INTERNATIONAL TELECOMMUNICATION UNION

General Secretariat

Radio Regulations

Edition of 1990

3 Radio Regulations: Resolutions and Recommendations

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RESOLUTIONS

Note by the General Secretariat

The Resolutions are arranged in order and numbered along the lines of the grouping and numbering system below. As some Resolutions in one group have direct relationship to Resolutions in other groups, this has been reflected, as far as possible, to facilitate consultation*.

* In this respect, see also the Analytical Index.

RESOLUTIONS DELETED SINCE THE 1979 WARC:

By WARC Mob-83: *Nos. 11, 305, 313*

By WARC Mob-87: *Nos. 12, 30, 202, 203, 204, 206, 301, 302, 303, 304, 306, 307, 308, 309, 311, 317, 318, 320, 321, 400, 401, 402, 404, 407, 600*

By WARC Orb-88: *Nos. 3, 31, 40, 41, 43, 100, 101, 102, 502, 503, 504, 700, 701*

RESOLUTION No. 1

Relating to Notification of Frequency Assignments [1]

The World Administrative Radio Conference, Geneva, 1979,

referring to

- the Preamble of the Convention*,
- Article 31 of the Convention* (Special Arrangements),
- Article **7** of the Radio Regulations (Special Agreements),
- Article **12** of the Radio Regulations (Notification and Recording in the Master International Frequency Register of Frequency Assignments to Terrestrial Radiocommunication Stations),
- Article **13** of the Radio Regulations (Notification and Recording in the Master International Frequency Register of Frequency Assignments to Radio Astronomy and Space Radiocommunication Stations Except Stations in the Broadcasting-Satellite Service),
- Article **17** of the Radio Regulations (Procedure for the Bands Allocated Exclusively to the Broadcasting Service Between 5 950 kHz and 26 100 kHz);

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[1] Replaces Resolution No. 5 of the Administrative Radio Conference, Geneva, 1959.

* International Telecommunication Convention (Malaga-Torremolinos, 1973).

resolves

that, unless specifically stipulated otherwise by special arrangements communicated to the Union by administrations, any notification of a frequency assignment to a station shall be made by the administration of the country on whose territory the station is located.

RESOLUTION No. 2

Relating to the Equitable Use, by All Countries, with Equal Rights, of the Geostationary-Satellite Orbit and of Frequency Bands for Space Radiocommunication Services [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

that all countries have equal rights in the use of both the radio frequencies allocated to various space radiocommunication services and the geostationary-satellite orbit for these services;

taking into account

that the radio frequency spectrum and the geostationary-satellite orbit are limited natural resources and should be most effectively and economically used;

having in mind

that the use of the allocated frequency bands and fixed positions in the geostationary-satellite orbit by individual countries or groups of countries can start at various dates depending on the requirements and readiness of technical facilities of countries;

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[1] Replaces Resolution No. **Spa2** – 1 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

resolves

1. that the registration with the IFRB of frequency assignments for space radiocommunication services and their use should not provide any permanent priority for any individual country or groups of countries and should not create an obstacle to the establishment of space systems by other countries;

2. that, accordingly, a country or a group of countries having registered with the IFRB frequencies for their space radiocommunication services should take all practicable measures to realize the possibility of the use of new space systems by other countries or groups of countries so desiring;

3. that the provisions contained in paragraphs 1 and 2 of this Resolution should be taken into account by the administrations and the permanent organs of the Union.

RESOLUTION No. 4 (Rev.Orb-88)

Period of Validity of Frequency Assignments to Space Stations Using the Geostationary-Satellite Orbit [1]

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that rational and efficient use must be made of the frequency spectrum and the geostationary-satellite orbit and that account should be taken of the provisions of Resolution **2** of the World Administrative Radio Conference, Geneva, 1979, relating to the use by all countries, with equal rights, of frequency bands for space radiocommunication services;

b) that limiting the period of validity of frequency assignments to space stations using the geostationary-satellite orbit is a concept which could promote the attainment of these objectives;

c) that amortizing the considerable investments made in connection with the development of space radiocommunications is a particularly heavy burden for all administrations and that these investments should be spread over a predetermined period;

d) that efforts should be made to encourage administrations in a position to do so to develop techniques designed to improve the utilization of the frequency spectrum and the geostationary-satellite orbit with a view to increasing the total radiocommunication facilities available to the world community;

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[1] This Resolution does not apply to the frequency bands covered by the Allotment Plan as contained in Appendix **30B**.

e) that it would be advantageous to introduce an experimental procedure to gain experience from application of the new concept of notifying the period of validity of an assignment in space radiocommunication, but that it is not desirable to impose on administrations a statutory period identical in all cases but that on the contrary administrations should be left to propose the period of validity themselves in the light of their requirements and of the common interest;

f) that the present Conference has reviewed this Resolution and decided that more time is required in its application before it can be properly assessed;

resolves

1. that, until this Resolution is reviewed by the next competent world administrative radio conference, frequency assignments to space radiocommunication stations located on the geostationary orbit shall be dealt with as follows:

1.1 a frequency assignment to a space station [1] on a geostationary satellite shall be deemed definitively discontinued after the expiry of the period of operation shown on the assignment notice, reckoned from the date on which the assignment was brought into service. This period shall be limited to that for which the satellite network was designed. The Board shall then invite the notifying administration to take steps to cancel the assignment. If the Board receives no reply within three months following the expiry of the period of operation, it shall insert a symbol in the Remarks Column of the Master Register to indicate that the assignment is not in conformity with this Resolution;

[1] The expression "space station" may apply to more than one satellite provided that only one satellite is in operation at any particular moment and that the stations installed on board successive satellites have identical basic characteristics.

1.2 if a notifying administration which wishes to extend the period of operation originally shown on the assignment notice of a frequency assignment of an existing space station [1] informs the Board accordingly more than three years before the expiry of the period in question and if all other basic characteristics of that assignment remain unchanged, the Board shall amend as requested the period of operation originally recorded in the Master Register and publish that information in a special section of the weekly circular;

1.3 if, at least three years before the expiry of the period of operation recorded in the Master Register of a frequency assignment to an existing space station [1], an administration initiates the coordination procedure specified in No. **1060** to bring into service a new space station using the same assigned frequency and the same orbital position but with different technical characteristics, and if the Board finds after the notification that the new assignment conforms with the provisions of No. **1503** and does not increase, in relation to the preceding assignment, the probability of interference to the detriment of a frequency assignment recorded in the Master Register or involved in the coordination procedure, the new assignment shall be given a favourable finding and shall be entered in the Master Register;

1.4 a notifying administration which wishes to modify a basic characteristic of a frequency assignment of a space station [1] recorded in the Master Register shall initiate, in any case other than those covered by paragraphs 1.2 and 1.3, the appropriate modification procedure in accordance with the provisions of Nos. **1547** to **1551**;

2. that, for the application of the provisions of paragraph 1.1 above, the information concerning the period of validity of frequency assignments to space stations shall be notified in addition to that contained in Appendices **3** and **4** to the Radio Regulations;

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[1] The expression "space station" may apply to more than one satellite provided that only one satellite is in operation at any particular moment and that the stations installed on board successive satellites have identical basic characteristics.

3. that the application of this Resolution shall not prejudge in any way the decisions of future administrative radio conferences;

invites the next competent world administrative radio conference

to take cognizance of the results of the application of this Resolution and take action, as appropriate;

instructs the Secretary-General

to bring this Resolution to the attention of the Administrative Council.

RESOLUTION No. 5

Relating to Technical Cooperation with the Developing Countries in the Study of Propagation in Tropical Areas

The World Administrative Radio Conference, Geneva, 1979,

having noted

that the assistance provided for the developing countries by the Union in cooperation with other United Nations specialized agencies, such as the United Nations Development Programme (UNDP), in the field of telecommunication augurs well for the future;

being aware

a) of the fact that the developing countries, particularly those in tropical areas, require adequate knowledge of radio wave propagation in their territories in order to make rational and economical use of the radio spectrum;

b) of the importance of propagation in radiocommunications;

c) of the importance of the work of the CCIs for the development of telecommunications in general and radiocommunications in particular;

considering

a) the need for the developing countries themselves to study telecommunications in general and propagation in particular in their territories, this being the best means of enabling them to acquire telecommunication techniques and to plan their systems effectively and in conformity with the special conditions in the tropical areas;

b) the scarcity of resources available in these countries;

resolves to invite the Secretary-General

1. to offer the assistance of the Union to developing countries in the tropical areas which endeavour to carry out national propagation studies in order to improve and develop their radiocommunications;

2. to assist these countries, if necessary with the collaboration of international and regional organizations such as the African Postal and Telecommunications Union (APTU), the Panafrican Telecommunication Union (PATU) and the Union of National Radio and Television Organizations of Africa (URTNA) which may be concerned, in carrying out national propagation measurement programmes, including collecting appropriate meteorological data, on the basis of CCIR Recommendations, Questions and Study Programmes in order to improve the use of the radio spectrum;

3. to arrange funds and resources for this purpose from the UNDP or other sources in order to enable the Union to provide the countries concerned with adequate and effective technical assistance for the purpose of this Resolution;

urges administrations

to submit the results of these propagation measurements to the CCIR for consideration in its studies;

invites the Administrative Council

to follow the progress made in carrying out programmes of propagation measurements and the results achieved, and to take any action that it considers necessary.

RESOLUTION No. 6

Relating to the Preparation of a Handbook to Explain and Illustrate the Procedures of the Radio Regulations

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the complexity of the regulatory procedures specified in Chapter **IV** of the Radio Regulations;

b) the need of many administrations for a handbook to give their staff a better understanding of these procedures to help in their application;

c) the possible use of diagrams, flow charts and other graphical aids to the understanding of complex procedures;

recognizing

1. that the World Administrative Radio Conference, Geneva, 1979, has insufficient time to develop explanatory material and diagrams for inclusion in or attachment to the Final Acts;

2. that a special effort will be required to develop a handbook to meet adequately the need referred to in *b)* above;

3. that it would be advantageous if the format of such a handbook were compatible with that of the Radio Regulations;

resolves

that the IFRB should, as soon as possible after the World Administrative Radio Conference, Geneva, 1979, prepare a handbook incorporating appropriate graphical material, including flow charts, to help the staff of

administrations to apply the regulatory procedures of Chapter **IV** of the Radio Regulations;

instructs the Secretary-General

1. to publish the handbook prepared by the IFRB;

2. to insert the flow charts, when available, in an appropriate manner in published editions of the Radio Regulations, clearly marked to the effect that they are an aid to understanding and that they do not form part of the Radio Regulations.

RESOLUTION No. 7

Relating to the Development of National Radio Frequency Management

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the Radio Regulations contain, *inter alia*, procedures for the coordination, notification and registration of frequencies which specify the rights and obligations of Member countries;

b) that the application of the above-mentioned procedures necessitates an appropriate radio frequency management unit in each Member country;

c) that the existence of such a unit helps Member countries to safeguard their rights and to discharge their obligations under the Radio Regulations;

d) that the application of the Radio Regulations through the agency of such units is in the interest of the international community as a whole;

noting

that such a unit requires an adequate number of suitably qualified staff;

noting further

that the administrations of many developing countries need to create or to strengthen such a unit, appropriate to their administrative structure, with responsibility for the application of the Radio Regulations at the national and international levels;

recommends

that the administrations of such countries take appropriate action;

resolves

1. that meetings shall be organized between representatives of the IFRB, the CCIR and the personnel involved in frequency management matters from administrations of developing and developed countries;

2. that such meetings shall be aimed at designing standard structures suitable for administrations of developing countries and include discussions concerning the establishment and operation of radio frequency management units;

3. that such meetings should also identify the particular needs of developing countries in establishing such units, and the means required to meet those needs;

recommends

that developing countries when planning the use of funds, particularly those received from international sources, make provision for participation in these meetings as well as for the introduction and development of such units;

invites the Administrative Council

to take the necessary measures for the organization of such meetings;

instructs the Secretary-General

1. to circulate this Resolution to all Members of the Union, drawing their attention to its importance;

2. to circulate the results of such meetings, particularly to the developing countries;

3. to inform the developing countries of the types of assistance the ITU can provide in setting up the desired structure;

draws the attention of the next Plenipotentiary Conference to

1. the particular problems identified in this Resolution;

2. the need for prompt and effective action to resolve them;

3. the need to take all practicable measures to ensure that resources are made available for this purpose.

RESOLUTION No. 8 (Rev.Mob-87)

Implementation of the Changes in Allocations in the Bands Between 4 000 kHz and 27 500 kHz

(See also Resolution **512 (HFBC-87)**)

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that parts of frequency bands between 4 000 kHz and 27 500 kHz that were previously allocated on an exclusive or shared basis to the fixed service have been re-allocated to other services;

b) that existing fixed and mobile assignments must be removed progressively from those re-allocated bands to make way for other services;

c) that the assignments to be removed, termed "displaced assignments", must be re-accommodated in other frequency bands;

recognizing

the difficulties facing administrations and the IFRB during the period of transition from the previous allocations to those made by this Conference;

resolves

1. that the transitional procedure in Annex A to this Resolution shall be used for the purpose of ensuring an orderly and equitable implementation of the changeover from the previous allocations to those made by this Conference;

2. that the provisions of No. **1242** and the associated provisions of Article **12** concerning the examination and recording in the Master Register of assignments in the bands between 4 000 kHz and 27 500 kHz

allocated on an exclusive or shared basis to the fixed service shall be suspended from 1 January 1982 to 30 June 1984;

3. that the interim procedure in Annex B to this Resolution shall be used for the purpose of dealing with any urgent new frequency assignments in the relevant bands during the period of suspension of the provisions of Article **12** as specified in *resolves* 2;

4. that the review procedure in Annex C to this Resolution shall be used for the purpose of examining any urgent new assignments notified during the period of suspension of the provisions of Article **12** as specified in *resolves* 2;

invites administrations

1. when seeking re-accommodation for their mobile assignments in the bands between 4 000 kHz and 27 500 kHz re-allocated to other services, to make every effort to find replacement assignments in the bands allocated exclusively to the mobile service concerned;

2. to cooperate by not submitting notices for assignments in the relevant bands during the period of suspension of the provisions of Article **12** as specified in *resolves* 2, except for urgent new assignments to be dealt with under the interim procedure;

requests the IFRB

not to examine any notices in the relevant bands under Article **12** during the period of suspension of the provisions of that Article as specified in *resolves* 2, other than those notices requesting deletions of existing assignments.

ANNEX A TO RESOLUTION No. 8 (Rev.Mob-87)

Transitional Procedure for the Selection and Approval of Replacement Assignments

PART I – PREPARATORY PHASE

Section I. Preparation and Publication by the IFRB of Consolidated Proposals for Replacement Assignments

1. For the purpose of this Resolution, the term "displaced assignment" means a frequency assignment to a station in the fixed service in the parts of the bands re-allocated from the fixed service to other services for which a replacement assignment shall be found in accordance with this Resolution.

2. The Board, as soon as possible after completion of the procedure annexed to Resolution **9**, shall prepare consolidated proposals for replacements for all displaced assignments listed in the Provisional Section of the Master Register in the bands between 4 000 kHz and 27 500 kHz which the World Administrative Radio Conference, Geneva, 1979, has re-allocated from the fixed service to other services.

3. The displaced assignment shall be treated in the order of the revised date recorded in Column 2d as indicated in Resolution **9**. Furthermore, all displaced assignments which have the same revised date shall be treated in the following order:

1) assignments for national use;

2) assignments for international use.

In the application of this provision, the displaced assignments shall be processed in batches without any priority being applied to the assignments of any administration.

4. The displaced assignments of class of operation C shall not be treated until all displaced assignments of class of operation A or B have been satisfied.

5. Displaced assignments of class of operation C shall be as far as possible evenly distributed throughout the bands that continue to be allocated to the fixed service.

6. The Board, in complying with the provisions of this Section, shall for the purposes of protecting existing recorded assignments employ only the Master Register reconstructed in accordance with the procedure annexed to Resolution **9**.

7. The Board, on 1 July 1983, shall send to each administration a document listing all the assignments concerning that administration, identifying those that were recorded in the Provisional Section of the Master Register, and those proposed as replacements.

Section II. Examination and Approval of Proposed Assignments

8. Each administration, upon receipt of the document specified in paragraph 7, shall acknowledge receipt and shall then examine the proposed replacement assignments contained therein with regard to their acceptability, following which the administration shall advise the Board as soon as possible:

- of its agreement; or
- which of the proposed assignments it finds unacceptable.

In the latter case, the administration shall inform the Board, as quickly as possible, of its reasons therefor.

9. The Board shall examine the responses under paragraph 8 and shall try, preferably by applying small adjustments, to satisfy the administration concerned with respect to the proposed assignments it found unacceptable. The Board shall do so in the following way:

- the Board shall collect all responses received under paragraph 8 within six months after 1 July 1983, and then process them together and without any priority being applied to the reply of any administration; and then

– the Board shall collect all responses received under paragraph 8 in the period from six months to nine months after 1 July 1983, and then process this second batch in the same manner as described above for the first batch.

10. The procedure described in this Section shall terminate on 1 July 1984.

Section III. Subsequent Action by the Board

11. The Board, on termination of the procedure prescribed by Sections I and II of this Annex, shall insert in the Master Register all replacement assignments that have been agreed by administrations, with annotations to indicate:

– that they shall have the same common status as the undisplaced assignments as provided for in Resolution **9**; and

– their provisional nature in accordance with No. **1311**.

12. The Board shall, for all assignments mentioned in paragraph 11, insert in Column 2d of the Master Register the appropriate date according to paragraph 6.3 of the Annex to Resolution **9**.

13. The Board shall then publish, in recapitulatory supplements to the International Frequency List, all replacement assignments made in accordance with the procedure prescribed in Part I of this Annex.

14. The Board, on publication of the supplements prescribed in paragraph 13, shall inform by telegram any administration having outstanding displaced assignments of class of operation A which have not been satisfied.

Section IV. Implementation of Article 12

15. As from 1 July 1984, the provisions of Article **12** shall apply to frequency bands allocated to the fixed service between 4 000 kHz and 27 500 kHz.

16. Following that date, an administration, having been informed by the Board under paragraph 14 that certain of its displaced assignments have not been replaced under this transitional procedure, shall be free to select new assignments taking into account the assignments recorded in the Master Register under paragraph 11, and shall submit new notices to the Board in accordance with Article **12**.

PART II – TRANSFER PHASE

Section V. Subsequent Action by Administrations

17. An administration, having received and accepted replacements for its recorded assignments that were displaced by decisions of the World Administrative Radio Conference, Geneva, 1979, shall effect the changeover from the old to the new assignment not later than:

– 1 July 1989 for frequency bands above 10 MHz; and

– 1 July 1994 for frequency bands below 10 MHz.

18. An administration shall promptly inform the Board of the date on which the changeover from an old to a replacement assignment takes place. The Board shall remove from that replacement assignment the special symbol placed in accordance with No. **1311** (see paragraph 11) in the Master Register, thus indicating that it has been implemented, and shall enter the date of the changeover in Column 2c. The date in Column 2c, originally recorded with the displaced assignment, shall be entered in the Remarks Column.

19.1 An administration, having effected the change to a replacement assignment of class of operation A, and having experienced harmful interference or having received a complaint of harmful interference involving another class of operation A assignment:

a) shall make every effort with any other administration concerned to resolve the problem, and, if unsuccessful,

b) may select and submit to the Board an alternative replacement assignment [1].

19.2 An administration, having effected the change to a replacement assignment of class of operation B, and having experienced harmful interference for this class of operation, may select and submit to the Board an alternative replacement assignment [1].

20. Following a favourable finding by the Board on the replacement assignment selected under paragraph 19.1 *b)* or 19.2, the administration shall be entitled to have inserted in Column 2d of the Master Register, against that assignment, the common date 1 January 1982 for class of operation A and 2 January 1982 for class of operation B.

Section VI. Relevance of Dates in the Master Register

21. The relevance of the dates related to displaced assignments is referred to in the Annex to Resolution **9** and Article **12**.

ANNEX B TO RESOLUTION No. 8 (Rev.Mob-87)

Interim Procedure Concerning Notices Relating to Assignments in the Bands Between 4 000 kHz and 27 500 kHz Allocated on an Exclusive or Shared Basis to the Fixed Service

1. During the period between 1 January 1982 and 30 June 1984, an administration, having an urgent requirement which cannot possibly be delayed until the end of that period, may notify a new assignment in the bands between 4 000 kHz and 27 500 kHz allocated on an exclusive or

[1] On request from an administration, the Board shall assist in the application of provision 19.1 *b)* or 19.2.

shared basis to the fixed service. Such notices shall contain the information listed in the appropriate section of Appendix **1**.

2. An administration submitting a notice in accordance with paragraph 1 above shall be deemed to accept that its assignment:

a) shall be of an interim nature; and

b) shall be subject to the review procedure contained in Annex C to this Resolution and shall then be modified if necessary to conform to the results of that review; and

c) shall not cause harmful interference to any assignments recorded in the Master Register that are entitled to protection.

3. The Board, upon receipt of a complete notice under paragraph 1, shall examine it with respect to No. **1240** and shall return to the notifying administration any notice not complying with that provision together with the reasons for this action.

4. Notices in conformity with No. **1240** shall be included in a special section of the weekly circular, where they shall be annotated to show that they are subject to both the interim and review procedures contained in this Annex and Annex C to this Resolution respectively. Assignments notified under No. **1218** shall additionally be annotated to that effect.

5. The Board shall compile and maintain a Special List of all notices dealt with under paragraph 4.

ANNEX C TO RESOLUTION No. 8 (Rev.Mob-87)

Review Procedure Concerning Notices Relating to Assignments for Stations of the Fixed Service in the Bands Between 4 000 kHz and 27 500 kHz

1. The Board, commencing on 1 July 1984, shall examine under the appropriate provisions of Article **12** all interim assignments contained in the Special List compiled in accordance with Annex B to this Resolution with a view to recording them in the Master Register.

2. For the purposes of this examination, interim assignments shall be processed without priority being given to the assignments of any administration; however, assignments notified under No. **1218** shall be treated first.

3. All interim assignments shall be examined by the Board with respect to the probability of harmful interference from or to assignments entered in the Master Register on a provisional basis as a result of the application of Annex A to this Resolution. Depending on the findings of the Board subsequent to this examination, further action shall be as follows:

4. *Favourable finding with respect to paragraph 3 above*

4.1 The interim assignments notified under No. **1218** shall be recorded in the Master Register, and the date 1 July 1984 shall be entered in Column 2d.

4.2 The other interim assignments shall be examined under No. **1242** with respect to frequency assignments recorded in the Master Register at the date of commencement of the interim procedure described in Annex B to the present Resolution. Depending on the findings of the Board, the appropriate provisions of Article **12** shall be applied. When such assignments are to be recorded, the date 1 July 1984 shall be entered in Column 2d.

5. *Unfavourable findings with respect to paragraph 3 above*

The Board shall, having regard to the class of operation of assignments and the contents of the reconstructed Master Register, propose suitable replacement assignments and enter them on a provisional basis with the date of 1 July 1984 in Column 2d.

6. The Board shall, upon completion of this review, compile a Temporary List of recorded and proposed replacement assignments and publish it as an Annex to its weekly circular. A copy of this List, together with a national extract thereof, shall be sent to each administration having interim assignments in the Special List mentioned in paragraph 1 of this Annex.

7. An administration, upon receipt of the List mentioned in paragraph 6, shall consider the proposed replacements for its interim assignments and shall, within five months of the date of publication of the Temporary List, inform the Board whether the proposed assignments are acceptable. If the proposed assignments are not acceptable, the administration shall give the reasons therefor.

8. Upon acceptance of a proposed assignment, the administration shall indicate the latest date of bringing into use. This date shall be within one year of the publication of the Temporary List.

9. The Board shall examine the replies under paragraph 7 and shall try, if necessary by applying small adjustments, to satisfy the administration concerned with respect to the proposed assignments it found unacceptable and propose alternative frequencies. Simultaneously, the Board shall replace the appropriate provisional entry by the new proposed frequency.

10. If, on 1 July 1985, provisional entries made under paragraphs 5 or 9 have not been accepted by the administrations concerned, the Board shall replace these entries by the corresponding interim assignments appropriately annotated. As from that date neither the Special List nor the Temporary List shall be taken into consideration.

11. An administration, having an interim assignment for which no acceptable replacement assignment has been found, shall be free to select a new replacement and shall forward a new notice under the provisions of Article **12**. Upon request from an administration, the Board shall assist in the application of this provision.

RESOLUTION No. 9

Relating to the Revision of Entries in the Master International Frequency Register in the Bands Allocated to the Fixed Service Between 3 000 kHz and 27 500 kHz

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that there is a need to improve the accuracy and reliability of the Master International Frequency Register, particularly in the bands allocated on an exclusive or shared basis to the fixed service between 3 000 kHz and 27 500 kHz;

b) that previous initiatives of the IFRB have shown that, with the cooperation of administrations, substantial improvements can be made in the accuracy and reliability of the Master Register;

recognizing

a) that only a vigorous and cooperative worldwide attack on this problem will lead to a solution;

b) that a procedure involving the mutual cooperation of all administrations and the IFRB is required for the purpose of revising parts of the Master Register;

recognizing also

a) that a significant proportion of assignments for the fixed service is intended for purposes other than regular operational use;

b) that the identification of the class of operation of such assignments in the Master Register would facilitate international frequency management of the fixed service in this part of the spectrum and should be made a standard feature of the Master Register;

c) that the identification of the hours of regular operation would further facilitate the management of this service;

d) that both the class and the hours of regular operation of assignments should be introduced in any procedure intended for revision of parts of the Master Register;

e) that upon completion such action would provide a firm foundation for the transitional arrangements required to provide replacements for assignments to stations in the fixed service displaced by decisions of the World Administrative Radio Conference, Geneva, 1979;

resolves

to adopt the procedure in the Annex to this Resolution for the purpose of revising the parts of the Master Register relating to the bands allocated to the fixed service between 3 000 kHz and 27 500 kHz;

further resolves

that this Resolution shall enter into force on 1 January 1980;

invites administrations and the IFRB

to participate fully and promptly in this procedure.

ANNEX TO RESOLUTION No. 9

Procedure for Reviewing Entries in the Master Register in Frequency Bands Allocated to the Fixed Service Between 3 000 kHz and 27 500 kHz

1. The Board shall extract from the Master Register and shall, as soon as possible after 1 January 1980, forward to each administration an individual National List [1] of all assignments [2] recorded in the Master Register on behalf of that administration or for which notices have been received prior to that date in the bands allocated exclusively or on a shared basis to the fixed service between 3 000 kHz and 27 500 kHz. The Board shall at the same time draw the attention of the administration to any assignments for which another means of telecommunication is believed to be available.

2. Each administration, upon receiving the List mentioned in paragraph 1 above, shall so inform the Board by telegram. An administration not receiving its National List by 1 April 1980 shall promptly inform the Board, which shall forthwith send to that administration a further copy of the National List. The Board shall ensure that every administration has received the National List pertaining to its own assignments.

3. Each administration, after having acknowledged receipt of its National List, shall examine the List and shall:

a) delete from it any of the entries no longer required;

b) classify the remaining entries of the fixed service with the use of the following symbols:

Symbol A – assignment for regular operational use which is not provided by another satisfactory means of telecommunication; or

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[1] The Board shall determine by prior enquiries the number of copies of the National List to be sent to each administration. The National List shall be prepared in the format of the International Frequency List but the form in which the List is forwarded may, at the request of individual administrations and with the agreement of the Board, be varied to suit different circumstances.

[2] For the purposes of this procedure, assignments to stations of the aeronautical fixed service shall be treated as if they were stations of the fixed service within the band(s) concerned.

Symbol B – assignment for use as a standby to some other means of telecommunication; or

Symbol C – assignment for occasional use on a reserve basis and not requiring internationally recognized protection from harmful interference;

c) indicate the regular hours of operation of the frequency assignment in UTC; otherwise indicate the hours of operation as day service (HJ), night service (HN), or transition period service (HT).

4. An administration, after having completed the actions described in paragraphs 2 and 3 above, shall return its annotated National List to the Board as quickly as possible and in any event not later than 31 March 1981.

5. The Board shall send to each administration an acknowledgement of receipt of its annotated National List, and shall, in cases of special difficulty or at the request of administrations, give such help and advice as the circumstances may warrant.

6. On 1 October 1981, the Board shall publish a provisional section of the Master Register relating solely to the assignments in the bands allocated to the fixed service between 3 000 kHz and 27 500 kHz. This section shall contain all assignments shown in National Lists as annotated by administrations and those shown in the National Lists which have not been returned to the Board, excluding those assignments with an unfavourable finding with respect to No. **1240**, without reference to No. **342**. The assignments in this provisional section shall be annotated as follows:

6.1 all assignments shall bear a symbol indicating a reference to this Resolution;

6.2 the dates entered in Columns 2a, 2b or 2d or the symbol entered in Column 2d and the findings shown in the appropriate part of Column 13 shall be amended as shown in the attached table;

6.3 frequency assignments to fixed service stations in the parts of bands re-allocated to other services shall bear a symbol indicating that they are assignments for which replacement assignments shall be found in accordance with Resolution **8**, retaining the date and status afforded in the attached table.

7. Before applying items I.2 and II.2 of the attached table to assignments of countries having a small number of assignments, the Board shall consult the administration whose assignment caused the unfavourable finding in order to ensure that no actual interference has occurred since the registration of the recorded assignment. If the administration replies that no actual interference has occurred, the Board shall enter the symbol corresponding to class of operation A for the assignment and amend the unfavourable finding. Otherwise, it shall apply the provisions of No. **1218** in order to find another frequency and shall proceed to replace the frequency in consultation with the administration concerned.

8. As soon as possible after 1 January 1982, the Board shall:

8.1 publish a supplement to the provisional section of the Master Register containing those assignments for which notices were received between 1 January 1980 and 31 December 1981 and recorded in the Master Register;

8.2 send to administrations a copy of their National List;

8.3 incorporate in the Master Register the provisional section mentioned in paragraph 6 including the assignments mentioned in paragraph 8.1 above in replacement of the corresponding entries in the frequency bands concerned.

9. Following completion of the action described above, the Board shall publish a report showing the results obtained from the operation of this procedure.

TABLE

	Column 13a	Column 2	Column 13c
I. *Frequency bands below 3 900 kHz (Region 1) 3 950 kHz (Region 3) 4 000 kHz (Region 2)*			
I.1 *Lists returned to the Board:*			
– A class of operation assignments	Delete any symbols indicating the finding under No. **1241**	Replace the date in 2a or 2b by 1.1.82 in 2a	RES **9** SUP RR 515
– B or C class of operation assignments	idem	Replace the date in 2a or 2b by 2.1.82 in 2b	RES **9** SUP RR 515
– entries under No. **342** of the Radio Regulations	NOC	Replace the date by 5.1.82 in 2b	RES **9**
I.2 *Lists not returned to the Board:*			
– assignments entered with a date in 2a	NOC	Replace the date by 3.1.82 in 2a	RES **9**
– assignments entered with a date in 2b	NOC	Replace the date by 4.1.82 in 2b	RES **9**
– entries under No. **342** of the Radio Regulations	NOC	Replace the date by 5.1.82 in 2b	RES **9**

TABLE *(cont.)*

	Column 13a	Column 2	Column 13c
II. *Frequency bands above 3 900 kHz (Region 1) 3 950 kHz (Region 3) 4 000 kHz (Region 2)*			
II.1 *Lists returned to the Board:*			
– A class of operation assignments	Delete any symbols indicating the finding under No. **1242**	Replace the date or the symbol in 2d by 1.1.82	RES **9** SUP RR 515
– B or C class of operation assignments	idem	Replace the date or the symbol in 2d by 2.1.82	RES **9** SUP RR 515
– entries under No. **342** of the Radio Regulations	NOC	Replace the date or the symbol in 2d by 5.1.82	RES **9**
II.2 *Lists not returned to the Board:*			
– finding favourable under No. **1240**	NOC	Replace the date or the symbol in 2d by 3.1.82	RES **9**
– entries under No. **342** of the Radio Regulations	NOC	Replace the date or the symbol in 2d by 5.1.82	RES **9**

RESOLUTION No. 10

Relating to the Use of Radiotelegraph and Radiotelephone Links by the Red Cross, Red Crescent, and Red Lion and Sun Organizations

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the worldwide relief work of the Red Cross, Red Crescent, and Red Lion and Sun Organizations is of increasing importance and often indispensable;

b) that in such circumstances normal communication facilities are frequently overloaded, damaged, completely interrupted or not available;

c) that it is necessary to facilitate by all possible measures the reliable intervention of these national and international organizations;

d) that rapid and independent contact is essential to the intervention of these organizations;

e) that for international relief work of the Red Cross, it is necessary that the national Red Cross, Red Crescent, and Red Lion and Sun Organizations be able to communicate with each other as well as with the International Committee of the Red Cross and the League of Red Cross Societies;

decides to urge administrations

1. to take account of the possible needs of the Red Cross, Red Crescent, and Red Lion and Sun Organizations for communication by radio when normal communication facilities are interrupted or not available;

2. to assign to these organizations the minimum number of necessary working frequencies in accordance with the Table of Frequency Allocations; in the case of fixed circuits between 3 MHz and 30 MHz, the frequencies shall be selected, as far as possible, adjacent to the amateur bands;

3. to take all practicable steps to protect such links from harmful interference.

RESOLUTION No. 13

Relating to the Formation of Call Signs and the Allocation of New International Series [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the recommendation of the International Radio Conference, Atlantic City, 1947, relating to the formation of call signs;

b) the increasing demand for call signs justified by the increased number of Members of the Union and by the increased requirements of countries which are already Members;

c) the information supplied by the Secretary-General regarding allocations of call signs since 1947 and the possibilities of the current system of forming call signs;

believing

that call signs already in use should, as far as possible, not be changed;

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[1] Replaces Resolution No. 8 of the Administrative Radio Conference, Geneva, 1959.

noting

a) that the former call sign series formed of three letters, or a figure and two letters, having been exhausted, a new series has been introduced formed of a letter, a figure and a letter; but in no case may the figure be 0 or 1;

b) that the method mentioned in *noting a)* is not applicable to series beginning with one of the following letters: B, F, G, I, K, M, N, R, U, W;

c) that a proposal has been submitted to this Conference for the formation of new call sign series by replacing the third character, which is a letter, by a digit;

d) however, that this would require consequential changes in Section III of Article **25**;

resolves

1. that the Secretary-General shall continue to urge administrations:

1.1 to make the maximum use of the possibilities of the series at present allocated, to avoid, as far as possible, further requests;

1.2 to review the call-sign assignments they have already made from their present allocations, with a view to releasing any series and place them at the disposal of the Union;

2. that the Secretary-General shall, upon request, furnish advice to administrations on the means of effecting the greatest economy, which should be the rule, in the use of a series of call signs;

3. that if, nevertheless, before the next competent world administrative radio conference, it appears that all the possibilities of the present system of forming call signs will be exhausted, the Secretary-General shall:

3.1 explore the possibilitity of forming new series on the basis of the proposal mentioned in *noting c)* ;

3.2 issue a circular-letter:

3.2.1 explaining the position;

3.2.2 urging the administrations to send in their proposals for possible solutions;

4. that, from the information thus submitted, the Secretary-General shall prepare a report, together with his comments and suggestions, for submission to the next competent world administrative radio conference.

RESOLUTION No. 14

Relating to the Transfer of Technology

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the terms of the Resolution relating to International Economic Development and Cooperation (3362(S-VII)) adopted by the United Nations General Assembly at its seventh special session, and the terms of Section III of this Resolution, which emphasizes the role of science and technology in development;

b) the terms of General Assembly Resolution 32/160, which proclaims a Transport and Communications Decade in Africa in the period 1978-1987, during which a World Communications Year is scheduled to be proclaimed;

c) the decisions of the General Assembly relating to the preparation of an international development strategy during the Third United Nations Development Decade, i.e. in the 1980s (Resolution 33/193);

noting

that, at the recent United Nations Conference on Science and Technology for Development, Vienna, August 1979, the governments adopted a Declaration relating to a Programme of Action aimed at accelerating the application of science and technology for development;

aware

of the importance of the application of science and technology in telecommunications for the purposes of developing the services and attaining social, economic and cultural objectives;

also aware

of the important role of the ITU as the United Nations specialized agency responsible for undertaking activities leading to the attainment of the objectives set forth in the International Telecommunication Convention;

resolves to urge

1. *the governments of the Member countries*, particularly those of the developing countries, and their administrations, to take steps to establish national telecommunication development policies to strengthen their technical cooperation activities in order to achieve the efficient transfer of telecommunication technology, with a view to improving telecommunication services of all types, especially in the field of radiocommunications;

2. *administrations* to participate to the maximum extent practicable in the Study Groups of the International Consultative Committees of the Union, which are important forums for the transfer of information on the progress and application of telecommunication technology;

resolves to instruct the Secretary-General

1. to strengthen further those technical cooperation activities geared to the planning, setting up, maintenance and operation of telecommunication systems and to the training of staff for such purposes, with a view to accelerating the transfer and satisfactory application of technology in favour of development, having regard to the specific requirements of each country;

2. to seek, at the international level, the resources required to accelerate these technical cooperation programmes, particularly funds which could be allocated under the Vienna Programme of Action;

3. to bring the present Resolution to the notice of all the Member countries of the Union and the competent bodies of the United Nations;

invites the Administrative Council

to keep abreast of the progress made in the attainment of the objectives set forth in this Resolution and to report on such progress, as appropriate, to the next Plenipotentiary Conference.

RESOLUTION No. 15

Relating to International Cooperation and Technical Assistance in the Field of Space Radiocommunications [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that a large number of countries Members of the International Telecommunication Union are not in a position to take immediate advantage of satellite techniques for the development of their telecommunication services;

b) that such countries would benefit immensely through the technical assistance programmes sponsored by the Union;

recognizing

a) that international satellite-communication systems are subject to the Convention and Regulations and that they permit participation of all countries including, in particular, the developing countries, in space communication systems;

b) that a number of problems need to be solved in order that the developing countries may participate effectively in international space communication systems and integrate these systems with their national telecommunication networks;

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[1] Replaces Resolution No. **Spa** 4 of the Extraordinary Administrative Radio Conference, Geneva, 1963.

resolves to invite the Administrative Council

1. to draw the attention of administrations to the means by which they may avail themselves of technical assistance in connection with the introduction of space communications;

2. to consider the most effective manner in which requests for such assistance by Member countries of the Union may be formulated and presented in order to secure maximum financial and other assistance;

3. to consider how best to make use of funds made available by the United Nations in accordance with its Resolution 1721 to give technical and other assistance to administrations of Member countries of the Union to make effective use of space communications;

4. to consider in what way the work of the Consultative Committees and other organs of the Union may be utilized in the most effective way for the information and assistance of administrations of Member countries of the Union in the development of space radiocommunications.

RESOLUTION No. 16

Relating to the Role of Telecommunications in Integrated Rural Development

The World Administrative Radio Conference, Geneva, 1979,

recalling

Resolution 3362 (S-VII) of the seventh special session of the United Nations General Assembly which, *inter alia*, requested Member States to promote integrated rural development in the developing countries;

recalling further

the importance placed on rural development by various inter-governmental conferences during the Second United Nations Development Decade, which recognized the need for the intensification of development efforts aimed at satisfying the aspirations of the rural communities and accelerating the development of infrastructure in the rural areas;

the ITU Administrative Council Resolutions 779 (Implementation of the International Development Strategy for the Second United Nations Development Decade) and 800 (Telecommunications, an important factor of economic and social development: role of the ITU in this domain) and the importance of telecommunications for social and economic development, as well as the various projects and studies undertaken by the Union to meet these objectives;

convinced

of the importance of telecommunications as an essential element of infrastructure for the rural areas;

recognizing

a) that most developing countries are still lacking adequate telecommunication resources;

b) that many rural areas of the world do not currently enjoy the benefits of telecommunication technology;

c) that many populations within individual countries live in isolation from each other due to geographical barriers such as oceans, mountains, forests and deserts;

d) that the provision of modern telecommunications and, in particular, radiocommunications, including satellite technology, can serve to overcome those difficulties and to integrate rural communities in the development process;

e) that many developing countries are unable to provide entirely from their own resources such modern telecommunications;

noting

the proven possibilities of modern telecommunication technology as a means of bringing to the rural areas education, health care and other welfare services of importance for social development;

noting further

the significant supporting role of an adequate rural telecommunication network in stimulating growth in agricultural activities and in other sectors important for economic and social progress;

urges Member governments

to strengthen their technical cooperation efforts for the realization of accelerated telecommunication development to serve the rural communities, bearing in mind the existing inadequacies in the resources of various developing countries;

urges also administrations

to participate actively in the studies carried out by the Autonomous Working Groups (GAS 3 and GAS 5) of the CCITT/CCIR in regard to rural telecommunication development;

requests the Secretary-General

1. to continue to give special attention to the Union's technical assistance activities for the detailed planning, operation and maintenance of the rural telecommunication infrastructure and application of appropriate technology;

2. to bring this Resolution to the attention of the appropriate United Nations bodies;

3. to continue to cooperate with the specialized agencies and organizations of the United Nations system in the field of integrated rural development;

invites the Administrative Council

to consider this Resolution, to monitor its implementation and to report on progress in the Annual Report on the activities of the Union.

