frequency bands are shown in the table below.

Regions	Guard band at the lower edge of the band (11.7 GHz)	Guard band at the upper edge of the band (12.2/12.5 GHz)
1	14 MHz	11 MHz
2	12 MHz	9 MHz
3	14 MHz	11 MHz

These guard bands assume maximum beam centre e.i.r.p. values of 67 dBW for Regions 1 and 3 and 63 dBW for Region 2 (values relating to individual reception), and a filter roll-off of 2 dB/MHz. If smaller e.i.r.p. values are assumed, the guard bands can be reduced in width by 0.5 MHz for each decibel decrease in e.i.r.p.

3.9.3 Since developments in technology or the choice of lower e.i.r.p. values than those given above are likely to permit a reduction in the necessary guard bands, it is recommended that, for purposes other than *a priori* planning at this Conference, the latest CCIR Recommendations concerning spurious emissions from broadcasting satellites should be followed.

3.10 *Orbital spacing*

The Plan for Regions 1 and 3 has been based generally on nominal orbital positions spaced uniformly at intervals of 6°.

3.11 *Satellite station keeping*

Space stations in the broadcasting-satellite service must be maintained in position with an accuracy of better than ±0.1° in both the N-S and E-W directions. (These tolerances lead to a maximum excursion of ±0.14° from the nominal satellite position.)

3.12 *Elevation angle of receiving antennae*

The Plan has been based on the consideration of a minimum angle of elevation of 20° to minimize the required e.i.r.p. of the satellite and to reduce the effects of shadowing and the possibility of interference from terrestrial services. However, for areas situated in latitudes above about 60°, the angle of elevation is of necessity less than 20°. Attention is also directed to Section 2.2.

For mountainous areas where an angle of 20° may not suffice, an angle of at least 30° has been provided where possible to provide an acceptable service. An angle of elevation of at least 40° has been considered for service areas subject to high precipitation (e.g., rain-climatic zone 1).

Some dry, non-mountainous areas may be given an acceptable service at angles of elevation less than 20°.

In areas with small angles of elevation, the shadowing effect of tall buildings may have to be taken into account.

In choosing a satellite position designed to give the maximum angle of elevation at the ground, the influence of such a position on the eclipse period has been borne in mind.

3.13 *Transmitting antenna*

3.13.1 *Cross-section of transmitted beam*

Planning has been based on the use of transmitting antennae with beams of elliptical or circular cross-section.

If the cross-section of the transmitted beam is elliptical, the effective beamwidth φ_o is a function of the angle of rotation q between the plane containing the satellite and the major axis of the beam cross-section and the plane in which the beamwidth is required.

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression:

$$G_m = 27\,843/ab$$

or

$$G_m\,(\text{dB}) = 44.44 - 10\log_{10}a - 10\log_{10}b$$

where:

a and b are the angles (in degrees) subtended at the satellite by the major and minor axes of the elliptical cross-section of the beam.

An antenna efficiency of 55% is assumed.

3.13.2 *Minimum beamwidth of transmitting antenna*

A minimum value of 0.6° for the half-power beamwidth of a transmitting antenna has been agreed on for planning.

3.13.3 *Transmitting antenna reference patterns*

The reference patterns for the co-polar and cross-polar components of satellite transmitting antenna used in preparing the Plan are given in Figure 6.

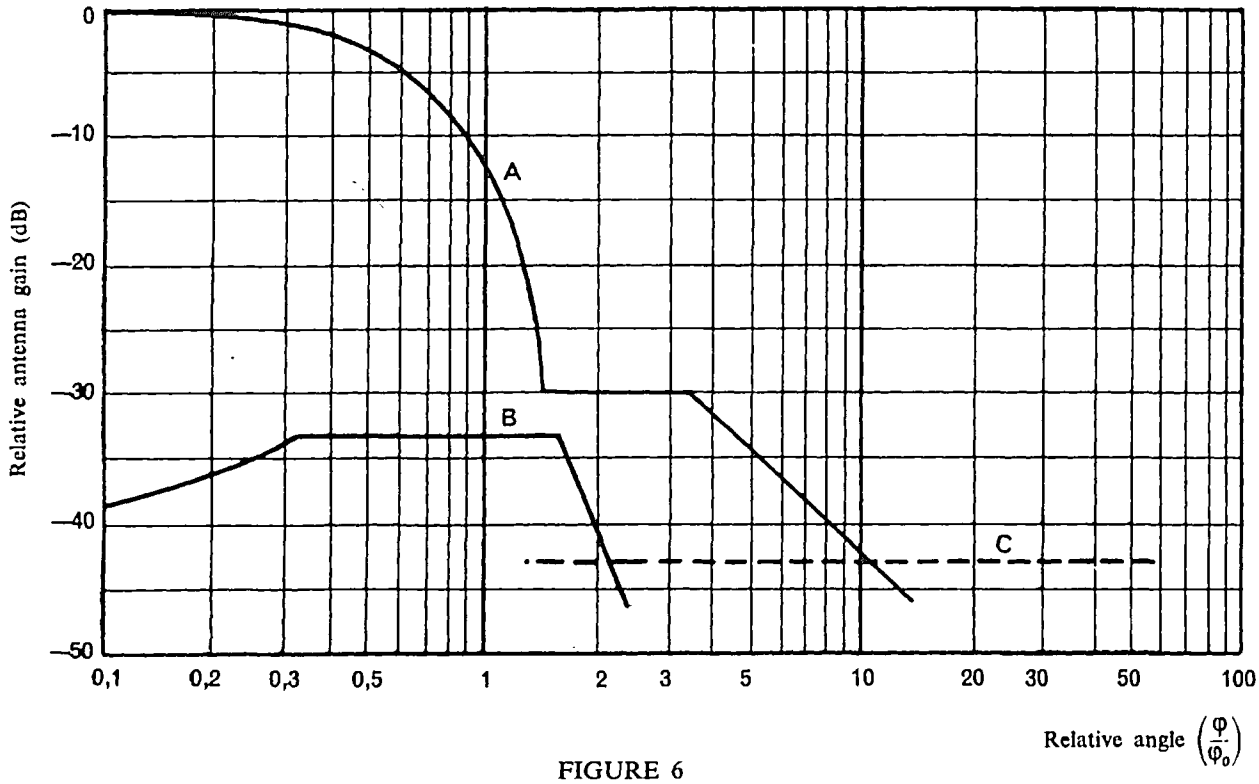
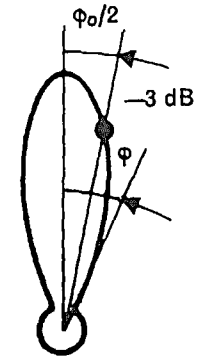


FIGURE 6

Reference patterns for co-polar and cross-polar components for satellite transmitting antenna



Curve A: Co-polar component

$-12\left(\frac{\varphi}{\varphi_o}\right)^2$ for $0 \leqslant \varphi \leqslant 1.58\,\varphi_o$

-30 for $1.58\,\varphi_o < \varphi \leqslant 3.16\,\varphi_o$

$-\left[17.5 + 25\log_{10}\left(\frac{\varphi}{\varphi_o}\right)\right]$ for $3.16\,\varphi_o < \varphi$

after intersection with curve C: as curve C

Curve B: Cross-polar component

$$-\left(40 + 40 \log_{10} \left| \frac{\varphi}{\varphi_o} - 1 \right| \right) \text{ for } 0 \leqslant \varphi \leqslant 0.33\, \varphi_o$$

$$-33 \quad \text{for } 0.33\, \varphi_o < \varphi \leqslant 1.67\, \varphi_o$$

$$-\left(40 + 40 \log_{10} \left| \frac{\varphi}{\varphi_o} - 1 \right| \right) \text{ for } 1.67\, \varphi_o < \varphi$$

after intersection with curve C: as curve C

Curve C: Minus the on-axis gain.

3.14 *Pointing accuracy of satellite antennae*

3.14.1 The deviation of the antenna beam from its nominal pointing direction must not exceed a limit of 0.1° in any direction. Moreover, the angular rotation of a transmitting beam about its axis must not exceed a limit of ±2°; this latter limit is not necessary for beams of circular cross-section using circular polarization.

3.14.2 The following factors contribute to the total variation in the area on the surface of the Earth illuminated by the satellite beam:

- variations in satellite station-keeping;
- the variations caused by the pointing tolerances, which become more significant for coverage areas with low angles of elevation;
- the effect of the yaw error increases as the beam ellipse lengthens.

3.14.3 The effect of these possible variations should be assessed on a case-by-case basis,since their total effect on the area covered will vary as the geometry of the satellite beam varies, and it would not be reasonable to indicate a single value of shift in the area covered for all situations.

3.14.4 If linear polarization is used for an emission, yaw error makes a significant contribution to increasing the transmitted cross-polarized component; this increases the interference with other carriers which were originally cross-polarized with the emission in question.

3.15 *Limitation of output power in the satellite transmitter*

The output power of a space station in the broadcasting-satellite service must not rise by more than 0.25 dB relative to its nominal value throughout the life of the satellite.

3.16 *Power flux density at edge of coverage area*

The value of the power flux density at the edge of the coverage area for 99% of the worst month is:

−103 dBW/m² for individual reception in Regions 1 and 3;

−105 dBW/m² for individual reception in Region 2;

−111 dBW/m² for community reception in all Regions.

3.17 *Difference between the e.i.r.p. directed towards the edge of the coverage area and that on the axis of the beam*

For planning, the absolute value of the difference between the e.i.r.p. directed towards the edge of the coverage area and that on the axis of the beam should preferably be 3 dB.

If the beam area is larger than the coverage area, the value will be less than 3 dB.

3.18 *Use of energy dispersal*

For planning, an energy dispersal value has been adopted which reduces by 22 dB the spectral power flux density measured in a 4 kHz bandwidth in relation to that measured in the entire bandwidth; this reduction corresponds to a peak-to-peak deviation of 600 kHz.

ANNEX 9

Criteria for Sharing between Services

1. *Protection requirements for sharing between services in the 12 GHz band*

1.1 The establishment of sharing criteria for the different services using the 12 GHz band should be based on the protection requirements listed in the table below:

Wanted service [1]	Wanted signal [1]	Interfering service [1]	Interfering signal [1]	Protection requirements [2]	
				Total acceptable [3]	Single entry
BSS	TV/FM	BSS, FSS, FS, BS	TV/FM	C/I = 30 dB [4,7]	C/I = 35 dB [4]
FSS	FDM/FM	BSS	TV/FM	N = 500 pW0p [8]	N = 300 pW0p
FSS	TV/FM	BSS, FSS	TV/FM	C/I = 32 dB [5]	C/I = 37 dB [5]
FSS	4φ-PSK	BSS, FSS	TV/FM	C/I = 30 dB	C/I = 35 dB
FSS	FDM/FM	FSS	FDM/FM	N = 1000 pW0p	N = 400 pW0p
FS	FDM/FM	BSS	TV/FM	N = 1000 pW0p	−125 dBW/m²/4 kHz [6]
BS	TV/VSB	BSS	TV/FM	C/I = 50 dB	not applicable

Notes: [1] BSS = broadcasting-satellite service
FSS = fixed-satellite service
BS = broadcasting service
FS = fixed service
TV = television
FM = frequency modulation
FDM = frequency division multiplex
4φ–PSK = four-level phase shift keying
VSB = vestigial sideband

[2] These limits include both up-link and down-link contributions. They are expressed:
— in dB for carrier-to-interference ratio;
— in pW0p for noise
— in dBW/m^2/4 kHz for power flux density in a 4 kHz band.

[3] Values in dB are protection ratios for the sum of interfering signals.
Values in pW0p represent interference noise in the worst telephone channels caused by the sum of interfering signals.

[4] For BSS satellites located at the interfaces of Regions 1/3 and Region 2, the *C/I* ratios should be 1 dB higher.

[5] See CCIR Recommendation 483.

[6] This value may be suitably modified for tropical regions to take account of rain attenuation. Allowance may also be made for polarization discrimination.

[7] *C/I* = ratio of carrier-to-interfering signal

[8] *N* = noise power

1.2 The values given as "total acceptable" are those necessary to protect the wanted signal. The "single entry" values are those which should be used as a guide for determining sharing criteria. The total interference from all sources must be calculated, since satisfying the "single entry" criteria for each source may not guarantee that the total interference meets the above protection requirements. A "single entry" is defined as the aggregate of emissions from any one station entering any receiver in the wanted service within the channel to be protected.

1.3 The term *C/I* refers to the ratio of the wanted-to-interfering power at the interfered-with ground station. The value given shall be exceeded for all but 20% of the worst month for the fixed-satellite service (FSS), and for all but 1% of the worst month for the broadcasting service (BS) and the broadcasting-satellite service (BSS).

1.4 The term *N* refers to the post-demodulation noise power at a point of 0 dBm0 relative test tone level in any voice channel of an FDM/FM telephony system. The value given shall not be exceeded for more than 20% of the worst month.

1.5 The specified values of protection ratio (i.e., the carrier-to-interference power ratio corresponding to a specified picture quality) are applicable, for planning purposes, to television signals of any of the several television standards.

1.6 For BSS systems with FM/TV as the wanted signal, the protection ratios are given for particular reference conditions, the most important of which are:

a) frequency deviation of the wanted signal (12 MHz peak-to-peak);

b) quality of the wanted service (grade 4.5)[1];

c) co-channel carriers (no carrier-frequency offset).

---

[1] Impairment grade on a 5-point scale as defined in CCIR Recommendation 500.

1.7 If system design is based on conditions other than *a)* and *b)* above, the FM/TV protection ratio is given by:

$$R = 12.5 - 20 \log (D_v/12) - Q + 1.1\, Q^2 \quad \text{(dB)}$$

where D_v = nominal peak-to-peak frequency deviation (MHz)
Q = the impairment grade, concerning the interference only.

1.8 When carriers are offset in frequency, condition *c)* does not apply and the adjacent channel protection ratios should be adjusted according to the frequency offset as shown in Figure 1. For example, at a frequency offset of 20 MHz, the total acceptable ratio of protection against interference to an FM/TV signal from another FM/TV signal is 13 dB. The corresponding "single entry" value is 18 dB.

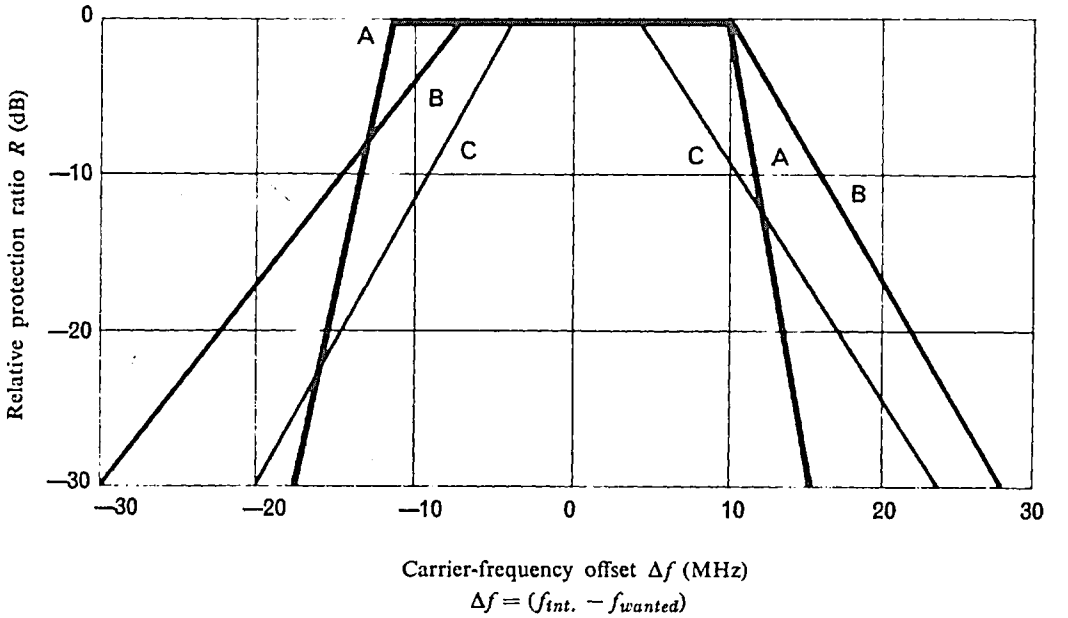


FIGURE 1

Reference case protection ratios relative to co-channel values

Curve A: TV/VSB-wanted, TV/FM interfering

Curve B: TV/FM-wanted, TV/FM interfering

Curve C: TV/FM-wanted, TV/VSB interfering

2. *Reference antenna diameter for a fixed-satellite Earth station to be used in calculating interference from space stations in the broadcasting-satellite service*

2.1 For antennae larger than 100λ (2.5 m) in the fixed-satellite service, the gain of the side-lobes is given by the equation 32−25 log θ, where θ is the angle from the boresight (CCIR Recommendation 465). The side-lobe gain is independent of antenna diameter.

2.2 However, in the case of transmitting Earth stations, the level of interference radiated into the up-link of other satellite systems would be inversely proportional to the square of the antenna diameter. In this case, the interference decreases with increasing antenna diameter. Since the 11.7-12.2 GHz band is only assigned in the space-to-Earth direction in the fixed-satellite service, this point is not of direct concern to the broadcasting-satellite service.

2.3 Hence it does not appear appropriate, for antenna diameters greater than 100 λ, to specify a minimum antenna diameter for receiving Earth stations in the fixed-satellite service sharing the band 11.7-12.2 GHz. It may be useful to consider a 4.5 m antenna having an efficiency of 60% and an on-axis gain of 53 dB as typical for the purpose of planning the sharing of this band; however, it should be noted that administrations in Region 2 are considering the use of antennae 3 m to 10 m in diameter.

3. *Use of energy dispersal in the broadcasting-satellite service*

3.1 Artificial energy dispersal is useful in promoting sharing between the broadcasting-satellite service and the other services to which the band is also allocated.

3.2 Such energy dispersal is achieved by the addition at baseband of a triangular waveform to the video signal to form a composite baseband which, in turn, is used to frequency-modulate the up-link carrier. The frequency of the triangular waveform is usually synchronized at a sub-multiple of the television frame frequency. Typical frequencies range from 12.5 Hz to 30 Hz.

3.3 The table below gives the relative reduction in spectral power flux density in a 4 kHz bandwidth as a function of the peak-to-peak deviation due to the energy dispersal signal. This table is based on the following equation:

$$\left.\begin{array}{l}\text{Relative reduction (in dB)}\\ \text{in a 4 kHz band}\end{array}\right\} = 10 \log \frac{\Delta F_{pp} + \delta f_{rms}}{4}$$

where ΔF_{pp} = peak-to-peak deviation due to the energy dispersal signal (kHz)

δf_{rms} = rms deviation due to "natural" energy dispersal (kHz)

In compiling the table below, a value of 40 kHz has been assumed for δf_{rms}, on the basis of the value of 10 dB for "natural" dispersion given in Table 4 of CCIR draft Report 631 (Rev.76).

Reduction of spectral power flux density relative to a 4 kHz bandwidth

Peak-to-peak deviation (kHz)	Relative reduction (dB)
0	10
100	15.44
200	17.78
300	19.29
400	20.41
500	21.30
600	22.04
700	22.67
800	23.22
900	23.71
1 000	24.15

3.4 The value of energy dispersal for the broadcasting-satellite service has been determined such that the spectral power flux density measured in a 4 kHz bandwidth is reduced by 22 dB relative to that measured in the entire bandwidth; this reduction corresponds to a peak-to-peak deviation of 600 kHz.

ANNEX 10

Orbital Position Limitations

In applying the procedure of Article 4 for modifications to the Plan administrations shall observe the following criteria:

1) No broadcasting-satellite serving an area in Region 1 and using a frequency in the band 11.7-12.2 GHz shall occupy a nominal orbital position further West than 37° W or further East than 146° E.

2) Any new orbital position in the Plan in the range of orbital arc between 37° W or 10° E associated with a new assignment, or resulting from a modification of an assignment in the Plan, shall be coincident with, or within 1° to the East of, a nominal orbital position in the Plan at the date of entry into force of the Final Acts.

In the event of a modification to an assignment in the Plan, the use of a new nominal orbital position not coincident with any nominal orbital position in the Plan at the date of entry into force of the Final Acts shall be associated with an 8 dB reduction in the e.i.r.p. compared to that appearing in the Plan for the assignment before modification.

ANNEX 11

Method of Calculating the Power Flux Density produced in the Territories of Region 2 by Space Stations in the Broadcasting-Satellite Service in Regions 1 and 3

Method of calculation

1. The power flux density produced, under conditions of free space propagation, at a given point, P, on the surface of the Earth, by a satellite in the geostationary orbit, can be calculated from the following data:

1.1 nominal orbital position;

1.2 e.i.r.p., dBW;

1.3 characteristics of the antenna beam at half-power points (i.e. the major and minor axes together with the orientation of the corresponding ellipse);

1.4 geographical coordinates of the boresight (B);

1.5 geographical coordinates of the point P.

2. The values relevant to items 1.1 to 1.4 are indicated in the Plan. The point P can be chosen with reference to the objective of calculation. For the calculations which follow, the coordinates of point P have been taken as 35°W and 8°S.

3. To obtain the power flux density [dB (W/m²)] produced at P, calculate:

- the distance, d (metres), between the satellite and the point P;
- the spreading attenuation, A for the distance d:

$$A = 10\log \frac{1}{4\pi d^2}$$

- the angle φ, as seen from the satellite, between points B and P;
- φ_o, the half-power beamwidth, in the direction of P (in the case of a circular beam φ_o will be independent of direction);
- the relative antenna gain, δG in dB, for the calculated values of φ and φ_o using the reference pattern for the co-polar component of the satellite transmitting antenna.

Then apply the expression*:

$$\text{pfd } [\text{dB(W/m}^2)] = \text{e.i.r.p.} + \delta G + A$$

to obtain the power flux density produced at P.

Results

The power flux densities produced at the coordinates 35°W, 8°S from broadcasting space stations of Regions 1 and 3, to which orbital positions from 37°W to 5°E and channels 1 to 25 have been assigned in the Plan, are given in the following table.

* *Note by the CCIR Specialized Secretariat:* In this expression, e.i.r.p. refers to boresight. The relative antenna gain δG is with respect to boresight antenna gain, therefore δG is negative.