RESOLUTION No. 17

Relating to the Determination, on the Basis of the Agenda, of the Possible Committee Structure to Be Set Up at an Administrative Radio Conference

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that some administrations, owing to lack of personnel, have difficulty in staffing their delegations at administrative radio conferences so as to be able to send at least one delegate to attend each of the committees;

b) that at present it is difficult for administrations to predict beforehand the number and names of the committees to be set up at conferences, and the subjects to be allocated to each committee;

c) that the Secretary-General might usefully prepare a draft structure for future conferences sufficiently in advance, in the light of relevant former conferences;

recognizing

a) that the organization of the work of each administrative radio conference can be determined only by the conference itself, in the light of its agenda and of the proposals and other documents submitted to it;

b) that nevertheless the organization of previous conferences can often be a helpful guide to the organization of a new conference, and that information about the organization of the work of previous conferences could therefore be of assistance to administrations in their preparations for conferences;

resolves

1. that, when the Administrative Council has established the agenda of an administrative radio conference, the Secretary-General shall send to administrations, together with a copy of the resolution containing the agenda, an invitation to give their opinion on the structure of the conference in the light of the agenda;

2. that, on receipt of replies from administrations, the Secretary-General, in consultation with the IFRB and the Director of the CCIR and guided by the experience of earlier conferences of a similar character, shall draw up a draft conference structure showing which of the articles, appendices, resolutions, recommendations and other topics contained in the agenda might be considered by each committee;

3. that the Secretary-General shall bring this draft document to the attention of the Administrative Council and shall send it as an information paper to all administrations.

RESOLUTION No. 18 (Mob-83)

Relating to the Procedure for Identifying and Announcing the Position of Ships and Aircraft of States Not Parties to an Armed Conflict

The World Administrative Radio Conference for the Mobile Services, Geneva, 1983,

considering

a) that ships and aircraft encounter considerable risk in the vicinity of an area of armed conflict;

b) that for the safety of life and property it is desirable for ships and aircraft of States not parties to an armed conflict to be able to identify themselves and announce their position in such circumstances;

c) that radiocommunication offers such ships and aircraft a rapid means of self-identification and providing location information prior to their entering areas of armed conflict and during their passage through the areas;

d) that it is considered desirable to provide a supplementary signal and procedure for use, in accordance with customary practice, in the area of armed conflict by ships and aircraft of States representing themselves as not parties to an armed conflict;

resolves

1. that the frequencies specified in No. **3201** of the Radio Regulations may be used by ships and aircraft of States not parties to an armed conflict for self-identification and establishing communications. The transmission will consist of the urgency or safety signals, as appropriate, described in

Article **40** followed by the addition of the single group "NNN" in radiotelegraphy and by the addition of the single word "NEUTRAL" pronounced as in French "neutral" in radiotelephony. As soon as practicable, communications shall be transferred to an appropriate working frequency;

2. that the use of the signal as described in the preceding paragraph indicates that the message which follows concerns a ship or aircraft of a State not party to an armed conflict. The message shall convey at least the following data:

a) call sign or other recognized means of identification of such ship or aircraft;

b) position of such ship or aircraft;

c) number and type of such ships or aircraft;

d) intended route;

e) estimated time en route and of departure and arrival, as appropriate;

f) any other information, such as flight altitude, radio frequencies guarded, languages and secondary surveillance radar modes and codes;

3. that the provisions of Sections I and III of Article **40** shall apply as appropriate to the use of the urgency and safety signals, respectively, by such ship or aircraft;

4. that the identification and location of ships of a State not party to an armed conflict may be effected by means of appropriate standard maritime radar transponders. The identification and location of aircraft of a State not party to an armed conflict may be effected by the use of the secondary surveillance radar (SSR) system in accordance with procedures to be recommended by the International Civil Aviation Organization (ICAO);

5. that the use of the signals described above would not confer or imply recognition of any rights or duties of a State not party to an armed conflict or a party to the conflict, except as may be recognized by common agreement between the parties to the conflict and a non-party;

6. to encourage parties to a conflict to enter into such agreements;

requests the Secretary-General

to communicate the contents of this Resolution to the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) for such action as they may consider appropriate;

requests the CCIR

to recommend an appropriate signal in the digital selective calling system for use in the maritime mobile service and other appropriate information as necessary.

RESOLUTION No. 19 (Mob-87)

The Need to Study the Question of Including Decisions of Regional Administrative Radio Conferences in the Radio Regulations

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that this Conference had Resolution **704** as an item on its agenda;

b) that the general question of the inclusion of decisions of regional conferences in the Radio Regulations was raised;

c) that there is a need for general guidance on the question to ensure consistency of approach;

recognizing

a) that the question of including decisions of regional conferences in the Radio Regulations, in order to render those decisions applicable to all the Members of a particular Region, raises a question of principle which affects all the Members of the Union;

b) that the best source of guidance on this question is the supreme organ of the Union;

resolves

to submit to the next Plenipotentiary Conference for consideration the question of including in the Radio Regulations the decisions of regional administrative radio conferences and the implications of such inclusion on all Members of the Union;

invites the IFRB

to prepare a report on the radio regulatory aspects of this question for the information of the Administrative Council and administrations;

instructs the Secretary-General

to prepare a report on the legal aspects of this question for the Administrative Council and administrations;

invites the Administrative Council

to bring to the attention of the Plenipotentiary Conference the need for a decision by that Conference on the possible inclusion of decisions of regional administrative radio conferences in the Radio Regulations;

recommends the Plenipotentiary Conference

to consider the question of including in the Radio Regulations decisions of regional administrative conferences in order to provide general guidance on this subject.

RESOLUTION No. 20 (Mob-87)

Technical Cooperation with Developing Countries in the Field of Aeronautical Telecommunications

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the allocations of the frequency bands and the provisions concerning the various aeronautical mobile services have been revised;

b) that some of these frequency bands and provisions are intended for the world-wide implementation of new aeronautical telecommunication systems;

c) that these new systems will employ more advanced techniques, such as satellite communications, in combination with modern information transmission media;

d) that this technological modernization should serve to improve the safety and regularity of international civil aviation, the accuracy and security of aeronautical radionavigation and the efficiency of distress and rescue systems;

e) that the developing countries may require assistance in improving the training of technical staff, as well as in introducing new systems, in coping with technological modernization and enhancing the operation of aeronautical telecommunications;

recognizing

the value of the assistance which, in conjunction with other international organizations, the Union has provided and may continue to provide to developing countries in the field of telecommunications;

instructs the Secretary-General

1. to encourage the International Civil Aviation Organization (ICAO) to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications, in particular by providing them with technical advice for the planning, establishment, operation and maintenance of equipment, as well as help with the training of staff, essentially in matters relating to the new technologies;

2. for this purpose, to seek the continued collaboration of ICAO, the United Nations Conference for Trade and Development (UNCTAD) and other specialized agencies of the United Nations, as appropriate;

3. to inform ICAO that this Conference has recognized the valuable cooperation provided by that organization to developing countries in its technical assistance programmes;

4. to continue to give special attention to seeking the aid of the United Nations Development Programme (UNDP) and other sources of financial support, to enable the Union to render sufficient and effective technical assistance in the field of aeronautical telecommunications;

invites the developing countries

so far as possible, to give a high level of priority to and include in their national programmes of requests for technical assistance projects relating to aeronautical telecommunications and to support multinational projects in that field.

RESOLUTION No. 32

Relating to the Use of Frequency Assignments to Terrestrial and Space Radiocommunication Stations in the Band 11.7 - 12.2 GHz in Region 3 and in the Band 11.7 - 12.5 GHz in Region 1 [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, adopted Resolution No. **Sat** – 2;

b) that No. **838** 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 that Conference;

c) that the decisions of that Conference included a Plan for stations in the broadcasting-satellite service;

d) that the coordination procedures described in Resolution **33** are to be applied only until the entry into force of plans pursuant to Resolution **507**;

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);

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[1] Replaces Resolution No. **Sat** – 2 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

2. that administrations may continue to use frequency assignments which are not in accordance with the Plan, provided that agreement is reached with the administration whose broadcasting-satellite stations are affected;

3. that the administrations seeking agreement shall inform the IFRB of the terms of the agreement reached;

4. 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;

5. that Resolution No. **Sat** – 2 is abrogated and superseded by this Resolution;

invites the IFRB

to assist administrations in implementing the provisions of this Resolution.

RESOLUTION No. 33

Relating to the Bringing into Use of Space Stations in the Broadcasting-Satellite Service, Prior to the Entry into Force of Agreements and Associated Plans for the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that while Resolution **507** envisages plans for the broadcasting-satellite service, some administrations might nevertheless feel the need to bring stations in that service into use prior to such plans being established;

b) that administrations should, as far as possible, avoid proliferation of space stations in the broadcasting-satellite service before such plans have been established;

c) that a space station in the broadcasting-satellite service may cause harmful interference to terrestrial stations operating in the same frequency band, even if the latter are outside the service area of the space station;

d) that the procedures specified in Article **11** of the Radio Regulations contain no provisions for coordination between space stations in the broadcasting-satellite service and terrestrial stations and between space stations in that service and space systems of other administrations;

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[1] Replaces Resolution No. **Spa2** – 3 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

resolves

1. that, except in those cases where agreements and associated plans for the broadcasting-satellite service have been established and have entered into force, the following procedure shall be applied:

Section A. Coordination Procedure Between Space Stations in the Broadcasting-Satellite Service and Terrestrial Stations

2.1 Before an administration notifies to the IFRB or brings into use any frequency assignment to a space station in the broadcasting-satellite service in a frequency band where this frequency band is allocated, with equal rights, to the broadcasting-satellite service and to a terrestrial radiocommunication service, either in the same Region or sub-Region or in different Regions or sub-Regions, it shall coordinate the use of this assignment with any other administration whose terrestrial radiocommunication services may be affected. For this purpose, it shall inform the Board of all the technical characteristics of the station, as listed in the relevant sections of Appendix **3** to the Radio Regulations, which are necessary to assess the risk of interference to a terrestrial radiocommunication service [1].

[1] The calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant CCIR Recommendations agreed by the administrations concerned either as a result of Resolution **703** or otherwise. In the event of disagreement on a CCIR Recommendation or in the absence of such Recommendations, the methods and criteria shall be agreed between the administrations concerned. Such agreements shall be concluded without prejudice to other administrations.

2.2 The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram.

2.3 Any administration which considers that its terrestrial radiocommunication services may be affected shall forward its comments to the administration seeking coordination and, in any case, to the Board. These comments must be forwarded within four months from the date of the relevant IFRB weekly circular. It shall be deemed that any administration which has not forwarded comments within that period considers that its terrestrial radiocommunication services are unlikely to be affected.

2.4 Any administration which has forwarded comments on the projected station shall either give its agreement, with a copy to the Board, or, if this is not possible, send to the administration seeking coordination all the data on which its comments are based as well as any suggestions it may be able to offer with a view to a satisfactory solution of the problem.

2.5 The administration which plans to bring into use a space station in the broadcasting-satellite service as well as any other administration which believes that its terrestrial radiocommunication services are likely to be affected by the station in question may request the assistance of the Board at any time during the coordination procedure.

2.6 In the event of continuing disagreement between an administration seeking to effect coordination and one with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the Board has been requested, defer the submission of its notice concerning the proposed assignment by six months from the date of publication of the information according to paragraph 2.2.

Section B. Coordination Procedure Between Space Stations in the Broadcasting-Satellite Service and Space Systems of Other Administrations

3. An administration intending to bring into use a space station in the broadcasting-satellite service shall, for the purpose of coordination with space systems of other administrations, apply the following provisions of Article **11** of the Radio Regulations:

3.1 Nos. **1041** to **1058** inclusive.

3.2.1 Nos. **1060** to **1065** [1].

3.2.2 No coordination under paragraph 3.2.1 is required when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the probability of harmful interference to stations in the space radiocommunication service of other administrations.

3.2.3 Nos. **1074** to **1105** inclusive.

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[1] The calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant CCIR Recommendations agreed by the administrations concerned either as a result of Resolution **703** or otherwise. In the event of disagreement on a CCIR Recommendation or in the absence of such Recommendations, the methods and criteria shall be agreed between the administrations concerned. Such agreements shall be concluded without prejudice to other administrations.

Section C. Notification, Examination and Recording in the Master Register of Assignments to Space Stations in the Broadcasting-Satellite Service Dealt With under this Resolution

4.1 Any frequency assignment[1] to a space station in the broadcasting-satellite service shall be notified to the Board. The notifying administration shall apply for this purpose the provisions of Nos. **1495** to **1497** of the Radio Regulations.

4.2 Notices made under paragraph 4.1 shall initially be treated in accordance with No. **1498**.

5.1 The Board shall examine each notice with respect to:

5.2 *a)* its conformity with the Convention, the Table of Frequency Allocations and the other provisions of the Radio Regulations, with the exception of those relating to the coordination procedures and to the probability of harmful interference, which are the subject of paragraphs 5.3, 5.4, and 5.5;

5.3 *b)* its conformity, where applicable, with the provisions of paragraph 2.1 of Section A above, relating to coordination of the use of the frequency assignment with the other administrations concerned;

5.4 *c)* its conformity, where applicable, with the provisions of paragraph 3.2.1 of Section B above, relating to coordination of the use of the frequency assignment with the other administrations concerned;

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

5.5 *d)* where appropriate, the probability of harmful interference to the service rendered by a station in a space or terrestrial radiocommunication service for which a frequency assignment has already been recorded in the Master Register in conformity with the provisions of No. **1240** or **1503** of the Radio Regulations, as appropriate, if that assignment has not, in fact, caused harmful interference to the service rendered by a station for which an assignment has been previously recorded in the Master Register and which itself is in conformity with No. **1240** or **1503** as appropriate.

6.1 Depending upon the findings of the Board subsequent to the examination prescribed in paragraphs 5.2, 5.3, 5.4 and 5.5, further action shall be as follows:

6.2 Where the Board reaches an unfavourable finding with respect to paragraph 5.2, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Board for this finding together with such suggestions as the Board is able to offer with a view to a satisfactory solution of the problem.

6.3 Where the Board reaches a favourable finding with respect to paragraph 5.2, or where it reaches the same finding after resubmission of the notice, it shall examine the notice with respect to the provisions of paragraphs 5.3 and 5.4.

6.4 Where the Board finds that the coordination procedures mentioned in paragraphs 5.3 and 5.4 have been successfully completed with all administrations whose services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in Column 2d of the Master Register with an entry in the Remarks Column indicating that such recording does not prejudge in any way the decisions to be included in the agreements and associated plans referred to in Resolution **507**.

6.5 Where the Board finds that the coordination procedures mentioned in paragraph 5.3 or 5.4 have not, as appropriate, been applied or have been unsuccessfully applied, the notice shall be returned immediately by airmail to the notifying administration with the reason for its return together with such suggestions as the Board is able to offer with a view to a satisfactory solution of the problem.

6.6 Where the notifying administration resubmits the notice and states that it has been unsuccessful in endeavouring to effect the coordination, the notice shall be examined by the Board with respect to paragraph 5.5.

6.7 Where the notifying administration resubmits the notice and the Board finds that the coordination procedures have been successfully completed with all administrations whose services may be affected, the assignment shall be treated as indicated in paragraph 6.4.

6.8 Where the Board reaches a favourable finding with respect to paragraph 5.5, the assignment shall be recorded in the Master Register. The appropriate symbol indicating the finding by the Board shall indicate that the coordination procedures, as appropriate, referred to in paragraph 2.1 or 3.2.1 were not successfully completed. The date of receipt by the Board of the notice shall be entered in Column 2d of the Master Register, with the remark mentioned in paragraph 6.4.

6.9 Where the Board reaches an unfavourable finding with respect to paragraph 5.5, the notice shall be returned immediately by airmail to the notifying administration with the reasons for the Board's finding together with such suggestions as the Board is able to offer with a view to a satisfactory solution of the problem.

6.10 If the administration resubmits the notice unchanged with the insistence that it be reconsidered, but should the Board's unfavourable finding under paragraph 5.5 remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Board that the assignment has been in use for at least four months

without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d of the Master Register, with the remark mentioned in paragraph 6.4. An appropriate remark shall be placed in Column 13 to indicate that the assignment is not in conformity with the provisions of paragraph 5.3, 5.4 or 5.5, as appropriate. In the event that the administration concerned receives no complaint of harmful interference concerning the operation of the station in question for a period of one year from the commencement of operation, the Board shall review its finding.

6.11 If harmful interference is actually caused to the reception of any space station in the broadcasting-satellite service whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to paragraphs 5.2, 5.3, 5.4 and 5.5 of this Resolution, as appropriate, by the use of a frequency assignment to a space station which has been subsequently recorded in the Master Register in accordance with the provisions of paragraph 6.10 of this Resolution or of No. **1544** of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

6.12 If harmful interference is actually caused to the reception of any space radiocommunication station using an assignment recorded in the Master Register as a result of a favourable finding with respect to Nos. **1503** to **1512**, as appropriate, by the use of an assignment to a space station in the broadcasting-satellite service which has been subsequently recorded in the Master Register in accordance with the provisions of paragraph 6.10 of this Resolution, the station using the latter assignment must, on receipt of advice thereof, immediately eliminate this harmful interference.

6.13 If harmful interference is actually caused to the reception of any terrestrial station using an assignment recorded in the Master Register as a result of a favourable finding with respect to No. **1240**, by the use of an assignment to a space station in the broadcasting-satellite service which has been subsequently recorded in the Master

Register in accordance with the provisions of paragraph 6.10 of this Resolution, the station, using the latter assignment must, on receipt of advice thereof, immediately eliminate this harmful interference.

6.14 If harmful interference to the reception of any station whose assignment is in accordance with paragraph 5.2 of this Resolution is actually caused by the use of a frequency assignment which is not in conformity with No. **1240**, **1352** or **1503**, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

RESOLUTION No. 34

Relating to the Establishment of the Broadcasting-Satellite Service in Region 3 in the 12.5 - 12.75 GHz Frequency Band and to Sharing with Space and Terrestrial Services in Regions 1, 2 and 3

The World Administrative Radio Conference, Geneva, 1979,

considering

that this Conference has allocated the band 12.5 - 12.75 GHz to the broadcasting-satellite service for community reception in Region 3;

recognizing

that under Resolution **507** the Administrative Council may wish to empower a future competent administrative radio conference to establish a plan for the broadcasting-satellite service in the band 12.5 - 12.75 GHz in Region 3;

resolves

1. that, until such time as a plan may be established for the broadcasting-satellite service in the band 12.5 - 12.75 GHz in Region 3, the provisions of Resolution **33** together with Article **11** shall continue to apply to the coordination between stations in the broadcasting-satellite service in Region 3 and:

1) space stations in the broadcasting-satellite and fixed-satellite services in Regions 1, 2 and 3;

2) terrestrial stations in Regions 1, 2 and 3;

2. that the CCIR shall study urgently the technical provisions which may be appropriate for the sharing between stations in the broadcasting-satellite service in Region 3 and:

1) space stations in the broadcasting-satellite and fixed-satellite services in Regions 1 and 2;

2) terrestrial stations in Regions 1 and 2;

3. that, until such time as technical provisions are developed by the CCIR and accepted by administrations concerned under Resolution **703**, the sharing between space stations in the broadcasting-satellite service in Region 3 and terrestrial services in Regions 1, 2 and 3 shall be based on the following criteria as appropriate:

1) the power flux-density at the Earth's surface, produced by emissions from a space station in the broadcasting-satellite service in Region 3 for all conditions and for all methods of modulation shall not exceed the limits given in Annex 5 of Appendix **30**; noting that sub-paragraph 2) shall only apply with respect to protection of the broadcasting service;

2) in addition to 1) above, the provisions of No. **2574** shall apply in the countries mentioned in Nos. **848** and **850**;

3) the limits given in 1) and 2) above may be exceeded on the territory of any country provided the administration of that country has so agreed.

RESOLUTION No. 35

Relating to a Procedure for Resolving a Disagreement over the Technical Standards or Rules of Procedure of the International Frequency Registration Board

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that, in accordance with No. **1001.1**, the Technical Standards and Rules of Procedure of the IFRB shall be distributed to all Members of the Union and shall be open to comment from administrations;

b) that an administration may disagree with the substantive contents of these documents;

c) that, in the event of such a disagreement remaining unresolved, there should be a procedure for the resolution of that disagreement;

recognizing

a) that, with respect to the Technical Standards, the CCIR could provide the best source of professional advice;

b) that, with respect to the Rules of Procedure, a world administrative radio conference could provide the best source of interpretation of the Radio Regulations;

resolves

1. that, in the event of an unresolved disagreement over the substantive contents of the Technical Standards of the IFRB, the Board, in agreement with the administration concerned, shall refer the question to the CCIR for international study and the development of a Recommendation thereon by the next Plenary Assembly of the CCIR;

2. that, in the event of the CCIR not having formulated a Recommendation thereon, or in the event of an unresolved disagreement over the substantive contents of the Rules of Procedure of the IFRB, in either case the matter may be referred to the Administrative Council for inclusion in the agenda of the next world administrative radio conference;

3. that, pending resolution of the matter, the Board shall continue to use the particular Technical Standard or Rule of Procedure in dispute but that, following resolution of the matter by a CCIR Recommendation or by a decision of a world administrative radio conference, the Board shall promptly take the consequential action including a review of all relevant findings.

RESOLUTION No. 36

Relating to the Preparation of Explanatory Information by the International Frequency Registration Board on the Application of the New Method for Designating Emissions in Notification Procedures and the Consequential Revision of the Master International Frequency Register

The World Administrative Radio Conference, Geneva, 1979,

having adopted

Article **4** and Appendix **6** containing a new system for the designation of emissions;

considering

a) that such designations are fundamental to the notification procedures detailed in the Radio Regulations;

b) that it is essential for this new system of designating emissions to be applied not only to new frequency assignments but also to existing entries in the Master Register;

c) that certain new designations are more detailed than the former designations;

d) that the IFRB does not have the means to replace automatically all former designations by the new designations;

noting

a) that some administrations may have difficulties in implementing the new method of designating emissions when it first comes into use;

b) that these administrations need explanatory information well in advance of the entry into force of the Final Acts of this Conference;

resolves

1. that the IFRB shall prepare explanatory information on the application of the new method of designation, including examples, in the context of the notification procedures specified in the Radio Regulations and shall make this information available to administrations as early as possible and not later than 1 October 1980;

2. that the IFRB shall proceed with the conversion of the data appearing in the Master Register in consultation with, and on the basis of information provided by, administrations;

3. that, if the Board does not receive from administrations within a reasonable time the information required in the application of *resolves* 2, it shall convert the data appearing in the Master Register as accurately as possible and insert in the Remarks Column a remark referring to the fact that the conversion was made under the terms of this paragraph;

4. that, from the date of entry into force of the present revision of the Radio Regulations, only the designations of emissions contained in Article **4** shall be used in the coordination and notification procedures. If however the Board receives, after this date, information or notifications containing the old type of designation, the Board shall not consider them incomplete for this reason alone. The Board shall, when practicable, modify the designation and, if clarification is required, shall consult the administrations concerned.

RESOLUTION No. 37

Relating to the Introduction and Development of Computer Assistance in Radio Frequency Management Within Administrations

The World Administrative Radio Conference, Geneva, 1979,

considering

a) Resolution **7** relating to the development of national radio frequency management;

b) Resolution **6** relating to the preparation of a handbook to explain and illustrate certain provisions of the Radio Regulations;

c) Recommendation **31** addressed to the CCIR relating to the preparation of a handbook on computer-aided techniques in radio frequency management;

considering also

d) the potential value of computer aids in many aspects of radio frequency management;

e) the need for further assistance to administrations, particularly in developing countries, in introducing and developing computer facilities or in optimizing the use of their existing computer facilities as aids to radio frequency management;

resolves that the Secretary-General

shall promptly initiate a review of these problems to ensure that the following actions be taken in the most effective manner:

1. the holding of regional seminars particularly directed to education in this field, bearing in mind the national requirements of administrations;

2. the use of all educational resources available to the Union to provide further training in this field appropriate to the national requirements of administrations;

3. the making of appropriate arrangements, within the existing framework of the ITU, for aiding administrations in the identification of special problems in this field and helping to provide solutions, by the best possible application of computer technology;

invites the Administrative Council

to consider the recommendations of the Secretary-General and to find the necessary resources.

RESOLUTION No. 38 (Rev.Mob-87)

Reassignment of Frequencies of Stations in the Fixed and Mobile Services in the Bands Allocated to the Radiolocation and Amateur Services in Region 1

(1 625 - 1 635 kHz, 1 800 - 1 810 kHz,
1 810 - 1 850 kHz and 2 160 - 2 170 kHz)

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

that the World Administrative Radio Conference, Geneva, 1979, adopted modifications to the allocation of the frequency bands between 1 606.5 kHz and 2 850 kHz;

noting

a) that the implementation of the revised Table of Frequency Allocations presents difficulties, in particular for stations in the maritime mobile service in Region 1 in the bands 1 625 - 1 635 kHz, 1 800 - 1 810 kHz and 2 160 - 2 170 kHz made available for radiolocation services and in the band 1 810 - 1 850 kHz made available to the amateur service;

b) that replacement frequencies for stations of the maritime mobile service have been provided in the frequency assignment plan contained in the Final Acts of the Regional Administrative Radio Conference for the Planning of the MF Maritime Mobile and Aeronautical Radionavigation Services (Region 1), Geneva, 1985, together with the arrangements for their implementation;

resolves

1. that in Region 1, except for the countries and frequency bands mentioned[1] in Nos. **485**, **490**, **491**, **493** and **499** of the Radio Regulations, on the date of implementation (1 April 1992) of the frequency assignment plan for the maritime mobile service contained in the Final Acts of the Regional Administrative Radio Conference for the Planning of the MF Maritime Mobile and Aeronautical Radionavigation Services (Region 1), Geneva, 1985, all operations of stations of the fixed and mobile services shall be terminated in the bands 1 625 - 1 635 kHz, 1 800 - 1 810 kHz, 1 810 - 1 850 kHz and 2 160 - 2 170 kHz;

2. that administrations having assignments to stations of the fixed, land mobile or aeronautical mobile (OR) services in the bands concerned shall choose and notify to the IFRB appropriate replacement assignments; and where the finding of the Board is favourable with respect to Nos. **1240** and **1241** of the Radio Regulations, each such replacement assignment shall have the same date and status as that which it has replaced, so far as the assignments of the countries in Region 1 are concerned;

3. that the protection afforded to stations of the fixed and mobile services by Nos. **486** and **492** of the Radio Regulations shall continue to apply until such time as satisfactory replacement assignments have been found and implemented in accordance with this Resolution;

4. that, after the date of implementation (1 April 1992) of the frequency assignment plan for the maritime mobile service contained in the Final Acts of the Regional Administrative Radio Conference for the Planning of the MF Maritime Mobile and Aeronautical Radionavigation Services (Region 1), Geneva, 1985, the continued use of frequency assignments that have not been transferred in accordance with *resolves* 3 shall be only on the basis of No. **342** of the Radio Regulations.

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[1] No. **485**, bands 1 625 - 1 635 kHz, 1 800 - 1 810 kHz and 2 160 - 2 170 kHz;
No. **490**, band 1 810 - 1 830 kHz;
No. **491**, band 1 810 - 1 830 kHz;
No. **493**, band 1 810 - 1 850 kHz;
No. **499**, band 2 160 - 2 170 kHz.

RESOLUTION No. 39 (Mob-83)

Relating to the Improved Use of the International Monitoring System in Applying Decisions of Administrative Radio Conferences

The World Administrative Radio Conference for the Mobile Services, Geneva, 1983,

considering

a) Article **20** of the Radio Regulations concerning the international monitoring system;

b) No. **1218** of the Radio Regulations concerning the assistance which may be provided by the IFRB in the selection of frequency assignments;

c) Resolution **103** of the World Administrative Radio Conference, Geneva, 1979, relating to improvements in assistance to developing countries in securing access to the HF bands for their fixed services and ensuring protection of their assignments from harmful interference,

d) Resolution **309** of the World Administrative Radio Conference, Geneva, 1979, relating to the unauthorized use of frequencies in the bands allocated to the maritime mobile service;

e) Resolution **407** of the World Administrative Radio Conference, Geneva, 1979, relating to the unauthorized use of frequencies in the bands allocated to the aeronautical mobile (R) service;

f) Recommendation **203** of the World Administrative Radio Conference, Geneva, 1979, relating to the future use of the band 2 170 - 2 194 kHz;

g) Resolution 9 of the Plenipotentiary Conference, Nairobi, 1982, relating to the use by the broadcasting service of the bands additionally allocated to this service by the WARC-79;

h) that it is of the utmost importance to ensure that distress and safety channels, particularly those used for alerting, are kept free of harmful interference;

convinced

that an increase in the number of stations participating in the international monitoring system and that a more rational use of the information obtained from such stations would be of considerable assistance to all administrations and to the IFRB:

a) in acquiring a real knowledge of the degree of occupancy of the radio-frequency spectrum;

b) in the performance of certain tasks assigned to the IFRB by administrative conferences, particularly as regards the application of the provisions of the Radio Regulations relating to assistance to administrations and to the identification and elimination of harmful interference (see Nos. **1963** to **1965**);

aware

that the nature and the form of the monitoring information received by the IFRB is so diverse as to make it difficult to analyse and publish;

noting

- the Article 80 of the International Telecommunication Convention, Nairobi, 1982, requesting that financial implications be taken into account when decisions are made by administrative conferences, and

- Resolution 48 of the Plenipotentiary Conference, Nairobi, 1982, concerning the impact on the budget of the Union of the decisions of administrative conferences;

resolves

1. that there is an urgent need to improve protection of frequency bands allocated to the maritime mobile and aeronautical mobile services and to the distress and safety system and that this protection may be facilitated through an improvement in the international monitoring system;

2. that to this end, ad hoc meetings shall be organized between monitoring experts from administrations, the IFRB and the CCIR;

3. that for practical reasons such ad hoc meetings should be organized to coincide in time and place with the competent CCIR Study Group meetings, without increasing their duration. Similar meetings may be organized, if necessary, concurrently with the World Administrative Radio Conference for the Mobile Services planned for 1987;

4. that the purpose of such meetings is:

- to examine the international monitoring system procedures (see Article **20** of the Radio Regulations) with a view to making the system more effective by improving the quality of information collected, as well as the form in which it is analysed, used and published by the IFRB;

- to draw up for administrations a report indicating recommended actions as a result of this examination;

requests the IFRB and the Director of the CCIR

1. to take appropriate measures in order to convene such ad hoc meetings during the interim and final meetings of the competent CCIR Study Group;

2. to jointly report results of these meetings to the Administrative Council for consideration, as appropriate, when the Council is formulating the agenda of a future competent administrative radio conference;

invites administrations

1. to develop monitoring systems and contribute to improved spectrum management by participating in the international monitoring system;

2. to take part in monitoring programmes requested by the IFRB in accordance with Article **20** of the Radio Regulations on any frequency, particularly in the HF bands allocated to the mobile services, with a view to identifying and locating stations of services other than those authorized in these bands; and

3. to take the joint report of the IFRB and CCIR into account when preparing proposals for the competent administrative radio conference.

RESOLUTION No. 42 (Rev.Orb-88)

Use of Interim Systems in Region 2 in the Broadcasting-Satellite and Fixed-Satellite (Feeder-Link) Services in Region 2 for the Bands Covered by Appendix 30 (Orb-85) and Appendix 30A (Orb-88)

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2, Geneva, 1983, prepared a Plan for the broadcasting-satellite service in the band 12.2 - 12.7 GHz and a Plan for the associated feeder links in the band 17.3 - 17.8 GHz with provisions for implementing interim systems in accordance with Resolution No. 2 (Sat-R2);

b) that in the implementation of their assignments in the Plans, administrations of Region 2 may find it more appropriate to adopt a phased approach and initially use characteristics different from those appearing in the appropriate Region 2 Plan;

c) that some administrations of Region 2 may cooperate in the joint development of a space system with a view to covering two or more service areas from the same orbital position or to using a beam which would encompass two or more service areas;

d) that some administrations of Region 2 may cooperate in the joint development of a space system with a view to covering two or more feeder-link service areas from the same orbital position or to using a beam which encompasses two or more feeder-link service areas;

e) that interim systems shall not adversely affect the Plans nor hamper the implementation and evolution of the Plans;

f) that the number of assignments to be used in an interim system shall not in any case exceed the number of assignments appearing in the Region 2 Plan which are to be suspended;

g) that the interim systems shall not in any case use orbital positions that are not in the Region 2 Plan;

h) that an interim system shall not be introduced without the agreement of all administrations whose space and terrestrial services are considered to be affected;

resolves

that administrations and the IFRB shall apply the procedure contained in the Annex to this Resolution, so long as Appendices **30 (Orb-85)** and **30A (Orb-88)** remain in force.

ANNEX TO RESOLUTION No. 42 (Rev.Orb-88)

1. An administration or a group of administrations in Region 2 may, after successful application of the procedure contained in this Annex and with the agreement of the affected administrations, use an interim system during a specified period not exceeding ten years in order:

1.1 *For an interim system in the broadcasting-satellite service*

a) to use an increased e.i.r.p. in any direction relative to that appearing in the Region 2 Plan provided that the power flux-density does not exceed the limits given in Annex 5 to Appendix **30 (Orb-85)**;

b) to use modulation characteristics[1] different from those appearing in the Annexes to the Region 2 Plan and resulting in an increased probability of harmful interference or in a wider assigned bandwidth;

c) to change the coverage area by displacing boresight, or by increasing the major or minor axis, or by rotating them from an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 Plan;

d) to use a coverage area appearing in the Region 2 Plan or a coverage area encompassing two or more coverage areas appearing in the Region 2 Plan from an orbital position which shall be one of the corresponding positions appearing in the Region 2 Plan;

e) to use a polarization different from that in the Region 2 Plan.

1.2 *For an interim feeder-link system*

a) to use an increased e.i.r.p. in any direction relative to that appearing in the Region 2 feeder-link Plan;

b) to use modulation characteristics[1] different from those appearing in the Annexes to the Plan and resulting in an increased probability of harmful interference or in a wider assigned bandwidth;

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[1] For example, 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.

c) to change the feeder-link beam area by displacing the boresight, or by increasing the major or minor axis, or by rotating them in relation to an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 feeder-link Plan;

d) to use a feeder-link beam area appearing in the Region 2 feeder-link Plan or a feeder-link beam area encompassing two or more feeder-link beam areas appearing in the Region 2 feeder-link Plan in relation to an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 feeder-link Plan;

e) to use a polarization different from that in the Region 2 feeder-link Plan.

2. In all cases, an interim system shall correspond to assignments in the appropriate Region 2 Plan; the number of assignments to be used in an interim system shall not in any case exceed the number of assignments appearing in the Region 2 Plan which are to be suspended. During the use of an interim system, the use of the corresponding assignments in the Region 2 Plan is suspended; they shall not be brought into use before the cessation of the use of the interim system. However, the suspended assignments, but not the interim system's assignments, of an administration shall be taken into account when other administrations apply the procedure of Article 4 of Appendix **30 (Orb-85)** or of Article 4 of Appendix **30A (Orb-88)**, as appropriate, in order to modify the Plans, or the procedure of this Annex in order to bring an interim system into use. The assignments of interim systems shall not be taken into account in applying the procedure of Article 6 or Article 7 of Appendix **30 (Orb-85)** and the procedure of Article 6 or Article 7 of Appendix **30A (Orb-88)**.

3. As a specific consequence of paragraph 2 above, Region 2 interim system assignments shall not obtain protection from, or cause harmful interference to, new or modified assignments appearing in the Regions 1 and 3 Plans following the successful application of the procedure of Article 4 of Appendix **30 (Orb-85)** or of Article 4 of Appendix **30A (Orb-88)**, as appropriate, even if the assignment modification procedure is concluded and the assignments become operational within the time-limits specified in paragraph 4 *a)*.

4. When an administration proposes to use an assignment in accordance with paragraph 1, it shall communicate to the IFRB the information listed in Annex 2 to Appendix **30 (Orb-85)** or in Annex 2 to Appendix **30A (Orb-88)**, as appropriate, not earlier than five years but, preferably, not later than twelve months before the date of bringing into use. The administration shall also indicate:

a) the maximum specified period during which the interim assignment is intended to remain in use;

b) the assignments in the Region 2 Plans the use of which will remain suspended for the duration of the use of the corresponding interim assignment;

c) the names of the administrations with which an agreement for the use of the interim assignment has been reached, together with any comment relating to the period of use so agreed and the names of administrations with which an agreement may be required but has not yet been reached.

5. Administrations are considered to be affected as follows:

5.1 *For an interim system in the broadcasting-satellite service*

a) an administration of Region 2 is considered to be affected if any overall equivalent protection margin of one of its assignments in the Region 2 Plan, calculated in accordance with Annex 5 to Appendix **30 (Orb-85)** including the cumulative effect of all interim uses during the maximum

specified period of use of the interim system, but excluding the corresponding suspended assignments (paragraph 4 *b)*), becomes negative or a former negative value is made more negative;

b) an administration of Region 1 or 3 is considered to be affected if it has an assignment which is in conformity with the Regions 1 and 3 Plan contained in Appendix **30 (Orb-85)** or in respect of which proposed modifications have been published by the Board in accordance with the provisions of Article 4 of that Appendix with a necessary bandwidth which falls within the necessary bandwidth of the proposed interim assignment and the appropriate limits of Section 3 of Annex 1 to Appendix **30 (Orb-85)** are exceeded;

c) an administration of Region 1 or 3 is considered to be affected if it has a frequency assignment 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. **1060** of the Radio Regulations or under Article 7 of Appendix **30 (Orb-85)** or which has been published in accordance with No. **1044** of the Radio Regulations or of paragraph 7.1.3 of Appendix **30 (Orb-85)** and the appropriate limits of Section 6 of Annex 1 to Appendix **30 (Orb-85)** are exceeded;

d) an administration of Region 1 or 3 is considered to be affected if, although having no frequency assignment in the appropriate Regions 1 and 3 Plan in the channel concerned, it nevertheless would receive on its territory a power flux-density value which exceeds the limits given in Section 5 of Annex 1 to Appendix **30 (Orb-85)** as a result of the proposed interim assignment, or if it has such an assignment for which its associated service area does not cover the whole of the territory of the administration, and in its territory outside that service area the power flux-density from the interim system space station exceeds the above mentioned limits;

e) an administration of Region 2 is considered to be affected if, although having no frequency assignment in the appropriate Region 2 Plan in the channel concerned, it nevertheless would receive on its territory a power flux-density value which exceeds the limits given in Section 8 *b)* of Annex 1 to Appendix **30 (Orb-85)** as a result of the proposed interim assignment, or if it has such an assignment for which its associated service area does not cover the whole of the territory of the administration, and in its territory outside that service area the power flux-density from the interim system space station exceeds the abovementioned limits;

f) an administration of Region 3 is considered to be affected if it has a frequency assignment to a space station in the broadcasting-satellite service in the band 12.5 - 12.7 GHz with a necessary bandwidth any portion of which falls within the necessary bandwidth of the proposed assignment, and which:

– is recorded in the Master Register; *or*

– has been coordinated or is being coordinated under the provisions of Resolution **33** of the World Administrative Radio Conference, Geneva, 1979; *or*

– appears in a Region 3 Plan to be adopted at a future administrative radio conference, taking account of modifications which may be introduced subsequently in accordance with the Final Acts of that conference,

and the limits of Section 3, Annex 1 to Appendix **30 (Orb-85)** are exceeded.

5.2 *For interim feeder-link systems*

a) an administration of Region 2 is considered to be affected if any overall equivalent protection margin of one of its assignments in the Plan, calculated in accordance with

Annex 3 to Appendix **30A (Orb-88)** including the cumulative effect of all interim uses during the maximum specified period of use of the interim system, but excluding the corresponding suspended assignment(s) (paragraph 4 *b)*), becomes negative or a former negative value is made more negative;

b) an administration in Region 1 or 3 is considered to be affected if it has an assignment for feeder links in the fixed-satellite service (Earth-to-space), any portion of the necessary bandwidth of which falls within the necessary bandwidth of the proposed assignment, which is in conformity with the feeder-link Plan for Regions 1 and 3, or in respect of which proposed modifications to the Plan have already been published by the Board in accordance with the provisions of paragraphs 4.2.6.1 and 4.2.7 of Article 4 of Appendix **30A (Orb-88)** and for which the limits set out in Section 5 of Annex 1 to Appendix **30A (Orb-88)** are exceeded;

c) an administration in Regions 1, 2 or 3 is considered to be affected if it has a frequency assignment in the fixed-satellite service (space-to-Earth) which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. **1060** of the Radio Regulations and the appropriate limits of Section 1 of Annex 1 to Appendix **30A (Orb-88)** are exceeded;

d) an administration in Regions 1, 2 or 3 is considered to be affected if it has a frequency assignment in the band 17.7 - 17.8 GHz to a terrestrial station, in use or intended to be brought into use within three years of the projected date of bringing into use of the feeder-link earth station, which is located within the coordination area of the feeder-link earth station concerned and the limits of Section 2 of Annex 1 to Appendix **30A (Orb-88)** are exceeded.

6. The Board shall publish in a special section of its weekly circular the information received under paragraph 4, together with the names of the administrations which the Board has identified in applying paragraph 5.

7. When the Board finds that the suspended assignment of an administration having an interim system is not affected, it shall examine the projected interim system with respect to the interim system of that administration and if there is an incompatibility, it shall request the two administrations concerned to adopt any measures that may enable the new interim system to be operated.

8. 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.

9. Any administration not listed in the special section which considers that its planned interim assignment may be affected shall so inform the administration responsible for the interim system and the Board, and the two administrations shall endeavour to resolve the difficulty before the proposed date of bringing the interim assignment into use.

10. An administration which has not sent its comments either to the administration seeking agreement or to the Board within a period of four months following the date of the weekly circular referred to in paragraph 6 shall be understood as having agreed to the proposed interim use.