Densité surfacique de puissance (DSP) produite dans la Région 2, au point: longitude = 35° W, latitude = 8° S

Power flux density (PFD) produced in Region 2 at a point having: longitude = 35° W, latitude = 8° S

Densidad de flujo de potencia (DFP) producida en la Región 2 en el punto correspondiente a las siguientes coordenadas: longitud = 35° W, latitud = 8° S

Position nominale sur l'orbite Nominal orbital position Posición orbital nominal −37,0			Position nominale sur l'orbite Nominal orbital position Posición orbital nominal −31,0			Position nominale sur l'orbite Nominal orbital position Posición orbital nominal −25,0			Position nominale sur l'orbite Nominal orbital position Posición orbital nominal −19,0		
N° IFRB IFRB No. N.° de la IFRB	Canaux N°s Channel Nos. N.°s de los canales	DSP PFD DFP dBW/m²	N° IFRB IFRB No. N.° de la IFRB	Canaux N°s Channel Nos. N.°s de los canales	DSP PFD DFP dBW/m²	N° IFRB IFRB No. N.° de la IFRB	Canaux N°s Channel Nos. N.°s de los canales	DSP PFD DFP dBW/m²	N° IFRB IFRB No. N.° de la IFRB	Canaux N°s Channel Nos. N.°s de los canales	DSP PFD DFP dBW/m²
AND 341	4 8 12 16 20	−146,35	AZR 134	3 7 11 15 19	−140,72	ALG 251	2 6 10 14 18	−135,17	AUT 016	4 8 12 16 20	−143,67
CVA 085	23	−141,92	CNR 130	23	−140,93	ALG 252	4 8 12 16 20	−130,26	BEL 018	21 25	−144,97
GMB 302	3 7 11 15 19	−137,17	CPV 301	4 8 12 16 20	−137,14	GHA 108	23	−134,45	BEN 233	3 7 11 15 19	−140,20
GUI 192	1 5 9 13 17	−132,98	CTI 237	22	−132,20	LBY 280	1 5 9 13 17	−138,64	D 087	2 6 10 14 18	−140,17
LIE 253	3 7 11 15 19	−146,00	E 129	23	−137,48	LBY 321	3 7 11 15 19	−139,00	F 093	1 5 9 13 17	−138,67
MCO 116	21 25	−145,75	G 027	4 8 12 16 20	−140,02	MRC 209	21 25	−128,74	GNE 303	23	−141,30
MLI 327	2 6 10 14 18	−132,79	GNP 304	2 6 10 14 18	−137,07	NGR 115	24	−127,77	HOL 213	23	−144,77
MLI 328	4 8 12 16 20	−131,06	HVO 107	21 25	−131,90	TGO 226	2 6 10 14 18	−141,45	I 082	24	−138,57
MTN 223	22	−129,20	IRL 211	2 6 10 14 18	−144,38	TUN 150	22	−141,14	LUX 114	3 7 11 15 19	−145,56
MTN 288	24	−135,68	ISL 049	21 25	−142,72				NIG 119	22	−129,39
SEN 222	21 25	−133,19	LBR 244	3 7 11 15	−137,10				NMB 025	25	−130,13
SMR 311	1 5 9 13 17	−145,92	POR 133	3 7 11 15 19	−142,35				SUI 140	22	−143,10
			SRL 259	23	−136,72				ZAI 322	4 8 12 16 20	−130,94
									ZAI 323	2 6 10 14 18	−130,05

Position nominale sur l'orbite Nominal orbital position Posición orbital nominal −13,0			Position nominale sur l'orbite Nominal orbital position Posición orbital nominal −7,0			Position nominale sur l'orbite Nominal orbital position Posición orbital nominal −1,0			Position nominale sur l'orbite Nominal orbital position Posición orbital nominal +5,0		
Nº IFRB IFRB No. N.º de la IFRB	Canaux Nºs Channel Nos. N.ºs de los canales	DSP PFD DFP dBW/m²	Nº IFRB IFRB No. N.º de la IFRB	Canaux Nºs Channel Nos. N.ºs de los canales	DSP PFD DFP dBW/m²	Nº IFRB IFRB No. N.º de la IFRB	Canaux Nºs Channel Nos. N.ºs de los canales	DSP PFD DFP dBW/m²	Nº IFRB IFRB No. N.º de la IFRB	Canaux Nºs Channel Nos. N.ºs de los canales	DSP PFD DFP dBW/m²
AGL 295	23	−129,57	ALB 296	22	−146,49	BOT 297	2 6 10 14 18	−134,49	CYP 086	21 25	−147,47
CAF 258	24	−130,81	EGY 026	4 8 12 16 20	−136,59	BUL 020	4 8 12 16 20	−144,97	DNK 089	12 16 20	−143,42
CME 300	1 5 9 13 17	−132,87	SDN 231	22	−133,37	DDR 216	21 25	−145,17	DNK 090	24	−135,20
COG 235	22	−134,83	SDN 230	23	−136,84	HNG 106	22	−145,07	FNL 103	2 6 10	−138,17
GAB 260	3 7 11 15 19	−136,65	SDN 232	24	−134,23	IFB 135	22	−136,51	FNL 104	22	−135,20
ISR 110	25	−145,02	YUG 148	21 25	−140,79	MOZ 307	4 8 12 16 20	−135,37	GRC 105	3 7 11 15 20	−140,87
MLT 147	4 8 12 16	−148,55	YUG 149	23	−140,79	MWI 308	24	−142,67	IFB 021	21 25	−132,06
STP 241	4 8 12 16 20	−144,70				POL 132	1 5 9 13 17	−142,67	ISL 050	23	−137,87
TCD 143	2 6 10 14 18	−133,89				ROU 136	2 6 10 14 18	−143,17	LSO 305	24	−145,06
						SWZ 313	1 5 9 13 17	−147,30	NOR 120	14 18	−139,42
						TCH 144	3 7 11 15 19	−143,27	S 138	4 8	−138,94
						ZMB 314	3 7 11 15 19	−134,29	TUR 145	1 5 9 13 17	−138,47

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FINAL PROTOCOL *

At the time of signing the Final Acts containing the provisions, the associated Plan and the decisions concerning the re-arrangement of the Radio Regulations and the Additional Radio Regulations adopted by the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the undersigned delegates take note of the following statements forming part of the Final Acts of the aforesaid Conference.

No. 1

For the State of Comoros:

The delegation of the State of Comoros has noted with disappointment the publication of requirements for the Island of Mayotte, which is within the absolute territory of the State of Comoros, in Documents Nos. 16, 103 and 135.

This annexation of a part of the Comoros by France is contrary to the United Nations Declaration of Human Rights and to the following resolutions:

1. Resolution of the OAU, July 1975, Kampala;
2. Resolution of the United Nations, November 1975, New York;
3. Resolution of the Arab League, March 1976, Cairo;
4. Resolution of the Islamic Conference, May 1976, Istanbul;
5. Resolution of the Non-Aligned States, August 1976, Colombo.

The delegation of the State of Comoros objects strongly to this interference by a Member country of the ITU and insists that this Conference should accept no proposals, take no decisions and adopt no resolutions that would run counter to the rights arising from the independence of its country.

No. 2

For the Republic of Indonesia:

The Delegation of the Republic of Indonesia hereby reserves the right of its Government to take any action and preservation measures to safeguard its telecommunication services should the Final Act and the Plan attached thereto drawn up in this Conference be in contravention with the Constitution, Laws and Rights of the Republic of Indonesia which exist or may result from the principles laid down in the Bogotá Declaration of 3 December 1976 by Equatorial Countries and from any other principles of international law.

In taking action and preservation measures, the Republic of Indonesia will recognize the legitimate interests of other countries with a view to enhancing international cooperation based on equality for all countries in the peaceful uses of space for the benefit of all mankind.

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* *Note by the General Secretariat:* The texts of the Final Protocol are shown in the chronological order of their deposit. In the Table of Contents these texts are grouped in the alphabetical order of country names.

No. 3

For France:

The French delegation, referring to statement No. 1, informs the Conference that it cannot but maintain the requirement for five channels with minimum coverage which it has submitted on behalf of Mayotte.

The Island of Mayotte comes under French sovereignty. The French delegation reminds the Conference that France exercises those sovereign rights neither through force nor through arbitrary action. The fact that Mayotte belongs to the French Republic results from the democratic choice of the island's population.

During the consultation on 23 October 1974, a large majority of the population voted for the island's continuing to form part of the French Republic, whereas the other three islands in the Comoro Archipelago voted in favour of independence. Drawing the consequences from this twofold choice, the French Parliament organized the successive stages whereby Anjouan, Grand Comoro and Moheli have acceded to sovereignty, and reserved the possibility for the population of Mayotte to join them in a State which would guarantee the political and administrative status of each of the islands.

This procedure was rejected by the autonomous Government of Moroni, which proclaimed its independence.

By the Act of 31 December 1975, the French Parliament, competent in the matter under French constitutional law, noted that Anjouan, Grand Comoro and Moheli had ceased to form part of the French Republic and it made arrangements for the population of Mayotte to vote once again on its future. On 8 February 1976, the population voted, by a very large majority, for Mayotte to continue to belong to the French Republic.

The Island of Mayotte therefore forms part of the French Republic and it is proper, in these conditions, for the French delegation to state its requirements in the matter of the assignment of frequencies and orbital position in the Document it has submitted to the Conference.

No. 4

For France:

In Document No. 172 the delegation of Mauritius has indicated the need to provide facilities for individual reception for the Island of Tromelin.

In so far as this implies that the Port Louis Government considers itself entitled to exercise rights of sovereignty over the territory of Tromelin, the French Delegation is obliged to enter a formal reservation.

France has exercised sovereignty over the Island of Tromelin since 1722 by right of geographical discovery.

Its sovereignty was not acquired at the expense of any other State or of any local population, since the island was uninhabited.

It was exercised without interruption until conquest by the United Kingdom in 1810. It has again been exercised, under the same conditions, since the Paris Treaty of 30 May 1814.

This sovereignty has been constantly re-asserted by various legal measures relating to the administration of the island and by various practical measures (construction of a landing strip, a lighthouse for shipping, a weather station), measures which meet the requirements of present-day international law with regard to effective exercise.

No. 5

For the Republic of Panama:

The delegation of the Republic of Panama, having in mind the progress made and agreements reached by this Broadcasting-Satellite Conference, specifically in the preparation of a plan for sharing the 11.7-12.2 GHz frequency band in Region 2, wishes to state that, Panama being a Member country belonging to Region 2, its Government alone is responsible for frequency registrations for the whole of the territory of the Republic of Panama, including the Panamanian territory known as the Canal Zone, and that all registrations must be made by the Republic of Panama under its country symbol PNR.

Accordingly, it wishes to inform the Conference that any registration with the International Frequency Registration Board of frequencies in the Canal Zone by any other State belonging to Region 2 will be regarded by the Government of the Republic of Panama as an impermissible and illegal act constituting a flagrant violation of its territorial integrity and the sovereignty it exercises over the whole of its territory, since Panama has never at any time ceded its sovereign rights over any part of its territory to any other country.

No. 6

For the Republic of the Ivory Coast:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Republic of the Ivory Coast reserves its Government's right to take any measures it may deem necessary to safeguard its interests if one or more Members of the Union should formulate reservations liable to infringe upon the sovereign rights of the Republic of the Ivory Coast.

No. 7

For the Republic of Zaire:

The delegation of the Republic of Zaire, in signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), draws the attention of the Conference to its country's right, by virtue of its sovereignty and respect for its national laws, to take whatever measures may be necessary to safeguard its interests.

Furthermore, the delegation of the Republic of Zaire declares that its country will always encourage international cooperation based on the equal rights of all countries, large and small, concerning the peaceful use both of the atmosphere and of outer space for the advancement and the dignity of all mankind.

No. 8

For Iran:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of Iran declares that its Administration reserves the right to take any action required to safeguard its interests should the reservations entered by other delegations on behalf of their Administrations or failure to respect the Final Acts and the Annexes thereto prove prejudicial to the proper functioning of its satellite broadcasting and terrestrial services.

No. 9

For the Republic of Afghanistan:

The delegation of the Republic of Afghanistan to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) reserves its Government's right to take any measures it may deem necessary to protect its interests if other countries fail to observe the provisions adopted by the Conference in accordance with its terms of reference.

No. 10

For the Byelorussian Soviet Socialist Republic, People's Republic of Bulgaria, Hungarian People's Republic, Mongolian People's Republic, People's Republic of Poland, German Democratic Republic, Ukrainian Soviet Socialist Republic, Czechoslovak Socialist Republic, Union of Soviet Socialist Republics:

In connection with a number of statements issued at this Conference concerning the questions of the use of the geostationary orbit, the above delegations deem it necessary to declare that the decisions of this Conference regarding the assignment of positions on the geostationary orbit for broadcasting satellites are fully in conformity with the generally recognized principles and rules of international law, including the International Telecommunication Convention (1973), the relevant provisions of the Radio Regulations and other instruments of international law regulating questions of space communications.

No. 11

For the People's Republic of Bangladesh:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the People's Republic of Bangladesh declares that its Administration reserves the right to take any action required to safeguard its interests should the reservations entered by other delegations on behalf of their Administrations or failure to respect the Final Acts and the Annexes thereto prove prejudicial to the proper functioning of its satellite broadcasting and terrestrial services.

No. 12

For the Islamic Republic of Mauritania:

The delegation of the Islamic Republic of Mauritania reserves its Government's right to take any action it may consider necessary to ensure the proper functioning of its broadcasting-satellite service in the event of:

– an Administration in any way failing to abide by the provisions of the Final Acts and the associated Plan, or

– an Administration formulating reservations or taking action liable to infringe upon the sovereign rights of the Islamic Republic of Mauritania.

No. 13

For the Republic of India:

1. In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Republic of India reserves the right of its Government to take such measures as may be necessary to safeguard its interests should any country make reservations and/or not accept the provisions of the Final Acts including the Associated Plan.

2. The delegation of the Republic of India wishes to point out that the Plan contains frequency assignments for the Pakistan Administration for providing satellite-broadcasting services to include coverage of the state of Jammu and Kashmir, which is an integral part of India. The Indian Administration does not recognize these frequency assignments to the Pakistan Administration for operating such services. The Indian Administration reserves the right of its Government to take appropriate measures to ensure that its territory does not come under intentional coverage by the above-mentioned services of Pakistan.

No. 14

For Mauritius:

The delegation of Mauritius is unable to accept the arguments advanced in statement No. 4 by the French delegation in support of the French claim of sovereignty over Tromelin and consequently rejects the reservation recorded therein.

The French claim that France has exercised sovereignty without interruption over Tromelin since the Paris Treaty of 1814 cannot be sustained.

The concept of geographical discovery of L'Isle de Sables, renamed Tromelin in 1776, cannot by itself be invoked at this stage in support of sovereignty.

Tromelin annexed as several other islands to the Isle de France (now Mauritius) during French colonial rule until 1810 was lost to France and retained its status of dependency of Mauritius following British conquest.

The only French possession in the West Indian Ocean which was ceded to France under the Treaty of Paris is Bourbon (now Réunion) which was itself dependent upon French administration based in Isle de France until 1810.

It is stipulated under the Treaty of Paris that *"the Isle of France and its Dependencies,* especially Redrigues and Seychelles" are ceded to Great Britain. The term "especially" as well as the French equivalent used in the Treaty "nommément" clearly indicate that the dependencies such as the Chagos Archipelago, the Cargados Carajos archipelago, Agalega and Tromelin are not listed exhaustively (c.f. Littré, Robert, Larousse).

Other dependencies of Mauritius or of Tobago are not specifically cited under the Treaty of Paris but have historically and legally retained their status of dependencies.

A number of dependent islands scattered in the oceans and considered as less important are not always mentioned by name in legal instruments concerning the main islands and this practice is recognized under international law.

The French claim of uninterrupted exercise of sovereignty after 1814 is also not valid as the Mauritius Government has periodically leased its dependency to several companies and individuals during the 20th century.

The Mauritius Government, both under British rule and after independence achieved in 1968, has affirmed its sovereignty over Tromelin by various acts both at national and international level.

In view of the heavy reliance of Mauritius upon weather information, particularly in respect of cyclone detection and movements, the delegate of Mauritius, addressing the Third Congress of the World Meteorological Organization held in Geneva in 1959, while welcoming the erection in Tromelin of a meteorological station following Resolution 9 of the first session of the Regional Association for Africa, held in Tananarive in 1953 which called for examination of the possibility of erecting such a station, reminded the Congress that express authority had not been sought for the construction of the weather station and that Mauritius exercises full sovereignty over Tromelin. This assertion of sovereignty was not challenged by the French delegation.

The erection of the weather station as well as the construction of a landing strip and of a lighthouse for shipping purposes are regarded by the Mauritius Government as having been undertaken for the good of the region within the framework of international cooperation and, therefore, can in no way be construed as a surrender of the legitimate exercise of its sovereignty to the French technical mission operating on the island.

For all the reasons outlined above, the Mauritius Government formally maintains the inclusion of Tromelin in its coverage area, and views with concern the intention of the French Government to ensure broadcasting coverage by satellite of a dependency of Mauritius.

Consequently, the Mauritius delegation urges the Conference not to accept any proposal which would affect the sovereign rights of Mauritius in respect of Tromelin.

Further, the Government of Mauritius reserves the right to take any measures it may think to safeguard its interests if one or more administrations, members or not of the Union, do not adhere to the Decisions recorded in the Final Acts and the Plan.

No. 15

For the Principality of Liechtenstein:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of Liechtenstein reserves the right of its Government to ensure that, in the case of any modification to the Plan, the prior notification that Liechtenstein is situated in a mountainous area is duly taken into consideration.

No. 16

For the People's Republic of the Congo:

Bearing in mind:

– the development of space radiocommunication technology and the wide range of its applications, on the one hand, and

– the legitimate statements of the Equatorial countries, on the other;

the delegation of the People's Republic of the Congo reserves its Government's right to take any decision it may consider necessary to safeguard the interests of its national sovereignty.

No. 17

For the Republic of Upper Volta:

The delegation of the Republic of Upper Volta to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) reserves its Government's right to take any action required to safeguard its interests should these interests be jeopardized by failure to observe the provisions adopted by this Conference.

No. 18

For Australia:

During discussions in this Conference various proposals and views have been presented concerning planning for and use of the geostationary satellite orbit.

Several countries are seeking recognition of national sovereignty of some portion of outer space in relation to the use or intended use of the geostationary satellite orbit. The Australian delegation, which has set down its views in Document No. 181, wishes to declare that the Australian Government considers such claims not to be in accordance with international law.

No. 19

For the Republic of Guatemala:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Republic of Guatemala reserves its Government's right to take whatever action it may deem necessary to safeguard its interests should any Member of the Union formulate reservations liable to affect the sovereign rights of the Republic of Guatemala over the Guatemalan Department of Belize.

No. 20

For Ghana:

The Ghana delegation, in signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), reserves its Government's right to take any measures it considers necessary to protect its interests should non-compliance with the Final Acts and the reservations made by other Members jeopardize its broadcasting-satellite service.

No. 21

For the Federal Republic of Nigeria:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Federal Republic of Nigeria hereby declares that its Government reserves the right to take any action which it considers necessary to safeguard its interests should any country or countries fail to observe the provisions of the Final Acts and the Annexes thereto or should reservations by other countries endanger the satellite broadcasting and telecommunication services of the Federal Republic of Nigeria.

No. 22

For the Republic of the Philippines:

The delegation of the Republic of the Philippines reserves for its Government the right to take action as may be necessary to safeguard its interests should the Final Acts and the Plan attached thereto drawn up at this Conference be in contravention with the Constitution and sovereignty of the Republic of the Philippines.

No. 23

For Sultanate of Oman:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Sultanate of Oman declares that its Government reserves the right to take any measures it may deem necessary to safeguard its interests.

However the delegation of the Sultanate of Oman recalls that its country will encourage cooperation based on equal rights of all participating countries.

No. 24

For the Republic of Mali:

The delegation of the Republic of Mali to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) declares that it reserves its Administration's right to take any action it might deem necessary in order to safeguard its interests should these interests be jeopardized by the failure of another Administration to observe the provisions adopted by this Conference.

No. 25

For the Republic of Kenya:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Republic of Kenya reserves its Government's right to take any measures it may deem necessary to protect its interests if other countries or administrations should fail to observe the provisions contained in the Final Acts and the Annexes thereto, as adopted by this Conference.

No. 26

For the People's Republic of Bangladesh:

According to Documents Nos. 233 and 265 and the Maps of the Antenna Beam Ellipse, the beam IND 0037 allocated to India covers about 90% of the territory of the People's Republic of Bangladesh. This spillover, which appears to be technically avoidable, is not acceptable to the Bangladesh Administration.

The Bangladesh delegation would therefore like to have this reservation recorded by this Conference for necessary corrective measures, with the cooperation of the respected Indian delegation.

No. 27

For the Republic of Senegal:

In signing the Final Acts and associated Plan, the delegation of the Republic of Senegal reserves its Government's right to take any steps or action designed to safeguard its telecommunication services and the rights of the Republic of Senegal.

Furthermore, the delegation of the Republic of Senegal affirms that its Government will continue to cooperate at the international level, on a basis of equality and mutual observance of the rights of countries large and small, in the use of the natural resource constituted by spectrum-orbit space.

No. 28

For the People's Republic of Benin:

The delegation of the People's Republic of Benin reserves its Government's right to take any action it may consider necessary should any reservations formulated by other administrations jeopardize its interests and to take any steps needed to protect its services should any Members of the Union fail to observe the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977).

No. 29

For the Togolese Republic:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Togolese Republic reserves its Government's right to take any action it may consider necessary to safeguard its interests should any Member fail to abide by the provisions of the Final Acts and the Annexes thereto or should any reservations formulated by other countries jeopardize the proper functioning of its broadcasting-satellite services.

No. 30

For the Republic of Guinea:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Republic of Guinea reserves its Government's right to take any measures necessary in order to safeguard its interests if reservations made by other delegations on behalf of their administrations or non-compliance with the Final Acts and the Annexes thereto should have the effect of jeopardizing the satisfactory operation of the satellite and terrestrial-broadcasting services of the Republic of Guinea.

No. 31

For Australia, New Zealand and Papua New Guinea:

The Plan as published shows an Australian system providing three beams each of six channels from orbital position 98°E to the Western States and similarly three beams each with six channels to the Eastern States from orbital position 128°E. The Plan also shows New Zealand systems operating from both 158°E and 128°E and Papua New Guinea systems operating from 110°E and 128°E.

In the case of the systems on 128°E it is proposed, as an interim development, for the three countries to share a satellite which would enable a small number of programmes to be provided into each of the Australian states and in New Zealand and Papua New Guinea.

The planning of this initial system has not yet been finalized and the coordination of the channel allocations will be undertaken outside the Conference using the technical criteria and coordination procedures established at the Conference.

No. 32

For the Republic of Bolivia:

The delegation of the Republic of Bolivia to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), in signing the Final Acts of this Conference, reserves its Government's right to take any action it might consider necessary to safeguard its interests should the lack of a plan for Region 2 in any way jeopardize subsequent plans for the use of the orbital arc by the broadcasting-satellite or any other telecommunication service.

No. 33

For the Algerian Democratic and Popular Republic, Kingdom of Saudi Arabia, State of Bahrain, Arab Republic of Egypt, United Arab Emirates, State of Kuwait, Kingdom of Morocco, Islamic Republic of Mauritania, Sultanate of Oman, Islamic Republic of Pakistan, Democratic Republic of the Sudan, Tunisia, Yemen Arab Republic, People's Democratic Republic of Yemen:

The delegations of the above-mentioned countries declare that the signature and possible subsequent ratification by their respective Governments of the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) do not in any way imply the recognition of Israel.

No. 34

For the Algerian Democratic and Popular Republic, Arab Republic of Egypt, Kingdom of Saudi Arabia, State of Kuwait, Kingdom of Morocco, Democratic Republic of the Sudan, Tunisia, Yemen Arab Republic:

The above-mentioned delegations reserve their countries' rights to take any action required to safeguard their interests to implement and protect their satellite-broadcasting and terrestrial telecommunication services in case any country violates the Final Acts of this Conference.

No. 35

For the Republic of Afghanistan, Algerian Democratic and Popular Republic, Kingdom of Saudi Arabia, State of Bahrain, People's Republic of Bangladesh, Arab Republic of Egypt, United Arab Emirates, Republic of Guinea, State of Kuwait, Malaysia, Republic of Mali, Kingdom of Morocco, Islamic Republic of Mauritania, Sultanate of Oman, Islamic Republic of Pakistan, Republic of Senegal, Democratic Republic of the Sudan, Tunisia, Yemen Arab Republic, People's Democratic Republic of Yemen:

The delegations of the above-mentioned countries, which have supported the request submitted by the delegation of Saudi Arabia, for the proposed Islamic Programme originating from Saudi Arabia, which has not been incorporated in the Plan appropriately, reserve the right to press for the implementation of this proposal in future whenever it is technically feasible.

No. 36

For the United Republic of Tanzania:

The delegation of the United Republic of Tanzania to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) declares that its Government reserves the right to take any measures it considers necessary to safeguard its interests should failure by other countries to observe the provisions of the Final Acts of the Conference prove prejudicial to the proper functioning of its services.