11. On the expiry of four months following the date of publication of the weekly circular referred to in paragraph 6, the Board shall review the matter, and, depending on the results obtained, shall inform the administration proposing the interim assignment that:

a) it may notify its proposed use under Article 5 of Appendix **30 (Orb-85)** or Article 5 of Appendix **30A (Orb-88)**, as appropriate, if no agreement is required or the required agreement has been obtained from the administrations concerned. In this case the Board shall update the Interim List;

b) it may not bring into use its interim system before having obtained the agreement of the administrations affected, either directly or by applying the procedure described in Article 4 of Appendix **30 (Orb-85)** or Article 4 of Appendix **30A (Orb-88)**, as appropriate, as a means of obtaining that agreement.

12. The Board shall include all the interim assignments in an Interim List in two parts, one each for the broadcasting-satellite service and the feeder-link assignments, and shall update it in accordance with this Annex. The Interim List shall be published together with the Region 2 Plans but does not constitute part of them.

13. One year prior to the expiry of the interim period, the Board shall draw the attention of the administration concerned to this fact and request it to notify in due time the deletion of the assignment from the Master Register and the Interim List.

14. If, notwithstanding the reminders by the Board, an administration does not reply to its request sent in application of paragraph 13, the Board shall, at the termination of the interim period:

a) enter a symbol in the Remarks Column of the Master Register to indicate the lack of response and that the entry is for information only;

b) not take that assignment into account in the Interim List;

c) inform the administrations concerned and affected of its action.

15. When an administration confirms the termination of the use of the interim assignment, the Board shall delete the assignment concerned from the Interim List and the Master Register. Any corresponding assignment in the Plan(s), suspended earlier, may then be brought into use.

16. An administration which considers that its interim system may continue to be used after the expiry of the interim period may extend it by not more than four years and to this effect shall apply the procedure described in this Annex.

17. When an administration applies the procedure in accordance with paragraph 16, but is unable to obtain the agreement of one or more affected administrations, the Board shall indicate this situation by inserting an appropriate symbol in the Master Register. Upon receipt of a complaint of harmful interference, the administration shall immediately cease operation of the interim assignment.

18. When an administration, having been informed of a complaint of harmful interference, does not cease transmission within a period of thirty days after the receipt of complaint, the Board shall apply the provisions of paragraph 14.

RESOLUTION No. 44 (Mob-87)

Compatibility of Equipment Used in the Mobile-Satellite Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that only a limited number of frequency bands is allocated to the mobile-satellite service;

b) that the CCIR is studying the preferred technical and operating characteristics for a mobile-satellite system which would have earth stations on ships, land and/or aircraft, all operating within the same system;

c) that there is a need to use efficiently the bands allocated to the mobile-satellite service;

d) that the maritime mobile-satellite service and the aeronautical mobile-satellite service have special requirements with regard to safety;

resolves

that the CCIR should continue to study, as a matter of urgency, terminal characteristics which are common to the extent practicable, in order to ensure compatibility between the land, maritime, and aeronautical mobile-satellite services;

urges administrations

to encourage the development and manufacture of compatible mobile-satellite user equipment.

RESOLUTION No. 45 (Orb-88)

Improvement of the Accuracy of the Master International Frequency Register, the International Frequency List, and List VIIIA

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that an accurate and updated Master International Frequency Register is essential for the application of all the relevant procedures in the Radio Regulations;

b) that there is a need to improve the accuracy and reliability of the Master International Frequency Register;

c) the importance to administrations of an accurate and up-to-date record in the Master International Frequency Register, the International Frequency List, and List VIIIA for the efficient use of the radio-frequency spectrum and geostationary-satellite orbit;

d) that previous initiatives of the IFRB have shown that, with the cooperation of administrations, substantial improvements can be made in the accuracy and reliability of the Master International Frequency Register;

e) that the application of the periodical inquiry procedure in Article **13** by the IFRB has encountered difficulties;

recognizing

a) that only vigorous and cooperative worldwide action on this problem will lead to a solution;

b) that a procedure involving the mutual cooperation of all administrations and the IFRB is required for the purpose of revising parts of the Master International Frequency Register;

resolves

1. to urge administrations to observe the time limits prescribed in the Radio Regulations concerning modification, cancellation and review of entries in the Master International Frequency Register;

2. to urge administrations to cooperate fully with the IFRB in the application of the provisions of the Radio Regulations relating to the cancellation of assignments no longer in use and to the notification of suspended assignments to space and earth stations.

RESOLUTION No. 60

Relating to Information on the Propagation of Radio Waves Used in the Determination of the Coordination Area

(See Appendix **28**)

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that Appendix **28** to the Radio Regulations provides a method for the determination of the coordination area which incorporates certain material concerned with radio wave propagation;

b) that the propagation information contained in Appendix **28** is based directly or indirectly on propagation data given in the texts of the CCIR;

c) that CCIR studies of radio wave propagation are continuing, and therefore the conclusions of these studies are subject to change and may in future show the need to revise those sections of Appendix **28** which incorporate the propagation information;

d) that no radio wave propagation measurements have been carried out in some parts of the world;

recognizing

a) that a period of several years is generally required to accumulate sufficient data to form reliable conclusions concerning radio wave propagation;

b) that for administrative reasons it is desirable that the propagation information used for the determination of the coordination area should not be revised too frequently and, in any case, should be revised only if the effect of such revision on the size of the coordination area is significant;

c) that in Appendix **28** the coordination area is determined without the need for detailed knowledge of the propagation characteristics of individual paths, and it is desirable that this approach be maintained;

invites the CCIR

to continue to study propagation data concerned with the determination of the coordination area, and to maintain the relevant CCIR texts in a format which would permit direct insertion into Appendix **28** in place of the existing paragraphs 3, 4 and 6 or Annex III;

resolves

1. that each Plenary Assembly of the CCIR should come to a conclusion as to whether, according to the propagation information given in the most recent CCIR Recommendations, any revision of paragraphs 3, 4 and 6 or Annex III of Appendix **28** to the Radio Regulations is warranted;

2. that when a Plenary Assembly of the CCIR has come to the conclusion that a revision of paragraphs 3, 4 and 6 or Annex III of Appendix **28** is warranted, the Director of the CCIR shall so inform the Secretary-General of the ITU and send him the proposed amendments to Appendix **28**;

requests

1. that the Administrative Council then place, as an extraordinary item, on the agenda of the next world administrative radio conference, the consideration of the conclusion of the CCIR;

2. that, if the said world administrative radio conference decides that the propagation information used in Appendix **28** is to be revised, the Secretary-General, in consultation with the IFRB, incorporate the amendments agreed at the said conference in a document which contains the new text of paragraphs 3, 4 and 6 or Annex III of Appendix **28** in a form

suitable for direct substitution in the version of Appendix **28** then in force, and send this document to all administrations;

decides

that from a date established by the said conference, the revised text shall form the basis of all subsequent determinations of the coordination area using Appendix **28**.

RESOLUTION No. 61

Relating to the Division of the World into Climatic Zones for the Purpose of Calculation of Propagation Parameters

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the propagation of radio waves, particularly at frequencies greater than 1 GHz, is significantly influenced by rain, as well as by sand and dust storms;

b) that measured values of rainfall intensity and more particularly short-term rain intensity statistics are not available for certain geographical regions;

c) that very little information exists on the occurrence and effects of sand and dust storms;

d) that for the purpose of evaluating propagation characteristics, the CCIR has divided the world into five rain-climatic zones, broadly corresponding to the characteristics of the rainfall and this division is no longer adequate;

e) that the present division of the world into such a limited number of rain-climatic zones is likely to be insufficiently precise to give a correct evaluation of attenuation and scattering by rain in some parts of the world;

f) that the effects of dust and sand storms have not been adequately examined and evaluated, either in terms of their severity or in terms of their temporal variations;

g) that the CCIR has some studies in progress on the effects of rain, as well as of dust and sand storms;

requests the CCIR

1. to expedite and expand the studies on the effects of rain and to give greater emphasis to the studies of sand and dust storms;

2. to advise on the nature of the studies required in geographical regions for which little information exists;

3. in the light of new data becoming available, to give particular attention to the revision of the current classification of the world into climatic zones;

resolves to urge administrations

1. to encourage and undertake, as a matter of urgency, measurements in their countries of the rates of precipitation of rain and of the spatial and temporal variations of this precipitation including its cellular structure;

2. to encourage and undertake, also as a matter of urgency, measurements of the influence of sand and dust storms on propagation;

3. to communicate the results of such measurements to the CCIR to enable the development of a better and more comprehensive description of the phenomena which apply and an improved classification of dust and sand storms and rainfall climates for application to radiocommunication problems.

RESOLUTION No. 62

Relating to the Experimental Use of Radio Waves by Ionospheric Research Satellites [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that research into the Earth's ionosphere is very important in the study of the relationship between the Sun and the Earth and also for the effective use of radio wave transmission via the ionosphere;

b) that successful research has been conducted with satellites such as Alouette 1 and 2, ISIS 1 and 2 and ISS in which top-side sounding equipment is installed;

c) that similar ionospheric research satellites will be used for further research into the ionosphere and beyond;

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

e) that these types of satellite are usually operated intermittently during a limited period each day according to the orbital characteristics;

f) that operation of the sounder can be accurately commanded at will by the earth station concerned;

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[1] Replaces Resolution No. **Spa2** – 4 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

resolves

that administrations may continue to permit the emissions of radio waves from ionospheric research satellites in orbit above the ionosphere in the MF and HF bands provided that suitable means are available for controlling emissions from these satellites as required by No. **2612** of the Radio Regulations to prevent harmful interference to other services.

RESOLUTION No. 63

Relating to the Protection of Radiocommunication Services Against Interference Caused by Radiation from Industrial, Scientific and Medical (ISM) Equipment

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that ISM equipment generates and uses locally radio frequency energy, whereby outward radiation cannot always be avoided;

b) that there is an increasing amount of ISM equipment working on various frequencies throughout the spectrum;

c) that in some cases a considerable part of the energy may be radiated by ISM equipment outside its working frequency;

d) that some radio services, especially those using low field strengths, may suffer interference caused by radiation from ISM equipment, a risk which is unacceptable particularly in the case of radionavigation or other safety services;

e) that, in order to limit the risks of interference to specified parts of the spectrum:

i) the preceding Radio Conferences of Atlantic City, 1947, and Geneva, 1959, have designated some frequency bands within which the radiocommunication services must accept harmful interference produced by ISM equipment;

ii) this Conference has accepted an increase in the number of bands to be designated for ISM equipment, but only on the condition that limits of radiation from such equipment be specified within the bands newly designated for worldwide use and outside all the bands designated for ISM equipment;

resolves

that, to ensure that radiocommunication services are adequately protected, studies are urgently required on the limits to be imposed on the radiation from ISM equipment in the entire radio spectrum, particularly in the newly designated bands;

invites the CCIR

1. to continue, in collaboration with the CISPR and the IEC, its studies relating to radiation from ISM equipment in the entire radio spectrum in order to ensure adequate protection of radiocommunication services;

2. to specify as soon as possible, in the form of Recommendations, the limits to be imposed on radiation from ISM equipment inside and outside the bands designated for their use in the Radio Regulations.

Priority should be given to the studies which would permit the formulation of a Recommendation relating to the frequency bands, newly designated for use by ISM equipment by this Conference, which are listed below:

6 765	-	6 795	kHz
433.05	-	434.79	MHz
61	-	61.5	GHz
122	-	123	GHz
244	-	246	GHz

invites the next competent world administrative radio conference

to resolve the problem of interference from ISM equipment to radiocommunication services taking into account the CCIR Recommendations.

RESOLUTION No. 64

Relating to CCIR Study of Lightning Protection of Radio Equipment

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that there are areas in the world where, although the required protective devices against lightning have been installed, equipments constantly deteriorate, often very seriously, following discharges produced during electrical or violent storms;

b) that due to circumstances such as climatic conditions, man-made environmental pollution, etc., studies have not led to conclusive results;

c) the lack of material means and of experience among technicians confronted with this phenomenon;

considering further

No. 72 of the International Telecommunication Convention (Malaga-Torremolinos, 1973);

invites the CCIR

1. to study this phenomenon, in consultation with the CCITT and to formulate a Recommendation in this matter;

2. to include in the study of this phenomenon, in order to facilitate the application of such protection techniques and, to the extent possible, statistics on lightning with respect to climatic zones of occurrence, frequency of occurrence and magnitude of lightning as measured in terms of induced currents or voltages and their related time constants;

and invites administrations

to submit to the CCIR technical data and results of studies in this matter.

RESOLUTION No. 65

Relating to the Circulation of Current Information on CCIR Recommendations Referred To in the Radio Regulations

The World Administrative Radio Conference, Geneva, 1979,

noting

a) that reference is made in the Radio Regulations to specific CCIR Recommendations as well as to "relevant CCIR Recommendations";

b) that Resolution **703** provides for consultation on the applicability of those CCIR Recommendations relating to the technical criteria for sharing frequency bands between space radiocommunication and terrestrial radiocommunication services or between space radiocommunication services;

c) that the CCIR Recommendations may be revised by CCIR Plenary Assemblies, with consequent changes of reference numbers;

considering

a) that a correct application of the Radio Regulations requires the identification by administrations of the relevant CCIR Recommendations to be taken into account;

b) that information on the up-dating of these Recommendations is of the utmost importance;

invites the CCIR

1. to identify and list those provisions of the Radio Regulations containing a reference to a specific CCIR Recommendation or to a "relevant CCIR Recommendation" together with the reference numbers and titles of those Recommendations;

2. to instruct the Director of the CCIR to provide the Secretary-General with the information required to update the list;

requests the Secretary-General

to communicate to all administrations the list of those Recommendations as well as any subsequent updating thereof.

RESOLUTION No. 66

Relating to the Division of the World into Regions for the Purposes of Allocating Frequency Bands

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the present division of the world into Regions 1, 2 and 3 for the purposes of allocating frequency bands was made in 1947 and the technical bases for this division were not clearly defined;

b) that since 1947 considerable advances in radiocommunication techniques have been made and many new countries have emerged;

being aware

that this division of the world into three Regions as presently constituted, may not be appropriate to meet the requirements of all countries on an equitable basis;

recognizing

that it is not possible to carry out the required revision of the existing Regional division during this Conference;

resolves

that this division should be reviewed in the light of the major developments in radio technology and increase in the membership of the Union with countries at different stages of development;

requests the CCIR

to undertake a study of the technical and operational bases for the possible revision of the division of the world for the purposes of allocating the frequency bands, based on all relevant factors such as radio propagation, climatic conditions, natural geographical configuration of the world, state of economic and technical development, which would permit improvement in the efficient utilization of the radio frequency spectrum by all Member countries of the Union;

urges all Members of the Union

to participate actively in the above study by contributing to its work;

further requests the CCIR

to complete and submit this study not later than its XVIth Plenary Assembly, and in any case to prepare a report for consideration by the next Plenary Assembly;

invites the Administrative Council

to follow the conduct of the study and to furnish advice to the Plenipotentiary Conference with a view to this matter being suitably resolved at one of the future world administrative radio conferences of the Union.

RESOLUTION No. 67

Relating to Improvements in the Design and Use of Radio Equipment

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the radio frequency spectrum is a scarce natural resource which has value only when used;

b) that efficient utilization of the spectrum can be limited by the characteristics of both transmitting and receiving equipment;

c) that operational aspects of radio systems can also limit the efficient utilization of the spectrum;

d) that continuing advances in electronics and allied fields are enabling the production of more spectrum-efficient radiocommunication systems;

resolves

that administrations should encourage improvements in the design and construction of radio equipment and in the mode of operation of systems in order to improve the utilization of the radio frequency spectrum.

RESOLUTION No. 68

Relating to the Redefinition of Certain Terms Contained in Annex 2 to the International Telecommunication Convention (Malaga-Torremolinos, 1973) and Applicable to the Radio Regulations

The World Administrative Radio Conference, Geneva, 1979,

having considered and adopted

the terms and definitions contained in Article **1** of the Radio Regulations (Geneva, 1979) which includes a number of terms already defined in Annex 2 ("Definition of Certain Terms Used in the Convention and in the Regulations of the International Telecommunication Union") to the International Telecommunication Convention (Malaga-Torremolinos, 1973);

believing

that some of the terms as defined in Annex 2 to the Convention which are of importance to the Radio Regulations, i.e. "harmful interference", "telegraphy" and "telephony", and associated terms, should be reviewed and made more precise and better adapted to current technology;

recognizing however

that, in view of Article 51, in particular No. 167, of the International Telecommunication Convention (Malaga-Torremolinos, 1973), only a Plenipotentiary Conference of the International Telecommunication Union is competent to amend the terms and their definitions contained in Annex 2 to that Convention;

recommends

that the Plenipotentiary Conference of the International Telecommunication Union, Nairobi, 1982, re-examine the definition in Annex 2 to the International Telecommunication Convention of the terms "harmful interference", "telegraphy", "telephony" and associated terms, taking into account the terms and definitions adopted for the purposes of the Radio Regulations by the World Administrative Radio Conference, Geneva, 1979, together with any proposals submitted by the CCIR and CCITT under Resolution No. 44 of the Plenipotentiary Conference, Malaga-Torremolinos, 1973;

instructs the Secretary-General

1. to bring this matter to the attention of that Plenipotentiary Conference;

2. to indicate in the published text of the Radio Regulations, by means of notes, those definitions which are not in alignment with Annex 2 to the Convention, drawing attention to the fact that the corresponding definitions in that Annex shall prevail over those in the Radio Regulations to the extent that there are differences between them;

3. to amend or delete these notes in the light of any relevant decisions of the Plenipotentiary Conference.

RESOLUTION No. 69 (Orb-88)

Estimation of Interference between Satellite Networks Using Simplified Methods

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that CCIR texts contain information on evolving simplified methods which may be used to provide a significant improvement in the accuracy of interference estimates when compared with the calculations of Appendix **29** of the Radio Regulations;

b) that an improvement in the accuracy of interference estimates would facilitate the coordination process, thereby relieving administrations of an administrative burden and unneccessary costs;

c) that most of the data requirements for these methods are identified in Appendix **3** of the Radio Regulations;

resolves

to invite the CCIR to continue studies on simplified methods for estimating interference between satellite networks and to recommend a preferred method or methods;

encourages

administrations to participate in the studies of the CCIR, to assure full consideration of all potential methods, to use these methods and to provide the necessary data.

RESOLUTION No. 90 (Mob-83)

Relating to the Revision, Replacement and Abrogation of Resolutions and Recommendations of the World Administrative Radio Conference, Geneva, 1979

The World Administrative Radio Conference for the Mobile Services, Geneva, 1983,

considering

its agenda (Conference Document No. 1), in particular agenda item 2 and the action taken on a number of Resolutions and Recommendations of the World Administrative Radio Conference, Geneva, 1979;

further considering

a) that the following Resolutions and Recommendations have been revised as indicated:

Resolution **200**	Relating to the Use of Class R3E and J3E Emissions for Distress and Safety Purposes on the Carrier Frequency 2 182 kHz, by Resolution **200 (Rev.Mob-83)**;
Resolution **310**	Relating to Frequency Provisions for Development and Future Implementation of Ship Movement Telemetry, Telecommand and Data Exchange Systems, by Resolution **310 (Rev.Mob-83)**;
Recommendation **201**	Relating to Distress, Urgency and Safety Traffic, by Recommendation **201 (Rev.Mob-83)**;

Recommendation **204**	Relating to the Application of Chapters NX, NXI and NXII of the Rearranged Radio Regulations, by Recommendation **204 (Rev.Mob-83)**;
Recommendation **313**	Relating to Temporary Provisions Covering the Technical and Operational Aspects of the Maritime Mobile-Satellite Service, by Recommendation **313 (Rev.Mob-83)**;
Recommendation **602**	Relating to Maritime Radiobeacons, by Recommendation **602 (Rev.Mob-83)**;
Recommendation **604**	Relating to the Future Use and Characteristics of Emergency Position-Indicating Radiobeacons, by Recommendation **604 (Rev.Mob-83)**;

b) that the following Resolution and Recommendation have been superseded as indicated:

Resolution **313**	Relating to the Introduction of a New System for Identifying Stations in the Maritime Mobile and Maritime Mobile-Satellite Services (Maritime Mobile Service Identities), by Resolution **320 (Mob-83)**;
Recommendation **200**	Relating to the Date of Entry into Force of the 10 kHz Guardband for the Frequency 500 kHz in the Mobile Service (Distress and Calling), by Resolution **206 (Mob-83)**;

c) that all necessary action has been taken on the following Resolutions and Recommendations:

Resolution **11**	Relating to the Use of Radiocommunications for Ensuring the Safety of Ships and Aircraft of States not Parties to an Armed Conflict;
Resolution **305**	Relating to the Use of Class R3E and J3E Emissions on the Carrier Frequencies 4 125 kHz and 6 215.5 kHz Used to Supplement the Carrier Frequency 2 182 kHz for Distress and Safety Purposes;
Recommendation **202**	Relating to the Improvement of Protection of Distress and Safety Frequencies, and those Related to Distress and Safety, against Harmful Interference;
Recommendation **309**	Relating to the Designation of a Frequency in the Bands 435 - 495 kHz or 505 - 526.5 kHz (525 kHz in Region 2) on a Worldwide Basis for the Transmission by Coast Stations of Navigational and Meteorological Warnings to Ships, Using Narrow-Band, Direct-Printing Telegraphy;

resolves

that all the said Resolutions and Recommendations of the World Administrative Radio Conference, Geneva, 1979, listed under *a)*, *b)* and *c)* above, are abrogated.

RESOLUTION No. 91 (HFBC-87)

Revision, Replacement and Abrogation of Resolutions and Recommendations of the World Administrative Radio Conference (Geneva, 1979)

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

its agenda as contained in Resolution No. 912 adopted by the Administrative Council at its 39th session (1984), in particular agenda item 2.1.6, and the action taken on one Resolution and three Recommendations of the World Administrative Radio Conference (Geneva, 1979),

considering further

a) that the following Resolution and Recommendation have been revised as follows:

Resolution **641**	relating to the Use of the Frequency Band 7 000-7 100 kHz – superseded by Resolution **641 (Rev.HFBC-87)**,
Recommendation **503**	relating to HF Broadcasting – superseded by Recommendation **503 (Rev.HFBC-87)**;

b) that all the action required by the following Recommendations has been taken:

Recommendation **500**	relating to the Preparation of the Technical Information Necessary for the World Administrative Radio Conference for HF Broadcasting,

Recommendation **501** relating to Studies for the Introduction of Single-Sideband (SSB) Techniques in the HF Bands Allocated to the Broadcasting Service, in Preparation for the World Administrative Radio Conference for HF Broadcasting,

resolves

that Resolution **641** and Recommendations **500**, **501** and **503** of the World Administrative Radio Conference (Geneva, 1979) are abrogated.

RESOLUTION No. 92 (Orb-88)

Revision, Replacement and Cancellation of Resolutions of the World Administrative Radio Conference, Geneva, 1979, and the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (First Session – Geneva, 1985) (Orb-85)

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

its agenda, in particular items 6, 7, 10 and 13, and the action taken on a number of Resolutions of the World Administrative Radio Conference, Geneva, 1979, and of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (First Session – Geneva, 1985) (Orb-85);

further considering

a) that the following Resolutions of the conferences referred to above have been revised as indicated:

Resolution **4**	Relating to the Period of Validity of Frequency Assignments to Space Stations Using the Geostationary-Satellite Orbit, replaced by Resolution **4 (Rev.Orb-88)**;

Resolution **42 (Orb-85)** Relating to the Provisional Application for Region 2 of Resolution No. 2 (Sat-R2), replaced by Resolution **42 (Rev.Orb-88)** relating to the Use of Interim Systems in Region 2 in the Broadcasting-Satellite and Fixed-Satellite (Feeder Link) Services in Region 2 for the Bands Covered by Appendix **30 (Orb-85)** and Appendix **30A (Orb-88)**;

Resolution **506** Relating to the Use, by Space Stations Operating in the 12 GHz Frequency Bands Allocated to the Broadcasting-Satellite Service, of the Geostationary-Satellite Orbit and No Other, replaced by Resolution **506 (Rev.Orb-88)**;

b) that all necessary action has been taken for the implementation of the following Resolutions of the conferences referred to above:

Resolution **3** Relating to the Use of the Geostationary-Satellite Orbit and to the Planning of Space Services Utilizing It;

Resolution **31** Relating to the Application of Certain Provisions of the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, to Take into Account Changes Made by the World Administrative Radio Conference, Geneva, 1979, to the Table of Frequency Allocations for Region 2 in the Band 11.7 - 12.7 GHz;

Resolution **40 (Orb-85)** Relating to the Recording in the Master International Frequency Register of the Assignments for Region 2 contained in Appendix **30 (Orb-85)** and Appendix **30A** ;

Resolution **41 (Orb-85)** Relating to the Provisional Application of the Partial Revision of the Radio Regulations as Contained in the Final Acts of the WARC Orb-85 Prior to its Entry into Force;

Resolution **43 (Orb-85)** Relating to Orbital Position Limitations for the Broadcasting-Satellite Service in Regions 1 and 2 in the Band 12.2 - 12.5 GHz and for the Fixed-Satellite Service (Feeder-Link Stations) in Region 2 for the Band 17.3 - 17.8 GHz;

Resolution **100** 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;

Resolution **101** Concerning the Drawing Up of Agreements and of the Associated Plans for Feeder Links to Space Stations in the Broadcasting-Satellite Service Operating in the 12 GHz Band Under the Plan Adopted by the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, for Regions 1 and 3;

Resolution **102** Relating to Coordination among Administrations of the Technical Characteristics of Feeder Links to Space Stations in the Broadcasting-Satellite Service in the Band 11.7 - 12.5 GHz (Region 1) and 11.7 - 12.2 GHz (Region 3) during the Period Between the Entry into Force of the Final Acts of the World Administrative

Radio Conference, Geneva, 1979, and the Entry into Force of the Final Acts of a Future Conference on the Planning of Feeder Links to Such Space Stations;

Resolution **502** — Relating to the Period Between the Entry into Force of the Final Acts of the Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, and the Date on Which the Provisions and Associated Plan Adopted by that Conference Are Annexed to the Radio Regulations;

Resolution **503** — 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;

Resolution **504** — Relating to the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, with Respect to Region 2;

Resolution **700** — Relating to Sharing Between the Fixed-Satellite Service in Regions 1 and 3 and the Broadcasting-Satellite Service in Region 2 in the Band 12.2 – 12.7 GHz;

Resolution **701** — Relating to the Convening of a Regional Administrative Radio Conference for the Detailed Planning of the Broadcasting-Satellite Service in the 12 GHz Band and Associated Feeder Links in Region 2;

resolves

that the Resolutions of the World Administrative Radio Conference, Geneva, 1979, and the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (First Session – Geneva, 1985) (Orb-85), listed under *a)* above shall apply as revised by this Conference and that those listed under *b)* above shall be cancelled.

RESOLUTION No. 103

Relating to Improvements in Assistance to Developing Countries in Securing Access to the HF Bands for their Fixed Services and in Ensuring Protection of their Assignments from Harmful Interference

The World Administrative Radio Conference, Geneva, 1979,

noting

the other Resolutions adopted at this Conference relating to the special needs of developing countries;

considering

a) that in many cases the developing countries have a need of assistance of a highly specialized nature and that this assistance must often be obtained at short notice, particularly in relation to the fixed service and the use of the HF bands;

b) that the technical knowledge and experience of most value to the developing countries in this field is obtainable from or through the International Frequency Registration Board;

considering also

c) that the resources of the IFRB are limited;

resolves

1. that the provisions of the Radio Regulations Nos. **1218**, **1260**, **1275** to **1304**, **1416** and **1963** to **1966** are intended essentially for use by the administrations of developing countries;

2. that the administrations of developed countries should make the minimum possible use of these provisions;

3. that the administrations of developing countries should make the maximum possible use of these provisions.

RESOLUTION No. 104 (Orb-88)

Application of the Provisions of No. 1550 of the Radio Regulations as Modified by WARC Orb-88

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that it has revised No. **1550** of the Radio Regulations relating to the extension of the date of bringing into use of assignments to space radiocommunication stations;

b) that, in accordance with the revised provision, an administration may extend the date of bringing into use of its assignment by a period of three years, leading to a total period of nine years between the date of publication of the Special Section referred to in No. **1044** and the date of bringing into use;

c) that the current No. **1550** limits this period to five years and 18 months;

d) that exceptional circumstances may make it difficult for administrations to bring satellite networks into use by the date originally envisaged;

e) that one such exceptional circumstance is the problem of the availability of launch facilities;

f) that currently there exist satellite networks in the advanced publication or coordination stages, for which an extension of the date of bringing into use beyond five years and 18 months has been requested;

resolves

that administrations and the IFRB shall, with immediate effect, apply the provisions of No. **1550** of the Radio Regulations, as contained in the Final Acts of this Conference, with respect to any request for an extension of the date of bringing into use of assignments to space radiocommunication stations;

instructs the IFRB

1. to apply forthwith, for all satellite networks for which the IFRB has already received the advance publication information or for which the coordination procedure has been initiated, a period of extension which would lead to a total period of nine years between the date of publication under No. **1044** and the date of bringing into use;

2. when revising its Rules of Procedure relating to the application of No. **1550**, to take account of the revision adopted by the Conference for this provision, and of this Resolution.

RESOLUTION No. 105 (Orb-88)

Improvement of the Quality of certain Allotments in Part A of the Fixed-Satellite Service Plan

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the delegations of the administrations participating in this Conference have made intensive efforts to achieve the goals identified in the agenda of the Conference;

b) that the Conference has made intensive use of the ITU computer facilities and associated software to develop an Allotment Plan for the fixed-satellite service in the frequency bands identified for the Plan;

c) that a Plan has been developed which guarantees one coverage for each administration (Part A of the Plan) and accommodates existing systems (Part B of the Plan);

d) that, in the case of a small number of allotments in the Plan, the reference value of 26 dB has not been achieved for the C/I ratio;

noting

that in spite of all efforts made by the Conference, some allotments in Part A of the Plan are still below the reference value for C/I;

noting further

that the evaluation of some solutions for raising the value of C/I would be facilitated by appropriate consultations after the Conference between administrations working together in a spirit of cooperation to find equitable solutions;

recognizing

the right of each administration to have a value of C/I of 26 dB for its allotment;

believing

that further cooperation among administrations, and the application of technical aspects to particular situations, could improve the allotments in *considering c)* above, given the progress made in this field;

resolves

1. that, following the Conference, an administration which has an allotment with a value of C/I lower than 26 dB, and administrations whose allotments may have an impact on that allotment, should make every effort to reach agreement on measures to improve the quality of that allotment;

2. that, with the agreement of the administrations concerned, consideration could be given to slight adjustments to the nominal orbital position of other satellites on condition that all agreed protection criteria are observed;

invites administrations

to implement the provision of this Resolution in the spirit of cooperation which characterizes the relations between Members of the ITU;

calls upon

the permanent organs of the ITU to provide technical advice, if requested by the administrations concerned, to facilitate mutually satisfactory solutions.

RESOLUTION No. 106 (Orb-88)

Provisional Application of the Partial Revision of the Radio Regulations (Appendix 30A (Orb-88)) as Contained in the Final Acts of the WARC Orb-88 Prior to its Entry into Force

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the present Session has decided to incorporate in the Radio Regulations the provisions and the associated Plans for the fixed-satellite service for feeder links in the bands 14.5 - 14.8 GHz and 17.3 - 18.1 GHz in Regions 1 and 3;

b) that during the period preceding the date of entry into force of the partial revision of the Radio Regulations, as contained in the Final Acts of the Second Session of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (WARC Orb-88), administrations of countries of Regions 1 and 3 may wish to bring into use assignments appearing in the Regions 1 and 3 feeder-link Plan or to modify them;

c) that there is a need to apply the interregional sharing criteria developed by this Session for all Regions;

further considering

that there is a need for procedures to be applied by all administrations and the IFRB during the interim period referred to in *b)* above;

resolves

1. that during the period preceding the date of entry into force of the partial revision of the Radio Regulations included in Appendix **30A (Orb-88)**, as contained in the Final Acts of the WARC Orb-88, administrations and the IFRB shall apply the said partial revision on a provisional basis;

2. that on the date of entry into force of the partial revision of the Radio Regulations referred to in *resolves* 1, as contained in the Final Acts of the WARC Orb-88, the IFRB shall publish the modifications to the Plans introduced in application of *resolves* 1 above, in a special section of its weekly circular in order to enter them into the Regions 1 and 3 feeder-link Plan.

RESOLUTION No. 107 (Orb-88)

Satellite Networks Intended for Use in the Frequency Bands of the Plan in Appendix 30B for Which Information Was Communicated to the IFRB Between 8 August 1985 and 5 October 1988

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that it has adopted a Plan with a Part B containing the existing systems which had commenced the procedures of Article **11** of the Radio Regulations before 8 August 1985;

b) that, since that date, information on new satellite networks intended for use in the frequency bands of the Plan has been communicated to the IFRB between 8 August 1985 and 5 October 1988 (see Annex);

c) that in order to safeguard the Plan and its associated procedures, it is essential to prevent other satellite networks from being implemented in the planned bands before the date of the entry into force of Appendix **30B**;

d) that, nevertheless, the satellite networks referred to in *considering b)* should be permitted to develop if they can be regarded as a conversion of national allotments in Part A of the Plan into assignments;

resolves

1. that the satellite networks mentioned in *considering b)* may continue to develop and, if necessary, the provisions of Section I or IA of Article 6 of Appendix **30B** may exceptionally be applied to only one of those networks per administration before the date of the entry into force of the Plan provided it is compatible with Parts A and B of the Plan;

2. that the Board shall invite the Administrations concerned to indicate whether their satellite networks listed in the Annex to this Resolution are to be regarded as a conversion of their national allotments in Part A of the Plan into assignments;

3. that the networks not identified in the application of *resolves* 2 will be considered as additional uses and be subject to the provisions of Section III of Article 6 of Appendix **30B**.

ANNEX

Administration	Space station	Longitude	Status *	11 GHz	13 GHz
D	DFS 5	33.50	A	X	X
	DFS 1	23.50	A	X	X
	DFS 2	28.50	A	X	X
E	HISPASAT 1/2	−31.00	A	X	X
USA	USASAT 13N	70.00	C	X	
	USASAT 13L	−165.00	A	X	
I	SARIT	−19.00	A	X	X

* A: Advance publication
C: Coordination

RESOLUTION No. 108 (Orb-88)

Use of the Bands 4 500 - 4 800 MHz, 6 725 - 7 025 MHz, 10.70 - 10.95 GHz, 11.2 - 11.45 GHz and 12.75 - 13.25 GHz prior to the Date of Entry into Force of Appendix 30B

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that this Conference has adopted a new Appendix **30B** dealing with the frequency bands listed above covered by the Allotment Plan for the fixed-satellite service;

b) that Appendix **30B** and Resolution **107** contain provisions relating to satellite networks intended for use in the frequency bands listed above and communicated to the Board prior to 5 October 1988 in application of Articles **11** and **13** of the Radio Regulations;

c) that new satellite networks intended for use in these frequency bands may not be compatible with the allotments in the Plan;

resolves

that administrations shall not apply the provisions of Article **11** of the Radio Regulations in the bands mentioned above for satellite networks not listed in Part B of the Plan in Appendix **30B** pending the entry into force of this Appendix;

instructs the IFRB

to apply the provisions of this Resolution to information it receives concerning any satellite network intended for use in all or part of the frequency bands listed above and to return the information to the administration concerned, drawing its attention to the present Resolution.

RESOLUTION No. 109 (Orb-88)

Recording in the Master International Frequency Register of the Assignments for Regions 1 and 3 Contained in Appendix 30A(Orb-88)

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

that the provisions and associated feeder-link Plans adopted by this Conference with the appropriate modifications have been incorporated in the Radio Regulations in Appendix **30A (Orb-88)**;

resolves

that, on the date of signature of the Final Acts of the Second Session of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It, Geneva, 1988, the frequency assignments in the Plans 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.

RESOLUTION No. 110 (Orb-88)

Improved Procedures for Certain Bands of the Fixed-Satellite Service

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the process of coordination of space services was initially laid down by the Extraordinary Radio Conference, 1963, improved by the World Administrative Radio Conference for Space Telecommunications, 1971 (WARC-71), and further expanded by the World Administrative Radio Conference, 1979 (WARC-79);

b) that Resolution **2** of WARC-79 reiterated the principle of the equitable use by all countries, with equal rights, of the geostationary-satellite orbit (GSO) and of the frequency bands allocated to space services, first embodied in Resolution No. Spa2 – 1 of WARC-71;

c) that Resolution **3** of WARC-79 resolved on the need to guarantee in practice for all countries equitable access to GSO and to the frequency bands allocated to space services and for this purpose decided to convene the World Administrative Radio Conference, to be held in two sessions;

d) that the First Session of the present Conference (Orb-85) agreed on the need for improved regulatory procedures as one of the methods for the planning of the fixed-satellite service and stipulated certain guidelines for this purpose;

noting

that Article **11** of the Radio Regulations has elements of bilateral and multilateral consultations for coordinating the space systems and networks which administrations plan to bring into use;

noting further

that the concept of Multilateral Planning Meetings (MPM) is a part of a mechanism to provide equitable access to the limited natural resources of the GSO and the radio-frequency spectrum;

recognizing

a) that the coordination of each satellite network presents unique circumstances and requirements;

b) that success in such coordination and the resolution of the difficulties of new satellite networks could, in some cases, necessitate appropriate burden sharing;

c) that any coordination process requires the cooperation and goodwill of all concerned administrations so as to realize a balance of interests of all parties;

d) the need and obligation of all administrations concerned to reach mutually acceptable solutions in regard to the characteristics of the systems involved in the coordination process;

e) that the provisions of Article **11**, as amended by this Conference, foresee bilateral and multilateral discussions at any stage in the process of obtaining access to the limited natural resources of the GSO and the radio-frequency spectrum;

f) that in some circumstances the convening of Multilateral Planning Meetings (MPM), as a part of the process of obtaining access to the limited natural resources of the GSO and the radio-frequency spectrum, could become an effective means of resolving difficulties;

g) that the IFRB can assist administrations seeking to resolve difficulties in accordance with Nos. **1088-1094** of the Radio Regulations;

resolves

1. that Multilateral Planning Meetings (MPM) shall also be a part of the process of coordination for the fixed-satellite service in the bands:

– 3 700 - 4 200 MHz
  5 850 - 6 425 MHz

– 10.95 - 11.20 GHz
  11.45 - 11.70 GHz
  11.70 - 12.20 GHz in Region 2 [1]
  12.50 - 12.75 GHz in Regions 1 and 3 [1, 2]
  14.00 - 14.50 GHz

2. that the convening of such Multilateral Planning Meetings (MPM) would be appropriate when an administration finds it has a major difficulty in obtaining coordination under the pertinent provisions of Article **11** in the frequency bands specified in *resolves* 1 above;

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[1] In these bands the improved procedures shall apply between networks of the fixed-satellite service only.

[2] When a fixed-satellite service network is to be operated in the frequency band 12.5 - 12.75 GHz, as well as under No. **845** in the frequency band 12.2 - 12.5 GHz, the improved procedures may apply for coordination of that network.

3. that any administration seeking the coordination of a satellite network in the fixed-satellite service to be operated in the frequency bands mentioned in *resolves* 1 above with respect to any other satellite network of the fixed-satellite service, has the right to propose to the other administrations concerned the holding of a Multilateral Planning Meeting (MPM);

4. that any administration which cannot attend a Multilateral Planning Meeting (MPM) may delegate another administration to represent it;

5. that if one or more of the affected administrations are unable to participate in a Multilateral Planning Meeting (MPM) for any reason, then the pertinent provisions of Article **11** shall be applied to its (their) network(s);

6. that the results of a Multilateral Planning Meeting (MPM) shall be considered as coordination agreements among the participants and shall in no way prejudice the rights of non-participating administrations;

7. that the results of a Multilateral Planning Meeting (MPM) shall be conveyed to the Board in accordance with Nos. **1087B** and **1087C**;

also resolves

that the representatives of the organizations responsible for the affected multi-administration systems can also participate in the Multilateral Planning Meeting (MPM);

urges

1. all administrations and organizations whose systems are affected to make every effort to participate in the Multilateral Planning Meeting (MPM);

2. all participants to make every effort for the success of the Multilateral Planning Meeting (MPM);

resolves further

1. that the Multilateral Planning Meeting (MPM) may be held at a place agreed by the affected administrations;

2. that the cost of a Multilateral Planning Meeting (MPM) shall be borne by the participants according to the arrangements agreed upon by all participants;

3. that, at the request of the administration initiating the Multilateral Planning Meeting (MPM), in agreement with the other affected administrations, the Secretary-General may supply secretarial services under contractual arrangements in accordance with No. **286** of the Nairobi Convention;

4. that any affected administration may call upon the permanent organs of the Union (General Secretariat, IFRB and CCIR) for any technical advice as it deems necessary;

further urges administrations

1. to hold bilateral or multilateral consultations at any stage of the process of obtaining access to the limited natural resources of the GSO and the radio-frequency spectrum when it is expected that such consultations will assist in the resolution of difficulties;

2. to cooperate and resolve mutually coordination problems in a spirit of international understanding, so as to uphold the principles of equal rights and equitable access to the GSO and the frequency bands allocated to space services for all administrations;

invites

the Administrative Council to monitor the progress of the application of this Resolution and, if difficulties arise in practice in the assurance of such equitable access, to propose that the Multilateral Planning Meeting (MPM) process be reviewed by a future competent conference.