No. 37

For the Federative Republic of Brazil:

A plan for the broadcasting-satellite service in Region 2 is to be established by a Regional Administrative Radio Conference to be held in 1982.

In Region 2 the broadcasting-satellite service should be operated on the basis of principles and provisions contained in Document No. 204.

The Brazilian Administration draws the attention of this Conference to the fact that 5 TV channels for each service area in the territory of Brazil are the minimum necessary to satisfy its requirements.

No. 38

For the Democratic Republic of the Sudan:

1. In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Democratic Republic of the Sudan reserves the right of its Government to take such measures as may be necessary to safeguard its interests should any country make reservations and/or not accept the provisions of the Final Acts, including the associated Plan.

2. The delegation of the Democratic Republic of the Sudan wishes to point out that the interference caused by the beam ET 0092A may prove harmful. It reserves the right of its Government to take appropriate measures to ensure that its satellite broadcasting services are free of harmful interference.

No. 39

For the People's Democratic Republic of Yemen:

The delegation of the People's Democratic Republic of Yemen to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) reserves its Government's right to take any measures it may deem necessary to protect its interests if other countries fail to respect the Final Acts and Annexes thereto adopted by this Conference.

No. 40

For the Central African Empire:

The delegation of the Central African Empire to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), desiring the geostationary orbit to be used in an equitable manner and solely for peaceful purposes, declares that its Government reserves the right to take whatever action may be required to safeguard its national and international interests should the Final Acts and the Plan annexed thereto, as drawn up by the Conference, contravene the provisions of its Constitution or infringe upon its sovereignty.

No. 41

For the State of Bahrain and the United Arab Emirates:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegations of the State of Bahrain and of the United Arab Emirates declare that their Administrations reserve the right to take such measures as they may deem necessary to safeguard their interests, should an Administration fail in any way to observe the provisions of the Final Acts or should the reservations made by other Administrations jeopardize the telecommunication services or be liable to infringe upon the sovereign rights of the State of Bahrain and of the United Arab Emirates.

No. 42

For the People's Republic of China:

In service areas IND 0037 and IND 0038, which the Indian Telecommunication Administration is having included in the Plan, certain regions of Tibet and Sinkiang, both of them Chinese territories, are shown as being in Indian territory. This is an illegal and impermissible infringement upon Chinese sovereignty.

The Hsisha and Nansha Islands, as well as the other islands of the South China Sea, have always been Chinese territory; the People's Republic of China has indisputable sovereignty over these islands and the adjacent waters. The Chinese Government has repeatedly published declarations defining its position on the subject. The use by any foreign country of the broadcasting-satellite service area for the purpose of creating confusion regarding the status of the territories is illegal and invalid.

The Chinese Government reserves the right to take whatever action may be required should the Chinese telecommunication services, during the implementation of the Plan, suffer interference resulting from any infringement of the Final Acts.

No. 43

For the Lao People's Democratic Republic:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Lao People's Democratic Republic reserves its Government's right to take whatever measures it may deem necessary to safeguard the interests of its national sovereignty with respect to any country having a common frontier with its territory and using a beam covering its country.

Such countries should obtain the agreement of the Lao People's Democratic Republic before bringing their broadcasting-satellite stations into operation.

No. 44

For the Kingdom of Saudi Arabia:

The equivalent protection margins of Saudi Arabian beams indicated in Document No. 265 are unacceptable to the delegation of Saudi Arabia. At the meeting of Working Group 5A on Thursday 10 February 1977, the Chairman of the Working Group indicated that these margins would be corrected to acceptable values. As the results of these corrective measures are not available as yet, the delegation of Saudi Arabia wishes to declare that if the results are not satisfactory, it reserves its right, in the interest of its Administration, to take any suitable action technically feasible and deemed fit to achieve satisfactory and good quality reception.

No. 45

For the Islamic Republic of Pakistan:

1. In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the Islamic Republic of Pakistan hereby declares that its Government reserves the right to take any action which it considers necessary to safeguard its interests should any country or countries fail to observe the provisions of the Final Acts and the Annexes thereto or should the reservations made by other countries adversely affect the satellite-broadcasting and telecommunications services of the Islamic Republic of Pakistan.

2. The delegation of the Islamic Republic of Pakistan declares that the decisions of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) regarding areas falling within the territory of the disputed state of Jammu and Kashmir are without prejudice to the position recognized by the relevant resolutions of the United Nations on the question.

3. The delegation of the Islamic Republic of Pakistan has noted with concern that the Plan has frequency assignments to the Indian Administration for providing satellite-broadcasting services to include coverage of a large area of the territory of Pakistan. This spillover, which is technically avoidable, is not acceptable to the Pakistan Administration. The Government of Pakistan reserves the right to take appropriate measures to ensure that its territory does not come under intentional coverage by the above-mentioned services of India.

No. 46

For the Byelorussian Soviet Socialist Republic, People's Republic of Bulgaria, Hungarian People's Republic, People's Republic of Poland, German Democratic Republic, Ukrainian Soviet Socialist Republic, Czechoslovak Socialist Republic and Union of Soviet Socialist Republics:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the above-mentioned delegations reserve their Governments' right to take whatever action may be required to ensure the normal operation of their telecommunication services, should any countries fail to comply with the provisions adopted by this Conference and the Plan associated with these provisions.

No. 47

For Thailand:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of Thailand reserves the right of its Government to take any measures it may deem necessary to safeguard its interests should any country or countries fail to observe the provisions of the Final Acts and the Annexes thereto or should reservations by other countries jeopardize its broadcasting-satellite or other radio Services.

No. 48

For the Republic of Burundi:

The delegation of the Republic of Burundi to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) declares that it reserves its Government's right to take whatever action it may deem necessary to safeguard its interests should they be jeopardized by failure to observe the provisions of the Final Acts and the Annexes thereto, as adopted by this Conference.

No. 49

For the Republic of the Chad:

In signing the Final Acts of this Conference, the Chad delegation reserves its Government's right to take whatever action may be necessary to protect its services should any Member of the Union fail to observe the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977).

No. 50

For Ethiopia:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of Ethiopia declares that its Government reserves the right to take any measures it may deem necessary to safeguard its interests if other countries or administrations fail to observe the provisions contained in the Final Acts adopted by this Conference.

No. 51

For the Republic of Colombia, People's Republic of the Congo, Ecuador, Gabon Republic, Republic of Kenya, Republic of Uganda, Republic of Zaire:

The delegations of the above-mentioned countries declare that their Governments are not claiming sovereignty in space, in accordance with the letter and spirit of the Treaty on the Peaceful Uses of Outer Space, since there can be no doubt that these countries have always exercised sovereignty over their internationally recognized territories and within their projections.

Consequently, in line with the principles enshrined in the Declaration of Bogotá, signed on 3 December 1976, they wish to make the following reservations in signing the Final Acts of the Broadcasting-Satellite Conference.

First reservation:

The delegations of the above-mentioned countries officially declare that they do not accept and accordingly are under no circumstances bound, through the signature of the Final Acts, by the resolutions, agreements and decisions of this Conference regarding the location of geostationary satellites on the segments of the orbit over which these States exercise sovereign rights.

Second reservation:

The positioning of such geostationary satellites will require the prior authorization of the equatorial country con cerned and their functioning and operation shall be subject to the provisions of the national laws of the Equatorial States concerned.

Third reservation:

The Equatorial countries reserve the right to take whatever steps they may deem fit to preserve and secure the observance of their sovereign rights which include the segments of the geostationary orbit corresponding to their respective national territories, in accordance with the constitutional and legal rules in force in each country.

No. 52

For the Federative Republic of Brazil:

The Brazilian Administration reserves its position regarding the sentences in section 12.2.1 of Article 12 of Part I of the Final Acts which read: "As an exception, it is accepted that, for Greenland, a position in the geostationary satellite orbit between 55°W and 60°W may be used for the broadcasting-satellite service as a primary service. The administrations concerned should make every effort to allow for the sharing of this portion of the orbital arc by a broadcasting satellite for Greenland and space stations in the fixed-satellite service of other administrations in Region 2."

In this connection, the Brazilian Administration is of the opinion that a decision about the optimum orbital arc usable for Greenland or any other Administration in Region 2 must only be taken by the Regional Administrative Radio Conference which should be held not later than 1982.

The signature by Brazil of the Final Acts of this Conference must be interpreted only as an acceptance of the technical deliberations of this Conference. This acceptance does not however prejudge the Brazilian position concerning any future decision about the juridical regulation of the utilization of the geostationary satellite orbit which might be taken by this or by any other competent forum.

No. 53

For the Algerian Democratic and Popular Republic:

The Government of the Algerian Democratic and Popular Republic which considers invalid any action taken by Spain, the administrative power, or by Morocco or Mauritania with a view to changing in any manner whatsoever the status of Western Sahara with regard to the fundamental provisions of Resolution 1514 and the other relevant resolutions of the United Nations General Assembly and the provisions of international law, or with a view to infringing any of the lawful and sovereign rights of the Sahraoui people to its own territory, formally contests the notification of the beams: 0209 = MRC and 0223 = MTN.

The resulting deliberate spillover both over the territory of Western Sahara and consequently over part of Algerian territory is an intentional infringement of the Radio Regulations (No. 428A), strict compliance with which should be ensured.

Western Sahara is still a responsibility of the United Nations, whose duty it is to complete the process of decolonization and to create all the conditions required to guarantee that country's independence and territorial integrity, and no provision of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) may exceed the Conference's terms of reference or affect or restrict the Sahraoui people in the exercise of their sovereign rights and in the present case of their rights in matters of broadcasting.

No. 54

For the Republic of Venezuela:

The delegation of the Republic of Venezuela declares that its Administration reserves the right to take whatever measures it may deem appropriate to ensure the development of its telecommunication services in the 11.7-12.5 GHz band should its interests be adversely affected by the decisions of this Conference.

No. 55

For the Oriental Republic of Uruguay:

The delegation of the Oriental Republic of Uruguay declares that its Government reserves the right to take whatever measures it may deem appropriate to ensure the development of its telecommunication services in the 11.7-12.5 GHz band should its interests be adversely affected by the decisions of this Conference.

No. 56

For the People's Republic of Bulgaria:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of the People's Republic of Bulgaria reserves its Government's right to take any necessary action of a technical nature if the negative protection margin obtained for Bulgaria fails to ensure a high-quality service for the territory of the People's Republic of Bulgaria.

No. 57

For the Republic of Panama:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of Panama reserves its Government's right to take any measures it may deem necessary to safeguard its interests should one or more Members of the Union formulate reservations liable to affect its sovereign rights and territorial integrity.

No. 58

For the Argentine Republic:

1. The delegation of the Argentine Republic declares that its Government reserves the right to take any measures it may deem appropriate to ensure the development of its telecommunication services in the band 11.7-12.5 GHz should its interests be adversely affected by the decisions of this Conference.

2. In signing these Final Acts, the delegation of the Argentine Republic reiterates its Declaration No. LXXXVII contained in the International Telecommunication Convention (Malaga-Torremolinos, 1973).

No. 59

For the Republic of Korea:

1. The delegation of the Republic of Korea reserves its Government's right:

a) to take any measures it may deem necessary to safeguard its broadcasting and telecommunication services should any Contracting Member fail to comply with the provisions and associated Plan of the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), thus causing harmful effects on the services of the Republic of Korea; and

b) to demand and, if necessary, take due action to reduce any Member's coverage area in case it extends beyond a reasonable extent into the territory of the Republic of Korea and the Member fails to take appropriate remedial measures in implementing the Plan under relevant provisions of the Radio Regulations.

2. The delegation of the Republic of Korea further declares that, within its territory, no signals in the Plan other than its own will be protected by its Administration.

No. 60

For the Islamic Republic of Pakistan:

The delegation of Pakistan has the honour to refer to paragraph 2 of the reservations made by the delegation of the Republic of India (statement No. 13) and wishes to make the following comments:

The State of Jammu and Kashmir has been recognized by the United Nations as a disputed territory and its permanent status has yet to be determined by the people of the State, in accordance with the relevant resolutions of the United Nations Security Council. Decisions regarding areas falling within the disputed State are without prejudice to the position recognized by the United Nations in its resolutions on the subject. The areas covered by the Indian Coverage Plan which fall within the State of Jammu and Kashmir are not recognized by Pakistan as being part of Indian territory.

No. 61

For the Republic of India:

With reference to statement No. 26 for the People's Republic of Bangladesh, the delegation of India wishes to state the following:

The Indian beam IND 0037, submitted by the Indian Administration, was designed to cover Indian territory only. In the process of optimization by the Planning Group, the beam dimensions have been enlarged. The coverage of Bangladesh territory by this enlarged beam is thus only a technical spillover and does not interfere with any assignment to Bangladesh. However, the Indian Administration is prepared to take any corrective measures in accordance with the procedure laid down by the Conference.

No. 62

For the Federative Republic of Brazil:

In signing the Final Acts of the present Conference, the delegation of the Federative Republic of Brazil wishes to make the following statement.

The Conference has adopted a Plan for the allotment of frequencies and positions in the geostationary satellite orbit for the broadcasting-satellite service for Regions 1 and 3. The delegation of the Federative Republic of Brazil draws the attention of the Conference to the fact that this Plan and its associated sharing criteria do not make adequate provision for the needs of the fixed-satellite and broadcasting-satellite Services in some countries in Region 2 and that the sharing criteria do not provide the protection required under paragraphs 117 and 428A of the Radio Regulations.

Furthermore, this Plan and its sharing criteria may preclude the successful development of a plan for Region 2 countries in 1982. The Brazilian Administration therefore reserves the right to operate its systems in accordance with the provisions of the International Telecommunication Convention and the Radio Regulations and to claim the protection thus afforded.

No. 63

For the Democratic People's Republic of Korea:

In connection with the Japanese ellipse for the broadcasting-satellite service which covers wide areas of the territory of the Democratic People's Republic of Korea, the delegation of the Democratic People's Republic of Korea submitted a letter to the IFRB and Committee 5 requesting that the Japanese ellipse should be reduced to the minimum.

The delegation of the Democratic People's Republic of Korea was informed, however, that the Japanese ellipse could not be reduced under a technical pretext.

The reduction of an ellipse for the broadcasting-satellite service is not merely a technical matter; it is a question which has political implications. Hence, the solution of this problem depends entirely on the attitude of the Japanese authorities.

This unjust attitude on the part of the Japanese authorities not only runs counter to No. 428A of the Radio Regulations but is also an infringement of the sovereignty of the Democratic People's Republic of Korea.

Consequently, the delegation of the Democratic People's Republic of Korea cannot tolerate the Japanese ellipse for the broadcasting-satellite service which covers the territory of the Democratic People's Republic of Korea and states that all necessary measures will be taken against the coverage by the Japanese ellipse of the territory of the Democratic People's Republic of Korea.

No. 64

For the Democratic People's Republic of Korea:

In view of the fact that the South Korean "authorities" intentionally enlarged the ellipse of their broadcasting-satellite service to cover even the service area of the Democratic People's Republic of Korea, the delegation of the Democratic People's Republic of Korea participating in the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), submitted proposals to the IFRB requesting that the necessary measures should be taken to solve this problem.

In disregard of the just demand of the Democratic People's Republic of Korea and the advice of the IFRB, however, the South Korean "authorities" further enlarged the size of the ellipse, which thus covers an even wider area of the Democratic People's Republic of Korea's service area. This machination of the South Korean "authorities", which ignores the International Telecommunication Convention, is aimed at attaining its insidious political goal.

The delegation of the Democratic People's Republic of Korea states that it does not recognize any proposals of the South Korean "authorities" and that it cannot tolerate the coverage of the service area of the Democratic People's Republic of Korea by the ellipse of the broadcasting-satellite service of the South Korean "authorities" and states that all necessary measures will be taken against the coverage of the service areas of the Democratic People's Republic of Korea by the ellipse of the South Korean "authorities".

No. 65

For Tunisia:

The Tunisian delegation to the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) desires to affirm solemnly that strict observance of the provisions of No. 428A of the Radio Regulations is a necessary condition for the application of the Plan and for implementation of the Final Acts.

The Tunisian delegation requests the reduction of the coverage area resulting from the assignments to certain neighbouring countries; except for technically unavoidable spillover, coverage should be limited to their national territory in conformity with No. 428A mentioned above.

The Tunisian delegation declares unacceptable any technically avoidable spillover on its territory by the assignments to these countries and reserves its Government's right to take any technical or other measures required to ensure by whatever means the integrity of its national territory in the face of any external interference and to protect its broadcasting services.

No. 66

For the Kingdom of Morocco:

The beams designated ALG 251 and ALG 252 which have been assigned to the Algerian Democratic and Popular Republic spill over on Moroccan territory to an unacceptable degree. This spill over is by no means technical. A valid technical solution ensuring coverage of the entire Algerian territory, while safeguarding the interests of the Kingdom of Morocco, has been proposed by the Moroccan delegation to the Algerian delegation.

In view of the Algerian delegation's refusal to adopt the proposed compromise solution, the Moroccan delegation formulates the most emphatic reservations regarding the assignment of the two above-mentioned beams to the Algerian Democratic and Popular Republic and requests the Conference to note that the provisions of No. 428A of the Radio Regulations have not been respected. It should also be noted that the beam assigned to the Kingdom of Morocco and designated MRC 209 covers the entire Moroccan territory in the minimal conditions fixed by this Conference. The Moroccan delegation accordingly reserves its Government's right to take any action required in order to ensure the proper operation of its broadcasting-satellite network throughout its territory should any Administration formulate reservations or take measures liable to infringe the sovereign rights of the Kingdom of Morocco.

No. 67

For Turkey:

In signing the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977), the delegation of Turkey reserves its Government's right to take whatever action may be necessary to safeguard its interests and ensure the proper functioning of its broadcasting-satellite and terrestrial services should any country fail to comply with the Final Acts and the Annexes thereto, or should reservations by other countries jeopardize its above-mentioned services.

No. 68

For the United Kingdom of Great Britain and Northern Ireland:

With reference to statement No. 19 in relation to the territory of Belize made by Guatemala on signing the Final Acts, the United Kingdom does not accept that Guatemala has any rights or any valid claim with respect to that territory.

No. 69

For Mexico:

The delegation of Mexico declares that its Administration reserves the right to adopt whatever measures it may deem appropriate to ensure the development of its telecommunication services in the band 11.7-12.5 GHz should its interests be adversely affected by the decisions of this Conference.

No. 70

For the Kingdom of Morocco and the Islamic Republic of Mauritania:

The delegations os the Kingdom of Morocco and the Islamic Republic of Mauritania, having taken note of statement No. 53 made by the Algerian Democratic and Popular Republic, wish to point out that the dimensions of the beams intended for the coverage of their territories were defined by the planning bodies set up by the Conference. These beams are in full conformity with the provisions of No. 428A of the Radio Regulations.

It should also be noted that the Saharan provinces of the Kingdom of Morocco and the Islamic Republic of Mauritania were recovered legally under the aegis of the international authorities and are an integral part of these countries.

Statement No. 53 by the Algerian delegation is one of the latest symbolic acts carried out by the pseudo-revolutionary and expansionist régime of this country following its vain attempts to impose its will on our Saharan territories.

The Moroccan and Mauritanian delegations consider this statement to be an act of flagrant interference in their internal affairs and call on the Conference to consider it null and void.

No. 71

For Japan:

The delegation of Japan wishes to state that the ellipse of Japan is established in such a manner as to obtain the most efficient and reasonable broadcasting-satellite system for covering the territory of Japan, every technical precaution being taken to reduce to the maximum extent practicable the radiation over the territory of other countries in accordance with the provisions of No. 428A of the Radio Regulations.

In connection with the reservations made by the delegation of any other country in this respect, the delegation of Japan reserves its Administration's right to safeguard its interests.

No. 72

For Japan:

With reference to statement No. 63 made by the delegation of the Democratic People's Republic of Korea, the delegation of Japan wishes to state as follows:

The ellipse of Japan is established in such a manner as to obtain the most efficient and reasonable broadcasting-satellite system for covering the territory of Japan, every technical precaution being taken to reduce to the maximum extent practicable the radiation over the area outside its own territory in accordance with the provisions of No. 428A of the Radio Regulations.

As the ellipse is a purely technical problem which contains no political elements, the delegation of Japan cannot accept the contention of the delegation of the Democratic People's Republic of Korea in this respect.

The delegation of Japan therefore states that its Administration reserves all the rights necessary to safeguard its interests in connection with the reservations made by the delegation of the Democratic People's Republic of Korea.

No. 73

For Japan:

With regard to statements Nos. 16 and 51 made by several Equatorial countries in connection with sovereignty over the geostationary orbit, the delegation of Japan wishes to declare, on behalf of the Japanese Government, that the ITU is not competent to deal with this question and that the delegation of Japan cannot agree with the above-mentioned statements because of the universally accepted principle that outer space is not subject to national appropriation by claim of sovereignty.

No. 74

For the Federal Republic of Germany, Austria, Belgium, Canada, Denmark, United States of America, Finland, France, Ireland, Italy, Luxembourg, Monaco, Norway, Kingdom of the Netherlands, United Kingdom of Great Britain and Northern Ireland, Sweden:

The above-mentioned delegations, referring to the reservations made by the Republic of Colombia, the People's Republic of the Congo, Ecuador, the Gabon Republic, the Republic of Kenya, the Republic of Uganda and the Republic of Zaire in statement No. 51, consider that such claims cannot be recognized by this Conference and declare that the decisions of this Conference to assign frequencies and orbital positions in the geostationary orbit are fully in accordance with the International Telecommunication Convention (Malaga-Torremolinos, 1973) by which this Conference is bound.

No. 75

For the Republic of India:

With reference to statement No. 42 as submitted by the delegation of the People's Republic of China, the delegation of India wishes to state the following.

India categorically refutes the contention of the People's Republic of China that certain regions of Chinese territory are shown as Indian territory in the service areas of beams IND 0037 and IND 0038. All the polygon points for these two beams are within India. The service areas of these beams are an integral part of India.

No. 76

For the Republic of Korea:

With reference to statement No. 64, the delegation of the Republic of Korea wishes to make the following statement:

1. The delegation of the Republic of Korea categorically rejects the unfounded allegation of the North Korean authorities with regard to the ellipse to which the Republic of Korea is legitimately entitled for the broadcasting-satellite service.

The delegation of the Republic of Korea, as it has stated many times at various meetings of this Conference, reaffirms that the ellipse for the Republic of Korea is the minimum requirement for its broadcasting services and that the Republic of Korea has no intention of causing any intentional spillover to any adjacent countries.

2. The delegation of the Republic of Korea totally rejects the groundless and malicious political polemics of North Korean authorities which have no relevance at all in light of the objectives and technical nature of this Conference.

3. The delegation of the Republic of Korea declares that it does not recognize the ellipse of North Korean authorities which extends into the territory of the Republic of Korea and further declares that it will take all necessary measures to protect the legitimate interests of the Republic of Korea in this regard.

No. 77

For Spain:

The Spanish delegation rejects the allusion made to Spain in statement No. 53 relating to Western Sahara.

In a communication dated 26 February 1976 to the Secretary-General of the United Nations from the Ambassador and Permanent Representative of Spain to that organization (Document A/31/56/S11997), the Spanish Government announced that it had on that date definitively brought to an end its presence in the territory of the Sahara and noted that it considered itself henceforth released of all international responsibility with regard to the administration of that territory. With regard to the attitude of the Spanish Government in connection with the Western Sahara, the Spanish delegation refers to the communications and declarations submitted by Spain to the competent bodies of the United Nations.

No. 78

For the Algerian Democratic and Popular Republic:

In statement No. 65, the delegation of Tunisia alludes to "the coverage area resulting from the assignments to certain neighbouring countries".

In case this allusion should concern the Algerian Democratic and Popular Republic, the Algerian delegation formally draws the attention of the Conference to the fact that beam TUN 150 allocated to Tunisia intentionally covers part of the territory of Algeria and is therefore subject to the application of No. 428A of the Radio Regulations.