RESOLUTION No. 111 (Orb-88)

Planning of the Fixed-Satellite Service in the Bands 18.1 - 18.3 GHz, 18.3 - 20.2 GHz and 27 - 30 GHz

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the First Session of the present Conference (Geneva, 1985) in its Report to the Second Session, requested the CCIR to study the technical characteristics of the fixed-satellite service in the bands 18.1 - 18.3 GHz, 18.3 - 20.2 GHz and 27 - 30 GHz with a view to a decision on the future planning of these bands for the fixed-satellite service being taken by a future competent conference;

b) that the CCIR concluded that it would be extremely unwise for these bands to be subject to planning at this time and that further study would be necessary;

recognizing

1. that these bands have not been exploited extensively due to technical and economic reasons, although they potentially have great capacity;

2. that the required satellite orbital spacing may be reduced, thus resulting in easier coordination between satellite networks because narrower satellite antenna beamwidths can be achieved than in the lower frequency bands;

3. that different performance criteria may well be necessary from those which currently exist for frequency bands below 15 GHz, since the propagation characteristics are different;

resolves

that the bands 18.1 - 18.3 GHz, 18.3 - 20.2 GHz and 27 - 30 GHz shall not be included in frequency bands identified for planning at this time;

invites the CCIR

to continue its studies into the technical characteristics of the bands 18.1 - 18.3 GHz, 18.3 - 20.2 GHz and 27 - 30 GHz until a decision is taken by a future competent conference.

RESOLUTION No. 200 (Rev.Mob-87)

Class of Emission to be Used for Distress and Safety Purposes on the Carrier Frequency 2 182 kHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

noting

a) the requirements of No. **2973** of the Radio Regulations concerning the class of emission to be used on the carrier frequency 2 182 kHz;

b) that the main objective of this provision is to permit the orderly introduction of the new and improved global maritime distress and safety system using advanced techniques whilst at the same time maintaining reliable distress and safety communications using existing and proven techniques;

recognizing

a) that the use of class J3E emission on the carrier frequency 2 182 kHz would provide the operational advantages, inherent in single-sideband techniques, which are being obtained on other frequencies;

b) that, however, provision for transmission and reception of the radiotelephone alarm signal on the carrier frequency 2 182 kHz will be required until, and for some time after, the introduction of the Global Maritime Distress and Safety System (GMDSS);

c) that there are many uncertain factors relating to the date of introduction of the GMDSS;

d) that the Radio Regulations provide frequencies in the band 2 173.5 - 2 190.5 kHz for the orderly introduction of the GMDSS without calling for the interruption or cessation of present distress and safety communication systems using existing and proven techniques;

e) that the requirement for direction finding and homing must be satisfied under all conditions;

resolves

that the question of the date for transferring entirely to J3E emissions on the carrier frequency 2 182 kHz for distress and safety communications be referred to the next competent world administrative radio conference.

RESOLUTION No. 201

Relating to Operational Provisions, Charging and Accounting for Public Correspondence in the Mobile Services

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the CCITT, in accordance with a request by the World Maritime Administrative Radio Conference, Geneva, 1974, has prepared two Recommendations relating to the operational provisions for the maritime mobile service, and charging, accounting, and refunds in the maritime mobile service;

b) that this Conference has accepted the overall conclusions and most of the detailed conclusions of the report of the CCITT studies carried out in accordance with the pertinent Resolutions of the World Maritime Administrative Radio Conference, Geneva, 1974, which have now been abrogated;

c) that as a consequence, the Additional Radio Regulations and certain provisions of the Radio Regulations relating to the operation of, and charging and accounting for, public correspondence in the mobile services have been replaced by provisions governing the general application of the CCITT Recommendations;

d) that a number of the provisions which have been replaced referred to mobile services other than the maritime mobile service and the maritime mobile-satellite service;

e) that the provisions contained in the two above-mentioned CCITT Recommendations relating to public correspondence apply at present only to the maritime mobile service and the maritime mobile-satellite service;

f) further, that in any revision of the relevant CCITT Recommendations full account needs also to be taken of maritime interests, ensuring adequate time for administrations to consult these interests;

recognizing

a) that there is at present no specific provision for international public correspondence in any mobile service other than the maritime mobile service and the maritime mobile-satellite service;

b) that international public correspondence might nevertheless be extended in the future to mobile services other than the maritime mobile service and the maritime mobile-satellite service;

invites the CCITT

to undertake, if the need arises, studies on the operational provisions, charging and accounting for international public correspondence in the mobile services other than the maritime mobile service and the maritime mobile-satellite service, seeking to harmonize to the maximum extent possible all such provisions for the mobile services in question;

further invites the CCITT

in continuance of its work relating to the maritime mobile service and the maritime mobile-satellite service to take particular account of maritime interests therein;

resolves

that in the case of a new international public correspondence service being established in a mobile service other than the maritime mobile service or the maritime mobile-satellite service, the new service should conform as far as practicable in its operational provisions, charging and accounting with the existing provisions of the Telephone Regulations, the Telegraph Regulations and the Radio Regulations and with the relevant CCITT Recommendations, until such time as any necessary revision could be made.

RESOLUTION No. 205 (Rev.Mob-87)

Protection of the Band 406 - 406.1 MHz Allocated to the Mobile-Satellite Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the World Administrative Radio Conference, Geneva, 1979, allocated the band 406 - 406.1 MHz to the mobile-satellite service in the Earth-to-space direction;

b) that Nos. **649** and **649A** of the Radio Regulations limit the use of the band 406 - 406.1 MHz to low-power satellite emergency position-indicating radiobeacons (EPIRBs);

c) that the World Administrative Radio Conference for the Mobile Services, Geneva, 1983 (WARC MOB-83), made provision in the Radio Regulations for the introduction and development of a global distress and safety system;

d) that the use of satellite EPIRBs is an essential element of this system;

e) that, like any frequency band reserved for a distress and safety system, the band 406 - 406.1 MHz is entitled to full protection against all harmful interference;

f) that WARC MOB-83 adopted Recommendation **604 (Rev.Mob-83)** which recommends that the CCIR continue its studies on the technical and operational questions for EPIRBs, including those using the frequencies in the band 406 - 406.1 MHz;

g) that the CCIR has initiated a study of the compatibility between satellite EPIRBs in the band 406 - 406.1 MHz and services using adjacent bands;

considering further

h) that some administrations have developed and implemented an operational low-altitude, near-polar orbiting satellite system (COSPAS-SARSAT) operating in the band 406 - 406.1 MHz to provide alerting and to aid in the locating of distress incidents;

i) that the International Maritime Organization (IMO) has decided that EPIRBs operating in the COSPAS-SARSAT system will form part of the Global Maritime Distress and Safety System (GMDSS);

j) that observations of the use of frequencies in the band 406 - 406.1 MHz show that they are being used by stations other than those authorized by No. **649** of the Radio Regulations, and that these stations have caused harmful interference to the mobile-satellite service, and particularly to the reception of satellite EPIRB signals by the COSPAS-SARSAT system;

k) that in the future, new satellite systems which may be either geostationary or non-geostationary may be introduced in this band;

recognizing

that it is essential for the protection of human life and property that bands allocated exclusively to a service for distress and safety purposes be kept free from harmful interference;

resolves

to instruct the IFRB

to organize monitoring programmes in the band 406 - 406.1 MHz in order to identify the source of any unauthorized emission in that band;

to urge administrations

1. to take part in monitoring programmes requested by the IFRB in accordance with No. **1874** of the Radio Regulations, in the band 406 - 406.1 MHz, with a view to identifying and locating stations of services other than those authorized in the band;

2. to ensure that stations other than those operated under No. **649** abstain from using frequencies in the band 406 - 406.1 MHz;

3. to take the appropriate measures to eliminate harmful interference caused to the distress and safety system;

invites the CCIR

to continue on an urgent basis its study of compatibility between satellite EPIRBs in the band 406 - 406.1 MHz and services using adjacent bands.

RESOLUTION No. 207 (Mob-87)

Unauthorized Use of Frequencies in the Bands Allocated to the Maritime Mobile Service[1] and to the Aeronautical Mobile (R) Service[2]

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that monitoring observations of the use of frequencies in the band 2 170 - 2 194 kHz and in the bands allocated exclusively to the maritime mobile service between 4 063 kHz and 27 500 kHz and to the aeronautical mobile (R) service between 2 850 kHz and 22 000 kHz show that a number of frequencies in these bands are still being used by stations of other services, some of which are operating in contravention of No. **2665** of the Radio Regulations;

b) that these stations are causing harmful interference to the maritime mobile and aeronautical mobile (R) services;

c) that radio is the sole means of communication for the maritime mobile service and that certain frequencies in the bands mentioned in *considering a)* are reserved for distress and safety purposes;

d) that radio is the sole means of communication for the aeronautical mobile (R) service and that this is a safety service;

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[1] Replaces Resolution **309** of the WARC, Geneva, 1979.

[2] Replaces Resolution **407** of the WARC, Geneva, 1979.

considering in particular

e) that it is of paramount importance that the distress and safety channels of the maritime mobile service be kept free from harmful interference, since they are essential for the protection of the safety of life and property;

f) that it is also of paramount importance that channels directly concerned with the safe and regular conduct of aircraft operations be kept free from harmful interference, since they are essential for the safety of life and property;

resolves

to urge administrations

1. to ensure that stations of services other than the maritime mobile service abstain from using frequencies in distress and safety channels and their guard bands and in the bands allocated exclusively to that service, except under the conditions expressly specified in Nos. **342**, **518**, **519**, **522** and **956** to **958** of the Radio Regulations; and to ensure that stations of services other than the aeronautical mobile (R) service refrain from using frequencies allocated to that service except under the conditions expressly specified in Nos. **342** and **956** of the Radio Regulations;

2. to make every effort to identify and locate the source of any unauthorized emission capable of endangering human life or property and the safe and regular conduct of aircraft operations, and to communicate their findings to the IFRB;

3. to participate in the monitoring programmes that the IFRB may organize pursuant to this Resolution;

4. to make every effort to ensure that such emissions are made in appropriate bands allocated to services other than the maritime mobile service or the aeronautical mobile (R) service;

5. to request their competent authorities to take, within their respective jurisdiction, such legislative or regulatory measures which they consider necessary or appropriate in order to prevent stations from operating in contravention of No. **2665** of the Radio Regulations;

to invite the IFRB

1. to continue to organize monitoring programmes, at regular intervals, in the maritime distress and safety channels and their guard bands and in the bands allocated exclusively to the maritime mobile service between 4 063 kHz and 27 500 kHz and to the aeronautical mobile (R) service between 2 850 kHz and 22 000 kHz, with a view to identifying the stations of other services operating on these channels or in these bands;

2. to seek the cooperation of administrations in identifying the sources of those emissions by all available means and in securing the cessation of those emissions;

3. when the station of another service transmitting in a band allocated to the maritime mobile service or to the aeronautical mobile (R) service has been identified, to inform the administration concerned;

requests administrations

to take all necessary steps in such cases to ensure the cessation of any transmissions contravening the provisions of the Radio Regulations on the frequencies or in the bands referred to in this Resolution.

RESOLUTION No. 208 (Mob-87)

Extension of the Frequency Bands Allocated to the Mobile-Satellite and Mobile Services and Their Conditions of Use

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the demand for frequency allocations for the various mobile-satellite services has increased during the last few years;

b) that the allocations for the mobile-satellite services at 1.5 GHz are the only allocations generally available for those services below 10 GHz;

c) that the International Civil Aviation Organization (ICAO) studies indicate that future Aeronautical Mobile-Satellite (R) Service (AMSS(R)) systems will require the use of all the spectrum presently allocated to that service;

d) that since AMSS(R) systems may not fully utilize, before 1992, all of the spectrum allocated to that service, a portion of that spectrum has been reallocated to the Land Mobile-Satellite Service;

e) that in view of the growing demand for frequency bands for satellite communications with mobile stations, it is necessary to revise the allocations in parts of the frequency spectrum to cover the needs beyond 1992;

f) that the most suitable frequencies for the operation of mobile and mobile-satellite services are below about 3 GHz;

g) that the CCIR is studying the possibility and need for maritime, aeronautical and land mobile-satellite systems to use common frequency bands of the mobile-satellite service;

h) Resolutions **2** and **4** of the World Administrative Radio Conference (WARC-1979);

resolves

1. that mobile satellite systems operating in the bands 1 530 - 1 544 MHz, 1 555 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 656.5 - 1 660.5 MHz shall be limited to providing national service or, with the agreement of administrations concerned, to providing multinational service;

2. that in defining the characteristics of the antennas of such systems, all technical means available shall be used to reduce to the maximum extent practicable the radiation over the territories of other countries, unless an agreement has been previously reached with such countries;

resolves to recommend

the Plenipotentiary Conference, 1989, to take appropriate steps for the convening of a world administrative radio conference, not later than 1992, to consider revising certain parts of the Table of Frequency Allocations in Article **8** of the Radio Regulations in the approximate range 1 - 3 GHz and other relevant provisions of the Radio Regulations with a view to providing the necessary spectrum for the mobile-satellite services as well as for the mobile services taking into account Resolutions **2** and **4** of WARC-1979;

invites

1. the CCIR to study as a matter of urgency, the technical and operational issues relating to geostationary and non-geostationary mobile-satellite systems. These studies should include applications, spectrum requirements, available and future technology and intersystem and intra-system sharing aspects concerning the mobile-satellite systems;

2. the International Maritime Organization (IMO), ICAO and other interested international organizations and other participants in the work of the CCIR to cooperate in these studies and to make the results of their own studies available to the CCIR;

3. the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and on the Planning of Space Services Utilizing It (WARC ORB-1988) to consider the particular characteristics of the mobile-satellite services when dealing with provisions relating to procedures for coordination and notification;

instructs the Secretary-General

1. to bring this Resolution to the attention of IMO and ICAO;

2. to forward this Resolution to WARC ORB-88;

invites the Administrative Council

to bring this Resolution to the attention of the Plenipotentiary Conference, 1989.

RESOLUTION No. 209 (Mob-87)

Study and Implementation of a Global Land and Maritime Distress and Safety System

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the basic characteristics of the Global Maritime Distress and Safety System (GMDSS) have been developed by the International Maritime Organization (IMO) to meet the specific needs of the maritime mobile and maritime mobile-satellite services;

b) that stations of the land mobile and land mobile-satellite services may use the frequencies and procedures of the GMDSS in sparsely populated, uninhabited or remote areas for distress and safety purposes;

c) that further development of the communication facilities in the GMDSS would enable the system also to meet the specific needs of the land mobile and land mobile-satellite services for distress and safety;

noting

that the CCIR made a considerable contribution to the development of the GMDSS by carrying out appropriate technical and operational studies;

noting further

that the World Administrative Radio Conference for the Mobile Services, Geneva, 1983, decided that the stations of the land mobile service in sparsely populated and remote areas may be authorized to use the frequencies of the then Future Global Maritime Distress and Safety System on condition that no harmful interference was caused to other distress and safety communications;

recognizing

a) that this Conference has adopted provisions to facilitate implementation of the GMDSS;

b) that administrative, technical and operational studies concerning the land mobile and land mobile-satellite services need to be conducted before detailed provisions relating to the distress and safety requirements of these services can be incorporated into the Radio Regulations;

resolves

that a future competent conference be invited to include, as necessary, provisions in Chapter **N IX** to ensure adequate distress and safety communications in sparsely populated, uninhabited or remote areas;

invites the CCIR

to study the requirements for distress and safety communications in sparsely populated, uninhabited or remote areas by the land mobile and land mobile-satellite services, including the technical and operational characteristics of equipment which is simple to operate and inexpensive for use in the global land and maritime distress and safety system;

invites administrations

1. actively to contribute to and participate in the work of the CCIR;

2. to take all legislative or other appropriate measures for the implementation of such a system;

3. to permit the appropriate equipment to be used within the areas under their national jurisdiction;

invites the Administrative Council

to take the necessary steps to place this matter on the agenda of the next competent conference;

instructs the Secretary-General

to communicate this Resolution to IMO and the International Civil Aviation Organization (ICAO).

RESOLUTION No. 210 (Mob-87)

Date of Entry into Force of the 10 kHz Guardband for the Frequency 500 kHz in the Mobile Service (Distress and Calling)[1]

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the frequency spectrum should be used in the most efficient way possible;

b) that the World Administrative Radio Conference, Geneva, 1979, adopted a 495 kHz to 505 kHz guardband for the frequency 500 kHz, which is the international distress and calling frequency for Morse radiotelegraphy in the mobile service;

c) that the use of frequencies in the band 490 - 510 kHz must be such as to provide full protection for distress and safety communications on 500 kHz;

d) that an adequate amortization period has been allowed for the radio equipment currently in service;

taking into account

that the World Administrative Radio Conference for the Mobile Services, Geneva, 1983, asked this Conference to decide on the date of entry into force of the definitive 495 kHz to 505 kHz guardband;

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[1] Replaces Resolution **206 (Mob-83)**.

resolves

that the date of entry into force of the 10 kHz guardband for the frequency 500 kHz shall be the date for the full implementation of the Global Maritime Distress and Safety System (GMDSS).

RESOLUTION No. 300 (Rev.Mob-87)

Use and Notification of the Paired Frequencies Reserved for Narrow-Band Direct-Printing Telegraphy and Data Transmission Systems in the HF Bands Allocated on an Exclusive Basis to the Maritime Mobile Service

(see Appendix **32**)

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that certain sections of the HF bands allocated to the maritime mobile service have been reserved for narrow-band direct-printing telegraphy and data transmission systems for use on a paired frequency basis only;

b) that Appendix **32** of the Radio Regulations contains a channelling arrangement in the maritime mobile HF bands for narrow-band direct-printing telegraphy and data systems (paired frequencies);

c) that this Conference has made available an increased number of paired frequencies reserved for narrow-band direct-printing telegraphy and data transmission systems for use on a paired basis only, and has modified Appendix **32** accordingly;

d) that the World Maritime Administrative Radio Conference (WMARC, Geneva, 1974), established interim measures for the orderly bringing into use of the paired frequencies;

e) that the WMARC 1974 established a provisional procedure for the use and notification of paired frequencies for narrow-band direct-printing telegraphy and that the application of this procedure by administrations and by the IFRB was satisfactory;

resolves

1. that paired frequencies in the HF bands reserved for narrow-band direct-printing telegraphy between coast stations and ship stations shall be used by these stations, notified to the IFRB and recorded in the Master International Frequency Register in the following manner:

1.1 assignments of pairs of frequencies for transmission and reception shall be made solely to coast stations. Ship stations of any nationality shall use by right for their transmissions the receiving frequencies of the coast stations with which they exchange traffic;

1.2 each administration shall choose the pairs of frequencies for its requirements, if necessary with the assistance of the IFRB;

1.3 the assignments thus selected shall be notified to the IFRB in notices as shown in Appendix **1** to the Radio Regulations and administrations shall supply the basic characteristics listed in Section A or B of that Appendix, as appropriate;

1.4 whenever practicable, each notice should reach the Board before the date on which the assignment is brought into use. It must reach the Board not earlier than one year before the date on which it is to be brought into use but in any case not later than 30 days after it is actually brought into use;

1.5 assignments which are in conformity with the Radio Regulations, and in particular Appendix **32**, shall be examined by the Board from the viewpoint of the probability of harmful interference to be caused by or to other existing or proposed uses. The Board shall inform the administration concerned of the results of its examination and shall record the notified assignment with reference to this Resolution and without any date in Column 2. The date of receipt of the notice by the Board and the date of putting into use of the assignment shall be entered in the Remarks Column. In cases where the Board identifies incompatibilities, it shall make suggestions with a view to resolving them;

1.6 any notice not in conformity with the Radio Regulations shall be returned to the notifying administration by the IFRB, together with any suggestion which the Board may be able to submit in this respect;

1.7 should difficulties arise between administrations using the same channel, or adjacent channels, the matter shall be settled by agreement between the administrations concerned taking into account the information published by the IFRB;

2. that a future competent conference be invited to review this Resolution and examine any difficulties which may have arisen in its application;

3. that the entries made in the Master Register under this Resolution shall in no way prejudge any decisions which may be taken by the aforementioned conference;

invites the Administrative Council

to place this Resolution on the agenda of the next competent conference in order to examine any difficulties which may have arisen in its application.

RESOLUTION No. 310 (Rev.Mob-87)

Frequency Provisions for Development and Future Implementation of Ship Movement Telemetry, Telecommand and Data Exchange Systems

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) the need to specify radio frequencies which may be used by the maritime mobile service on a world-wide basis for ship movement requirements including transmission of electronic nautical chart data corrections, using digital automated data exchange, telemetry and telecommand techniques;

b) the developments now in progress in different portions of the frequency spectrum which will require common frequency bands in the future for efficient frequency utilization;

c) the importance of these systems in the safe and efficient operations of ships;

d) the advantages to port authorities for safe and efficient port management and operations;

noting

a) that the CCIR is considering this matter particularly within its Question 55/8;

b) that further operational and technical information is needed in deciding the most effective frequency utilization and sharing criteria;

c) that the International Maritime Organization (IMO) has identified a need for data exchange, using digital transmission techniques, between shore and ship for ship's position and movement data, correction data of radionavigation systems and electronic nautical charts (see CCIR Report 1044);

resolves

that the next competent world administrative radio conference shall review possible frequency provisions in the light of additional studies;

requests the CCIR

to examine and advise on bandwidths and data formats in coordination with administrations developing and testing these digital transmission systems;

invites the Administrative Council

to include this Resolution in the agenda of a forthcoming competent world administrative radio conference;

instructs the Secretary-General

to communicate this Resolution to the IMO and the International Hydrographic Organization (IHO).

RESOLUTION No. 312 (Rev.Mob-87)

Calling Procedures for HF A1A and A1B Morse Telegraphy

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that there is a need for more effective utilization of the radio frequency spectrum and of the time of operational personnel on board ships;

b) that it is desirable to continue to improve the effectiveness of calling in the HF A1A and A1B Morse telegraphy bands;

c) that the World Maritime Administrative Radio Conference, Geneva, 1974, adopted a new calling procedure for the HF A1A Morse telegraphy bands (Article **60** and Appendix **34**);

d) that the effectiveness of the new calling procedure requires agreement between administrations with respect to the groups specified in Appendix **34** in accordance with a planned distribution of coast stations on a regional and traffic basis;

e) that the administrations at the 1974 Conference agreed to the Distribution Plan of Coast Stations (annexed to this Resolution) arranged by countries and areas into four groups to ensure a better distribution of calls;

invites

administrations which are providing an international public correspondence service to indicate for publication in the List of Coast Stations the periods of service during which watch will be maintained on the common, and if necessary the group, channel or channels;

invites further

administrations which wish to enter into a group in the Distribution Plan, or administrations included in the Plan wishing to make a modification in the Plan, to coordinate as far as possible their proposed changes with other interested and affected administrations which are designated in the group concerned. An administration which has decided to enter into a group or change from a designated group in the Distribution Plan shall inform the Secretary-General of its decision and it shall be published in the Annex to the List of Coast Stations;

instructs the Secretary-General

to update, as necessary, the Distribution Plan annexed to the List of Coast Stations.

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87)

Distribution Plan for Group Channels
HF A1A Morse Coast Stations by Countries and Areas

Group 1*
Azores Angola (People's Republic of) Bahamas (Commonwealth of the) Bahrain (State of) Bangladesh (People's Republic of) Bermuda Brazil (Federative Republic of) Canada (West Coast and Western Arctic) Chile Ivory Coast (Republic of the) Djibouti (Republic of) Ecuador Spain (Canary Islands) United States of America (East Coast) Ethiopia France India (Republic of) (West) Ireland Israel (State of) Kenya (Republic of) Liberia (Republic of) Madagascar (Democratic Republic of) Martinique (French Department of) Mauritius New Caledonia and Dependencies New Hebrides Oman (Sultanate of) Philippines (Republic of the) French Polynesia Puerto Rico Reunion (French Department of) Roumania (Socialist Republic of) United Kingdom of Great Britain and Northern Ireland Sao Tome and Principe (Democratic Republic of) Singapore (Republic of) Switzerland (Confederation of) Union of Soviet Socialist Republics (Ukraine and South Asia)

* *Note by the General Secretariat:* In January 1981, the Administration of Nicaragua requested to be included in Group 1 of the Plan.

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87) (cont.)

Group 2
Algeria (Algerian Democratic and Popular Republic) Netherlands Antilles Saudi Arabia (Kingdom of) (West) Barbados Belgium Benin (People's Republic of) Cameroon (United Republic of) Cape Verde (Republic of) Christmas Islands (Indian Ocean) Cyprus (Republic of) Colombia (Republic of) Congo (People's Republic of the) Cook Islands Costa Rica Cuba Dominican Republic Egypt (Arab Republic of) United States of America (Gulf Coast) Falkland Islands and Dependencies (Malvinas) France Gabon Republic Gambia (Republic of the) Greece Hongkong Hungarian People's Republic Italy Democratic Kampuchea Lebanon Martinique (French Department of) Mexico New Caledonia and Dependencies New Hebrides Panama (Republic of) Paraguay (Republic of) Netherlands (Kingdom of the) Peru Poland (People's Republic of) French Polynesia Republic of Korea Reunion (French Department of) United Kingdom of Great Britain and Northern Ireland (22 MHz only) Sudan (Democratic Republic of the) Sri Lanka (Democratic Socialist Republic of) Czechoslovak Socialist Republic Thailand Union of Soviet Socialist Republics (North West and Far East) Yemen Arab Republic

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87) (cont.)

Group 3
Alaska (State of) Argentine Republic Burma (Socialist Republic of the Union of) Canada (East Coast and Eastern Arctic) China (People's Republic of) Denmark United States of America (West Coast) Finland Ghana Guam Guinea-Bissau (Republic of) Guinea (Revolutionary People's Republic of) Guyana Hawaii (State of) Iran (Islamic Republic of) Iceland Jamaica Libya (Socialist People's Libyan Arab Jamahiriya) Madeira Mariana Islands Morocco (Kingdom of) Mozambique (People's Republic of) Nauru (Republic of) Nigeria (Federal Republic of) Norway Pakistan (Islamic Republic of) German Democratic Republic Sweden Trinidad and Tobago Turkey Union of Soviet Socialist Republics (Far East and European Area) Venezuela (Republic of) Yugoslavia (Socialist Federal Republic of)

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87) (cont.)

Group 4
Albania (Socialist People's Republic of) Germany (Federal Republic of) Saudi Arabia (Kingdom of) (East) Australia Bulgaria (People's Republic of) China (People's Republic of) (Province of Taiwan) Spain (except the Canary Islands) Fiji Equatorial Guinea (Republic of) India (Republic of) (East) Indonesia (Republic of) Iraq (Republic of) Japan Jordan (Hashemite Kingdom of) Kuwait (State of) Malaysia Malta (Republic of) Mauritania (Islamic Republic of) New Zealand Papua New Guinea Pitcairn Island Portugal Syrian Arab Republic Solomon Islands American Samoa Senegal (Republic of the) Seychelles (Republic of) Sierra Leone South Africa (Republic of) Suriname (Republic of) Togolese Republic Tunisia Union of Soviet Socialist Republics (European Area and Arctic) Uruguay (Oriental Republic of) Viet Nam (Socialist Republic of) Yemen (People's Democratic Republic of) Zaire (Republic of)

RESOLUTION No. 314 (Rev.Mob-87)

Establishment of a Coordinated World-Wide System for the Collection of Data Relating to Oceanography

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) the expressed desire for the establishment of a coordinated world-wide system for the collection of data relating to oceanography;

b) that in the high frequency bands allocated exclusively to the maritime mobile service, bands are designated for use in the collection of data relating to oceanography in accordance with Appendix **31** to the Radio Regulations;

c) that use of these frequencies with maximum effectiveness is dependent upon cooperation and coordination among administrations;

d) that certain administrations expressed the desire that a coordinated world-wide system for the transmission of data relating to oceanography be established on the basis of a coordinated plan in the bands allocated by this Conference;

e) that, however, certain other administrations wish to use in the near future stations for the collection of data relating to oceanography within the framework of decisions taken on this matter by this Conference;

f) that, consequently, a coordinated programme for the collection of data relating to oceanography should be established using the frequency bands referred to in *b)* above;

g) that the Intergovernmental Oceanographic Commission (IOC) and the World Meteorological Organization (WMO) have been in consultation since 1962 with respect to cooperative efforts in the collection of data relating to oceanography;

resolves

1. that the IOC and WMO be invited to develop jointly, in consultation with the IFRB, and in consultation with administrations of the Members, as appropriate, a coordinated plan designed to meet existing and future requirements of all interested Members, for use by stations in the collection of data relating to oceanography in a world-wide system, within the framework of provisions made by this Conference for such a system; this plan to include the geographical distribution of oceanographic stations, their system of operation, the deployment of frequencies in the system and the manner in which oceanographic information is to be transmitted;

2. that administrations be encouraged to assign frequencies in conformity with the plan and the recommendations of IOC and WMO for the portion of the world-wide system over which they have jurisdiction;

3. that the IOC and WMO be invited further to assume jointly the responsibility, in consultation with the IFRB, for keeping such a plan current, in the light of changing requirements for data relating to oceanography;

4. that the plan developed under paragraphs 1 and 3 above shall be considered at the next administrative radio conference competent to deal with matters relating to the maritime mobile service, to determine what changes, if any, appear necessary to improve its effectiveness.

RESOLUTION No. 315

Relating to the Eventual Abolition of Mobile Station Charges for Public Correspondence in the Maritime Mobile Service

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the VIth Plenary Assembly of the CCITT, Geneva, 1976, adopted a draft Recommendation relating to charging, accounting and refunds in the maritime mobile service with the exception of the points relating, *inter alia*, to mobile station charges for public correspondence in the maritime mobile service;

b) that the above draft Recommendation was subsequently amended, in the light of the decision of the VIth Plenary Assembly of the CCITT, Geneva, 1976, regarding mobile station charges and that this draft Recommendation has been approved by letter ballot;

c) that the amended Recommendation includes the following provisions [1]:

"Mobile station charges may be applied in the radiotelegram, radiotelephone, and radiotelex services, in the MF and HF bands. They shall not be applied in any of the VHF services, nor in any of the mobile-satellite services, nor in any service with automatic operation; however, mobile station charges may also be applied for radiotelegrams transmitted via VHF."

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[1] See CCITT Recommendation D.90/F.111 (paragraphs K12 and K13).

"Mobile station charges shall be abolished for traffic exchanged after 2359 hours GMT 31 December, 1987.";

resolves

to adopt this recommended date for the abolition of mobile station charges for public correspondence in the maritime mobile service.

RESOLUTION No. 316 (Rev.Mob-87)

Technical Cooperation with the Developing Countries in Maritime Telecommunications

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

noting

that, in the field of maritime telecommunications, the assistance provided by the Union to developing countries, in collaboration with other organizations, in particular the International Maritime Organization (IMO), has been promising;

conscious of

a) the need for the developing countries to increase their own shipping activities and attract foreign maritime traffic in order to develop their trade;

b) the important role that telecommunications play in maritime activities throughout the world, from the economic and safety aspects;

c) the possibility of providing adequate safety and improved economy in shipping activities by a relatively modest investment in the installation and operation of maritime telecommunication facilities;

d) the significant changes in operating techniques and methods that are being introduced in the maritime mobile service for the improvement of general, distress and safety communications;

considering

a) that in many developing countries there is a need to increase the efficiency of the services for:

- safety of navigation and safety of life at sea;
- commercially viable port operations;
- public correspondence for passengers and crews;

b) that in this regard the Union's technical cooperation activities could be extended to render very valuable assistance to these countries;

c) that it is necessary to adapt the levels of knowledge of techniques among developing countries to meet the technological and operational changes in maritime telecommunications;

resolves

to request the Secretary-General

1. to offer the assistance of the Union to developing countries endeavouring to improve their maritime telecommunications, particularly by providing technical advice in the establishment, operation and maintenance of equipment and by assisting in training staff, especially in matters relating to the new technologies and operating methods examined at the present Conference;

2. in this context, to seek the collaboration of IMO, the United Nations Conference for Trade and Development (UNCTAD), other specialized agencies of the United Nations, and the World Maritime University (WMU), as appropriate;

3. to continue to give special attention to seeking the aid of the United Nations Development Programme (UNDP) and other sources of financial support, to enable the Union to render sufficient and effective technical assistance in the field of maritime telecommunications, when necessary in collaboration with other specialized agencies concerned;

to urge Member countries

to give priority in supporting, to the extent of their capabilities and their technical advancement, the Union's technical cooperation with developing countries in the field of maritime telecommunications by facilitating the recruitment of experts for missions to work in developing countries, by receiving students from developing countries who have been awarded a fellowship by the Union, by providing lecturers to seminars arranged by the Union and, upon request, by giving technical advice to the Union;

to invite the developing countries

to include maritime telecommunications projects as needed in their country programmes for external technical assistance and to support inter-country projects in this field.

RESOLUTION No. 319 (Rev.Mob-87)

General Review of the Bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz Allocated on a Shared Basis to the Maritime Mobile Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

noting

a) that the World Administrative Radio Conference for the Mobile Services, Geneva, 1983, has established channelling plans for maritime mobile radiotelephony in the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz on the basis of 3.0 kHz channel spacing and with carrier frequencies on integer multiples of 1 kHz;

b) that it was not within the competence of the World Administrative Radio Conference for the Mobile Services, Geneva, 1983, to carry out a general review of the sub-allocations and channelling plans in the HF maritime mobile bands;

c) that this Conference has decided not to include frequencies in the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz in either Appendix **31** or Allotment Plan of Appendix **25**, and that this decision was made taking into account the continuation of the related studies in the CCIR;

considering

a) that since the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz are shared with the fixed service, there are limitations on their planning and use by the maritime mobile service;

b) that consideration should nevertheless be given to the inclusion of frequencies in the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz in the Allotment Plan of Appendix **25**;

resolves

that the next competent world administrative radio conference (WARC) should carry out a general review and any necessary revision of the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz allocated on a shared basis to the maritime mobile service, taking into account the requirements of each administration;

invites the Administrative Council

1. to include on the agenda of the next competent world administrative radio conference the Articles and Appendices of the Radio Regulations relevant to the review and revision of the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz;

2. to empower the next competent WARC to consider the problems associated with the shared use of the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz, taking into account the current requirements of and developments in the maritime mobile service and the fixed service;

requests the CCIR

to study the technical issues involved in the establishment of sharing criteria between the maritime mobile and fixed services in the 4 000 - 4 063 kHz and 8 100 - 8 195 kHz frequency bands including the possibility of using other emissions in the maritime mobile service by ship stations;

invites administrations

to make appropriate contributions to the studies of the CCIR, including the collection and submission of data concerning their experience of sharing arrangements in the bands 4 000 - 4 063 kHz and 8 100 - 8 195 kHz.

RESOLUTION No. 322 (Rev.Mob-87)

Coast Stations and Coast Earth Stations Assuming Watch-Keeping Responsibilities on Certain Frequencies in Connection with the Implementation of Distress and Safety Communications for the Global Maritime Distress and Safety System (GMDSS)

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the International Maritime Organization (IMO) is implementing a Global Maritime Distress and Safety System (GMDSS);

b) that this Conference has introduced in the Radio Regulations provisions for distress and safety communications for the GMDSS to facilitate the progressive implementation of the new system while maintaining the provisions for the continuation of the existing system during the transitional period (see Resolution **331 (Mob-87)**);

c) that the new system necessitates the use or exclusive use of a number of additional frequencies for maritime distress and safety purposes;

d) that the extra watch-keeping responsibilities associated with these additional frequencies may prove to be too onerous to be assumed, for MF, HF and VHF frequencies, by all coast stations open to public correspondence and, for space systems, by all coast earth stations;

recognizing

a) that the successful implementation of the new system requires an adequate geographical distribution of coast earth stations and coast stations keeping watch on the appropriate frequencies and the continuation of watch-keeping on the present frequencies;

b) that the IMO is the organization best qualified to coordinate, in cooperation with administrations, a plan of coast earth stations and coast stations which administrations intend to use for watch-keeping on GMDSS frequencies;

resolves to invite

1. administrations to inform the Secretary-General and the IMO of the arrangements they intend to make for watch-keeping on GMDSS distress and safety calling frequencies;

2. IMO to ensure that the services provided by administrations are sufficient for world-wide HF DSC coverage;

instructs the Secretary-General

1. to indicate in the List of Coast Stations all coast and coast earth stations designated by administrations for providing distress and safety watch-keeping services for the GMDSS;

2. to communicate this Resolution to the IMO.

RESOLUTION No. 323 (Mob-87)

Implementation and Use of Frequency 156.525 MHz for Digital Selective Calling for Distress, Safety and Calling

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

noting

that the World Administrative Radio Conference for the mobile Services, 1983, designated, on an exclusive basis, the frequency 156.525 MHz for distress and safety calling by digital selective calling techniques;

considering

a) that the frequency 156.525 MHz became available for distress and safety calling using digital calling techniques on 1 January 1986;

b) that this Conference has decided that the frequency 156.525 MHz may also be used for other calling purposes using digital calling techniques;

c) that the partial revision of the Radio Regulations made by this Conference will enter into force on 3 October 1989;

d) that there is an urgent need to implement, at the earliest possible date, use of digital selective calling techniques on 156.525 MHz for calling purposes in addition to distress and safety calling;

e) that every effort must be made to prevent the use of 156.525 MHz for purposes other than digital selective calling in the maritime mobile service;

f) that the use of 156.525 MHz for other maritime mobile communication purposes must cease as soon as practical;

resolves

that as of 1 January 1988, the frequency 156.525 MHz in the maritime mobile service shall be used exclusively for digital selective calling for distress, safety and calling;

urges administrations

to take all practical measures, including the possible use of technical means, to prevent, as soon as possible and not later than 1 January 1988, any maritime mobile use of the frequency 156.525 MHz other than indicated in the *resolves*;

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization (IMO).

RESOLUTION No. 324 (Mob-87)

Procedures to be Applied for the Coordination of the Use of the Frequency 518 kHz for the International NAVTEX System

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that this Conference has adopted, as a new Article **14A**, a procedure to be applied by administrations and the IFRB for the coordination of the planned use of the frequency 518 kHz for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships by means of automatic narrow-band direct-printing telegraphy (International NAVTEX system);

b) that this Conference has decided to abrogate Resolution **318 (Mob-83)**;

resolves

that the administrations and the Board shall, with immediate effect, apply the procedures as described in the new Article **14A** in their activities to coordinate the planned use of the frequency 518 kHz for the International NAVTEX system;

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization (IMO), the International Hydrographic Organization (IHO) and the World Meteorological Organization (WMO).

RESOLUTION No. 325 (Mob-87)

Use of the Additional Channels Reserved for Duplex Radiotelephony in the HF Bands Allocated to the Maritime Mobile Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that there is an increasing demand for additional duplex channels for radiotelephony in the HF bands allocated on an exclusive basis to the maritime mobile service;

b) that this Conference has modified Appendices **16** and **31** of the Radio Regulations and has provided a number of additional duplex channels for radiotelephony (channel Nos.:

from 427 to 429
from 607 to 608
832, and from 834 to 837
from 1233 to 1241
from 1642 to 1656
from 1801 to 1805, and from 1807 to 1815
from 2241 to 2253
from 2501 to 2509);

c) that it is necessary to develop procedures for the establishment of initial duplex radiotelephony allotments for the newly available channels, as well as for the updating of the use of these channels;

noting

that the current Appendix **25** Allotment Plan together with Article **16** of the Radio Regulations have effectively served the maritime mobile service and the latter may be used for the updating of the use of the new channels;

resolves

1. that the newly available channels shall be initially allotted in accordance with the procedure contained in the Annex to this Resolution;

2. that Appendix **25** shall be updated by including in it the allotments resulting from the application of the provisions of the Annex to this Resolution;

3. that, following the application of *resolves* 2 above, the administrations shall apply the procedure of Article **16** for any modification to existing allotments or the addition of new allotments.

ANNEX TO RESOLUTION No. 325 (Mob-87)

Procedure for Establishing an Initial Allotment Arrangement in the Newly Available Channels for Duplex Radiotelephony in the HF bands

1. Administrations intending to use one of the new channels indicated in *considering b)* shall send their requirements to the Board by providing the information listed in Appendix **5** to the Radio Regulations before 1 April 1989.[1]

2. Following the receipt of this information, the Board shall examine these requirements and, if necessary, request the Administrations to communicate any missing information. Only those requirements which are complete will be taken into account in this procedure.

3. Using its Technical Standards, the Board shall prepare an initial allotment arrangement following the order indicated in paragraph 4 below.

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[1] *Note* – Administrations that cannot use channels Nos. 428, 429, 834, 835, 836, 837 shall indicate accordingly when submitting their requirements.

4. The initial allotment arrangement for the new channels shall include for a given band and a given allotment area the requirements in the following order:

4.1 requirements of administrations having no allotments in Appendix **25** to the Radio Regulations and which require such allotments;

4.2 requirements of administrations which, following the application of Article **16**, could not be given an allotment in the current Appendix **25** with the required protection criteria;

4.3 requirements of administrations asking for additional allotments to supplement their existing allotments in order to satisfy an increase in radiotelephony traffic.

5. The Board shall consult those administrations whose requirements could not be included in the allotment arrangement for the new channels and, if an administration insists, the Board shall determine from all the channels available for duplex radiotelephony the channel which is the least affected, and shall include the requirement in this channel.

6. Not later than 1 October 1990 the Board shall publish the allotment arrangement for the new channels so that administrations may comment on it.

7. If within a period of 60 days following this publication, an administration informs the Board that its proposed allotment is not acceptable to it, the Board shall endeavour to identify an alternative channel as indicated in paragraph 5 above.

8. If following the application of paragraph 7 above, the administration concerned is not in a position to accept the Board's recommendation, the requirement will be returned to the administration concerned with the suggestion that it apply the Article **16** procedure.

9. At 1 July 1991 the Board shall enter the allotment arrangement for the new channels in Appendix **25** and shall prepare a revised version of Appendix **25** for publication by the Secretary-General.