No. 79

For the Algerian Democratic and Popular Republic:

In statement No. 66, the Moroccan delegation claims that it proposed a compromise solution to the Algerian delegation and that the Algerian delegation refused to adopt this solution.

The Algerian delegation wishes to draw attention to the following points:

1) The compromise solution was proposed by the Algerian delegation, not by the Moroccan delegation;

2) The Algerian delegation consequently submitted the official documents required to the planning groups;

3) The Algerian delegation totally rejects the false and misleading assertions made in statement No. 66.

The delegations which signed the Final Acts also signed the Final Protocol.

RESOLUTION No. Sat – 1

Relating to the preparation and publication of information not contained in the broadcasting-satellite Plan for Regions 1 and 3

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that the planning work for Regions 1 and 3 has been based on the calculation of the protection margins at a number of test points;

b) that it would be useful to know the equivalent protection margin at each of these test points for all the assignments in the Plan, in order to assess any degradation which may result from subsequent amendments to the Plan;

c) that it would be helpful, in applying the method set forth in Annex 3, for any administration wishing to bring terrestrial stations into service to know the elevation angle of the receiving antennae of the earth stations in the broadcasting-satellite service;

invites the IFRB

to prepare, with a view to its publication by the Secretary-General in 1977, a document containing the following information:

a) *column 1*: country symbol and IFRB serial number for the beam;

b) *column 2*: geographical coordinates of the test points as given in Document No. 149 of the Conference;

c) *column 3*: elevation angle of the receiving antenna at each of these test points;

d) *column 4*: azimuth in degrees clockwise from True North of the major beam axis of the receiving antenna;

e) *column 5*: the equivalent protection margin in dB at each of these test points for all the assignments in the Plan.

RESOLUTION No. Sat – 2

Relating to the updating of the Master International Frequency Register for Regions 1 and 3 on the date of entry into force of the Final Acts

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that the Final Acts of this Conference will take effect before the entry into force of the revised Radio Regulations adopted by the 1979 World Administrative Radio Conference, and that meanwhile the relevant provisions of the current Radio Regulations and Resolutions Nos. Spa2 – 2 and Spa2 – 3 remain valid;

b) that No. 405BA of the Radio Regulations provides that in the band 11.7-12.2 GHz in Region 3 and in the band 11.7-12.5 GHz in Region 1, existing and future fixed, mobile and broadcasting services shall not cause harmful interference to broadcasting-satellite stations operating in accordance with the decisions of the present Conference;

c) that the coordination procedures described in Resolution No. Spa2 – 3 are to be applied only until the entry into force of plans pursuant to Resolution No. Spa2 – 2;

resolves

1. that all administrations using or intending to use frequency assignments to terrestrial stations in the bands covered by the Plan shall decide as soon as possible, whether or not these assignments will affect frequency assignments in accordance with the Plan (if necessary, with the assistance of the IFRB);

2. that, if it is found that frequency assignments in accordance with the Plan may be subject to interference, administrations shall inform the IFRB of the measures they intend to take to ensure the protection of the frequency assignments concerned before the date of entry into force of these Final Acts;

3. that administrations may continue to use frequency assignments which are not in accordance with the Plan, provided that agreement is reached with the administrations whose broadcasting-satellite stations are affected;

4. that the administrations seeking agreement shall inform the IFRB of the terms of the agreement reached;

5. that, upon receipt of such information, the IFRB shall insert a symbol in the Remarks column of the Master Register indicating the duration specified in the agreement. The duration specified shall also be published in a special section of its weekly circular;

6. that, on the date of entry into force of the Final Acts, the frequency assignments in the Plan will be entered in the Master Register. The date of signature of these Final Acts will be entered, together with an appropriate symbol, in Column 13c opposite these assignments;

invites the IFRB

to assist administrations in implementing the provisions of this Resolution.

RESOLUTION No. Sat – 3

Relating to the period between the entry into force of the Final Acts of the Conference and the date on which the provisions and associated Plan are annexed to the Radio Regulations

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that its Final Acts will come into force on 1 January 1979;

b) that, in its Resolution No. Sat – 4, it has requested the 1979 World Administrative Radio Conference to annex to the Radio Regulations the provisions and associated Plan established by the Conference;

c) that there will be an interim period between the date of entry into force of these Final Acts and the date on which the provisions and associated Plan are annexed to the Radio Regulations;

further considering

that these Final Acts are regarded as including a World Agreement and associated Plan in accordance with Resolution No. Spa2 – 2 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971;

resolves

1. that both during this interim period and after the date on which they have been annexed to the Radio Regulations, the provisions and the associated Plan shall retain their integrity as a legal instrument;

2. that during this period the IFRB and the other appropriate organs of the Union shall be guided by the provisions of these Final Acts and the Radio Regulations.

RESOLUTION No. Sat – 4

Relating to the annexing to the Radio Regulations of the provisions and associated Plan contained in the Final Acts of the Conference

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

noting

a) that the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, adopted Resolution No. Spa2 – 2 envisaging that stations in the broadcasting-satellite service shall be established and operated in accordance with agreements and associated plans adopted by world or regional administrative radio conferences;

b) that the present Conference has adopted provisions for all Regions and an associated Plan for Regions 1 and 3;

considering

the wish expressed by the Conference to annex the provisions and associated Plan to the Radio Regulations;

resolves

that the 1979 World Administrative Radio Conference be requested to annex the provisions and associated Plan to the Radio Regulations as an integral part thereof, in the form and to the extent it deems most appropriate without thereby affecting their content or integrity;

requests

the Administrative Council to include the request referred to in the above paragraph in the agenda of the 1979 World Administrative Radio Conference.

RESOLUTION No. Sat – 5

Relating to the coordination, notification and recording in the Master International Frequency Register of frequency assignments to stations in the broadcasting-satellite service in Region 2

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that a plan will be established for the broadcasting-satellite service in Region 2 in accordance with Recommendation No. Sat – 8;

b) that in Region 2 the broadcasting-satellite service should be operated on the basis of the principles contained in Article 12 and Annexes 6 and 7 of these Final Acts;

c) that some of the provisions adopted by this Conference concerning the broadcasting-satellite service in Regions 1 and 3 may also be applied in Region 2 prior to the entry into force of the plan for that Region to be established pursuant to Recommendation No. Sat – 8;

d) that, in the interim period, the procedures described in Resolution No. Spa2 – 3 will continue to apply in Region 2;

resolves

1. that an administration intending to bring into use a space station in the broadcasting-satellite service in Region 2 shall, for the purpose of coordination with space systems of other administrations, apply the relevant provisions of Article 9A of the Radio Regulations, i.e. Nos. 639AA to 639AI inclusive;

2. that the relevant provisions of Resolution No. Spa2 – 3 shall apply to the coordination, notification and recording of stations in the broadcasting-satellite service in Region 2, wherever a station in the broadcasting-satellite service or the fixed-satellite service in Region 2 is involved;

2.1 that an administration notifying a frequency assignment to a space station in the broadcasting-satellite service in Region 2 under paragraph 4.1 of Resolution No. Spa2 – 3 shall also notify a typical receiving earth station;

3. that the coordination, notification and recording procedures for stations in the fixed-satellite service specified in Article 7 of these Final Acts shall also apply to stations in the broadcasting-satellite service in Region 2 with respect to stations in the broadcasting-satellite service for which a frequency assignment appears in the Plan whenever

- any portion of the necessary bandwidth of the proposed frequency assignment in Region 2 falls within the necessary bandwidth of a frequency assignment in Region 1 or Region 3, and

– the power flux density which would be produced by the proposed broadcasting-satellite frequency assignment in Region 2 exceeds the value specified in Annex 1;

4. that Annex 2 of these Final Acts shall be used in supplying the information referred to in Section B of Resolution No. Spa2 – 3 and Section II of Article 7 of these Final Acts;

5. that an individual notice for each frequency assignment shall be drawn up as prescribed in Annex 2 for any frequency assignment notified under paragraph 4.1 of Resolution No. Spa2 – 3 or paragraph 2.1 of this Resolution or Section III of Article 7 of these Final Acts.

RESOLUTION No. Sat – 6

Relating to the coordination, notification and recording in the Master International Frequency Register of assignments to stations in the fixed-satellite service with respect to stations in the broadcasting-satellite service in Region 2

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

that the Radio Regulations contain no provisions governing the coordination, notification or recording in the Master International Frequency Register of frequency assignments to stations in the fixed-satellite service in the band 11.7-12.2 GHz with respect to stations in the broadcasting-satellite service in Region 2;

resolves

that the provisions of Article 9A of the Radio Regulations shall be applied in such cases until the matter is considered by a competent administrative radio conference.

RESOLUTION No. Sat – 7

Relating to the use, by space stations operating in the frequency bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1), of the geostationary orbit and no other

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that a Plan designating frequency assignments in the above-mentioned frequency bands and positions in the geostationary orbit has been adopted by the Conference for Regions 1 and 3;

b) that a similar plan for Region 2 is expected to result from a regional administrative radio conference in 1982;

c) that the operation of space radiocommunication services in the frequency bands concerned in orbits other than the geostationary orbit would be incompatible with the plans referred to in *a)* and *b)* above;

resolves

that administrations shall ensure that their space stations in these frequency bands are operated in the geostationary orbit and no other.

RESOLUTION No. Sat – 8

Relating to the preparation for an administrative radio conference for the detailed planning of the space services in the frequency band 11.7-12.2 GHz in Region 2

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that a regional administrative radio conference is to be held not later than 1982 for the detailed planning of the space services in the frequency band 11.7-12.2 GHz in Region 2;

b) that the technical criteria and procedures adopted at this Conference, the 1979 World Administrative Radio Conference and the latest CCIR Recommendations will be used in the interim period;

c) that a considerable amount of technical information will be required to ensure the success of this regional conference;

invites the CCIR

to carry out such additional studies as are necessary to ensure timely provision of the technical information likely to be required as a basis for the work of the regional conference.

RESOLUTION No. Sat – 9

Relating to the submission of requirements for the broadcasting-satellite service in Region 2

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) the decision taken by the Conference that an administrative radio conference for Region 2 is to be held not later than 1982;

b) that the said regional administrative radio conference is to draw up a detailed plan for the orbit spectrum resource available for the broadcasting-satellite services in the frequency band 11.7-12.2 GHz, taking into account the need to make equitable provision for the requirements of the other services to which this frequency band is also allocated in Region 2;

c) that the plan is to provide for the detailed assignment of the orbital positions and frequency channels available, ensuring that the broadcasting-satellite service requirements of the various administrations are met in an equitable manner satisfactory to all the countries concerned;

invites the IFRB

1. to request all administrations in Region 2 to submit their broadcasting-satellite service requirements to the IFRB not later than one year before the start of the said regional administrative radio conference. These requirements are understood to include the number and boundaries of service areas and the number of channels requested for each of them. They may be updated as required by each administration;

2. to remind administrations, by means of a circular letter and/or telegram six months before the above deadline for submitting requirements, of the need to submit them;

3. to assemble the information submitted by administrations in a form permitting a comparative study thereof and to communicate it to the Secretary-General for publication and despatch to administrations not later than nine months prior to the said regional administrative radio conference.