RESOLUTION No. 326 (Mob-87)

Transfer of Frequency Assignments of Radiotelephone Stations Operating in Accordance with Appendix 25

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that this Conference has modified Appendices **16** and **31** of the Radio Regulations and has placed the paired frequencies reserved for radiotelephony in the HF bands allocated to the maritime mobile service at intervals of 3.0 kHz as opposed to 3.1 kHz;

b) that it will be necessary to make a consequential modification to Appendix **25** of the Radio Regulations;

c) that coast and ship radiotelephone stations will need to change their transmitting and receiving frequencies to bring them into conformity with the corresponding channels in Appendix **16** (Section A);

d) that there should be an orderly transition to the revised paired frequencies reserved for radiotelephony in the HF bands allocated to the maritime mobile service;

resolves

1. that, at 0001 hours UTC on 1 July 1991, coast and ship radiotelephone stations shall change their transmitting and receiving frequencies to the replacement frequencies indicated for the same channel number in Appendix **16**;

2. that within three months prior to 1 July 1991 the administrations shall notify the Board of the transfer of their assignments to the replacement frequencies;

3. that an assignment for a replacement frequency, the other basic characteristics of which are not modified, shall be recorded with the date 1 July 1989 in column 2a;

4. that frequency assignments for which the Board received no notification for the frequency indicated in Appendix **16** shall bear a symbol to indicate that they will no longer be taken into account. The Board shall apply the provisions of Article **16** to the corresponding allotment appearing in Appendix **25**.

RESOLUTION No. 327 (Mob-87)

Transfer of Paired Frequency Assignments Reserved for Narrow-Band Direct-Printing Telegraphy and Data Transmission Systems

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

that it has provided for additional narrow-band direct-printing and data transmission channels;

recognizing

a) that the transfer of frequency assignments from the channels established by the World Maritime Administrative Radio Conference, Geneva, 1974, and already in use, to the channels adopted by this Conference, should be made with the least possible disruption of the service provided by each station;

b) that a satisfactory procedure for the use and notification of paired frequencies for narrow-band direct-printing telegraphy and data transmission has been established in Resolution **300 (Rev.Mob-87)**;

c) that the present coast station assignment arrangements for paired narrow-band direct-printing telegraphy and data transmission have been effective;

resolves

1. that, at 0001 hours UTC on 1 July 1991, coast and ship stations using paired narrow-band direct-printing and data transmission shall change their transmitting and receiving frequencies to bring them into conformity with Appendix **32**;

2. that, within three months prior to 1 July 1991, administrations shall notify the Board of the transfer of their assignments to the frequency indicated for the same channel number in Appendix **32**;

3. that notices of frequency assignments whose basic characteristics, other than the frequency, are not modified, shall be recorded in the Master International Frequency Register;

4. that frequency assignments for which the Board has received no notification for the frequency indicated in Appendix **32** shall bear a symbol to show that they will no longer be taken into account in the application of Resolution **300 (Rev.Mob-87)**.

RESOLUTION No. 328 (Mob-87)

Transfer of Frequency Assignments to Coast Stations for Wideband Telegraphy, for A1A or A1B Morse Telegraphy, for Facsimile, Special and Data Transmission Systems and for Direct-Printing Telegraphy Systems Operating in the Bands Allocated Exclusively to the Maritime Mobile Service Between 4 000 and 27 500 kHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the frequency bands allocated to the maritime mobile service for coast stations have been changed as a result of the general review of the HF maritime mobile service bands;

b) that new frequency limits for coast stations for wideband telegraphy, for A1A or A1B Morse telegraphy, for facsimile, special and data transmission systems and for direct-printing telegraphy systems (hereafter referred to collectively as "wideband telegraphy" in this Resolution), are laid down in the revised provisions of Appendix **31**;

c) that this Conference has not established a channelling arrangement for these bands;

d) that there should be an orderly transition of the frequency assignments to the newly allocated bands;

resolves

1. that those frequency assignments recorded in the Master Register, having an assigned frequency band totally within that part of the band which is no longer allocated to coast station wideband telegraphy, shall be transferred in blocks, as follows:

4 MHz band:	from	4 219.4 - 4 221	to	4 349.4 - 4 351
6 MHz band:	from	6 325.4 - 6 332.5	to	6 493.9 - 6 501
8 MHz band:	from	8 435.4 - 8 438	to	8 704.4 - 8 707
12 MHz band:	from	12 652.3 - 12 658.5	to	13 070.8 - 13 077
16 MHz band:	from	16 859.4 - 16 904.5	to	17 196.9 - 17 242
22 MHz band:	from	22 310.5 - 22 445.5	to	22 561 - 22 696

2. that the IFRB shall identify those frequency assignments recorded in the Master Register having an assigned frequency band overlapping the part of the band which is no longer allocated to coast station wideband telegraphy, shall search for an alternative frequency in accordance with Nos. **1445** to **1450** and shall propose it to the administration concerned;

3. that when the frequency transfer results in a degradation of operating conditions of any of these coast stations, the IFRB shall search for an alternative frequency in accordance with Nos. **1445** to **1450** and shall propose it to the administration concerned;

4. that at 0001 UTC on 1 July 1991 administrations shall transfer the transmitting frequencies of their stations to the newly designated frequencies, notifying the IFRB of these transfers, in accordance with the provisions of Article **12** of the Radio Regulations;

5. that replacement frequency assignments whose basic characteristics, other than the frequency, are not modified, shall be recorded without modifying the date appearing in column 2a or 2b;

6. that frequency assignments for which the Board has received no notification of changeover shall be examined under Article **12** of the Radio Regulations with respect to all the transferred assignments irrespective of the date of their notification to the Board. Following this examination the Board shall advise the administration to delete this assignment and enter a symbol to indicate that the assignment is not in conformity with this Resolution.

RESOLUTION No. 329 (Mob-87)

Procedure Applicable to Stations Transmitting NAVTEX-type Information on the Frequencies 490 kHz and 4 209.5 kHz Using Narrow-Band Direct-Printing Telegraphy

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that in the maritime mobile service the frequency 518 kHz is used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships using narrow-band direct-printing telegraphy (the International NAVTEX system);

b) that this Conference has included in Article **14A** the procedure for the coordination of the planned use of the frequency 518 kHz for the International NAVTEX system;

c) that this Conference has also designated within the maritime mobile service the frequencies 490 kHz and 4 209.5 kHz to be used exclusively for the transmission of NAVTEX-type information;

d) that the frequency 490 kHz will become available for NAVTEX-type transmissions after the full implementation of the GMDSS;

e) that the proper functioning of the transmission of NAVTEX-type information is dependent on the coordinated use of these transmissions by the coast stations involved;

f) that the coordination of the operational aspect of the International NAVTEX system on 518 kHz is being undertaken by the International Maritime Organization (IMO), the International Hydrographic Organization (IHO), and the World Meteorological Organization (WMO);

g) that it is moreover desirable that the IMO, in cooperation with the IHO and the WMO, provide assistance in the coordination of the transmission of NAVTEX-type information by coast stations on the frequencies 490 kHz and 4 209.5 kHz;

resolves

1. that administrations wishing the IMO to coordinate the use of the frequencies 490 kHz and 4 209.5 kHz for the transmission of NAVTEX-type information should also communicate to the IFRB the additional characteristics mentioned in No. **1632** of the Radio Regulations;

2. that for the frequencies 490 kHz and 4 209.5 kHz administrations and the IFRB shall use the procedures set forth in Article **14A** with the following qualifications:

- No. **1634** applies to the basic characteristics only;
- communication of the additional characteristics mentioned in No. **1632**, or of any analogous characteristics, is nevertheless recommended;
- No. **1635** shall also be applied to the frequency bands 489.75 - 490.25 kHz and 4 209.25 - 4 209.75 kHz;
- the IFRB shall communicate a copy of the special section of its weekly circular indicating any coordination already effected and the names of administrations identified in application of No. **1635** to the IMO, IHO and WMO for information only;

invites

1. the IMO to communicate, as soon as practicable after receipt of the information supplied by the IFRB under *resolves* 2, to the administrations concerned and the IFRB, any comments which may assist the administrations in reaching agreement;

2. the IMO, the IHO and the WMO to carry out any operational coordination which may be necessary;

requests the CCIR

to undertake the necessary technical studies with a view to ensuring global coordination of the planned utilization of the transmission of NAVTEX-type information, for use by the IMO, the WMO, the IHO and the IFRB;

instructs the Secretary-General

to communicate this Resolution to the IMO, the IHO and the WMO.

RESOLUTION No. 330 (Mob-87)

Frequencies for Routine (Non-Distress) Calling in the Bands Between 1 605 kHz and 4 000 kHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

noting

a) that after the full implementation of the Global Maritime Distress and Safety System (GMDSS) the carrier frequency 2 182 kHz may be required exclusively for distress and safety purposes (see Resolution **331 (Mob-87)**);

b) that, as a consequence, there may be a need to provide a frequency for routine (non-distress) calling by radiotelephony; however, this Conference is not in a position to identify a specific frequency for this purpose in the bands between 1 605 kHz and 4 000 kHz;

c) that this Conference has provided the frequency pair 2 177 kHz (coast stations) and 2 189.5 kHz (ship stations) for routine (non-distress) calling using digital selective calling techniques;

considering

that, as this Conference has provided frequencies for routine (non-distress) calling using digital selective calling techniques, there may no longer be a need to provide a frequency for routine (non-distress) calling by radiotelephony in the bands between 1 605 kHz and 4 000 kHz after the full implementation of the GMDSS;

resolves

to recommend that a future competent world administrative radio conference should consider whether there is a need to provide a frequency for routine (non-distress) calling by radiotelephony in the bands between 1 605 kHz and 4 000 kHz;

invites the Administrative Council

to place this matter on the agenda of the next competent world administrative radio conference;

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization (IMO).

RESOLUTION No. 331 (Mob-87)

Introduction of Provisions for the Global Maritime Distress and Safety System (GMDSS) and Continuation of the Existing Distress and Safety Provisions

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

noting

that the International Maritime Organization (IMO):

- has reached the final stage of development of the Global Maritime Distress and Safety System (GMDSS);
- is preparing a revision of the International Convention for the Safety of Life at Sea (SOLAS), 1974, with a view to introducing the GMDSS;
- will decide on the dates of initial and full implementation of the GMDSS, including any intermediate dates of application for various classes of ships subject to the above-mentioned Convention;

noting further

a) that to ensure compatibility between ships following Chapter **IX** and those following Chapter **N IX** of the Radio Regulations, all ships subject to the 1974 SOLAS Convention will continue to use applicable existing distress and safety provisions until the GMDSS has been implemented fully;

b) that some administrations and ships not subject to the 1974 SOLAS Convention may continue to use provisions of Chapter **IX** on Distress and Safety Communications after the GMDSS has been implemented fully;

c) that it would be costly for administrations to maintain in parallel for an excessive period of time shore-based facilities necessary to support both the existing distress and safety system and the GMDSS;

d) that it is necessary to continue existing shore-based distress and safety services so that ships not subject to the 1974 SOLAS Convention will be able to obtain assistance from these services until such time as they are able to participate in the GMDSS;

considering

a) that this Conference has placed in Chapter **N IX** the provisions which are required for the GMDSS to be implemented, and that Chapter **IX**, as modified, retains the provisions for the existing distress and safety system;

b) that the introduction of the GMDSS will offer the opportunity to gain administrative, technical and operational experience with the new system;

c) that the experience gained from the operation of the GMDSS should be used to improve the distress and safety system;

recognizing

a) that to assist IMO, the provisions of Chapter **N IX** should enter into force prior to the initial implementation date of the GMDSS;

b) that some elements of the GMDSS described in Chapter **N IX**, particularly digital selective calling, will not be fully operational in all parts of the world on the date of entry into force of the Final Acts of this Conference;

resolves

1. that the entry into force of Chapter **N IX**:

   a) implies that those administrations wishing to start using the provisions of Chapter **N IX** may do so;

   b) does not commit any administration to install or establish GMDSS facilities or to start using the provisions of Chapter **N IX**;

2. that nevertheless, and in light of *resolves* 1, administrations shall be obliged to follow the provisions of Chapter **IX** until adequate measures have been taken to ensure the continuation of safety communications for ships not subject to the 1974 SOLAS Convention, until full implementation of the GMDSS and until a future competent conference decides otherwise;

invites the Administrative Council

to draw this Resolution to the attention of the next Plenipotentiary Conference and to request that Conference to decide on a world administrative radio conference which should be made competent to review this Resolution and Chapters **IX** and **N IX**;

requests the IMO

when it is deciding the dates of implementation of the GMDSS, to take into account:

1. Resolution **322 (Rev.Mob-87)** relating to Coast Stations and Coast Earth Stations Assuming Watch-Keeping Responsibilities on Certain Frequencies in Connection with the Implementation of Distress and Safety Communications for the GMDSS, which is concerned with the adequate geographic distribution of coast stations and coast earth stations necessary for the implementation of the GMDSS;

2. the economic repercussions and benefits of the GMDSS and the particular limitations confronting the developing countries;

3. the possibility of a progressive implementation of the GMDSS by bringing into effect component parts of the system, particularly those having maximum benefit to the safety of life at sea;

instructs the Secretary-General

to communicate this Resolution to IMO and the International Civil Aviation Organization (ICAO).

RESOLUTION No. 332 (Mob-87)

Use of the Frequency 4 209.5 kHz for NAVTEX-type Transmissions in the Maritime Mobile Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that, *inter alia*, high atmospheric noise levels in the 500 kHz band, mainly in the tropical and sub-tropical regions, will limit the range at which NAVTEX signals transmitted on 518 kHz can be received in these regions;

b) that atmospheric noise levels in the tropical and sub-tropical regions are significantly lower in the 4 MHz band than at 518 kHz;

c) that a non-paired narrow-band direct-printing (NBDP) channel in the 4 MHz maritime mobile band is needed to provide such transmissions in a predominantly ground wave mode;

noting

a) that NAVTEX-type transmissions include navigational and meteorological warnings and urgent information to ships;

b) that the International Maritime Organization (IMO) has agreed that there is a need for NAVTEX-type transmissions on a 4 MHz NBDP channel;

recognizing

a) that the frequency 4 209.5 kHz has been allocated by this Conference exclusively for these purposes specified in *considering c)*;

b) that the IMO, the World Meteorological Organization (WMO) and the International Hydrographic Organization (IHO) are the competent organizations to develop a plan for the global use of the HF NBDP marine NAVTEX-type transmission channel;

resolves to invite the IMO, WMO and IHO

1. to develop jointly, in consultation with the IFRB, a plan for the global coordination of NAVTEX-type transmissions using NBDP techniques;

2. to assume joint responsibility for maintaining the plan in consultation with the IFRB;

urges administrations

which need to use this channel to assign the frequency in conformity with the procedures set out in Resolution **329 (Mob-87)** and the Recommendations of the IMO, WMO and IHO for that part of the system over which they hold jurisdiction;

invites the Administrative Council

to place this Resolution on the agenda of the next competent world administrative radio conference for review and any other action that may be required;

invites the CCIR

to develop the technical characteristics to allow these transmissions to be received using automated techniques;

instructs the Secretary-General

to communicate this Resolution to the IMO, IHO and WMO for consideration and comments.

RESOLUTION No. 333 (Mob-87)

Coordination of the Use of HF Maritime Mobile Frequencies for Transmission of High Seas Maritime Safety Information

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the International Maritime Organization (IMO) has reaffirmed the need for long-range navigational and meteorological warnings to all ships on all voyages;

b) that operational limitations prevent NAVTEX or satellite services from totally fulfilling this requirement;

c) that international narrow-band direct-printing channels for this purpose have been identified by this Conference;

d) that, due to HF propagation characteristics, global coordination of transmissions to prevent interference is required;

noting

a) that the IMO and the International Hydrographic Organization (IHO), in the development of the World-Wide Navigational Warning Service, have identified sixteen Navigational Areas (NAVAREAs), each under the jurisdiction of an area coordinator, for the transmission of maritime safety information;

b) that as maritime safety information includes meteorological as well as navigational messages, the World Meteorological Organization (WMO) also has an interest in this matter;

recognizing

that the IMO, WMO and IHO are the competent organizations to coordinate the operational aspects of the transmission of maritime safety information;

resolves that the IMO, WMO and IHO be invited

1. to develop jointly, in consultation with the IFRB, a global coordinated plan for the transmission of high seas maritime safety information using narrow-band direct-printing techniques;

2. to assume joint responsibility for maintaining the plan in consultation with the IFRB;

urges administrations

to effect the appropriate operational coordination with the IMO, IHO and WMO in accordance with this plan;

invites the CCIR

to develop the technical characteristics to allow these transmissions to be received using automated techniques;

invites the Administrative Council

to place this Resolution on the agenda of the next competent world administrative radio conference, with a view to reviewing and, if necessary, amending the coordination arrangements;

instructs the Secretary-General

to communicate this Resolution to the IMO, IHO and WMO for consideration and comments.

RESOLUTION No. 334 (Mob-87)

Inclusion in the Regulations to be Adopted by the World Administrative Telegraph and Telephone Conference (WATTC-88) of Provisions Concerning Charging and Accounting for Maritime Radiocommunications in the Maritime Mobile Service and the Maritime Mobile-Satellite Service except for Distress and Safety Communications, and Consequential Modifications to Article 66 of the Radio Regulations

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

recognizing

that it is expected that provisions concerning charging and accounting for maritime radiocommunications in the maritime mobile service and the maritime mobile-satellite service may be included in the Regulations to be adopted by the WATTC-88;

considering

that, if such provisions are included in those Regulations, it will not be necessary to retain similar provisions in the Radio Regulations;

noting

that those Regulations, if adopted, will enter into force after the revision of the Radio Regulations by this Conference;

resolves

1. that if provisions concerning charging and accounting for maritime radiocommunications in the maritime mobile service and the maritime mobile-satellite service are contained in the Regulations to be adopted by the WATTC-88, when the latter enter into force, Article **66** of the Radio Regulations should be replaced by the following text:

"ARTICLE 66

Charging and Accounting for Maritime Radiocommunications in the Maritime Mobile Service and the Maritime Mobile-Satellite Service except for Distress and Safety Communications

The provisions of the Regulations adopted by the WATTC-88, taking into account the relevant CCITT Recommendations, shall apply.";

2. that in any interim period between the entry into force of the Final Acts of this Conference and the entry into force of the new Regulations containing modified provisions concerning charging and accounting for maritime radiocommunications in the maritime mobile and maritime mobile-satellite services, administrations and recognized private operating agencies shall apply Article **66** of the Radio Regulations as modified by this Conference;

3. that if special provisions concerning charging and accounting in the maritime mobile and maritime mobile-satellite services are not included in the new Regulations adopted by the WATTC-88, Article **66** of the Radio Regulations, as modified by this Conference, shall continue to apply;

4. that a future competent conference should be invited to review this Resolution;

invites the Administrative Council

to place this Resolution on the agenda of the next competent conference.

RESOLUTION No. 335 (Mob-87)

Use of Non-Paired Ship Station Frequencies for Narrow-Band Direct-Printing Telegraphy and Data Transmission Systems[1]

(see Article **60** and Appendix **33**)

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that certain sections of the HF bands allocated to the maritime mobile service are reserved for narrow-band direct-printing telegraphy and data transmission systems operating on a non-paired frequency basis;

b) that neither the World Maritime Administrative Radio Conference, Geneva, 1974, nor the World Administrative Radio Conference, Geneva, 1979, were in a position to decide the extent to which it was necessary to regulate the orderly use of frequencies for the transmission by ship stations of non-paired direct-printing telegraphy signals or on what basis this might be done;

c) that administrations operating or bringing into operation non-paired narrow-band direct-printing telegraphy and data transmission systems for ships have notified the IFRB, for recording in the Master Register, the frequencies on which ship stations transmit;

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[1] Replaces Resolution **301** of the World Administrative Radio Conference, Geneva, 1979.

d) that these notices have not been subject to technical examination by the IFRB, and that the assignments notified have been recorded in the Master Register for information only, with no date in Column 2;

e) that this Conference has provided administrations with guidance on how the frequencies reserved for non-paired narrow-band direct-printing telegraphy and data transmission systems should be used by ship stations;

resolves

1. that administrations operating or bringing into operation non-paired narrow-band direct-printing telegraphy and data transmission systems for ships shall not be required to notify to the IFRB the frequencies on which ship stations transmit;

2. to instruct the IFRB to delete from the Master Register all assignments recorded as a result of the application of Resolution **301**.

RESOLUTION No. 336 (Mob-87)

Early Implementation of the Use of Digital Selective Calling on Maritime HF Radiotelephone Channels

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that it is desirable for ship stations using radiotelephony to be able also to signal using digital selective calling;

b) that, at present, the emission of digital signals on maritime HF radiotelephone channels is not allowed;

c) that this Conference has nevertheless adopted a modification to No. **4685** to permit the use of digital selective calling on maritime HF radiotelephone working channels;

resolves

that, with effect from 1 January 1988, digital selective calling signals may be emitted on maritime HF radiotelephone working channels.

RESOLUTION No. 337 (Mob-87)

Resolutions and Recommendations Which Remain in Effect Until the Provisions of the Radio Regulations as Partially Revised by WARC Mob-87 Take Effect

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the essential parts of Resolution **320 (Mob-83)** have been incorporated into the Radio Regulations, as partially revised by WARC Mob-87;

b) that this Conference has therefore decided to suppress Resolutions **304** and **320 (Mob-83)** and that Recommendations **302** and **312** shall eventually be suppressed;

noting

a) that as a general rule, Resolutions and Recommendations become effective at the time of the signing of the Final Acts of a Conference;

b) that the provisions of the Radio Regulations, as partially revised by this Conference, will become effective only at a much later date;

noting further

that, as a general rule, Resolutions and Recommendations which a WARC has decided to suppress, become ineffective at the time of the signing of the Final Acts of the Conference;

recognizing

a) that, in accordance with the general rule, such a suppression would effectively remove the guidelines contained in the Resolutions and Recommendations referred to above upon the signing of the Final Acts;

b) that these guidelines should, however, remain in effect until the entry into force of the provisions of the Radio Regulations, as partially revised by this Conference;

resolves

that Resolutions **304** and **320 (Mob-83)** and Recommendations **302** and **312** shall remain in effect until the entry into force of the provisions of the Radio Regulations, as partially revised by this Conference, at which date they shall become ineffective and definitively suppressed.

RESOLUTION No. 403

Relating to the Use of Frequencies 3 023 kHz and 5 680 kHz Common to the Aeronautical Mobile (R) and (OR) Services [1]

The World Administrative Radio Conference, Geneva,1979,

having noted

that some anomalies appeared to exist in the conditions prescribed in Appendix **26** to the Radio Regulations (Geneva, 1959) for the use of the frequencies 3 023.5 kHz and 5 680 kHz, as contained in Article 2 of the Frequency Allotment Plan, Column 3, clauses 2*a)* and 2*b)* and that steps have been taken to remove these anomalies;

considering

a) that the coordination of search and rescue operations at the scene of a disaster would be improved if the use of the frequencies 3 023 kHz (previously 3 023.5 kHz) and 5 680 kHz, in such operations, were extended to include communications between mobile stations and participating land stations;

b) that it would be in the general interests of the aeronautical mobile service if the same provisions relating to the use of the frequencies 3 023 kHz (previously 3 023.5 kHz) and 5 680 kHz were applied to operations both in the aeronautical mobile (R) service and the aeronautical mobile (OR) service;

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[1] Replaces Resolution No. **Aer2** – 1 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

resolves

to invite administrations to apply in the aeronautical mobile (OR) service, as from the date of the coming into force of the Frequency Allotment Plan adopted by the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978, the provisions governing the use of the frequencies 3 023 kHz and 5 680 kHz specified in Appendix **27 Aer2** (Part II, Section II, Article 3).

RESOLUTION No. 405

Relating to the Use of Frequencies of the Aeronautical Mobile (R) Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978, adopted and developed a new Frequency Allotment Plan for the use of HF channels for the aeronautical mobile (R) service (Appendix **27 Aer2** to the Radio Regulations);

b) that air operations are subject to continuous changes;

c) that these changes require attention by the administrations concerned; but

d) that, in seeking to satisfy new communication requirements, no decision should be taken that will prevent or handicap the coordinated utilization of those high frequency aeronautical mobile (R) band allotments as prescribed in the Plan;

e) that the families of frequencies allotted to the Major World Air Route Areas (MWARAs), Regional and Domestic Air Route Areas (RDARAs) and Sub-Areas and VOLMET areas have been chosen considering propagation conditions which allow for the selection of the most suitable frequencies for the distances involved;

f) that specific steps should be taken to ensure that the correct order of frequency is used;

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[1] Replaces Resolution No. **Aer2** – 7 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

g) that it is essential to distribute the communication traffic load as uniformly as possible over the frequencies available;

h) that frequencies have been allotted for worldwide use;

resolves

that administrations, individually or in collaboration, take the necessary steps:

1. to make as great a use as possible of higher frequencies in order to lessen the load on the HF aeronautical mobile (R) bands;

2. to make as great a use as possible of antennae of appropriate directivity and efficiency in order to minimize the possibilities of mutual interference within an area or between areas;

3. to coordinate the use of families of frequencies necessary for a given route segment in accordance with the technical principles in Appendix **27 Aer2** and in the light of the propagation data available, to ensure that the most appropriate frequencies are used with an aircraft at a given distance from the aeronautical station providing service over the route segment concerned;

4. to improve operating techniques and procedures and to use equipment which will make it possible to attain the highest possible efficiency in handling air-ground HF communications;

5. to collect precise data on the operation of their HF communication systems, particularly data having a bearing on technical and operating standards, so as to facilitate re-examination of the Plan;

6. to establish, through regional arrangements, the best method of providing the communications required for any new long-distance international or regional air operation which is not or cannot be accommodated within the system of MWARA and RDARA, in such a manner as not to cause harmful interference to the utilization of frequencies as prescribed in the Plan.

RESOLUTION No. 406

Relating to the Use of Frequency Bands Higher than the HF Bands in the Aeronautical Mobile (R) Service and the Aeronautical Mobile-Satellite (R) Service for Communication and for Meteorological Broadcasts [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that from an aeronautical viewpoint, higher frequency bands can provide a more reliable and more interference-free communication system than HF;

b) that from a technical and operational viewpoint, the use of VHF by aviation has progressed significantly;

c) that the future possibility of communications utilizing satellite technology is now recognized;

d) that, owing to the ever increasing development of aeronautical telecommunications in all areas of the world, there is an increasing demand for frequencies for communication with and for meteorological broadcasts to aircraft in flight;

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[1] Replaces Resolution No. **Aer2** – 6 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

resolves

that administrations, taking into account the relevant economic and technical factors, consider to the maximum extent possible meeting their requirements for communication and for meteorological broadcasts by frequencies in frequency bands, higher than the HF bands, which are allocated to the aeronautical mobile (R) service and the aeronautical mobile-satellite (R) service.

RESOLUTION No. 408 (Mob-87)

Use of the Band 136 - 137 MHz by Services other than the Aeronautical Mobile (R) Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

noting

a) the provisions of No. **595** concerning the use of the band 136 - 137 MHz by the aeronautical mobile (R) service commencing on 1 January 1990;

b) that frequencies allocated to the aeronautical mobile (R) service are reserved for communications related to safety and regularity of flight and therefore require special measures to ensure freedom from harmful interference;

considering

a) that the Table of Frequency Allocations includes allocations in the band 136 - 137 MHz to the aeronautical mobile (R) service on a primary basis, to the aeronautical mobile (OR) service in some countries (No. **594A**) on a permitted basis and to the fixed and mobile, except aeronautical mobile (R), services on a secondary basis;

b) that No. **595** also provides for allocation to the space operation service (space-to-Earth), the meteorological-satellite service (space-to-Earth) and the space research service (space-to-Earth) on a primary basis up to 1 January 1990, and thereafter on a secondary basis, and that the aeronautical mobile (R) service can be introduced only after 1 January 1990;

c) that from that date the aeronautical mobile (R) service may be subject to harmful interference which would endanger the safety of air navigation and that it is therefore necessary to protect this service from harmful interference that might be caused by stations in the fixed service, the mobile except aeronautical mobile (R) service, the space research service (space-to-Earth), the space operation service (space-to-Earth) and the meteorological-satellite service (space-to-Earth);

resolves

1. that administrations operating or intending to operate, stations in the fixed service, the mobile except aeronautical mobile (R) service, the space research service (space-to-Earth), the space operation service (space-to-Earth) and the meteorological-satellite service (space-to-Earth) in the band 136 - 137 MHz from 1 January 1990, take all necessary steps to protect the aeronautical mobile (R) service;

2. to request administrations to refrain from authorizing new assignments, as from 1 January 1990, to the services to which the band 136 - 137 MHz is allocated on a secondary basis;

recommends

1. that administrations cease operation of stations of the other services to which the band is allocated on a secondary basis as and when the stations of the aeronautical mobile (R) service come into operation;

2. that a future competent world administrative radio conference consider the deletion of all secondary allocations from the band 136 - 137 MHz;

invites the Administrative Council

to place this matter on the agenda of the next competent world administrative radio conference.

RESOLUTION No. 409 (Mob-87)

Use of Frequency Bands Allocated Exclusively to the Aeronautical Mobile Service for Various Forms of Public Correspondence

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that some administrations have notified assignments to the IFRB, in the frequency bands allocated exclusively to the aeronautical mobile service, which relate to public correspondence, limited public correspondence and correspondence of a private agency;

b) that such assignments are in contravention of No. **3633**, which does not permit public correspondence in frequency bands allocated exclusively to the aeronautical mobile service;

c) that such assignments are capable of causing harmful interference to the aeronautical mobile service;

d) that radio is the sole means of communication available to the aeronautical mobile service and that this service is concerned with the safety and regularity of flight;

recognizing

a) that this Conference has made appropriate amendments to Article **12** to allow the IFRB the flexibility required in dealing with notices not in conformity with No. **3633**;

b) that it is of paramount importance that frequencies directly concerned with the safe and regular conduct of aircraft operations be kept free from harmful interference, since they are essential for the safety of life and property;

resolves

1. *to urge administrations*

a) to refrain from making assignments to stations for various forms of public correspondence in frequency bands allocated exclusively to the aeronautical mobile service;

b) to cease such operations and delete related assignments from the Master International Frequency Register;

2. *to request the IFRB*

a) to advise the administrations concerned of their assignments contained in the Master International Frequency Register which are in contravention of No. **3633** of the Radio Regulations;

b) to seek the cooperation of administrations in the cessation of operations in contravention of No. **3633** of the Radio Regulations and consequent deletion of the assignments concerned from the Master International Frequency Register.

RESOLUTION No. 500

Relating to the Modification of Carrier Frequencies of LF Broadcasting Stations in Region 1

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that it would be advantageous, both technically and economically, to reduce interference in domestic broadcasting receivers caused by combination frequencies;

b) that such interference is considerably reduced when the nominal values of the carrier frequencies of broadcasting stations are multiples of the channel separation;

c) that the nominal values of the carrier frequencies of stations listed in the LF Broadcasting Plan for Region 1 (Geneva, 1975) are not multiples of the channel separation (9 kHz);

d) that, in order to avoid interference between the stations in question, it is necessary that the modifications of the carrier frequencies of LF broadcasting stations in Region 1 be carried out on the same date, at least for all stations sharing the same channel, without reducing thereby the spacing between adjacent carrier frequencies;

e) that modification of the carrier frequencies of LF broadcasting stations will, in certain cases, increase the interference caused to aeronautical radionavigation stations;

noting

that the aeronautical radionavigation service is a safety service;

resolves

1. that over the period 1 February 1986 to 1 February 1990 the nominal values of the carrier frequencies of all LF stations operating or planned in conformity with the LF/MF Broadcasting Agreement (Geneva, 1975) shall be reduced by 2 kHz, so that they become multiples of 9 kHz, the other characteristics of the stations remaining unchanged;

2. that, in order to ensure that all steps can be taken to avoid any additional interference to the aeronautical radionavigation service, the change of the frequencies of the broadcasting stations shall be made in groups of five channels beginning at the lowest assigned frequency;

3. that the changes shall be made in three steps, as follows:

channels 1 to 5 on 1 February 1986	at 0100 UTC
channels 6 to 10 on 1 February 1988	
channels 11 to 15 on 1 February 1990	

4. that at the date of the first change (1 February 1986) the lower limit of the band allocated to the broadcasting service shall become 148.5 kHz and that after 1 February 1990 the allocation to the broadcasting service shall become 148.5 - 283.5 kHz;

5. that any modifications to the frequency assignment of an aeronautical radionavigation station resulting therefrom shall be notified to the Board and upon receiving a favourable finding with respect to Nos. **1240** and **1241** shall be entered in the Master Register without any change of date or status. If, however, the finding is unfavourable only with respect to No. **1241**, it shall be entered in the Master Register in accordance with the relevant provisions of Article **12** with no change in the original date;

further resolves

that administrations shall inform the IFRB at least two years in advance of making any foreseen modifications of the characteristics of their existing LF broadcasting stations or bringing into use any new stations;

requests the IFRB

to publish this information in a special section of its weekly circular;

requests the Secretary-General

to send this Resolution to the Secretary-General of ICAO.

RESOLUTION No. 501

Relating to Examination by the IFRB of the Notices Referring to Stations in the Broadcasting Service in Region 2 in the Band 535 - 1 605 kHz During the Period Preceding the Entry into Force of the Final Acts of the Regional Administrative MF Broadcasting Conference (Region 2)

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that a Regional Administrative MF Broadcasting Conference (Region 2) will be convened, in two sessions, to draw up a plan for the broadcasting service in the band 535 - 1 605 kHz;

b) that the first session of that Conference will be held in March 1980, and the second session in November 1981;

c) that the relevant provisions of Article **12** have been modified by the present Conference;

d) that the Regional Administrative MF Broadcasting Conference (Region 2) should adopt provisions to be applied by the Board for notification and recording in the Master Register of frequency assignments included in the plan;

e) that it is therefore necessary to establish a procedure to be applied by the Board for the examination of notices referring to broadcasting stations in Region 2 in the band 535 - 1 605 kHz in the period between the entry into force of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, and the entry into force of the Final Acts of the Regional Administrative MF Broadcasting Conference (Region 2);

resolves

that between the date of entry into force of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, and the date of entry into force of the Final Acts of the Regional Administrative MF Broadcasting Conference (Region 2), the Board shall not examine, with respect to the provisions of No. **1241**, frequency assignment notices to a broadcasting station of Region 2 in the band 535 - 1 605 kHz and shall record them with no date in Column 2a or in Column 2b, the date in Column 2c being given for information only.

RESOLUTION No. 505

Relating to the Broadcasting-Satellite Service (Sound) in the Frequency Range 0.5 GHz to 2 GHz

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that several administrations have made proposals concerning frequency band allocations for broadcasting-satellite service (sound) in the range 0.5 - 2 GHz;

b) that the frequency bands presently allocated to the broadcasting-satellite service do not provide the possibility of individual reception of sound programmes by portable receivers and receivers installed in automobiles;

c) that the introduction of the broadcasting-satellite service (sound) in the range 0.5 - 2 GHz is technically feasible and will afford the possibility of individual reception with portable and automobile receivers;

d) that simulated experiments have confirmed certain postulations made in theoretical studies; however, no working system has yet been demonstrated;

e) that further studies are necessary before the implementation of operational systems;

f) that CCIR has initiated studies concerning this service in accordance with Study Programme 34B/10;

g) that the appropriate frequency range for the service is limited at the lower end to 0.5 GHz (because of increasing man-made noise and transmit antenna size with decreasing frequency) and at the upper end to 2 GHz (because of decreasing effective area of the receive antenna with increasing frequency);

h) that, because of the high power flux-density requirement, sharing with terrestrial services seems extremely difficult;

noting

a) that there are proposals by administrations for the frequency range 1 429 - 1 525 MHz;

b) that the radio astronomy service has an allocation in a lower neighbouring band and that for that reason the lower part of the band 1 429 - 1 525 MHz may not be considered for an allocation to the broadcasting-satellite service (sound);

c) that in the experimental phase a bandwidth of a few hundred kHz would suffice;

resolves

1. that administrations shall be encouraged to carry out experiments with a broadcasting-satellite service (sound) within the band 0.5 - 2 GHz, in appropriately placed narrow sub-bands, subject to agreement of administrations concerned. One area where such a sub-band may be placed is the band 1 429 - 1 525 MHz;

2. that the CCIR shall continue and expedite studies relating to the technical characteristics of a satellite sound-broadcasting system for individual reception by portable and automobile receivers, the feasibility of sharing with terrestrial services, and the appropriate sharing criteria;

3. that the next world administrative radio conference dealing with space radiocommunication services in general or with a specific space radiocommunication service shall be authorized to consider the results of various studies and to take appropriate decisions regarding the allocation of a suitable frequency band;

4. that the aforementioned conference shall also develop appropriate procedures for protection, and if necessary re-accommodation in other bands, of assignments to stations of terrestrial services which may be affected.

RESOLUTION No. 506 (Rev.Orb-88)

Use by Space Stations Operating in the 12 GHz Frequency Bands Allocated to the Broadcasting-Satellite Service of the Geostationary-Satellite Orbit and No Other

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that a Plan designating frequency assignments in the above-mentioned frequency bands and positions in the geostationary-satellite orbit has been adopted by the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, for Regions 1 and 3;

b) that a similar Plan for Region 2 has been adopted by the Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2, Geneva, 1983;

c) that the Plans referred to in *considering a)* and *b)* above were consolidated in Appendix **30 (Orb-85)** to the Radio Regulations at the First Session of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It, Geneva, 1985 (Orb-85);

d) that the operation of space radiocommunication services in the frequency bands concerned in orbits other than the geostationary-satellite 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-satellite orbit and no other.

RESOLUTION No. 507

Relating to the Establishment of Agreements and Associated Plans for the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that it is important to make the best possible use of the geostationary-satellite orbit and of the frequency bands allocated to the broadcasting-satellite service;

b) that the great number of receiving installations using such directional antennae as could be set up for a broadcasting-satellite service may be an obstacle to changing the location of space stations in that service on the geostationary-satellite orbit, as of the date of their being brought into use;

c) that satellite broadcasts may create harmful interference over a large area of the Earth's surface;

d) that the other services with allocations in the same band need to use the band before the broadcasting-satellite service is set up;

resolves

1. that stations in the broadcasting-satellite service shall be established and operated in accordance with agreements and associated plans adopted by world or regional administrative conferences, as the case may be, in which all the administrations concerned and the administrations whose services are liable to be affected may participate;

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[1] Replaces Resolution No. **Spa2** – 2 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

2. that during the period before the entry into force of such agreements and associated plans the administrations and the IFRB shall apply the procedure contained in Resolution **33**;

invites the Administrative Council

to keep under review the question of world administrative conferences, and/or regional administrative conferences, as required, with a view to fixing suitable dates, places and agenda.

RESOLUTION No. 508

Relating to the Convening of a World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the existing situation in the HF bands allocated exclusively to the broadcasting service is not satisfactory;

b) that it is important to ensure that all countries are guaranteed free and equal rights to the use of these bands;

resolves

1. that the use of the exclusive and shared HF bands allocated to the broadcasting service (excluding those bands reserved for broadcasting in the Tropical Zone) should be the subject of planning by a world administrative radio conference;

2. that the planning be based on DSB (double-sideband) emissions. Consideration should also be given to the manner in which an SSB (single-sideband) system could be introduced progressively without impairing the DSB emissions;

3. that the conference referred to in paragraph 1 should be held in two sessions;

4. that the first session:

4.1 is to establish the technical parameters to be used for planning and the principles governing the use of the HF bands allocated to the broadcasting service and in particular:

4.1.1 the power appropriate to HF broadcasting in conjunction with the other relevant technical factors;

4.1.2 the needs of each country for national and international broadcasting;

4.1.3 the maximum number of frequencies to be used for the broadcasting of the same programme to the same zone;

4.1.4 a specification of an SSB system suitable for future use for HF broadcasting;

4.2 should also decide the planning principles to be used and the method of planning to be adopted by the second session;

5. that, at its second session, to be held not sooner than twelve months nor later than eighteen months after the first session, the conference:

5.1 should carry out the planning according to the principles and the method established at the first session;

5.2 should review and, where necessary, revise the relevant provisions of the Radio Regulations relating to broadcasting in the HF bands;

urges administrations,

until the conference is held, to use no greater transmitter power than that required for satisfactory reception and to ensure that the number of frequencies used is the minimum necessary;

draws the attention of the Administrative Council

to the urgency of this conference;

and invites the Administrative Council

to take all necessary steps for the convening of the conference, the first session of which shall be held as soon as possible after the next CCIR Plenary Assembly and with the least possible delay as defined in Article 58 (No. 303) of the Convention;

requests the IFRB

to carry out the necessary engineering studies and preparations, including those envisaged in No. **1771** of the Radio Regulations;

requests the CCIR

to accelerate the studies described in Recommendations **500** and **501**.

RESOLUTION No. 509

Relating to the Convening of a Regional Broadcasting Conference to Review and Revise the Provisions of the Final Acts of the African VHF/UHF Broadcasting Conference, Geneva, 1963

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the last African VHF/UHF Plan was drawn up in Geneva in 1963 for Sound Broadcasting in Band II (87.5 - 100 MHz) and for Television Broadcasting in Band I (47 - 68 MHz), Band III (174 - 223 MHz), Band IV (470 - 582 MHz) and Band V (582 - 960 MHz);

b) that some of the African countries could not participate in the African VHF/UHF Broadcasting Conference, Geneva, 1963;

c) that many more sovereign African countries have emerged and will need to be included in a new plan;

noting

a) that for the band 87.5 - 108 MHz an FM sound-broadcasting planning conference is foreseen for Region 1 (see Resolution **510**);

b) the extension of the primary allocation to the broadcasting service (television) in Region 1 from 174 - 223 MHz to 174 - 230 MHz;

realizing

that there is a need to update the existing Plan;

resolves

that a regional conference be convened as soon as possible, preferably by 1984, to review and revise the provisions of the existing Television Broadcasting VHF/UHF Plan (Geneva, 1963) for the African Broadcasting Area, taking into account the assignments contained in the Stockholm Plan, 1961;

invites the Administrative Council

to take all necessary steps for convening the conference and to fix the date and agenda for the conference;

requests the CCIR

to carry out the necessary technical studies;

requests the IFRB

to carry out the preparations for the conference.

RESOLUTION No. 510

Relating to the Convening of a Planning Conference for Sound Broadcasting in the Band 87.5 - 108 MHz for Region 1 and Certain Countries Concerned in Region 3

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the extension of the primary allocation to the broadcasting service in Region 1 from 87.5 - 100 MHz to 87.5 - 108 MHz;

b) that in Region 1 the band 100 - 108 MHz is at present allocated to the mobile, except aeronautical mobile (R), service and in some countries also to the fixed service;

c) that several countries in Region 3 with land boundaries adjoining Region 1 also use this band for the broadcasting service;

d) that for those countries in Region 1 which use or intend to use the band 87.5 - 100 MHz for frequency-modulated sound broadcasting, there is a need to establish a new sound-broadcasting plan for the whole of the band 87.5 - 108 MHz;

e) that for other countries in Region 1 there is a need to establish a sound-broadcasting plan for the band 100 - 108 MHz;

f) that this new plan should in no way affect existing or planned assignments to television stations in the band 87.5 - 100 MHz made in accordance with the Regional Agreement (Stockholm, 1961);

g) that this new plan in the band 87.5 - 100 MHz should not result in the deterioration of the service areas of those existing sound-broadcasting stations operating in accordance with the Regional Agreement (Stockholm, 1961) which are situated in the coordination area with countries using this band for television in accordance with the Regional Agreement (Stockholm, 1961);

h) the requirement to introduce sound-broadcasting stations in the band 100 - 108 MHz in accordance with this plan at the earliest possible date;

i) that radio equipment used by aircraft for automatic landing purposes, which operates in the adjacent band 108 - 112 MHz, may be subject to harmful interference from nearby broadcasting stations operating in the band 87.5 - 108 MHz if the frequencies of the respective stations are not selected with care and that such interference can put human life at risk;

resolves

1. that a regional conference shall be convened before 31 December 1983 to draw up an agreement for Region 1 and the countries concerned in Region 3 and an associated plan for sound broadcasting in the band 87.5 - 108 MHz for Region 1 and for parts of Afghanistan and Iran which are contiguous with Region 1;

2. that this conference shall take place in two sessions:

- the first session will establish the technical bases for the preparation of the plan, including mutual criteria for sharing between sound broadcasting and other services, including television broadcasting, operating within the band 87.5 - 108 MHz;
- the second session, preferably to be separated from the first session by a period of more than six months, but not more than twelve months, will draw up the agreement and associated plan;

3. that countries concerned in Region 3 must be given the opportunity to participate in this conference;

requests the CCIR

to study, as a matter of urgency, the necessary technical bases required for planning and determining the protection criteria between sound-broadcasting stations and television-broadcasting stations and between sound-broadcasting stations and stations in the fixed and mobile, except aeronautical mobile (R), services;

invites the Administrative Council

to fix the dates and agenda for this conference;

calls upon administrations

to bear in mind the problems of compatibility with radionavigation systems operating in the adjacent band when planning the use of the band 87.5 - 108 MHz.

RESOLUTION No. 511 (HFBC-87)

Programme of Action Relating to the Improvement, Testing, Adoption and Practical Implementation of the Planning System for the High Frequency Bands Allocated Exclusively to the Broadcasting Service, and Associated Provisions

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

the need to adopt a programme of action,

resolves

1. that the HFBC Planning System and associated software are to be improved in accordance with the further instructions contained in Resolution **515 (HFBC-87)**;

2. that the improved HFBC Planning System is to be tested in accordance with the instructions contained in Resolution **515 (HFBC-87)** for adoption, if acceptable to a competent world administrative radio conference and for application in the following bands allocated exclusively to the broadcasting service:

26 MHz band: 25 900 - 26 100 kHz
21 MHz band: 21 650 - 21 850 kHz
17 MHz band: 17 550 - 17 750 kHz
15 MHz band: 15 400 - 15 600 kHz
13 MHz band: 13 600 - 13 800 kHz
11 MHz band: 11 650 - 11 700/11 975 - 12 050 kHz
9 MHz band: 9 775 - 9 900 kHz[1],

[1] This band cannot be implemented before 1 July 1994 (see Resolution **8**).

decides to recommend

that a world administrative radio conference (WARC) should be convened not later than 1992,

that this conference should:

- examine the results, provided by the IFRB, of the improved HFBC Planning System and the Consultation Procedure in Article **17**;
- examine the effects of the interaction between the two "systems" (improved HFBC Planning System and Consultation Procedure in Article **17**);
- decide on any improvements to be made to the two "systems";
- on the basis of the analysis of test results, decide on the date of introduction of the two "systems", which should be as soon as possible after the WARC of 1992*;
- decide on the date of introduction of the HFBC Planning System in the 9 MHz extension band;
- take the necessary steps to settle the question of the processing of national broadcasting requirements;
- establish a long-term plan with a view to planning all the bands allocated exclusively to HF broadcasting,

invites the Plenipotentiary Conference

as a matter of priority to make the necessary arrangements for including the WARC of 1992 in the schedule of conferences it is to establish,

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* *Note by the General Secretariat.* Subject to the inclusion of this conference in the conference programme to be adopted by the Plenipotentiary Conference.

invites the Administrative Council

to take whatever action is necessary for convening the conference not later than 1992,

instructs the IFRB

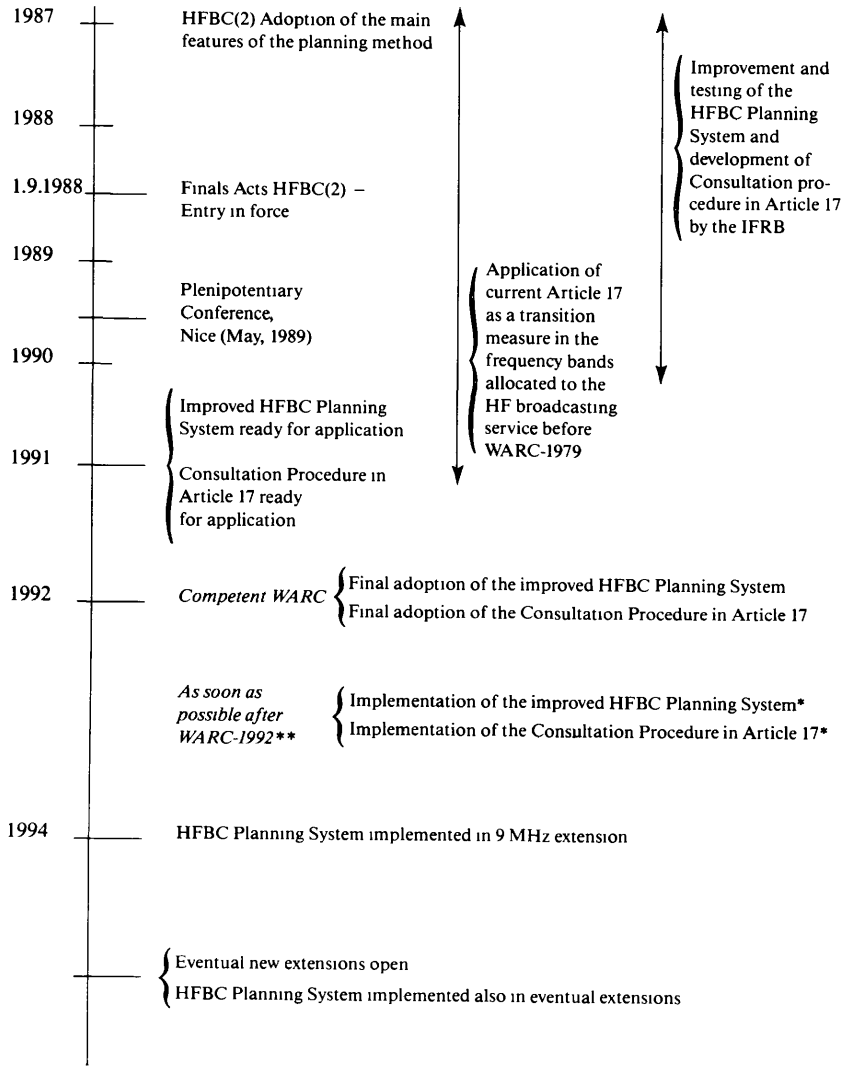
to undertake the improvements in the software of the HFBC Planning System, to test the system and to submit their results to administrations and to the WARC mentioned above,

instructs the Secretary-General

to bring this Resolution to the attention of the Administrative Council.

ANNEX TO RESOLUTION No. 511 (HFBC-87)

Programme of Action



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* Frequency bands, see Resolution **515 (HFBC-87)**.

** *Note by the General Secretariat:* Subject to the inclusion of this conference in the conference programme to be adopted by the Plenipotentiary Conference.

RESOLUTION No. 512 (HFBC-87)

Operation of HFBC Transmitters in the Extended Bands Above 10 MHz

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the World Administrative Radio Conference, Geneva, 1979 (WARC-79) allocated new HF bands to the broadcasting service on an exclusive basis;

b) that, in accordance with Resolution **8**, these bands will be available for use by the broadcasting service on 1 July 1989 (see Resolution **8**);

c) that, in accordance with No. **531** of the Radio Regulations, the use of these extended bands by the broadcasting service shall be subject to provisions to be established by the WARC for the Planning of HF Bands Allocated to the Broadcasting Service (see Resolution **508**),

considering further

that the improved HFBC Planning System can be applied in the extended HF bands specified in No. **531** of the Radio Regulations only after the entry into force of the provisions of the competent WARC foreseen for 1992,

resolves

1. that HFBC transmitting stations in the bands above 10 MHz specified in No. **531** of the Radio Regulations shall be brought into operation only as from the date decided by the future WARC referred to in Resolution **511 (HFBC-87)**;

2. that the date of 1 July 1989, as indicated in Annex A, paragraph 17 of Resolution **8** shall be postponed to the date decided by the future competent WARC referred to in Resolution **511 (HFBC-87)** with respect to the following frequency bands:

11 650 - 11 700 kHz
11 975 - 12 050 kHz
13 600 - 13 800 kHz
15 450 - 15 600 kHz
17 550 - 17 700 kHz
21 750 - 21 850 kHz.

RESOLUTION No. 513 (HFBC-87)

Improvement in the Use of the HF Bands Allocated Exclusively to the Broadcasting Service by Avoiding Harmful Interference

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) Article 4 (No. 19) of the International Telecommunication Convention concerning the purposes of the Union;

b) Article 10 (Nos. 79 and 80) of the International Telecommunication Convention concerning the duties of the IFRB;

c) Article 35 (No. 158) of the International Telecommunication Convention concerning harmful interference;

d) Article 54 (No. 209) of the International Telecommunication Convention concerning the instructions which may be given to the IFRB by a world administrative radio conference;

e) Article **20** of the Radio Regulations concerning the international monitoring system;

f) Article **18** (No. **1798**) of the Radio Regulations concerning measures against harmful interference;

g) Article **22** of the Radio Regulations concerning the procedure in cases of harmful interference;

h) Report by the IFRB on the Implementation of Resolution COM5/1 of the First Session of this Conference (Geneva, 1984),

noting

a) that harmful interference has a negative impact on the use of the frequency spectrum in general and on the use of frequency channels available for high frequency broadcasting in particular;

b) that broadcasting on channels adjacent to those being affected directly may also be subject to interference;

c) that a considerable number of high frequency broadcasting channels in various parts of the world are rendered unusable by harmful interference;

d) that the successful implementation of an HFBC Planning System would be adversely affected by the presence of harmful interference,

recognizing

a) that it is desirable for detailed information on the extent and impact of harmful interference to be available on a periodic basis;

b) that an increase in the number of stations participating in the international monitoring system, and the effective use of the information obtained from such stations would be of considerable assistance,

urges administrations

to avoid causing harmful interference,

instructs the IFRB

in accordance with the provisions of the Radio Regulations,

1. to organize periodic specialized monitoring programmes in the bands allocated to the high frequency broadcasting service with a view to identifying stations causing harmful interference;

2. to seek, as appropriate, the cooperation of administrations in identifying the sources of emissions which cause harmful interference and to provide this information to administrations;

3. to issue summaries of the monitoring data, including identification of all transmissions which have been reported as having a class of emission different from the one used for broadcasting;

4. to inform the world administrative radio conference referred to in Resolution **511 (HFBC-87)** of the results of the activities specified in 1, 2 and 3 above,

invites administrations

1. to take part in the monitoring programmes set up by the IFRB in accordance with the provisions of this Resolution;

2. to apply the provisions of Article **22** of the Radio Regulations in cases of harmful interference.

RESOLUTION No. 514 (HFBC-87)

Procedure to be Applied by the IFRB in the Revision of the Relevant Parts of its Technical Standards Used in the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that it has examined in detail the technical parameters used in the HF bands allocated exclusively to the broadcasting service;

b) that the planning exercises conducted by the IFRB in the intersessional period indicated that some of the technical parameters, such as those used in the propagation prediction method, may need to be improved, and applied with some flexibility, depending on the results of the actual regular implementation of plans and the technical studies carried out by the CCIR;

c) that, under No. **1001** of the Radio Regulations, the functions of the Board include the development of its Technical Standards;

d) that, under No. **1454** of the Radio Regulations, the Technical Standards of the IFRB shall be based, *inter alia*, on:

- the relevant provisions of the Radio Regulations and the Appendices thereto,
- the decisions of administrative conferences of the Union, as appropriate,
- the Recommendations of the CCIR,

– the state of the radio art,

– the development of new transmission techniques,

account being taken of exceptional propagation conditions which may prevail in certain regions;

e) that, in accordance with No. **1770** of the Radio Regulations, the Technical Standards of the IFRB shall be based on the items listed in paragraph *d)* above, on past experience in broadcasting planning, and on the experience gained by the Board in the application of the provisions of Article **17** of the Radio Regulations;

f) that, with respect to the Technical Standards of the IFRB, the CCIR could provide competent advice on technical matters;

g) the importance of the active involvement of administrations in the process of revising the technical parameters,

resolves

1. that, following each CCIR Plenary Assembly, the IFRB shall review its Technical Standards relating to the technical parameters of HF broadcasting in the light of new or modified CCIR Recommendations, and shall circulate to all administrations the results of its review, indicating the reasons for its proposed actions;

2. that, whenever the IFRB considers it appropriate to review its Technical Standards relating to the technical parameters of HF broadcasting without departing from the decisions of this Conference, it shall circulate to all administrations the proposed changes and the reasons for them;

3. that, before implementing any changes, the IFRB shall request administrations to provide their comments on the subjects referred to in *resolves* 1 and 2 within 4 months, and shall take them into account, unless it would be impossible to do so;

4. that the IFRB shall circulate a summary of comments received from administrations, together with the Board's views thereon, indicating whether a meeting of experts is necessary or not, before a final decision is taken. If a significant number of replies subsequently received from administrations supports the need for such a meeting, the Board shall proceed accordingly. If not, the Board shall inform the administrations accordingly and allow an appropriate period for further comments before taking its final decision on the implementation of the proposed changes;

5. that if, on the subject referred to in *resolves* 1 above and following the action mentioned in *resolves* 3 and 4 above, the Technical Standards of the IFRB are not modified, the IFRB shall prepare a contribution to the CCIR indicating the provisions of the new or modified CCIR Recommendations that were not included in the IFRB Technical Standards, together with any information required for further study of the matter.

RESOLUTION No. 515 (HFBC-87)

Improvements to the HFBC Planning System and the Consultation Procedures

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that its First Session, held from 10 January to 11 February 1984, adopted a planning method based on seasonal planning and instructed the IFRB to prepare the appropriate software and to test it using variations of criteria;

b) the Report of the IFRB on its activities during the intersessional period;

c) that the planning exercises demonstrated that the HFBC Planning System, developed by the IFRB on the basis of the decisions of the First Session, did not allow all the requirements submitted by administrations to be included in the draft seasonal plans;

d) that, to enable all HFBC requirements of administrations to be implemented, the procedure of the present Article **17** of the Radio Regulations should be improved, and used in combination with an improved HFBC Planning System;

e) that the working assumptions used by the IFRB in the planning exercises were reviewed and the HFBC Planning System was revised;

f) that consequently there is a need to modify the relevant software and to test the HFBC Planning System before its final adoption by a competent world administrative radio conference (see Resolution **511 (HFBC-87)**),

resolves that the IFRB

1. shall, in the post-conference period, improve the software for the procedures relating to the HFBC Planning System (Section 3 of Annex 1) and the procedures based on consultations (Section 2 of Annex 1), in accordance with the provisions contained in Annex 1 to this Resolution;

2. shall test both procedures, in the post-conference period, using the requirements in the requirements file. When submitting requirements, administrations shall indicate which of the requirements should be dealt with under the HFBC Planning System, and which under the Consultation Procedure;

3. shall carry out the above tests in the bands indicated in Annex 2 to this Resolution;

4. shall report regularly to administrations, at intervals not exceeding six months, the results of the work carried out under *resolves* 1, 2 and 3;

5. shall prepare and communicate a final report to administrations twelve months prior to the convening of the competent world administrative radio conference (see Resolution **511 (HFBC-87)**).

ANNEX 1 TO RESOLUTION No. 515 (HFBC-87)

Section 1. HFBC Requirements File

1. Administrations shall submit to the IFRB their operational broadcasting requirements and those which are expected to become operational in the bands allocated exclusively to the broadcasting service between 5 950 and 26 100 kHz. These requirements shall be entered in the HFBC requirements file, which shall contain:

- requirements intended for use within the next seasons;
- all requirements taken into account in the preparation or during the operation of a seasonal schedule or plan;
- requirements used during the preceding five-year period.

2. An entry in the HFBC requirements file shall be defined as a requirement indicated by an administration as necessary to provide a broadcasting service at specified periods of time to a specified reception area from a particular transmitting station.

3. Each requirement listed in the HFBC requirements file shall contain at least the basic information listed in Appendix **2** together with an indication of the season(s) in which the requirement was or will be used.

4. Each seasonal schedule or seasonal plan to be established shall cover one of the seasonal propagation periods indicated below. The month shown in the parentheses indicates the month to be used for the propagation prediction:

- Season D – November-February (January);
- Season M – March-April (April);

- Season J – May-August (July);
- Season S – September-October (October).

Each seasonal plan or seasonal schedule shall be implemented at 0100 hours UTC on the first Sunday of the season concerned.

5. Administrations shall notify the Board, using Appendix **2**, of any addition, modification or deletion of a requirement in the HFBC requirements file. Additions, modifications or deletions notified to the Board for a given season shall be taken into account for updating the requirements file provided that, following their examination by the Board, they are found to contain the basic information referred to in Appendix **2**.

6. On receipt of notices pursuant to paragraph 5 above, the Board shall ensure that the basic information listed in Appendix **2** has been provided and is correct and, if necessary, shall request the notifying administration to supply corrected or missing information. Following this examination the Board shall indicate those incompatibilities which can be identified without the need for detailed calculations and shall inform the administrations concerned of the results obtained together with any recommendation that may assist in avoiding this incompatibility.

7. After the end of each seasonal period the Board shall enter into the requirements file, for each requirement, the frequency or frequencies used, together with any indication from administrations of the actual use of the requirement. Requirements already used shall be kept in the HFBC requirements file for a period of five years. No priority shall be derived from this history of use.

8. An administration shall inform the Board when a broadcasting requirement is temporarily withdrawn, due to a natural disaster or other calamitous event, for a period of time not exceeding five years. The Board shall identify this requirement in the file by an appropriate symbol. When the administration concerned informs the Board that the requirement can be brought back into service and requests the removal of the symbol, the Board shall act in conformity with the request. If a request for the removal of the symbol is not received by the Board within the period of five years referred to above, the requirement shall be deleted from the file.

Section 2. Procedures Based on Consultations

9. Periodically, administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may also notify additions, modifications or deletions. For this purpose, administrations shall furnish to the Board at least the basic information listed in Appendix **2**. When the Board finds that the information submitted by administrations is in conformity with the said Appendix, it shall update the seasonal file accordingly.

Administrations may:

- submit, for all or part of their requirements, the frequencies they intend to use;
- request the Board to select the appropriate frequencies for their requirements.

A seasonal file shall be established on the basis of this information.

10. The frequencies to be included in the seasonal schedule shall be in conformity with No. **1240** of the Radio Regulations.

11. The closing date for the receipt of the information referred to in paragraph 9 shall be set by the Board. The Board shall gradually reduce the period between the closing date and the start of season to the minimum possible.

12. If, in spite of reminders by the Board, no reply is received from an administration by the date set by the Board as in paragraph 11, the Board shall consider that the requirements appearing in the requirements file for the season under consideration are confirmed if they were in operation during the previous season.

13. The IFRB shall identify, for each requirement, its appropriate bands and shall calculate the field strength at each test point, and the basic broadcast reliability (BBR)[1] in each of these bands. In so doing it shall take account of the need to ensure frequency continuity as indicated in the Appendix to Section 3 of this Annex.

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[1] The English acronyms are used in all three working languages for the sake of uniformity.

14. Those requirements that cannot be included in the corresponding seasonal plan following application of the Planning System procedure contained in Section 3 of this Annex are entered in the seasonal file and dealt with in accordance with the following paragraphs.

15. The final results obtained relating to the requirements of an administration in application of paragraph 13 as well as the requirements mentioned in paragraph 14 shall be sent to the administration concerned with an indication, where appropriate, of the number of frequencies needed to achieve the required BBR.

16. When sending the results referred to in paragraph 13, the Board shall request administrations to inform it, within a period of 8 weeks, as appropriate:

- whether they intend to use some or all of the frequencies already appearing in the seasonal file;
- whether they intend to use a frequency or frequencies other than those in the seasonal file;
- of the frequency or frequencies which they intend to use for those requirements for which no frequency or frequencies appear in the seasonal file;
- whether or not the Board should select the most appropriate frequency or frequencies.

On the basis of the information referred to in paragraph 9, the Board shall select one or more frequencies for any requirement for which the information received does not specify a frequency, and for any requirement concerning which no information has been received from the administration within this period.

17. Administrations may, following receipt of the information referred to in paragraph 13, communicate additional requirements in the form prescribed in Appendix **2** with or without indication of the selected frequency. These additional requirements shall be included in the seasonal file.

18. At the end of the period indicated in paragraph 16 the Board shall repeat the calculations referred to in paragraph 13 and shall determine the number of appropriate frequencies necessary for each requirement. If an administration has indicated a number of frequencies for a requirement which exceeds the number resulting from the Board's calculations in application of the Appendix to Section 3 to this Annex, the Board shall, in consultation with the notifying administration, reduce the number of frequencies for the requirement in question to the number resulting from the Board's calculations.

19. The Board shall select frequencies for those requirements which have neither frequencies selected by the notifying administration nor preset frequencies. In so doing, the Board shall take into account the need to ensure frequency continuity as indicated in paragraph IV.3 of the Appendix to Section 3 of this Annex. The Board shall undertake a calculation of the possible incompatibilities between all requirements and an assessment of the performance of each requirement as indicated in Section VIII of the above-mentioned Appendix.

20. A seasonal schedule shall be prepared for publication, indicating for each requirement the frequency or frequencies, notified or selected, and the basic characteristics enabling administrations to identify easily the requirement concerned. This schedule shall be sent to administrations 2 months before the start of the season. At the same time the Board shall send to each administration detailed results of the calculations and performance assessment for its requirements, indicating, for each requirement, the requirements with which it is incompatible. In addition, the Board shall promptly provide, on request, all other information deemed necessary by an administration.

However, administrations are urged to take all possible action to resolve incompatibilities prior to the start of the season. In their attempts to resolve the incompatibilities, administrations will take into consideration the principles stated in Section II of Article 17.

21. Taking into account all available data, the Board shall, where practicable, make recommendations to eliminate the incompatibilities and shall send them to administrations along with the seasonal schedule.

In preparing its recommendations to administrations, the Board shall take into account monitoring observations and all other available data. However, when actual frequency usage is apparently not in conformity with the assignments in a submitted schedule, the Board shall seek confirmation of this information from the administration concerned.

22. After publication of the seasonal schedule, administrations may notify additions, modifications or deletions in their seasonal requirements. However, administrations are urged to refrain from submitting additional requirements at this stage.

23. For changes notified in accordance with paragraph 22, the Board shall apply the procedure specified in paragraph 18. Such revisions to the seasonal schedules shall be published in the IFRB weekly circular.

Record of Seasonal Usage

24. After the end of each seasonal period, the Board shall update the requirements file to reflect the actual usage during the season as notified to the Board. Those assignments which the administrations found to be unsatisfactory in practice shall be reported to the Board and marked in the requirements file by an appropriate symbol.

25. Upon request, the IFRB shall make available to administrations the information on frequency usage during the season, on computer tape or in any other machine readable form.

Miscellaneous Provisions

26. The Technical Standards used by the Board when applying the provisions of this Annex should be based not only on the factors listed in No. **1454** of the Radio Regulations but also on past experience in broadcasting planning and on the experience gained by the Board in the application of Article **17** of the Radio Regulations (see also Resolution **514 (HFBC-87)**).

27. With a view to the eventual development of compatible technical plans for the frequency bands concerned, the Board shall take all necessary steps to carry out long-term engineering studies. For this purpose, the Board shall use all the information on frequency usage made available to it in the application of the procedure described in this Annex. The Board shall inform administrations at regular intervals of the progress and results of such studies.

28. In applying Article **22** of the Radio Regulations, Administrations shall resolve problems of harmful interference which may arise in frequency usage in the bands concerned by exercising the utmost goodwill and mutual cooperation, and by giving due consideration to all the relevant technical and operational factors involved.

Section 3. Procedures Relating to the HFBC Planning System

29. Periodically, administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may also notify additions, modifications or deletions. When the Board finds that the information submitted by administrations is in conformity with Appendix **2**, it shall establish the seasonal file accordingly.

30. The broadcasting requirements of administrations shall be submitted on the requirements form set out in Appendix **2** which specifies the data to be furnished.

31. The closing date for receipt of the information referred to in paragraph 29 shall be set by the Board. The Board shall gradually reduce the time period between the closing date and the start of the season to the minimum possible.

If, in spite of reminders by the Board, no reply is received from an administration by the closing date set by the Board, the Board shall consider that the requirements appearing in the requirements file for the season under consideration are confirmed if they were in operation during the previous season.

32. The IFRB shall calculate for each band the field strength at each test point and the basic broadcast reliability (BBR) and shall identify the appropriate bands for each requirement. In so doing it shall also take account of the need to ensure frequency continuity as indicated in the Appendix to this Section.

33. The IFRB shall, on the basis of the above calculations, apply the rules contained in the Appendix to this Section, from which the following results are derived for each hour/band:

a) a list of resolved requirements that will be entered in the seasonal plan, including:

i) requirements with an RF protection ratio greater than or equal to 17 dB;

ii) requirements with an RF protection ratio less than 17 dB. Consultations shall be undertaken with administrations which so request in their requirements forms;

b) a list of the requirements that could not be entered into the seasonal plan under *a)* above and which will be dealt with in accordance with Section 2 of this Annex.

34. The Board shall consult those administrations that wish to be consulted and have requirements of the type referred to in paragraph 33*a)* ii) above to ascertain whether they wish their requirements to be entered in the seasonal plan with the characteristics notified and the resulting RF protection ratios.

35. When administrations that wish to be consulted and have requirements of the type referred to in paragraph 33*a)* ii) above have indicated that they do not wish their requirements to be inserted in the seasonal plan under the specified conditions, the Board shall transfer those requirements to the list referred to in paragraph 33*b)*.

36. The Board shall establish a time limit for administrations to submit new requirements, and shall process these requirements and endeavour to insert them in the seasonal plans following the steps indicated in the Appendix to this Section without adversely affecting[1] those requirements already entered in the seasonal plans.

37. Administrations that so wish may request the Board to select alternative frequencies for their requirements. The Board shall endeavour to select alternative frequencies without adversely affecting[1] the requirements appearing in the plan. If the Board receives no comment from administrations following the publication of the seasonal plan, it shall consider that the frequencies indicated in the seasonal plan will be assigned by administrations to their stations.

APPENDIX TO SECTION 3 OF ANNEX 1 TO RESOLUTION No. 515 (HFBC-87)

Rules Applicable to the HF Bands which are Allocated Exclusively to the Broadcasting Service and are to be Planned

I. *Introduction*

The application of this Appendix shall ensure the best possible use of all the available channels.

[1] The criteria to determine whether a requirement is adversely affected are to be found in paragraph IV.4.2.12 of the Appendix to this Section.

II. *Definitions*

II.1 *Appropriate frequency band*

The appropriate band for a requirement is the band which will ensure the continuity of use of the same frequency during the longest possible period of operation, with the best possible values of basic broadcast reliability (BBR), taking account of propagation conditions, operational limitations and equipment availability and constraints.

II.2 *Circuit reliability*

Probability for a circuit that a specified performance is achieved at a single frequency.

II.3 *Reception reliability*

Probability for a receiver that a specified performance is achieved, taking into account all transmitted frequencies.

II.4 *Broadcast reliability*

Probability for a service area that a specified performance is achieved, taking into account all transmitted frequencies.

Note 1: In the above terms, "circuit" means a one-way transmission from one transmitter to one receiving location.

Note 2: The term "reliability" is qualified by the word "basic" when the background consists of noise alone.

Note 3: When the background consists of both noise and interference, the term "reliability" may relate either to the effects of a single interferer or to multiple interference from co-channel and adjacent-channel transmissions.

Note 4: The specified performance is expressed by a given value of signal-to-noise ratio or signal-to-(noise plus interference) ratio.

Note 5: The time periods to which the term "reliability" relates shall be stated.

II.5 *Percentile*

The X percentile (X%) value for a given set of values is defined by the following conditions:

1) the *X% value* is a member of the set of values;

2) the *X% value* is that value which is equal to or exceeded by at least X per cent of the members in the set;

3) the *X% value* is the largest value satisfying conditions 1) and 2).

II.6 *Radio-frequency (RF) wanted-to-interfering signal ratio*

The ratio, expressed in dB, between the values of the radio-frequency voltage of the wanted signal and the interfering signal, measured at the receiver input under specified conditions[1].

II.7 *Relative radio-frequency protection ratio*

The difference, expressed in dB, between the protection ratio when the carriers of the wanted and unwanted emissions have a frequency difference of ΔF (Hz or kHz) and the protection ratio when the carriers of these emissions have the *same frequency.*

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[1] The specified conditions include such diverse parameters as: spacing ΔF of the wanted and interfering carrier, emission characteristics (type of modulation, modulation depth, carrier-frequency tolerance, etc.), receiver input level, as well as the receiver characteristics (selectivity, susceptibility to cross-modulation, etc.).

II.8 *Term relating to the service area*

– *Required service area (in HF broadcasting):* The area within which an administration proposes to provide a broadcasting service.

II.9 *Minimum usable field strength* (E_{min})[1]

Minimum value of the field strength necessary to permit a desired reception quality, in specified receiving conditions, in the presence of natural and man-made noise, but in the absence of interference from other transmitters.

II.10 *Usable field strength* (E_u)[1]

Minimum value of the field strength necessary to permit a desired reception quality, in specified receiving conditions, in the presence of noise and interference, either in an existing situation or as determined by agreements or frequency plans.

III. *Propagation prediction method*

The propagation prediction method to be used shall be that contained in the Technical Standards of the IFRB[2]. For propagation prediction purposes, the year shall be sub-divided into four seasons and predictions shall be made for a single month to represent a season, as specified in Section 1 of Annex 1 to this Resolution (HFBC requirements file).

The solar index to be used for planning shall be the twelve-month running mean sunspot number R_{12}. The seasonal plan shall be prepared in accordance with the values of R_{12} for the period concerned. The lowest value of R_{12} predicted for any of the months in that season shall be used.

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[1] The terms "minimum usable field strength" and "usable field strength" refer to the specified field strength values which a wanted signal must have in order to provide the required reception quality.

In determining whether these requirements are met, the median value (50%) of a fading signal should be used.

[2] See also Recommendation **512 (HFBC-87)**.

IV. *HFBC Planning System*

IV.1 *Test points*

The set of test points listed in the Technical Standards of the IFRB shall be used to represent the CIRAF Zones and quadrants for planning purposes (see also IV.4.1.1).

Where a required service area, as notified by an administration in conformity with Appendix **2**, does not include a test point, the IFRB shall establish a new test point and include it in its Technical Standards. Such additions to its Technical Standards shall be distributed to administrations (Nos. **1001** and **1001.1** of the Radio Regulations).

IV.2 *Planning constraints*

IV.2.1 *Preset frequency*

When an administration indicates that its facilities can operate only on a limited number of fixed specified frequencies, the planning method shall take this into account as indicated in paragraph IV.4.2.10.

IV.2.2 *Limited use of the frequency bands*

a) When an administration indicates that its facilities can operate only in a given frequency band, only frequencies from that band shall be included in the plan.

b) When an administration indicates a preferred frequency band, the system shall attempt to select a frequency from this band. If this is impossible, frequencies from the nearest appropriate band shall be tried. Otherwise the system will select frequencies from the appropriate band, taking into account the equipment constraints referred to in paragraph IV.2.1.

IV.2.3 *Power*

a) When an administration indicates only a single power value due to equipment constraints, it shall be used in the planning process.

b) When an administration indicates several possible power values, the appropriate value shall be used to achieve the basic circuit reliability, and a single power value shall be determined for the duration of the emission.

IV.2.4 *Antenna*

When an administration indicates that its antenna can operate only in a given frequency band, only frequencies from that band shall be included in the plan.

IV.2.5 *Preferred frequency*

In accordance with the planning principles and without imposing constraints on planning, the following provisions shall be applied in the seasonal plans:

1) administrations may indicate a preferred frequency;

2) during the planning process, attempts shall be made to include the preferred frequency in the plan;

3) if this is impossible, attempts shall be made to select a frequency in the same band.

Otherwise, the HFBC Planning System shall be used to select the appropriate frequencies in such a way as to accommodate the maximum number of requirements, taking into account the constraints imposed by the technical characteristics of the equipment.

IV.3 *Frequency continuity*

IV.3.1 *Introduction*

Continuity in the use of a frequency is an important matter for both the broadcaster and the listener; it is a characteristic inherent in the broadcasting of a programme. In addition, limitations imposed by the technical characteristics of the means of transmission available to some administrations will impose mandatory requirements for frequency continuity. The desirable aim is that changes in frequency should be limited to those necessitated by variations in propagation conditions. The rules for applying frequency continuity are given in paragraph IV.3.4 below.

IV.3.2 *Definitions*

IV.3.2.1 *Intra-seasonal continuity*

IV.3.2.1.1 *Type 1 continuity*

Continuity of use of the same frequency within an hour or from one hour to the following hour for one requirement.

IV.3.2.1.2 *Type 2 continuity*

Continuity of use of the same frequency in the same season when passing from one requirement to another or one time block to another.

IV.3.2.2 *Inter-seasonal continuity*

IV.3.2.2.1 *Type 3 continuity*

Continuity of use of the same frequency for the same requirement in two consecutive seasons.

IV.3.2.2.2 *Type 4 continuity*

Continuity of use of the same frequency for the same requirement in two consecutive equinoctial seasons.

IV.3.2.2.3 *Type 5 continuity*

Continuity of use of the same frequency for the same requirement in the same season in two consecutive years.

IV.3.3 *Relationship between frequency continuity and appropriate band(s)*

IV 3.3.1 When a single frequency is sufficient to provide basic broadcast reliability (BBR) equal to or greater than the agreed reference value, the appropriate band is to be determined by the HFBC Planning System by taking account, *inter alia*, of the rules set out in paragraph IV.3.4 regarding the maintenance of the maximum frequency continuity within the limits of the agreed reference value for BBR (80%).

However, an administration may choose extended frequency continuity at the expense of BBR; in this event, it shall indicate the lower value of BBR to be used. As, in this portion of the requirement, the BBR falls below the above-mentioned reference value, the second and/or third frequencies are allowed only when the application of frequency continuity would not result in a number of additional frequencies greater than would be necessary with operation in the appropriate bands.

IV.3.3.2 When BBR obtainable by use of a single frequency is less than 80%, continuity of use of the first frequency or the single operating frequency will be assured within the lower limit of BBR indicated by the administration.

When the administration indicates that it is able to operate on more than one frequency, the use of this lower value of BBR shall not entail the use of a third frequency.

IV.3.3.3 When the requirement under consideration may use a second or third frequency according to the procedures established in Section VII of this Appendix, frequency continuity shall also be applied to the second (and third) frequency in the same manner as for the first frequency.

IV.3.3.4 When type 2 continuity is requested (from one requirement to another), the HFBC Planning System shall identify the appropriate band separately for each of the requirements concerned. The frequency assigned to the first of these requirements shall be assigned to the other related requirement if it is in its appropriate band.

IV.3.4 *Application of continuity*

IV.3.4.1 Type 1 continuity shall be applied automatically to all requirements under the conditions set out in paragraph IV.3.3 above.

IV.3.4.2 At the request of an administration, type 2 continuity shall be applied when this corresponds to equipment constraints. However, in other cases, this continuity may be applied to the extent possible (see paragraph IV.3.3.4 above).

IV.3.4.3 Continuity of types 3, 4 and 5 shall be applied to the extent possible when requested by the administration.

IV.4 *Planning steps and rules for dealing with incompatibilities*

IV.4.1 *Definitions*

IV.4.1.1 *Unit of service area*

Each CIRAF Zone is divided into one to four units of area called "quadrants"; these are depicted in the map of Section C of Appendix **2**. Any such "quadrant" containing at least one test point of a given requirement is called a "unit of service area" for the given requirement.

IV.4.1.2 A *group of incompatible requirements (GIR)** is a set of requirements, each of which is incompatible[1] with all other requirements in the set.

IV.4.1.3 The *GGIR*[1] *(greatest GIR)* is a GIR which contains the largest number of requirements.

IV.4.1.4 The *MGIR*[1] *(maximal GIR)* is the set of all requirements contained in at least one GGIR.

IV.4.2 *Planning steps and rules*

IV.4.2.1 The MGIR concept is used in the planning method to evaluate congestion.

IV.4.2.2 Congestion is evaluated by determining the GGIR and by comparing the number of channels required by that group with the number of channels available in the band considered.

IV.4.2.3 When, in a given hour/band, no congestion is found, the requirements concerned, for which a frequency will be identified, shall be entered in a "file of resolved requirements".

IV.4.2.4 When congestion is identified in a given hour/band by means of a GGIR, the requirements included in the MGIR will have their RF protection ratio reduced by 3 dB with a view to resolving the congestion. If, following this action, the congestion is not resolved, another MGIR is identified and the process is repeated until it is impossible to find a solution with an RF protection ratio of 17 dB. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved requirements".

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[1] Refer to the Technical Standards of the IFRB.

* *Note by the General Secretariat:* The English acronyms are used in all three working languages for the sake of uniformity.

IV.4.2.5 If the congestion is not resolved following the application of IV.4.2.4, a new MGIR is identified, as well as, for each administration, a set of requirements in the band under consideration with identical service areas. The planning process then identifies for transfer to the procedure in Section 2 of Annex 1 to this Resolution a number of such requirements in order to resolve the congestion. In order to identify the requirements to be transferred first, administrations having requirements in the MGIR are sorted in decreasing order of the number of such requirements. The process is repeated as many times as necessary until the congestion is resolved or the number of such requirements becomes equal to one per administration concerned. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved requirements".

IV.4.2.6 If the congestion is not resolved following the application of IV.4.2.5, all requirements of a given administration appearing in a MGIR have different service areas, some of them having common units of service area. More transfers may be required in order to resolve the congestion; they shall be made by having recourse to the identification of the unit of service area which appears most often in the requirements of a given administration in the hour/band under consideration. Once this unit of service area is identified, administrations having it in their requirements are sorted in decreasing order of the number of their requirements where this unit appears, with a view to transferring to the procedure in Section 2, requirements containing the unit of service area which appears most often. The GGIR is re-evaluated to determine whether congestion exists and the process is repeated as many times as necessary until the congestion is resolved or the number of such requirements becomes one per administration concerned. This rule shall be applied in such a way that any quadrant notified by an administration in the hour/band under consideration appears at least once in the plan. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved requirements".

IV.4.2.7 If the congestion is not resolved following the application of IV.4.2.6 the same rule is applied taking account of the requirements in all the bands in order to identify the requirements containing the unit of service area which appears most often. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved requirements".

IV.4.2.8 If the congestion is not resolved following the application of IV.4.2.7, each requirement appearing in the MGIR is examined in order to establish whether it appears in two or three bands due to its low BBR. Such a requirement may be transferred to the procedure in Section 2 if it appears in another band with a better BBR. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved requirements".

IV.4.2.9 If the congestion is not resolved following the application of IV.4.2.8, the requirements included in the MGIR shall have their RF protection ratio reduced by 3 dB. Following this action another MGIR is identified, and the 3 dB reduction shall be applied to requirements appearing in the new MGIR not yet affected by this reduction. The process of reduction by 3 dB shall be repeated until congestion is removed. Additional reductions of the RF protection ratio by steps of 3 dB are made in the same manner until all the remaining requirements are entered in the "file of resolved requirements". In this manner all requirements which, as a result of the previous steps, have not been transferred to the procedure in Section 2, have been placed in a "file of resolved requirements". This file contains, therefore, all the requirements which will always appear in the "seasonal plan". This will be the case of requirements with an RF protection ratio less than 17 dB; however, the requirements of those administrations who so wish may be transferred to the procedure in Section 2 as a result of consultation with the IFRB.