RESOLUTION No. Sat – 10*

Relating to the Possible Re-arrangement of the Radio Regulations and the Additional Radio Regulations

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) the Report "Possible Re-arrangement of the Radio Regulations and the Additional Radio Regulations" of the Group of Experts set up by the Administrative Council at its 30th Session in June 1975;

b) item 2.7 of the agenda of the 1979 World Administrative Radio Conference (1979 WARC) contained in Resolution No. 801 of the Administrative Council (32nd Session, May/June 1977) which provides for the consideration of the recommendations of this Conference on the re-arrangement of the Radio Regulations and the Additional Radio Regulations and to make such consequential changes as may be necessary to harmonize the revisions of the Radio Regulations since 1959;

recognizing

a) that such harmonization can include the further refinement of the re-arrangement of the Radio Regulations and any deletion, which the Group of Experts was unable to make, of superfluous or redundant provisions;

b) that Member countries may submit proposals for harmonization under item 2.7 of the agenda for the 1979 WARC as well as proposals relating to other items of the agenda;

c) that the 1979 WARC will make the final decision on the re-arrangement of the Radio Regulations and the Additional Radio Regulations, including harmonization under item 2.7 of its agenda;

endorses in principle

the re-arrangement proposed in the Report of the Group of Experts;

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* Text updated after the 32nd session of the Administrative Council.

resolves

1. that the re-arrangement of the Radio Regulations proposed by the Group of Experts, as endorsed by this Conference, which includes two new Appendices B and C, established by the Group of Experts and the re-arrangement, by titles only, of other appendices, resolutions and recommendations shall be published by the Secretary-General by September 1977;

2. that the Additional Radio Regulations and the texts of appendices, resolutions and recommendations contained in the 1976 loose-leaf edition should not be so published;

urges the CCITT

to complete as soon as possible the studies being carried out in accordance with Resolutions No. Mar2 — 22 and No. Mar2 — 23 and Recommendation No. Mar2 — 18 and to distribute the results to administrations to enable them to prepare their proposals on this basis for the 1979 WARC under agenda item 2.8 of that Conference;

urges Member countries

to use the re-arranged form of the Radio Regulations in *resolves* 1 and the present form of the Additional Radio Regulations as a basis for submitting proposals to the 1979 WARC for the revision of the Radio Regulations and the Additional Radio Regulations in accordance with its agenda, including any proposals relating specifically to harmonization under item 2.7 of its agenda (Resolution No. 801 of the Administrative Council);

requests the 1979 WARC

to agree that the documents in *resolves* 1 and 2 above should be used as the basic reference documents by delegates to that conference in discussing proposals.

RECOMMENDATION No. Sat – 1

Relating to up-links for the broadcasting-satellite service

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that, according to the definition given in No. 84AG of the Radio Regulations, the fixed-satellite service includes Earth-to-space links for the broadcasting-satellite service;

b) that there is an imbalance between the width of the bands allocated to Earth-to-space links and those allocated to space-to-Earth links in the fixed-satellite and broadcasting-satellite services between 10 and 15 GHz;

c) that, in consequence, the Earth-to-space capacity may be insufficient to meet future demands for space-to-Earth links for the broadcasting-satellite and fixed-satellite services;

d) that, due to interference considerations, space stations in both services may be subject to severe up-link constraints;

e) that Recommendation No. Sat – 5 invites the CCIR to continue the studies on up-links for the broadcasting-satellite service;

invites administrations

to estimate their future technical requirements for such links for the purpose of the studies mentioned in *e)* above, and to forward them to the appropriate CCIR Study Groups and to the Special Joint Meeting of CCIR Study Groups to be held in preparation for the 1979 World Administrative Radio Conference.

RECOMMENDATION No. Sat – 2

Relating to the radiation of harmonics of the fundamental frequency by broadcasting-satellite stations

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that the frequency band 23.6-24 GHz is allocated to the radio astronomy service on a primary basis;

b) that the second harmonic of the fundamental frequency of broadcasting-satellite stations operating within the band 11.8-12 GHz may seriously disturb radio astronomy observations in the band 23.6-24 GHz if effective steps are not taken to reduce the radiation level produced by this harmonic;

in view of

the provisions of No. 673 of the Radio Regulations;

recommends

that, when defining the characteristics of their space stations operating in the broadcasting-satellite service, particularly within the band 11.8-12 GHz, administrations take all necessary steps to reduce the radiation level of the second harmonic below the values indicated in the relevant CCIR Recommendations.

RECOMMENDATION No. Sat – 3

To the CCIR relating to studies of propagation at 12 GHz for the broadcasting-satellite service

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) the need for ample information on the various propagation factors required for the planning of the broadcasting-satellite service;

b) the technical data required to enable the 1979 World Administrative Radio Conference to revise the Radio Regulations;

c) the studies being pursued by the CCIR under the appropriate Study Programmes;

invites the CCIR

1. to continue the study of the effects of precipitation attenuation at low angles of incidence in all climatic zones;

2. to initiate the study of the effects of sand and dust storms;

3. to examine the relationship between the propagation characteristics for 99% of the worst month and those for the year;

4. to examine, for emissions using circular polarization, the level of the depolarized component relative to the polarized component;

5. to submit as much information as possible on these problems to the 1979 World Administrative Radio Conference.

RECOMMENDATION No. Sat – 4

To the CCIR relating to transmitting antennae for the broadcasting-satellite service

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) the need for ample information on transmitting antennae for the planning of the broadcasting-satellite service;

b) the technical data required to enable the 1979 World Administrative Radio Conference to revise the Radio Regulations;

c) the studies being pursued by the CCIR under the appropriate Questions and Study Programmes;

invites the CCIR

1. to continue the study of reference patterns for the co-polar and cross-polar components of transmitting antennae for the broadcasting-satellite service for both individual and community reception, and in particular the practicable means of achieving various degrees of improved side-lobe suppression and the economic implication thereof;

2. to initiate the study of the technical characteristics designed to achieve a pointing accuracy for transmitting antenna such that:

- the deviation of the antenna beam from its nominal direction of pointing shall not exceed 0.1°;
- the angle of rotation of the transmitting beam about its axis shall not exceed ±2°;

3. to submit as much information as possible on these problems to the 1979 World Administrative Radio Conference.

RECOMMENDATION No. Sat – 5

To the CCIR relating to up-links for the broadcasting-satellite service

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) the need for ample information on the characteristics of up-links for planning the broadcasting-satellite service;

b) the technical data required to enable the 1979 World Administrative Radio Conference to revise the Radio Regulations;

c) the studies being pursued by the CCIR under the appropriate Study Programme;

d) that the carrier-to-noise ratios for the up-links to broadcasting satellites should be of the order of ten times greater than those for the down-links;

e) that, as regards up-link interference between broadcasting satellites at different orbital positions, adequate up-link protection ratios (approximately 10 dB greater than those in the down-link) would appear to be readily achievable by antenna pattern discrimination in earth station transmitting antennae which would clearly have to be larger in diameter than the receiving antennae used in the down-links;

f) that, where planning is based on isolation parameters such as radiation patterns for space station transmitting antennae, carrier interleaving, and/or polarization discrimination in meeting the down-link carrier-to-interference requirements between service areas served from a single orbital position, the increased carrier-to-interference requirements in the up-links serving the satellite(s) at that same orbital position will have to use the same isolation parameters provided that this produces an improvement of about 10 dB in net isolation. The characteristics of the transmitting Earth station will clearly not affect this isolation, apart from the purety of their on-beam polarization;

g) that in the implementation of broadcasting-satellite systems, consideration must be given to all aspects of associated space operation service functions (tracking, telemetry, telecommand and ranging) in connection with the operation of broadcasting satellites;

invites the CCIR

1. to continue the study of those radiation characteristics of receiving antennae of space stations in the broadcasting-satellite service which, singly or in combination with other means of discrimination, would give the necessary protection ratios for the up-links of systems in the broadcasting-satellite service for (a) satellite(s) occupying a given position in the geostationary satellite orbit;

2. to continue the study of those polarization characteristics of receiving antennae of space stations in the broadcasting-satellite service which, singly or in combination with other means of discrimination, would give the necessary protection ratios for the up-links of systems in the broadcasting-satellite service for (a) satellite(s) occupying a given position in the geostationary satellite orbit;

3. to continue the study of the technical up-link characteristics required to implement the plan for this service;

4. to study the technical and design characteristics and requirements which affect the provision of "space operation service functions" of space stations in the broadcasting-satellite service;

5. to study the requirements for adjacent-channel isolation in up-links for (a) satellite(s) in the broadcasting-satellite service occupying a given position in the geostationary satellite orbit;

6. to draw up a Report at the Special Joint Meeting of CCIR Study Groups to be held for the preparation of technical data for the 1979 World Administrative Radio Conference.

RECOMMENDATION No. Sat – 6

To the CCIR relating to spurious emissions in the broadcasting-satellite service

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that space stations in the broadcasting-satellite service operating at high power levels are likely to cause interference to services in adjacent and in harmonically related frequency bands due to spurious emissions;

b) that, in the planning of the broadcasting-satellite service, account must be taken of the need to reduce interference to services operating in adjacent bands to acceptable levels at the lower and upper edges of the bands 11.7-12.2 GHz in Regions 2 and 3 and 11.7-12.5 GHz in Region 1, and to the radio astronomy service which has an exclusive allocation at 23.6-24 GHz in all three Regions;

c) the technical data required to enable the 1979 World Administrative Radio Conference to revise the Radio Regulations;

d) the studies being pursued by the CCIR under the appropriate Study Programme;

invites the CCIR

to continue, as a matter of urgency, the study of the technical and operational aspects of spurious emissions from space stations in the broadcasting-satellite service to enable the Special Joint Meeting of CCIR Study Groups to draw up a report for the 1979 World Administrative Radio Conference.

RECOMMENDATION No. Sat – 7

To the CCIR relating to the interdependence of receiver design, channel grouping and sharing criteria

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

considering

a) that receiver design, channel grouping and sharing criteria are interrelated and have a considerable influence on the development of a plan for the broadcasting-satellite service;

b) that, so far, insufficient attention may have been given to these factors and to their influence on the implementation of such a plan;

invites the CCIR

to study the problem of the interdependence of receiver design, channel grouping and sharing criteria, together with the effects of these factors on the operation of the broadcasting-satellite service.

RECOMMENDATION No. Sat – 8

Relating to the convening of a regional administrative radio conference for the detailed planning of the space services in the frequency band 11.7-12.2 GHz in Region 2

The World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977,

noting

a) that the detailed requirements of all administrations in Region 2 for the broadcasting-satellite service in the frequency band 11.7-12.2 GHz are not yet known;

b) that, in view of the large demands expected for the other services with which this band is shared, there is a need to ensure that this frequency band and the geostationary orbit are used as efficiently as possible;

c) that a future regional administrative radio conference for the detailed planning of space services in the frequency band 11.7-12.2 GHz would be able to take advantage of experiments now being carried out, of further technological advances, and of additional studies by the CCIR;

considering

the provisions adopted by this Conference to govern the implementation of space services in the frequency band 11.7-12.2 GHz pending the establishment of a detailed plan for Region 2;

recommends

1. that a regional administrative radio conference be held not later than 1982 for the purpose of carrying out detailed planning for the broadcasting-satellite and fixed-satellite services in Region 2, in accordance with 2., 3., 4., 5. and 6. below;

2. that the said regional administrative radio conference draw up a detailed plan for the orbit/spectrum resource available for the broadcasting-satellite services in the 11.7-12.2 GHz band. The plan shall provide for the detailed assignment of the orbital positions and frequency channels available, ensuring that the broadcasting-satellite service requirements submitted by the various administrations are met in an equitable manner satisfactory to all the countries concerned. It should be laid down as a matter of principle that each administration in the Region should be guaranteed a minimum number of channels (4) for the operation of the broadcasting-satellite service. Above this minimum, the special characteristics of the countries (size, time zones, language differences, etc.) shall be taken into account;

3. that planning be based on individual reception, but each administration may use the reception system which best meets its requirements, namely, individual or community reception, or both. Account shall also be taken of the decisions of the 1977 and 1979 World Administrative Radio Conferences and of the latest CCIR Recommendations in the case of parameters covered by its studies and research;

4. that, when planning the broadcasting-satellite service, it be borne in mind that systems should be designed with a view to reducing to a minimum technical differences and incompatibilities with the systems of other Regions;

5. that the conference also take into account the need to make equitable provision for the requirements of the fixed-satellite service to which this frequency band is also allocated in Region 2;

6. that in drafting the above-mentioned detailed plan, account also be taken of the terrestrial radio services sharing the same band;

invites the Administrative Council

to make preparations for convening the said regional administrative radio conference using the provisions of this Recommendation as a basis for the agenda and the terms of reference of the conference.

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