IV.4.2.10 Following the application of the above steps for the resolution of incompatibilities, frequencies shall be identified for the requirements appearing in the "file of resolved requirements". This process shall be applied as follows:

- requirements with a single preset frequency shall be granted this frequency;

- requirements with more than one preset frequency shall be granted that frequency that has the least degree of incompatibility;

- if two requirements have the same preset frequency, which after analysis results in an incompatibility, the case is referred to the administration(s) concerned;

- requirements with a preferred frequency, attempts shall be made to grant them this frequency.

IV.4.2.11 Before transferring a requirement to the procedure in Section 2, the Board shall verify whether the administration has indicated that the frequency continuity shall be applied in all circumstances. If so, the requirement shall be transferred to Section 2, throughout the entirety of its transmission period within the appropriate band.

IV.4.2.12 Requirements received by the IFRB after the beginning of the planning exercise are entered in the plan on condition that they do not adversely affect the requirements already entered in the plan. In applying this provision, a requirement already entered in the plan with an RF protection ratio exceeding 17 dB is deemed to be adversely affected if its RF protection ratio is reduced below 17 dB. A requirement already entered in the plan with an RF protection ratio lower than 17 dB is deemed to be adversely affected if its RF protection ratio is reduced by more than 1 dB.

IV.4.3 *Actions relating to harmful interference*

In the event of harmful interference to an HF broadcasting service which is using an assignment in accordance with a current seasonal plan, the administration concerned shall have the right to request the prompt assistance of the IFRB in finding another frequency to help restore that service to the level of performance achieved in the plan. Any new frequency proposed by the IFRB shall not adversely affect the seasonal plan in operation. The central automated system must be able to respond, as far as possible, to such requests from administrations. The cause of a situation of harmful interference shall find its definitive solution in accordance with Article **22** of the Radio Regulations. The original frequency shall be made available for future use once this problem has been solved.

V. *Reliability*

V.1 *Calculation of basic circuit reliability (BCR)**

The method for calculating basic circuit reliability (BCR) is given in Table 1 which describes steps (1) to (11). The median value of field strength for the wanted signal at step (1) is determined by the field strength

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* *Note by the General Secretariat:* The English acronyms are used in all three working languages for the sake of uniformity.

prediction method. The upper and lower decile values, steps (2) to (5) inclusive, are also determined, taking account of long-term (day-to-day) and short-term (within the hour) fading. The combined upper and lower deciles of the wanted signal are then calculated at steps (6) and (7) in order to derive the signal levels exceeded for 10% and 90% of the time at steps (8) and (9).

TABLE 1

Parameters used to compute basic circuit reliability (BCR)

Step	Parameter	Description	Source
(1)	$E_u(50)$ dB(μV/m)	Median field strength of wanted signal [1]	IFRB Technical Standards
(2)	$D_U(S)$ dB	Upper decile of slow fading signal (day-to-day)	IFRB Technical Standards
(3)	$D_L(S)$ dB	Lower decile of slow fading signal (day-to-day)	IFRB Technical Standards
(4)	$D_U(F)$ dB	Upper decile of fast fading signal (within the hour)	IFRB Technical Standards
(5)	$D_L(F)$ dB	Lower decile of fast fading signal (within the hour)	IFRB Technical Standards
(6)	$D_U(E_u)$ dB	Upper decile of wanted signal	$\sqrt{D_U(S)^2 + D_U(F)^2}$
(7)	$D_L(E_u)$ dB	Lower decile of wanted signal	$\sqrt{D_L(S)^2 + D_L(F)^2}$
(8)	$E_u(10)$ dB(μV/m)	Wanted signal exceeded 10% of the time	$E_u + D_U(E_u)$
(9)	$E_u(90)$ dB(μV/m)	Wanted signal exceeded 90% of the time	$E_u - D_L(E_u)$
(10)	E_{min} dB(μV/m)	Minimum usable field strength	IFRB Technical Standards
(11)	BCR	Basic circuit reliability	Formula (1) or Figure 1

[1] In the calculation of BCR at the test points within the required service areas of synchronized transmitters, the field strength value to be used is obtained by the method of root sum square addition of the constituent field strengths in microvolts/metre (μV/m).

The wanted signal probability distribution, assumed to be log-normal, is illustrated in Figure 1 (plotted on a normal probability scale for the abscissa) which indicates the signal level (in decibels) versus the probability that the value of signal level is exceeded. This distribution is used to obtain the *basic circuit reliability* (11), which is the value of probability corresponding to the minimum usable field strength (10).

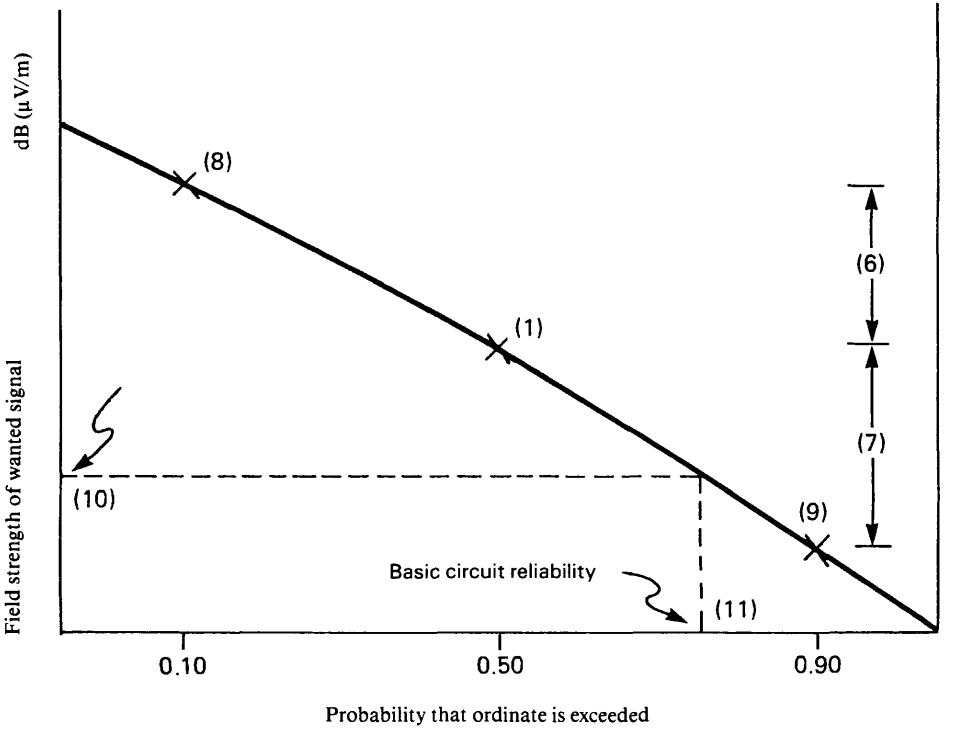

FIGURE 1

Parameters used to compute basic circuit reliability (BCR)

(Figures appearing in brackets refer to the step numbers in Table 1.)

The basic circuit reliability is given by the formula:

$$\mathrm{BCR} = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\gamma} \exp(-\tau^2/2)\,\mathrm{d}\tau \qquad (1)$$

when $E_w \geqslant E_{min}$:

$$\gamma = \frac{E_w - E_{min}}{\sigma_L}$$

$$\sigma_L = D_L(E_w)/1.282$$

when $E_w < E_{min}$:

$$\gamma = \frac{E_w - E_{min}}{\sigma_U}$$

$$\sigma_U = D_U(E_w)/1.282$$

V.2 *Calculation of median signal-to-interference ratio (S/I)*

The method of calculation is shown in Table 2. In step (1), the median wanted signal level is computed by the propagation prediction method.

In step (2), the median field strength levels (E_i) of each interfering source are obtained from the prediction method. In step (3), for a single source of interference the predicted median field strength is used; for multiple sources of interference the median field strength is calculated as follows: the field strengths of the interfering signals E_i are listed in decreasing order. Successive root sum square (r.s.s.) additions of the field strengths E_i are computed, stopping when the difference between the resultant field strength and the next field strength is greater than 6 dB. In step (3), the last computed value represents the resultant interference field strength I.

The values of the wanted signal and interference determined in steps (1) and (3) are combined in step (4) to obtain the median signal-to-interference ratio.

TABLE 2

Calculation of median signal-to-interference ratio (S/I)

Step	Parameter	Description	Source
(1)	E_w dB(μV/m)	Median field strength of wanted signal	IFRB Technical Standards
(2)	E_i dB(μV/m)	Median field strength of interfering signals E_1, E_2, ... E_n	IFRB Technical Standards
(3)	I dB(μV/m)	Resultant field strength of interference	$I = 20 \log_{10} \sqrt{\sum_{i=1}^{n} 10^{\left(\frac{E_i + \alpha_i}{10}\right)}}$ [1]
(4)	S/I	Median signal-to-interference ratio	$E_w - I$

[1] α_i is the appropriate relative protection ratio corresponding to the carrier frequency separation between the wanted signal and the unwanted signal.

V.3 *Basic reception reliability (BRR)**

The method for computing basic reception reliability (BRR) is given in Table 3. With a single frequency, basic reception reliability is the same as the basic circuit reliability (BCR) defined in paragraph V.1. With multiple frequencies, the interdependence between propagation conditions at different frequencies leads to the computation method given in Table 3. In steps (4) and (6), BCR (n) is the basic circuit reliability for frequency n, where $n = F_1$, F_2, etc. The *basic reception reliability* is obtained in step (2) for a single frequency, in step (4) for a set of two frequencies and in step (6) for a set of three frequencies.

---

* *Note by the General Secretariat:* The English acronyms are used in all three working languages for the sake of uniformity.

TABLE 3

Basic reception reliability

The following parameters are involved:

Single-frequency operation

Step	Parameter	Description	Source
(1)	BCR (F_1) %	Basic circuit reliability for frequency F_1	Step (11), Table 1
(2)	BRR (F_1) %	Basic reception reliability	BCR (F_1)

Two-frequency operation [1)]

Step	Parameter	Description	Source
(3)	BCR (F_2) %	Basic circuit reliability for frequency F_2	Step (11), Table 1
(4)	BRR (F_1) (F_2) %	Basic reception reliability	$1 - \prod_{n=F_1}^{F_2} (1 - \mathrm{BCR}(n))$

[1)] The two frequencies F_1 and F_2 shall be situated in different HF bands allocated to the broadcasting service.

Three-frequency operation [1]

Step	Parameter	Description	Source
(5)	BCR (F_3) %	Basic circuit reliability for frequency F_3	Step (11), Table 1
(6)	BRR (F_1) (F_2) (F_3) %	Basic reception reliability	$1 - \prod_{n=F_1}^{F_3} (1 - \mathrm{BCR}(n))$

[1] The three frequencies F_1, F_2 and F_3 shall be situated in different HF bands allocated to the broadcasting service.

V.4 *Basic broadcast reliability (BBR)*

The determination of basic broadcast reliability involves the use of test points within the required service area. The basic broadcast reliability is an extension of the basic reception reliability concept to an area instead of a single reception point. The method for computing basic broadcast reliability is shown in Table 4. In step (1), the basic reception reliabilities BRR (L_1), BRR (L_2), ... BRR (L_N) are computed as described in Table 3 at each test point L_1, L_2, ... L_N. These values are ranked in step (2) and the *basic broadcast reliability* is the value associated with the 80th percentile of the test points.

Broadcast reliability is associated with the expected performance of a broadcast service at a given hour. For periods longer than an hour, computation at one-hour intervals is required.

TABLE 4

Basic broadcast reliability

The following parameters are involved:

Step	Parameter	Description	Source
(1)	BRR (L_1), BRR (L_2), ... BRR (L_N) %	Basic reception reliability at all test points considered in the required service area	Step (2), (4) or (6), as appropriate, from Table 3
(2)	BBR (80) %	Basic broadcast reliability associated with the 80th percentile	The percentile chosen from the values ranked from (1) of this table

VI. *Proportionally reduced protection (PRP)**

Proportionally reduced protection (PRP) is a margin (M) by which the RF protection ratio to be applied at a test point may be reduced under the following specified conditions:

1) the BBR < 80%, *and*

2) only one frequency band is given by the planning system, *and*

3) at the test point considered the field strength E_w is less than E_{min} and greater than or equal to E_{min} − 10 dB.

In these conditions, M is determined as:

$$M = E_{min} - E_w$$

* *Note by the General Secretariat:* The English acronyms are used in all three working languages for the sake of uniformity.

In such cases, the proportionally reduced protection ratio is used in the evaluation of S/I at the test point considered. For all the remaining points within the required service area, full protection as determined by the relevant protection ratio is given when $E_w \geqslant E_{min}$, and no protection is given when $E_w < E_{min} - 10$ dB.

In cases where PRP is not applicable, full protection as determined by the relevant protection ratio is given when $E_w \geqslant E_{min}$, and no protection is given when $E_w < E_{min}$.

VII. *Maximum number of frequencies required per requirement*

VII.1 *Introduction*

Wherever possible, only one frequency should be used for a given requirement. In certain special circumstances, it may be found necessary to use more than one frequency per requirement, i.e.:

- over certain paths, e.g., very long paths, those passing through the auroral zone, or paths over which the MUF is changing rapidly;
- areas where the depth of the area extending outwards from the transmitter is too great to be served by a single frequency;
- when highly directional antennas are used to maintain satisfactory signal-to-noise ratios, thereby limiting the geographical area covered by the station concerned.

The decision to use more than one frequency per requirement should be taken on the merits of the particular case concerned.

The use of synchronized transmitters should be encouraged whenever possible in order to minimize the need for additional frequencies.

VII.2 *Use of additional frequencies*

The number of frequencies needed to achieve the specified level of BBR[1] shall be determined by the method given below. If the calculated BBR for a single frequency does not reach the adopted value, it is necessary to consider whether the BBR could be improved by additional frequencies in separate bands and whether the improvement would justify the use of additional frequencies.

VII.3 *Determination of additional frequency bands*

In cases where the BBR for the first band, based on all test points in the required service area, is between 50% and 80%, an additional band shall be tested using the following procedure.

Those test points whose basic circuit reliability (BCR) is less than or equal to the BBR are identified, and only these points are used to determine the second band. For each band, the minimum value of BCR (BCR_{min}) at these points is determined and that band having the highest BCR_{min} value is selected. If more than one band has this value, the highest frequency band is selected. The two-band BBR, taking account of the BRR at all test points in the required service area, is then computed, and if it exceeds the limit specified in Figure 2, the second band is permitted. In those special cases where the two-band BBR is less than 80%, a third band shall be tested as follows.

The BBR for each of the remaining bands is computed, using all the test points in the required service area. Of these bands, that band having the highest BBR is selected as the third band. If more than one band has this value the highest frequency band is selected. If the resulting three-band BBR, taking account of the BRR at all test points, exceeds the limit specified in Figure 2, the third band is permitted.

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[1] For calculation of the basic broadcast reliability (BBR), see paragraph V.4.

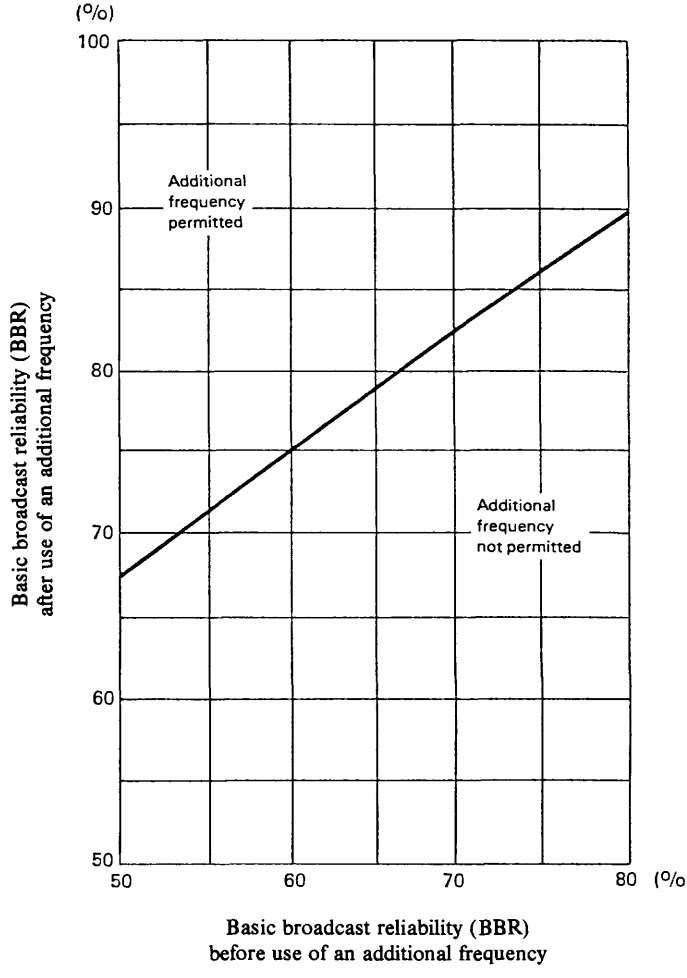

FIGURE 2

Limits for use of an additional frequency

The contents of this figure can be expressed by the following formulas:

BBR (after) > 30 + 0.75 × BBR (before) additional frequency permitted
BBR (after) ≤ 30 + 0.75 × BBR (before) additional frequency not permitted.

VIII. *Performance assessment*[1]

In order to assess the performance of a requirement, the following values should be given for each 15-minute period, each hour, or for the duration of the emission, as appropriate:

1) BBR – basic broadcast reliability at the 80th percentile of all test points;

2) percentages of test points for each frequency band where the field strength is equal to or greater than E_{min}, and E_{min} – 10 dB where proportionally reduced protection applies;

3) SIR (dB) – median signal-to-interference ratio obtained using the calculation procedure of paragraph V.2 at the 80th percentile of test points where the field strength is equal to or greater than E_{min}, or E_{min} – 10 dB where proportionally reduced protection applies. If economically practical, it would be desirable to indicate the test points which have been used in determining the median signal-to-interference ratio;

4) TP (%) – percentage of test points for each frequency band where the field strength is equal to or greater than E_{min}, or E_{min} – 10 dB where proportionally reduced protection applies, *and* the median signal-to-interference ratio is equal to or greater than 17 dB.

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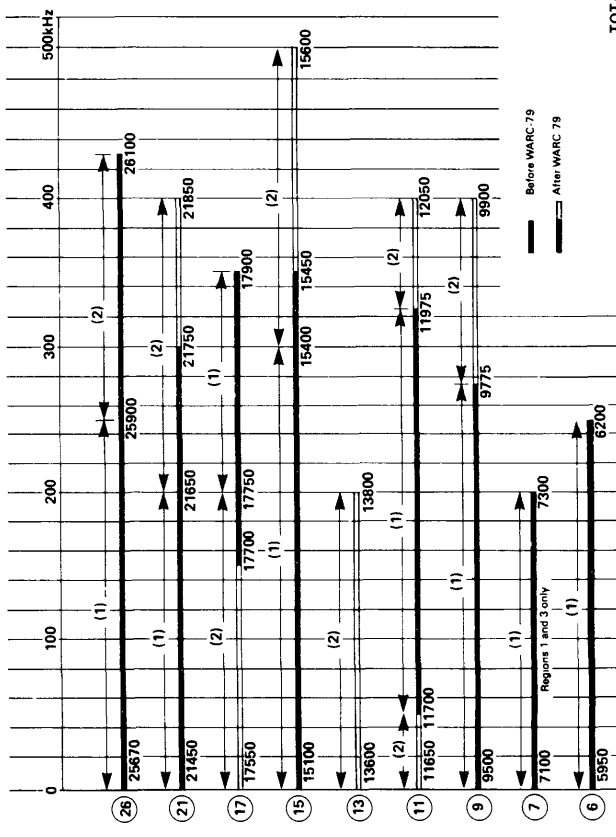
[1] The IFRB may develop additional parameters for assessing performance.

ANNEX 2 TO RESOLUTION No. 515 (HFBC-87)

	Total (kHz)	(1) Application of the consultation procedure (Annex 17) (kHz)	(2) Application of the improved HFBC Planning System (kHz)
26	430	230	200
21	400	200	200
17	350	150	200
15	500	300	200
13	200		200
11	400	275	125
9	400	275	125
7	200	200	
6	250	250	
TOTAL	3130	1880	1250



RESOLUTION No. 516 (HFBC-87)

Antennas to be Used for the Planning of the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the IFRB Technical Standards shall be developed according to Nos. **1001**, **1454** and **1770** of the Radio Regulations (see Resolution **514 (HFBC-87)**);

b) that the CCIR has published the Book of Antenna Diagrams (1984 Edition) and made available computer programs for HF antenna pattern calculations;

c) that administrations are developing improved antennas to be used for HF broadcasting;

d) that administrations may wish to use antenna types not included in the above-mentioned CCIR publication,

resolves

1. that the type of antenna most appropriate for the required service should be used;

2. that the use of antennas with a large number and size of side-lobes, e.g., rhombic antennas, should be avoided,

invites administrations

to take into account *resolves* 1 and 2 above,

further invites administrations

to provide the IFRB and the CCIR with the relevant data if they wish to use antenna types different from those included in the IFRB Technical Standards and in the CCIR Book of Antenna Diagrams,

invites the CCIR

to continue to update the Book of Antenna Diagrams,

invites the IFRB

1. to base its Technical Standards for reference antenna types on the CCIR Book of Antenna Diagrams and information supplied by administrations;

2. to publish and maintain in its Technical Standards the set of antenna characteristics to be used for HF broadcasting.

RESOLUTION No. 517 (HFBC-87)

Transition from Double-Sideband (DSB) to Single-Sideband (SSB) Emissions in the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the HF bands allocated exclusively to the broadcasting service are severely congested;

b) that the level of congestion within these HF bands is increasing;

c) that SSB techniques will provide a much more efficient utilization of the frequency spectrum than DSB techniques;

d) that SSB techniques enable reception quality to be improved;

e) that the lifetime of a transmitter is of the order of twenty years;

f) that the lifetime of a receiver is of the order of ten years;

g) that it is economically unattractive, using current technology, to convert existing conventional DSB transmitters to SSB operation;

h) Appendix **45** to the Radio Regulations concerning the SSB system specification for the HF bands allocated exclusively to the broadcasting service;

i) that the First Session of the Conference (Geneva, 1984), in its Report to the Second Session, dealt with the progressive introduction of SSB emissions;

j) that Recommendation **515 (HFBC-87)** encourages the accelerated design and manufacture of SSB transmitters and receivers,

resolves

1. that the procedure in the Annex to this Resolution shall be used for the purpose of ensuring an orderly transition from DSB to SSB emissions in the HF bands allocated exclusively to the broadcasting service;

2. that the final date for the cessation of DSB emissions specified in the annex to this Resolution shall be periodically reviewed by competent future world administrative radio conferences in the light of the latest available complete statistics on the world-wide distribution of SSB transmitters and synchronous demodulator receivers, and that at least one such review shall be carried out before the year 2000,

invites the Administrative Council

to place, in conformity with *resolves* 2 above, the matter referred to in that paragraph as an additional item on the agendas of competent future world administrative radio conferences,

instructs the Secretary-General

to compile and maintain the statistics referred to in *resolves* 2, to make these statistics available to interested administrations and to submit summaries thereof to the competent future world administrative radio conferences,

invites administrations

to assist the Secretary-General in this task by providing the relevant statistical data.

ANNEX TO RESOLUTION No. 517 (HFBC-87)

Procedure for the Transition from Double-Sideband (DSB) to Single-Sideband (SSB) Emissions in the HF Bands Allocated Exclusively to the Broadcasting Service

1. The immediate introduction of SSB emissions is encouraged, i.e., the transition period starts immediately.

2. All DSB emissions shall cease not later than 31 December 2015, at 2359 hours UTC (see also *resolves* 2 in the body of the Resolution).

3. SSB emissions shall comply with the characteristics specified in Appendix **45** to the Radio Regulations.

4. Until 31 December 2015, 2359 hours UTC, SSB emissions intended for reception by DSB receivers with envelope demodulation, as well as by SSB receivers with synchronous demodulation, shall have a carrier reduction of 6 dB relative to peak envelope power.

5. After 31 December 2015, 2359 hours UTC, only SSB emissions with a carrier reduction of 12 dB relative to peak envelope power shall be used.

6. Until 31 December 2015, 2359 hours UTC, whenever an administration replaces its DSB emission by an SSB emission, it shall ensure that the level of interference is not greater than that caused by its original DSB emission (see also Appendix **45** to the Radio Regulations and Recommendation **517 (HFBC-87)**).

RESOLUTION No. 518 (Orb-88)

Country/Geographical Area Symbols Used in Appendix 30 (Orb-85) and Appendix 30A (Orb-88)

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

noting

that several country/geographical area symbols used in Appendix **30 (Orb-85)** have changed or are no longer appropriate and are therefore not listed in the Preface to the International Frequency List (IFL);

noting further

the provisions of No. **2237** of the Radio Regulations;

recognizing

that country symbols in the Preface to the IFL may be changed at irregular intervals, as the need arises and on the basis of prior consultation between the Secretary-General and the IFRB and the countries concerned;

considering

that there should be no discrepancies between the country/geographical area symbols listed in the Preface to the IFL and those appearing in Appendix **30 (Orb-85)** and Appendix **30A (Orb-88)**;

resolves to instruct the Secretary-General

to ensure that, when publishing updated versions of the Radio Regulations, the country/geographical area symbols used in Appendix **30 (Orb-85)** and Appendix **30A (Orb-88)** reflect the latest status, following consultation with the countries concerned.

RESOLUTION No. 519 (Orb-88)

Possible Extension to Regions 1 and 3 of Provisions for Interim Systems

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that this Conference has reviewed Resolution **42 (Orb-85)** of the First Session and has incorporated into the Radio Regulations a modified text of that Resolution containing provisions covering the use of interim systems in Region 2;

b) that this Conference has adopted a feeder-link Plan for the broadcasting-satellite service in Regions 1 and 3;

c) that some administrations in Regions 1 and 3 have expressed interest in the adoption, for these Regions, of provisions similar to those adopted for interim systems in Region 2;

d) that the broadcasting-satellite and associated feeder-link Plans for Regions 1 and 3 differ from those adopted for Region 2;

resolves

1. that a future competent conference should consider the possible application of regulatory provisions covering the operation of interim systems in Regions 1 and 3;

2. that administrations of Regions 1 and 3 wishing to bring into use interim systems of the broadcasting-satellite service before the date that may be determined by the future competent conference referred to in *resolves* 1, shall apply the provisions of Article 4 of Appendix **30 (Orb-85)** or Article 4 of Appendix **30A (Orb-88)** as appropriate, using if necessary the provisions of 4.3.15 of Appendix **30 (Orb-85)** or 4.2.16 of Appendix **30A (Orb-88)**.

3. that, when such interim systems are notified, Article 5 of Appendix **30 (Orb-85)** or Article 5 of Appendix **30A (Orb-88)**, as appropriate, shall be applied;

invites the Administrative Council

to place this matter on the agenda of the next conference competent to consider broadcasting-satellite service matters.

RESOLUTION No. 520 (Orb-88)

Future Change in Article 8 for the Broadcasting-Satellite Service (Sound) In the Frequency Range 500 MHz to 3 000 MHz

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the subject of the broadcasting-satellite service (sound) has been under consideration within the Union for a quarter of a century;

b) that the World Administrative Radio Conference, Geneva, 1979 (WARC-79) resolved in Resolution **505** that the next world administrative radio conference dealing with space radiocommunication services in general or with a specific space radiocommunication service should be authorized to consider the results of various studies and to take appropriate decisions regarding the allocation of a suitable frequency band;

c) that Recommendation 2 of the First Session of this Conference (Geneva, 1985) recommended that the Second Session of this Conference should consider the results of the various up-to-date studies and in reviewing the situation prevailing at that time take appropriate decisions concerning the various aspects of this system as outlined in Resolution **505** of WARC-79;

d) that, at the Conference Preparatory Meeting (CPM) (1984), the CCIR indicated that further work would be needed to define the system parameters;

e) that the CCIR has provided this Session of the Conference with a report on its studies relating to the broadcasting-satellite service (sound);

f) that the broadcasting-satellite service (sound) is technically feasible;

g) that there is a need by a number of administrations for broadcasting-satellite services (sound) for individual reception with low cost, portable and mobile receivers with simple antennas, in rural and urban areas;

h) that a number of administrations consider that existing services have high importance and should be protected;

i) that individual reception of sound programmes with portable and automobile receivers is not possible using the frequency bands at present allocated to the broadcasting-satellite service;

j) that several administrations made proposals to WARC-79 concerning frequency band allocations to the broadcasting-satellite service (sound) in the range 500 to 2 000 MHz;

k) that, on the basis of the technical characteristics of the systems and of propagation factors, as studied by the CCIR up to now, the band 500 to 2 000 MHz would be preferable for the implementation of the service, the lower end at approximately 500 MHz because of increasing man-made noise and transmitting antenna size with decreasing frequency, and the upper end at approximately 2 000 MHz because of the decreasing effective area of the receiving antenna and reduced diffraction around obstacles with increasing frequency;

l) that studies to date have shown that accommodation of the broadcasting-satellite service (sound) in the frequency range 500 to 2 000 MHz or nearby will cause considerable sharing difficulties with other services and that extensive use of this frequency range is now being made by many services, thus making difficult the allocation of a band to the broadcasting-satellite service (sound);

m) that recent studies and developments included in the Report of the CCIR to this Session of the Conference have shown that the use of FM modulation techniques in low latitudes, the application of advanced digital modulation techniques in higher latitudes and the possibilities of sharing on the basis of geographical separation may, under the conditions specified in the CCIR Report, facilitate band-sharing with other radiocommunication services;

n) that by taking into consideration the extended band 500 to 3 000 MHz the possibility of identifying a new frequency band for the broadcasting-satellite service (sound) is enhanced, and that in general it is not easy for a broadcasting-satellite service (sound) to share a frequency band with other services, for which reason the CCIR reports that an exclusive band allocation would be preferred;

o) that due consideration should also be given to the need for the necessary associated feeder links for the broadcasting-satellite service (sound);

p) that more time is required to design and plan a sound-broadcasting system which might be introduced in the early part of the next century and, where necessary, to plan and effect the re-accommodation of existing services for those countries interested in these services;

considering also, as regards the work of the CCIR

a) that the frequency range now being considered is 500 to 3 000 MHz;

b) that experiments have confirmed certain postulates made in theoretical studies and further, that an experimental system using advanced digital modulation techniques has been demonstrated;

c) that advanced digital modulation systems have, amongst others, the advantage of low transmitting power and, consequently present the possibility of sharing with other services, although further studies are required;

d) that further system studies are necessary before the implementation of operational systems;

e) that studies concerning this service have been conducted in accordance with Study Programme 2K-1/10 and 11;

f) that the appropriate frequency range for the service is limited by man-made noise, the size of both the transmitting and receiving antennas, propagation factors, satellite transmit power, and sharing (including sharing on a geographical basis);

g) that the bandwidth requirements of the broadcasting-satellite service (sound) will depend on the extent of the possibilities of frequency re-use;

noting

that the World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service, Geneva, 1987, in Recommendation **511 (HFBC-87)** already raised the question of a future world administrative radio conference to review and, as necessary, revise the Table of Frequency Allocations in the high frequency portion of the spectrum; and that the World Administrative Radio Conference for the Mobile Services (Mob-87), Geneva, 1987, in Resolution **208 (Mob-87)** also raised the question of a world administrative radio conference to be held not later than 1992 to consider a partial revision of the Table of Frequency Allocation in the range 1 000 to 3 000 MHz;

further noting

that the reception conditions (portable and vehicular reception) and propagation factors (echoes, selective fading, etc.) for the broadcasting-satellite service (sound) are similar to those for the mobile-satellite service and a frequency band in a similar frequency range can therefore be considered;

resolves

a) that a band (or bands) of frequencies in the range 500 to 3 000 MHz be sought with a view to a possible allocation to the broadcasting-satellite service (sound);

b) that appropriate provisions be made for the associated feeder links;

c) that appropriate provisions be made to regulate sharing, with other radiocommunication services wherever applicable, of any bands identified in *resolves a)* and *b)*;

d) that appropriate provisions be developed to protect existing services and, if necessary, to re-accommodate in other bands assignments to the stations of existing services that may be affected in those countries in which frequency bands will be allocated to the broadcasting-satellite service (sound);

resolves to recommend

that the Plenipotentiary Conference, Nice, 1989, should include in the programme of conferences the subject of the revision of the Table of Frequency Allocations in Article **8**, as referred to in *noting*, taking into account the *further noting* and the conference proposed in Resolution **208 (Mob-87)** by WARC Mob-87, in order to provide, if possible, for the necessary allocation to the broadcasting-satellite service (sound) within the frequency range 500 - 3 000 MHz and the appropriate provisions to accommodate the associated feeder links;

invites the CCIR

to pursue its technical studies on the broadcasting-satellite service (sound) in the frequency range 500 - 3 000 MHz, especially on the following issues:

a) the impact of choice of frequency on system parameters, especially satellite power requirements, the characteristics of transmitting and receiving antennas and on propagation characteristics;

b) the bandwidth required by the service;

c) the technical aspects of sharing between services with special consideration to geographical sharing,

and to provide a report to the conference referred to in the *resolves to recommend* above;

instructs the Secretary-General

to bring this Resolution to the attention of the Plenipotentiary Conference, Nice, 1989, and to the Session of the Administrative Council in 1990.

RESOLUTION No. 521 (Orb-88)

Selection of a Frequency Band for Use by the Broadcasting-Satellite Service and Intended for Wide RF-Band High Definition Television, [1] and of an Associated Frequency Band for HDTV Feeder Links, and the Adoption of Related Provisions by a Future Competent Conference

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the development of techniques for high definition television broadcasting is rapidly progressing;

b) that the frequency bands around 12 GHz allocated to the broadcasting-satellite service do not, as presently planned, provide a worldwide allocation suitable for the implementation of HDTV via satellite;

c) that a worldwide frequency allocation to the broadcasting-satellite service suitable for HDTV transmissions is desirable to facilitate the implementation of a unique worldwide standard for HDTV transmissions by satellite and to reduce interregional inter-service sharing constraints;

---

[1] The wide RF-Band High Definition Television is referred to in the text of this Resolution as HDTV.

d) that the band 22.5 - 23 GHz is allocated to the broadcasting-satellite service in Regions 2 and 3, and is authorized in those Regions subject to agreement obtained under the procedure set forth in Article **14** of the Radio Regulations;

e) that due account should be taken of other radiocommunication services appearing in Article **8** of the Radio Regulations;

considering also

a) that the CCIR has carried out a number of studies concerning the broadcasting of HDTV signals, propagation aspects, and the difficulties of sharing with other services (see the CCIR Reports to the First and Second Sessions of this Conference);

b) that the CCIR in its Report to the Second Session has concluded that:

i) narrow RF-band systems (operating in a 24 - 27 MHz channel) are characterized by relatively high degrees of bandwidth compression and by analogue modulation;

ii) wide RF-band systems (both analogue and digital) require an RF channel bandwidth typically in the order of 50 - 120 MHz;

iii) some use of the 12 GHz band, as planned, can be made for narrow RF-band systems using single channel, highly compressed signal formats and, at the expense of a significant reduction in the number of available programmes, for formats using two RF channels. However, the 12 GHz band, as planned, will not accommodate single wide RF channel high definition TV, analogue or digital signals on a worldwide basis;

iv) from a propagation point of view, all bands from 12 GHz to 23 GHz may be suitable, but rain attenuation, which increases with frequency, and atmospheric absorption need to be taken into account;

c) that this Conference has confirmed the need for a suitable band to be made available, preferably on a worldwide basis, for the future introduction of HDTV in the broadcasting-satellite service (BSS) with an associated band for HDTV feeder links, also preferably on a worldwide basis;

resolves

1. that opportunities be given in Article **8** of the Radio Regulations to achieve a well balanced situation for all Regions to facilitate the introduction of HDTV on a worldwide basis;

2. that the frequency range 12.7 - 23 GHz be considered for the choice of an appropriate band for HDTV;

3. that, while the Plans for the 11.7 - 12.7 GHz band can already be used for certain types of high definition television, studies should be continued on the long range future suitability of these bands for HDTV without prejudice to the existing plans in this band;

4. that appropriate bands be considered for associated HDTV feeder links;

5. that further studies (going beyond those presented in the Reports of the CCIR to this Conference) will be essential before the most suitable bands can be chosen;

6. that, in choosing the band for the long term use by HDTV, due account must be taken of other services with allocations in the band and of existing systems operating in the band, and a minimum period, to be determined by the Conference referred to in *resolves to recommend* 2 below, should be allowed for any re-accommodation or adjustment of these services that might arise;

resolves to recommend

1. that the Plenipotentiary Conference, Nice, 1989, when establishing the post-1989 programme of conferences and meetings, should include provision for a world administrative radio conference competent to deal, *inter alia*, with matters relating to HDTV, which should be held sufficiently early to take due account of any period that may be needed to re-accommodate or adjust other services if necessary;

2. that the Administrative Council, when establishing the agenda for the above-mentioned WARC, should ensure that the Conference is authorized:

a) to make definitive selection of, and the appropriate radio regulatory provision for, a frequency band for HDTV in the broadcasting-satellite service in the long-term and for an associated HDTV feeder-link band, both preferably on a worldwide basis;

b) to adopt appropriate provisions to regulate the sharing of any such bands with other radiocommunication services, being guided by the appropriate CCIR studies, taking into account the needs of any existing services which might perhaps have to be adjusted or re-accommodated elsewhere in the frequency spectrum, including the time required to effect any necessary changes;

c) to determine the dates for the entry into force of its decisions, including the earliest date for the introduction of HDTV and associated feeder links into any frequency bands selected for these purposes;

invites the CCIR

to undertake further studies of feeder links and down-links necessitated by this Resolution and to submit its report not later than one year before the WARC mentioned above. These studies are to include the following:

1. system parameters for HDTV transmissions by satellite, with emphasis on the effect of the choice of frequency, e.g.:

- modulation (including baseband coding and channel coding);
- satellite power requirements;
- satellite and earth station technology;
- receiving system characteristics;
- type of polarization (including propagation effects);

2. propagation characteristics, e.g.:

- attenuation, including precipitation losses;
- atmospheric absorption;
- cross-polar discrimination;

3. inter- and intra-service sharing and interference, interregional sharing;

invites administrations

to carry out studies as required, taking into account the above-listed topics, and to communicate the results to the CCIR;

instructs the Secretary-General

to bring this Resolution to the attention of the Plenipotentiary Conference, Nice, 1989, and of the Administrative Council.

RESOLUTION No. 601 (Rev. Mob-87)

Recommendations and Standards for Emergency Position-Indicating Radiobeacons Operating on the Frequencies 121.5 MHz and 243 MHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that emergency position-indicating radiobeacons operating on the frequencies 121.5 MHz and 243 MHz are intended to facilitate search and rescue operations;

b) that the frequencies 121.5 MHz and 243 MHz are in common use by aircraft engaged in search and rescue operations;

c) that the International Civil Aviation Organization (ICAO) has established recommended signal characteristics and technical specifications for aircraft equipment operating on 121.5 MHz and/or 243 MHz;

d) Appendix **37A**;

resolves

that administrations authorizing the use of emergency position-indicating radiobeacons on 121.5 MHz and/or 243 MHz should ensure that such radiobeacons comply with the relevant CCIR Recommendations and standards and recommended practices of ICAO.

RESOLUTION No. 602 (Mob-87)

Data Transmission from Maritime Radiobeacons for Differential Radionavigation Systems

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that No. **466** of the Radio Regulations provides for the transmission of supplementary navigational information using narrow-band techniques, on condition that the prime function of the beacon is not significantly degraded;

b) that the International Maritime Organization (IMO) has identified a need for data exchange between shore and ship in the case of radionavigation systems (e.g., Omega, GPS, Loran-C) operating in the differential mode;

c) that Resolution **3** of the Regional Administrative Conference for the Planning of the Maritime Radionavigation Service (Radiobeacons) in the European Maritime Area (Geneva, 1985) (EMA) invited this Conference to consider the various aspects of the use of maritime radiobeacons to transmit data to ships using either minimum shift keying (MSK) or frequency shift keying (FSK) techniques, and to choose between these two techniques;

d) that CCIR studies have shown that, for continuous data transmission, it is necessary to use a second carrier, offset from the main carrier by 300 Hz or more, to prevent interference to certain types of automatic radio direction finders, regardless of whether MSK or FSK modulation is chosen;

e) that these studies have shown that MSK modulation has advantages over FSK modulation because of its improved spectral efficiency;

f) that the EMA Conference decided that radiobeacons in the European Maritime Area would be channelled in multiples of 500 Hz;

g) that if FSK or MSK modulation with an offset of 300 Hz or more is encoded on to a radiobeacon signal in the European Maritime Area, then the digital modulation signal will be contained partly in the channel adjacent to the radiobeacon channel, particularly in the case of high-speed data transmission;

h) that many administrations prefer the use of MSK modulation;

i) that the satellite system data corrections have to be transmitted on a continuous basis;

resolves

1. that the frequency for continuous data transmission to ships using FSK or MSK modulation on maritime radiobeacons should be offset from the radiobeacon main carrier frequency by an amount sufficient to ensure that no harmful interference is caused to automatic radio direction finders;

2. that the CCIR should continue to study the technical factors, including a standard coding format, modulation method, necessary bandwidth, protection ratios and frequency offsets, such that the prime function of the radiobeacon is not significantly degraded, and make Recommendations;

3. that channelling plans for maritime radiobeacons should accommodate the transmission of data to ships using frequency offset techniques;

invites the IFRB

to consider this Resolution in preparing its technical standards and rules of procedure;

invites

the Members of the Union in the European Maritime Area to consider convening a competent regional administrative radio conference concerning a possible revision of the Regional Agreement (Geneva, 1985) for the purpose of accommodating continuous data transmission using frequency offset techniques.

RESOLUTION No. 640

Relating to the International Use of Radiocommunications, in the Event of Natural Disasters, in Frequency Bands Allocated to the Amateur Service

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that in the event of natural disaster normal communication systems are frequently overloaded, damaged, or completely disrupted;

b) that rapid establishment of communication is essential to facilitate worldwide relief actions;

c) that the amateur bands are not bound by international plans or notification procedures, and are therefore well adapted for short-term use in emergency cases;

d) that international disaster communications would be facilitated by temporary use of certain frequency bands allocated to the amateur service;

e) that under those circumstances the stations of the amateur service, because of their widespread distribution and their demonstrated capacity in such cases, can assist in meeting essential communication needs;

f) the existence of national and regional amateur emergency networks using frequencies throughout the bands allocated to the amateur service;

g) that, in the event of a natural disaster, direct communication between amateur stations and other stations might enable vital communications to be carried out until normal communications are restored;

recognizing

that the rights and responsibilities for communications in the event of a natural disaster rest with the administrations involved;

resolves

1. that the bands allocated to the amateur service which are specified in No. **510** may be used by administrations to meet the needs of international disaster communications;

2. that such use of these bands shall be only for communications in relation to relief operations in connection with natural disasters;

3. that the use of specified bands allocated to the amateur service by non-amateur stations for disaster communications shall be limited to the duration of the emergency and to the specific geographical areas as defined by the responsible authority of the affected country;

4. that disaster communications shall take place within the disaster area and between the disaster area and the permanent headquarters of the organization providing relief;

5. that such communications shall be carried out only with the consent of the administration of the country in which the disaster has occurred;

6. that relief communications provided from outside the country in which the disaster has occurred shall not replace existing national or international amateur emergency networks;

7. that close cooperation is desirable between amateur stations and the stations of other radio services which may find it necessary to use amateur frequencies in disaster communications;

8. that such international relief communications shall avoid, as far as practicable, interference to the amateur service networks;

invites administrations

1. to provide for the needs of international disaster communications;

2. to provide for the needs of emergency communications within their national regulations.

RESOLUTION No. 641 (Rev.HFBC-87)

Use of the Frequency Band 7 000 - 7 100 kHz

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the sharing of frequency bands by the amateur and broadcasting services is undesirable and should be avoided;

b) that it is desirable to have world-wide exclusive allocations for these services in Band 7;

c) that the band 7 000 - 7 100 kHz is allocated on a world-wide basis exclusively to the amateur service,

resolves

that the broadcasting service shall be prohibited in the band 7 000 - 7 100 kHz and that the broadcasting stations operating on frequencies in this band shall cease such operation,

urges

the administrations responsible for the broadcasting stations operating on frequencies in the band 7 000 - 7 100 kHz to take the necessary steps to ensure that such operation ceases immediately,

instructs the Secretary-General

to bring this Resolution to the attention of administrations.

RESOLUTION No. 642

Relating to the Bringing into Use of Earth Stations in the Amateur-Satellite Service

The World Administrative Radio Conference, Geneva, 1979,

recognizing

that the procedures of Articles **11** and **13** are applicable to the amateur-satellite service;

recognizing further

a) that the characteristics of earth stations in the amateur-satellite service vary widely;

b) that space stations in the amateur-satellite service are intended for multiple access by amateur earth stations in all countries;

c) that coordination among stations in the amateur and amateur-satellite services is accomplished without the need for formal procedures;

d) that the burden of terminating any harmful interference is placed upon the administration authorizing a space station in the amateur-satellite service pursuant to the provisions of No. **2741** of the Radio Regulations;

notes

that certain information specified in Appendices **3** and **4** cannot reasonably be provided for earth stations in the amateur-satellite service;

resolves

1. that when an administration (or one acting on behalf of a group of named administrations) intends to establish a satellite system in the amateur-satellite service and wishes to publish information with respect to earth stations in that system it may:

1.1 communicate to the IFRB all or part of the information listed in Appendix **3**; the IFRB shall publish such information in a special section of its weekly circular requesting comments to be communicated within a period of four months after the date of publication;

1.2 notify under Nos. **1488** to **1491** all or part of the information listed in Appendix **3**; the IFRB shall record it in a special list;

2. that this information shall include at least the characteristics of a typical amateur earth station in the amateur-satellite service having the facility to transmit signals to the space station to initiate, modify, or terminate the functions of the space station.

RESOLUTION No. 702

Relating to the Convening of a Regional Administrative Radio Conference to Establish Criteria for the Shared Use of the VHF and UHF Bands Allocated to Fixed, Broadcasting and Mobile Services in Region 3

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that frequency allocations in the VHF and UHF bands have been substantially revised at this Conference, resulting in sharing mainly between the fixed, broadcasting and mobile services;

b) that the uncoordinated development of the services which share this spectrum throughout the Region may lead to unorderly and inefficient spectrum utilization;

c) that there are no well-established criteria for sharing the spectrum between these services to which these bands are allocated;

d) that within Region 3 there is no regional arrangement governing the establishment of broadcasting stations in these bands;

e) that it is not clear at this stage whether an assignment plan for Region 3 would be needed;

noting

the priority given by the World Administrative Radio Conference, 1979, to the convening of future administrative radio conferences;

resolves

1. that a regional administrative radio conference be convened at an appropriate time;

2. that this regional conference should establish the technical criteria for sharing between the fixed, broadcasting and mobile services to which the bands concerned are allocated;

3. that, after establishing the technical criteria, the conference should also decide upon the consequential action to be taken;

invites the Administrative Council

to make preparations for convening the said regional administrative radio conference using the provisions of this Resolution as a basis for the agenda of the conference;

invites the CCIR

to carry out the necessary studies with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of the regional conference;

invites administrations

to make appropriate contributions to the studies of the CCIR.

RESOLUTION No. 703

Relating to the Calculation Methods and Interference Criteria Recommended by the CCIR for Sharing Frequency Bands Between Space Radiocommunication and Terrestrial Radiocommunication Services or Between Space Radiocommunication Services [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that, in frequency bands shared with equal rights by space radiocommunication and terrestrial radiocommunication services, it is necessary to impose certain technical limitations and coordination procedures on each of the sharing services for the purpose of limiting mutual interference;

b) that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose coordination procedures for the purpose of limiting mutual interference;

c) that the calculation methods and interference criteria relating to coordination procedures referred to in paragraphs *a)* and *b)* above are based upon CCIR Recommendations;

d) that, in recognition of the successful sharing of the frequency bands by space radiocommunication and terrestrial radiocommunication services, and the continuing improvements in space technology, each CCIR Plenary Assembly subsequent to the Xth Plenary Assembly (Geneva, 1963) has

[1] Replaces Resolution No. **Spa2** – 6 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

improved upon some of the technical criteria recommended by the preceding Plenary Assembly;

e) that CCIR Plenary Assemblies are held triennially, whereas administrative radio conferences, which are competent to modify the Radio Regulations making substantial use of CCIR Recommendations, are in practice held less frequently and with much less regularity;

f) that the International Telecommunication Convention (Malaga-Torremolinos, 1973) recognizes the right of Members of the Union to make special agreements on telecommunication matters; however, such agreements shall not be in conflict with the terms of the Convention or of the Regulations annexed thereto as far as harmful interference to the radio services of other countries is concerned;

is of the opinion

a) that subsequent Plenary Assemblies of the CCIR are likely to make further changes in the recommended calculation methods and interference criteria;

b) that administrations should receive advance information of the drafts of the relevant CCIR Recommendations;

c) that the administrations should whenever possible apply the current CCIR Recommendations on sharing criteria when planning systems for use in frequency bands shared with equal rights between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services;

invites the CCIR

a) to request its Study Groups to prepare, at their final meetings before the Plenary Assembly, a provisional list identifying relevant parts of drafts of revised and new CCIR Recommendations affecting the calculation methods and the interference criteria, and also those specific sections of the

Radio Regulations to which they are applicable, relating to sharing between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services;

b) to request the Director of the CCIR to forward this list together with texts of these drafts of revised and new Recommendations to administrations and to the IFRB within thirty days following the final Study Group meetings;

resolves that

1. the IFRB shall immediately distribute the information mentioned in *invites b)* above to all administrations, so that it reaches them as soon as possible before the convening of the subsequent Plenary Assembly. This should be accompanied by a notice indicating that the enclosed texts are subject to approval at the next CCIR Plenary Assembly;

2. *a)* each CCIR Plenary Assembly, having adopted any or all of the relevant Recommendations and approved the appropriate portions of the list mentioned in *invites a)* above, should arrange for the Secretary-General to be informed of the list and those Recommendations which affect the appropriate calculation methods and the interference criteria to be employed;

b) the Secretary-General shall forward this list and the appropriate texts to all administrations within thirty days, asking them to indicate within four months those CCIR Recommendations or specific technical criteria defined in the Recommendations referred to in paragraph 2.*a)* above to which they agree for use in the application of the pertinent provisions of the Radio Regulations;

3. the administrations which do not reply to the Secretary-General's consultation within four months shall be sent a telegram asking for their decision on the application of these Recommendations under the relevant provisions of the Radio Regulations. If no reply is received within thirty days from the date of dispatch of the telegram, it shall be concluded that the administration does not wish to express an opinion at that time;

4. should an administration, in its reply to the Secretary-General's consultation, indicate that a given CCIR Recommendation or technical criterion defined in those Recommendations is unacceptable, or should an administration not reply to the Secretary-General's consultation as in paragraph 3 above, the relevant calculation methods and the interference criteria defined in the Radio Regulations shall continue to apply with respect to cases involving that administration;

5. the Secretary-General shall publish, for the information of all administrations, a list, prepared by the IFRB on the basis of the replies to the enquiry, of the CCIR Recommendations or of the relevant calculation methods and the interference criteria defined in those Recommendations, indicating the administrations to which each of those Recommendations or relevant technical criteria are acceptable or are not. This consolidated list shall also include the administrations mentioned in paragraph 3 above;

6. the IFRB shall take into account:

a) the applicability of the CCIR calculation methods and the interference criteria when making technical examinations with respect to cases involving only administrations to which such methods and criteria are acceptable;

b) the applicability of the calculation methods and the interference criteria defined in the Radio Regulations in accordance with the consolidated list referred to in paragraph 5 above, when making technical examinations with respect to cases involving the other administrations;

7. the Secretary-General of the ITU shall annually remind administrations which have not previously replied to communicate their decision in pursuance of paragraph 3 above;

8. if, at a later date, questions arise concerning the application of the relevant calculation methods and interference criteria to a case involving the administrations mentioned in paragraph 3 above, the IFRB shall enquire of the administrations concerned whether or not they would agree to the application of the methods and criteria defined in the relevant CCIR Recommendations referred to in paragraph 2 above;

9. the consolidated list published pursuant to paragraph 5 above shall be updated on the basis of the replies received in accordance with paragraphs 7 and 8 above.

RESOLUTION No. 704 (Mob-83)

Relating to the Holding of a Regional Administrative Radio Conference to Prepare Frequency Assignment Plans for the Maritime Mobile Service in the Bands Between 435 kHz and 526.5 kHz and in Parts of the Band Between 1 606.5 kHz and 3 400 kHz in Region 1 and to Plan for the Aeronautical Radionavigation Service in the Band 415 - 435 kHz in Region 1

The World Administrative Radio Conference for the Mobile Services, Geneva, 1983,

considering

a) that Recommendation **300** of the World Administrative Radio Conference, Geneva, 1979, confirmed that the Copenhagen Plan of 1948 (which provided frequency assignments for coast stations in the European Maritime Area using telegraphy in the bands between 415 kHz and 490 kHz and between 510 kHz and 525 kHz) had become out of date and that some of the technical standards used therein had been revised;

b) that the same Conference allocated the bands 505 - 526.5 kHz in Region 1 to the maritime mobile service on a primary basis and to the aeronautical radionavigation service on a permitted basis;

c) that Resolution **38** of the same Conference stressed the need for frequency assignment plans to be drawn up for Region 1 for the band 1 606.5 - 2 850 kHz for the maritime mobile service;

d) that the present Conference was unable to prepare frequency assignment plans for these two bands but has nevertheless taken the necessary decisions upon which assignment plans could be based;

e) that there is an urgent need for frequency assignment plans to be prepared for the bands mentioned above and brought into force for the benefit of the maritime mobile service and for other services requiring early access to certain bands to be vacated by that service;

f) that objective traffic statistics would form a useful basis for the determination of requirements to be included in the planning exercise;

g) that the present Conference modified the provisions of No. **4188** of the Radio Regulations concerning the subdivisions of the bands between 1 606.5 kHz and 3 800 kHz;

considering further

h) that the World Administrative Radio Conference, Geneva, 1979, allocated the band 415 - 435 kHz in Region 1 to the aeronautical radionavigation service on a primary basis and to the maritime mobile service on a permitted basis;

i) that this allocation permits the preparation of a frequency plan for the aeronautical radionavigation service;

j) that there is an urgent need for the band 415 - 435 kHz to be made available to the aeronautical radionavigation service in Region 1;

k) that in order to use the band 415 - 435 kHz to the maximum extent, it is necessary to plan this band for the aeronautical radionavigation service and to make adequate provisions for the use of this band by the maritime mobile service;

l) that to enable a coordinated introduction of the aeronautical radionavigation service in the band 415 - 435 kHz, the planning of this band should coincide with the planning of the band 435 - 526.5 kHz for the maritime mobile service;

m) that the planning of the band 415 - 435 kHz in Region 1 for the aeronautical radionavigation service will be of benefit to aircraft of all nations flying in these areas;

resolves

1. that a regional administrative radio conference for Region 1 be convened to prepare frequency assignment plans for the maritime mobile service in the frequency bands between 435 kHz and 526.5 kHz and in parts of the band between 1 606.5 kHz and 2 850 kHz and for the aeronautical radionavigation service in the band 415 - 435 kHz;

2. that the Tables of Recommended Assignable Frequencies appearing in Appendices 1 and 2 to this Resolution be used as a basis for the planning of the bands 435 - 526.5 kHz, 1 606.5 - 1 625 kHz, 1 635 - 1 800 kHz and 2 045 - 2 160 kHz for the maritime mobile service;

3. that when planning the band 415 - 435 kHz for the aeronautical radionavigation service, provision shall be made for the use of this band also by the maritime mobile service and when planning the band 505 - 526.5 kHz for the maritime mobile service provision shall be made for the use of this band also by the aeronautical radionavigation service;

4. that, in accordance with *resolves* 2 of the aforementioned Resolution **38**, replacement frequencies for stations of the maritime mobile service shall be provided in the frequency assignment plan mentioned above, together with the arrangements for their implementation;

recommends

that the Table of Recommended Assignable Frequencies appearing in Appendix 3 to this Resolution be used by administrations when planning and assigning frequencies in the bands 1 850 - 2 045 kHz, 2 194 - 2 498 kHz, 2 502 - 2 850 kHz, 3 155 - 3 400 kHz and 3 500 - 3 800 kHz to stations of the maritime mobile service;

invites the Administrative Council

1. to take all necessary steps (including fixing the date and the agenda) to convene at an early date, if possible early in 1985, a regional administrative radio conference for Region 1 for the purpose of:

a) establishing an agreement and associated plans in the bands listed in *resolves* 2 and 3 of the present Resolution;

b) establishing the final texts of Appendices to the Radio Regulations containing the channelling arrangements in the bands referred to above;

2. include in the agenda of the World Administrative Radio Conference for the Mobile Services foreseen for 1987 an item covering the inclusion in the Radio Regulations of the Appendices mentioned in paragraph 1 *b)* above;

invites the administrations concerned

to take the appropriate steps with a view to adopting the instrument for abrogation of the European Regional Convention for the maritime mobile service, Copenhagen, 1948, and the associated Plan;

requests the IFRB

1. to give technical assistance in the preparation for and organization of the Conference;

2. to invite administrations to submit at an appropriate date their requirements using the characteristics contained in Appendix **1** to the Radio Regulations;

requests the CCIR

to establish the necessary technical basis;

requests the Secretary-General

to forward this Resolution to the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO).

APPENDIX 1 TO RESOLUTION No. 704 (Mob-83)

Tables of Recommended Assignable Frequencies for Planning for the Maritime Mobile Service in the Band Between 435 kHz and 526.5 kHz in Region 1

1. The Tables below show the frequencies assignable to stations of the maritime mobile service for narrow-band direct-printing telegraphy, digital selective calling and Morse telegraphy in the band between 435 kHz and 526.5 kHz in Region 1. The frequency assignment plan will be based on a 0.5 kHz spacing. Until 1 January 1990, when tighter frequency tolerances for A1A Morse telegraphy become applicable, frequencies for A1A Morse telegraphy may be assigned with a channel spacing of 1 kHz.

a) *coast stations* (29 channels)

435.5	439	442.5	446	449.5
436	439.5	443	446.5	
436.5	440	443.5	447	
437	440.5	444	447.5	
437.5	441	444.5	448	
438	441.5	445	448.5	
438.5	442	445.5	449	

b) *coast stations, ship stations, intership working* (23 channels)

450	453	456	459
450.5	453.5	456.5	459.5
451	454 *	457	460
451.5	454.5	457.5	460.5
452	455	458	461
452.5	455.5	458.5	

Note: When choosing from the above frequencies, the use of 455 kHz as an intermediate frequency in broadcast receivers should be borne in mind.

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* See Nos. **4237** and **4238**.

c) *ship stations* (57 channels)

461.5	467.5	473.5	479.5	485.5
462	468	474	480	486
462.5	468.5	474.5	480.5	486.5
463	469	475	481	487
463.5	469.5	475.5	481.5	487.5
464	470	476	482	488
464.5	470.5	476.5	482.5	488.5
465	471	477	483	489
465.5	471.5	477.5	483.5	489.5
466	472	478	484	
466.5	472.5	478.5	484.5	
467	473	479	485	

d) *coast stations* (13 channels)

510.5	512.5	514	515.5	517
511	513	514.5	516	
511.5	513.5	515	516.5	

e) *coast stations, narrow-band direct-printing telegraphy (with forward error correction)*

518 kHz (see Resolution **318 (Mob-83)**)

f) *coast stations* (15 channels)

519	520.5	522	523.5	525
519.5	521	522.5	524	525.5
520	521.5	523	524.5	526

2. The recommended assignable frequencies 435.5 - 449.5 kHz to be used by coast stations shall be paired with the frequencies 475.5 - 489.5 kHz to be used by ship stations and the recommended assignable frequencies 461.5 - 475 kHz to be used by ship stations shall be paired with the frequencies in paragraphs *d)* and *f)*.

3. Frequency 512 kHz is used as a supplementary calling frequency by ship and coast stations (see Nos. **4239** and **4241**).

APPENDIX 2 TO RESOLUTION No. 704 (Mob-83)

Tables of Recommended Assignable Frequencies for Planning for the Maritime Mobile Service in the Bands 1 606.5 - 1 625 kHz, 1 635 - 1 800 kHz and 2 045 - 2 160 kHz in Region 1

a) *Coast stations, narrow-band direct-printing telegraphy, digital selective calling*

1 607 kHz . . . 36 channels spaced 0.5 kHz . . . 1 624.5 kHz.

b) *Coast stations, single-sideband radiotelephony*

1 636.4 kHz (1 635 kHz) . . . 55 channels spaced 3 kHz . . . 1 798.4 kHz (1 797 kHz).

c) *Ship stations, single-sideband radiotelephony* *

2 046.4 kHz (2 045 kHz) . . . 32 channels spaced 3 kHz . . . 2 139.4 kHz (2 138 kHz).

d) *Ship stations, narrow-band direct-printing telegraphy, digital selective calling*

2 142 kHz . . . 36 channels spaced 0.5 kHz . . . 2 159.5 kHz.

Note 1: Frequencies listed under *a)* and *b)* to be used by coast stations shall be paired with frequencies listed under *d)* and *c)* respectively to be used by ship stations.

Note 2: The frequencies between parentheses are the carrier frequencies.

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* For the conditions of use of certain frequencies of this sub-band, see Nos. **4358** to **4360**, **4362**, **4363**, **4365** and **4366**.

APPENDIX 3 TO RESOLUTION No. 704 (Mob-83)

Tables of Recommended Assignable Frequencies to be Used by Administrations in Region 1 when Planning and Assigning Frequencies in the Bands 1 850 - 2 045 kHz, 2 194 - 2 498 kHz, 2 502 - 2 850 kHz, 3 155 - 3 400 kHz and 3 500 - 3 800 kHz

a) *Coast stations, single-sideband radiotelephony*

1 852.4 kHz (1 851 kHz) ... 33 channels spaced 3 kHz ... 1 948.4 kHz (1 947 kHz).

b) *Ship stations, single-sideband radiotelephony*

1 952.4 kHz (1 951 kHz) ... 31 channels spaced 3 kHz ... 2 042.4 kHz (2 041 kHz).

c) *Ship stations, single-sideband radiotelephony*

2 196.4 kHz (2 195 kHz) ... 22 channels spaced 3 kHz ... 2 259.4 kHz (2 258 kHz).

d) *Intership, single-sideband radiotelephony*

2 264.4 kHz (2 263 kHz) ... 78 channels spaced 3 kHz ... 2 495.4 kHz (2 494 kHz).

e) *Ship stations, narrow-band direct-printing telegraphy*

2 502.5 kHz ... 150 channels spaced 0.5 kHz ... 2 577.5 kHz.

f) *Coast stations, narrow-band direct-printing telegraphy and single-sideband radiotelephony*

2 580.4 kHz (2 579 kHz) ... 90 channels spaced 3 kHz ... 2 847.4 kHz (2 846 kHz).

or

2 578.5 kHz ... 543 channels spaced 0.5 kHz ... 2 849.5 kHz.

g) *Ship stations, narrow-band direct-printing telegraphy*

3 155.5 kHz . . . 89 channels spaced 0.5 kHz . . . 3 199.5 kHz.

h) *Ship stations, single-sideband radiotelephony*

3 202.4 kHz (3 201 kHz) . . . 46 channels spaced 3 kHz . . . 3 337.4 kHz (3 336 kHz).

i) *Intership, single-sideband radiotelephony*

3 341.4 kHz (3 340 kHz) . . . 20 channels spaced 3 kHz . . . 3 398.4 kHz (3 397 kHz).

j) *Intership, single-sideband radiotelephony*

3 501.4 kHz (3 500 kHz) . . . 33 channels spaced 3 kHz . . . 3 597.4 kHz (3 596 kHz).

k) *Coast stations, single-sideband radiotelephony*

3 602.4 kHz (3 601 kHz) . . . 66 channels spaced 3 kHz . . . 3 797.4 kHz (3 796 kHz).

Note: The frequencies between parentheses are the carrier frequencies.

RESOLUTION No. 705 (Mob-87)

Mutual Protection of Radio Services Operating in the Band 70 - 130 kHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that various radio services, including radionavigation systems used by maritime and aeronautical services, operate in frequency bands between 70 and 130 kHz;

b) that, radionavigation being a safety service, all practical steps consistent with the Radio Regulations should be taken to prevent harmful interference to any radionavigation system;

c) that the CCIR has noted that users of phased pulse radionavigation systems in the band 90 - 110 kHz receive no protection outside the band, yet may receive benefit from their signals outside the occupied bandwidth;

noting

that CCIR studies show:

- that for CW radionavigation systems in the frequency bands 70 - 90 kHz and 110 - 130 kHz, the protection ratio should be 15 dB within the receiver passband of ± 7 Hz at 3 dB;
- that phased pulse radionavigation systems require a 15 dB protection ratio within the band 90 - 110 kHz;

– that these pulse radionavigation systems would be aided by protection ratios of 5 dB and 0 dB for frequency separations between wanted and interfering signal of 10 - 15 kHz and 15 - 20 kHz, respectively;

further noting

that the CCIR has recommended the exchange of information between authorities operating radionavigation systems in the band 90 - 110 kHz and those operating other systems in the band 70 - 130 kHz employing emissions of very high stability;

recognizing

a) that radio services other than radionavigation operating in the bands 70 - 90 kHz and 110 - 130 kHz fulfil essential functions that may be affected;

b) the provisions of Nos. **343**, **451**, **453** and **953** of the Radio Regulations;

resolves that administrations

1. in assigning frequencies to services in the bands 70 - 90 kHz, 90 - 110 kHz and 110 - 130 kHz, consider the potential mutual impairment to other stations operating in accordance with the Table of Frequency Allocations and apply protective measures;

2. use the relevant CCIR Recommendations and encourage the exchange of information between authorities operating radionavigation systems in the band 90 - 110 kHz and those operating other systems in the band 70 - 130 kHz employing emissions of very high stability, to assist in preventing potential interference problems;

3. encourage consultation, both nationally and internationally, between operators of radionavigation systems using the band 90 - 110 kHz and of other systems using the band 70 - 130 kHz;

requests the CCIR

to continue studies in this matter, particularly the development of technical criteria and standards to permit compatible operations within the allocated bands and to assist in developing the list of contacts of system operators;

invites

1. the Administrative Council to place this matter on the agenda of the next competent world administrative radio conference, in order to establish technical criteria for the harmonious operation of the services in the bands between 70 - 130 kHz;

2. the International Maritime Organization (IMO), the International Civil Aviation Organization (ICAO), the International Association of Lighthouse Authorities (IALA), the *Bureau international de l'heure* (BIH)* and national authorities to provide the Union with information pertaining to the potential impairment of systems operating in the bands 70 - 90 kHz, 90 - 110 kHz and 110 - 130 kHz, together with their views and proposals resulting therefrom.

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* *Note by the General Secretariat:* The 18th General Conference of the "Bureau International des Poids et des Mesures (BIPM)", 12-15 October 1987, adopted a Resolution transferring the responsibility of establishing the International Atomic Time (TAI) from the BIH to the BIPM.

RESOLUTION No. 706 (Mob-87)

Operation of the Fixed and Maritime Mobile Services in the Band 90 - 110 kHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) the need to protect phased pulse hyperbolic radionavigation systems (Loran-C) operating in the band 90 - 110 kHz used as a safety service for both maritime and aeronautical services;

b) the studies made by the CCIR in this band;

c) that harmful interference affecting safety of flight and ship navigation may be caused to this service by the operation of the fixed and maritime mobile services having a secondary allocation in this band;

d) that, notwithstanding No. **453A** of the Radio Regulations, this Conference has removed the allocation for the maritime mobile service from this band;

noting

that this Conference is not competent to affect significantly the allocation of the fixed service;

resolves

to invite the next competent conference to review the fixed service allocation in this band, and No. **453A** of the Radio Regulations, with a view to their possible deletion;

invites the Administrative Council

to place this matter on the agenda of the next competent world administrative radio conference.

RESOLUTION No. 708 (Mob-87)

Criteria for Sharing between the Radiodetermination-Satellite Service and Terrestrial Services in the Bands 1 610 - 1 626.5 MHz, 2 483.5 - 2 500 MHz and 2 500 - 2 516.5 MHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that this Conference allocated frequencies for the radiodetermination-satellite service in the bands 1 610 - 1 626.5 MHz, 2 483.5 - 2 500 MHz and 2 500 - 2 516.5 MHz;

b) that the technical criteria specified for this service, and in particular the provisions of Nos. **1107.2**, **2548A** and **2556** to **2564** were established or adapted for the purpose of allowing implementation of this service;

c) that further studies are required in order to obtain more precise results concerning the conditions of sharing in these bands, between the radiodetermination-satellite service (RDSS) and the terrestrial services;

resolves

that the next competent world administrative radio conference should consider reviewing the limits in *considering b)* above, taking into account the results of relevant CCIR studies;

invites the CCIR

to continue its studies in order to obtain more precise results concerning the conditions of sharing in the bands 1 610 - 1 626.5 MHz, 2 483.5 - 2 500 MHz and 2 500 - 2 516.5 MHz between the radiodetermination-satellite service on the one hand and the aeronautical radionavigation, fixed, mobile, radiolocation and radioastronomy services on the other hand;

urges administrations

1. to use the most recent information developed by the CCIR in assessing the probability of interference between the radiodetermination-satellite service and the terrestrial services sharing the same frequency bands;

2. to accept the application of the most recent CCIR Recommendations relating to the technical criteria referred to in *considering b)* above when they are consulted in the application of Resolution **703**;

invites the Administrative Council

to place this matter on the agenda of the next competent world administrative radio conference.

RESOLUTION No. 709 (Orb-88)

Coordination Between Feeder-Link Earth Stations and Stations of other Services in the Bands 14.5 - 14.8 GHz and 17.7 - 18.1 GHz in Regions 1 and 3

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that in Regions 1 and 3 the frequency bands 14.5 - 14.8 GHz and 17.7 - 18.1 GHz are allocated to several services on an equal primary basis;

b) that prior to the commencement of this Conference the IFRB was in receipt of notices for recording in the Master Register, concerning stations of services not included in the planning process;

c) that this Conference recognized in its agenda that the rights of such services must be taken into account;

d) that nevertheless administrations should be in a position to implement their feeder-link earth stations operating in accordance with Appendix **30A (Orb-88)** in shared bands;

resolves

1. that administrations in Regions 1 and 3 should examine within a period of six months after the end of this Conference whether it would be necessary to coordinate with the administrations identified in accordance with paragraph 5.1.4 of Appendix **30A (Orb-88)**;

2. that, if such a coordination with the administrations identified in accordance with paragraph 5.1.4 of Appendix **30A (Orb-88)** appears necessary, these administrations should inform those administrations responsible for existing stations mentioned in *considering b)*, the notices of which were submitted to the IFRB prior to 29 August 1988, of their intention to bring into use their frequency assignments in conformity with the Regions 1 and 3 feeder-link Plans as soon as they are able to do so;

3. that administrations responsible for such existing stations mentioned in *considering b)* shall make every effort to accelerate the process of coordination in order not to delay unduly the implementation of feeder-link earth stations.

RECOMMENDATIONS

Note by the General Secretariat

The Recommendations are arranged in order and numbered along the lines of the grouping and numbering system below. As some Recommendations in one group have direct relationship to Recommendations in other groups, this has been reflected, as far as possible, to facilitate consultation*.

* In this respect, see also the Analytical Index.

RECOMMENDATIONS DELETED SINCE THE 1979 WARC:

By WARC Mob-83: *Nos. 200, 202, 309*

By WARC HFBC-87: *Nos. 500, 501*

By WARC Mob-87: *Nos. 201, 203, 204, 300, 301, 307, 308, 311, 313, 314, 315, 400, 404, 600, 703, 713*

RECOMMENDATION No. 1

Relating to the Use of Space Radiocommunication Systems in the Event of Natural Disasters, Epidemics, Famines and Similar Emergencies [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that, in the case of natural disasters, epidemics, famines and similar emergencies, lives can be saved by prompt and effective relief;

b) that rapid and reliable telecommunications are essential for relief operations;

c) that, through damage or from other causes, the normal telecommunications facilities in disaster areas are often inadequate for relief operations and cannot be restored or supplemented quickly through local resources;

d) that use of space radiocommunication systems is one of the means by which rapid and reliable telecommunications could be provided for relief operations;

noting

a) that known planning of space radiocommunication systems makes no provision for specific frequencies or channels for emergency communications;

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[1] Replaces Recommendation No. **Spa2** – 13 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

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

c) that CCIR Report 554-1 gives current results of studies of transportable earth stations for relief operations;

recommends

1. that administrations, individually or in collaboration, provide for the needs of possible relief operations in planning their space radiocommunication systems and identify for this purpose preferred radio-frequency channels and facilities which could quickly be made available for relief operations;

2. that administrations concerned waive the coordination procedures provided for in the Radio Regulations in the case of transportable earth stations used for relief operations;

invites the CCIR

to continue its study of the standard specifications and preferred frequencies for transportable earth stations and for compatible mobile and transportable fixed radiocommunications equipment for relief operations.

RECOMMENDATION No. 2

Relating to the Examination by World Administrative Radio Conferences of the Situation with Regard to Occupation of the Frequency Spectrum in Space Radiocommunications [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the frequency bands available for space applications are limited in number and size;

b) that the possible positions for a satellite whose main purpose is to establish telecommunication links are limited in number and that certain positions are more favourable than others for certain links;

c) that all administrations should be enabled to establish the space links which they deem necessary;

d) that the scale and cost of space networks or systems are such that their operation and development must be hindered as little as possible;

e) that technology is steadily and rapidly evolving and that the best possible use should be made of resources in space radiocommunications;

f) that administrations should ensure that frequency assignments for space applications are utilized in the most efficient manner possible consistent with developing technology and that such assignments are relinquished when no longer in use;

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[1] Replaces Recommendation No. **Spa2** – 1 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

g) that despite the provisions of Article **11** of the Radio Regulations and the principles adopted by the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, which provide for full consultation and coordination between administrations with a view to the optimum accommodation of all space systems, it is possible that, as the use of frequencies and orbital positions increases, administrations may encounter undue difficulty in one or more frequency bands in meeting their requirements for space radiocommunication;

recommends

that the next appropriate world administrative radio conference be empowered to deal with the situation described in *considering g)*, if it arises;

invites the Administrative Council

in the event of such situations arising, to include in the agenda for the next appropriate world administrative radio conference specific provisions enabling it to examine all aspects of the use of the frequency band(s) concerned including, *inter alia*, the relevant frequency assignments recorded in the Master International Frequency Register and to find a solution to the problem.

RECOMMENDATION No. 3

Relating to the Transmission of Electric Power by Radio Frequencies from a Spacecraft

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that it may become technically feasible in the future to convert some portions of the sun's radiation into electric power on board a spacecraft and to transmit that power to Earth by means of radio transmissions and that such power could augment the world's energy resources;

b) that the possibility of such high power radiation may adversely affect the propagation of radio waves for other services through the ionosphere;

recognizing

a) that it would be necessary to ensure that the radio transmission of electric power from space did not give rise to harmful interference to radiocommunication services;

b) that an assessment needs to be made of any likely ecological and biological effects of radio transmissions of power from space, including in particular to aircraft passing through antenna beams used for such transmissions;

noting

that the Special Preparatory Meeting report to the World Administrative Radio Conference, Geneva, 1979, recognized the technical possibility of a solar power satellite;

noting also

the provisions of Article **6** of the Radio Regulations referring to the obligations on administrations not to cause harmful interference to radiocommunication services operating in accordance with the Regulations;

recommends that the CCIR

undertake appropriate studies on all aspects of the effects of such radio transmissions of power from space on radiocommunication services and make appropriate recommendations taking into account the ecological and biological implications;

invites the Secretary-General

to send this Recommendation to the Secretary-General of the United Nations.

RECOMMENDATION No. 4

Relating to the More Efficient Consolidation of National and International Radiocommunication Circuits Operating in the Bands Between 4 000 kHz and 27 500 kHz [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the ever-increasing need for frequencies particularly in the bands between 4 000 kHz and 27 500 kHz;

b) the present structure of national and international radiocommunication networks in these bands;

c) the relatively light traffic load on some of the circuits of these networks;

d) the provisions of the International Telecommunication Convention (Malaga-Torremolinos, 1973) concerning the rational use of frequencies and spectrum space (Article 33);

taking into account

a) the fact that the efficiency of a group of circuits is higher than that of the total number of single circuits;

b) that as a consequence the total number of frequencies needed may be reduced;

c) that in certain parts of the world there are areas and countries interconnected by several circuits, both radio and cable;

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[1] Replaces Recommendation No. 11 of the Administrative Radio Conference, Geneva, 1959.

REC4-2

recommends

1. that, wherever possible, administrations should contribute to reducing the pressure on bands between 4 000 kHz and 27 500 kHz by a more efficient consolidation of lightly-loaded radio circuits;

2. that countries interconnected by telecommunication circuits should, whenever practicable, conclude special arrangements on the common use of existing international radio circuits, operating in the bands between 4 000 kHz and 27 500 kHz;

3. that, as a general rule, these arrangements should give to each participating country equal benefit with regard to operational and financial conditions;

4. that in planning new radio circuits or the extension of existing radio circuits, administrations should as far as possible take into account the principles stated in paragraphs 1 to 3 above.

RECOMMENDATION No. 5

Relating to the Means of Reducing the Congestion in Band 7 (3 - 30 MHz) [1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

a) that there is an urgent need to reduce the pressure on Band 7 of the radio frequency spectrum;

b) that the utilization of modern developments in telecommunication techniques, particularly those involving the use of Band 8 and higher bands, coaxial cables, etc., can contribute to this reduction;

c) that the utilization of these improved and alternative techniques would entail considerable expenditure whereas the continued use of Band 7 techniques would be less expensive and therefore some administrations would find it more difficult to introduce these new techniques than other administrations more favourably placed;

recommends

1. that all administrations take the necessary steps to reduce the pressure on Band 7 by adopting the new techniques to the maximum extent possible;

2. that the international organizations giving aid be requested to give special consideration to the supply of equipment to administrations which are not in a position to procure it themselves due to economic difficulties, for the purpose of enabling these administrations to change over to the alternative means of telecommunication, thus contributing towards greater economy in the use of Band 7.

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[1] Replaces Recommendation No. 10 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 6

Relating to the Practical Needs of Countries in Need of Special Assistance [1]

The World Administrative Radio Conference, Geneva, 1979,

recommends

that all administrations should make special efforts to cooperate with the administrations of countries in need of special assistance by furnishing monitoring information and such technical assistance as may aid these countries in obtaining proper frequency assignments for their operations;

invites the IFRB

to provide administrations of countries in need of special assistance with the necessary information and technical data, including the detailed explanations of the Radio Regulations, which will permit these countries to choose and obtain proper frequency assignments for their operations.

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[1] Replaces Recommendation No. 35 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 7 (Rev.Mob-87)

Adoption of Standard Forms for Ship Station and Ship Earth Station Licences and Aircraft Station and Aircraft Earth Station Licences[1, 2]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the standardization of the licence forms issued to stations installed on board ships and aircraft making international voyages and flights would greatly facilitate the task of inspection of such stations;

b) that standard licence forms for ship stations and for aircraft stations would serve as a useful guide to those administrations desiring to improve their existing national licences;

c) that standard licence forms could be advantageously used by these administrations as the form of certification specified in No. **2027** of the Radio Regulations;

considering further

that the Administrative Radio Conference, Geneva, 1959, formulated:

a) a set of principles for the draft of a standard licence form (see Annex 1);

b) specimens of a ship station licence and of an aircraft station licence (see Annexes 2 and 3);

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[1] Replaces Recommendation No. 17 of the Administrative Radio Conference, Geneva, 1959.

[2] Throughout this Recommendation, references to ship stations may include references to ship earth stations and references to aircraft stations may include references to aircraft earth stations.

recommends

1. that administrations which find these forms practicable and acceptable should adopt them for international use;

2. that administrations should, as far as possible, endeavour to bring their national licence forms into line with these standard forms.

ANNEX 1 TO RECOMMENDATION No. 7 (Rev.Mob-87)

Principles for the Formulation of Standard Ship and Aircraft Station Licences

The Administrative Radio Conference, Geneva, 1959, considered that, in formulating standard ship and aircraft station licences, the following set of principles should be applied:

1. The licence should, as far as possible, be prepared in tabular form, and each line and column of the table clearly numbered or lettered.

2. The licence for ship stations and the licences for aircraft stations should be as similar as possible.

3. The size of the licence should be international standard A4.

4. The licence should be designed in a form which facilitates its exhibition on board a ship or an aircraft.

5. The licence should be printed in Latin characters in the national language of the country which issues it. Those countries whose national language cannot be written in Latin characters should use their national language and, in addition, one working language of the Union.

6. The title "Ship Station Licence" or "Aircraft Station Licence" should appear at the top of the licence in the national language as well as in the three working languages of the Union.

These principles were used in formulating the two standard forms which are given in Annexes 2 and 3.

ANNEX 2 TO RECOMMENDATION No. 7 (Rev.Mob-87)

(Full name of the authority issuing the licence,
in the national language)

..... *

SHIP STATION LICENCE
LICENCE DE STATION DE NAVIRE
LICENCIA DE ESTACIÓN DE BARCO

No. .....

Period of validity .....

In accordance with *(Title of the National Regulation)* and with the Radio Regulations annexed to the International Telecommunication Convention now in force, this authorization is herewith issued for the installation and for the use of the radio equipment described below:

1	2	3	4
Name of ship	Call sign or other identification	Owner of ship	Public correspondence category

		a	b	c	d
	Equipment	Type	Power (watts)	Class of emission	Frequency bands or assigned frequencies
5	Transmitters				**
6	Ship's emergency transmitters				**
7	Survival craft transmitters				**
8	Other equipment	*(Optional)*			

For the Issuing Authority:

....
Place Date Authentication

* The words "Ship Station Licence" written in the national language, if this is not one of the three working languages of the Union.

** Specifically or by reference.

ANNEX 3 TO RECOMMENDATION No. 7 (Rev.Mob-87)

(Full name of the authority issuing the licence,
in the national language)

.....*

AIRCRAFT STATION LICENCE
LICENCE DE STATION D'AÉRONEF
LICENCIA DE ESTACIÓN DE AERONAVE

No. .....

Period of validity ....

In accordance with *(Title of the National Regulation)* and with the Radio Regulations annexed to the International Telecommunication Convention now in force, this authorization is herewith issued for the installation and for the use of the radio equipment described below:

1	2	3	4
Nationality and registration mark of the aircraft	Call sign or other identification	Type of aircraft	Owner of aircraft

		a	b	c	d
	Equipment	Type	Power (watts)	Class of emission	Frequency bands or assigned frequencies
5	Transmitters				**
6	Survival craft transmitters *(when applicable)*				**
7	Other equipment	*(Optional)*			

For the Issuing Authority:

. . . .

Place Date Authentication

* The words "Aircraft Station Licence" written in the national language, if this is not one of the three working languages of the Union.

** Specifically or by reference.

RECOMMENDATION No. 8

Relating to Automatic Identification of Stations

The World Administrative Radio Conference, Geneva, 1979,

considering

a) Article **25** of the Radio Regulations which allows, where practicable, automatic identification of stations in appropriate services, and under certain circumstances;

b) that it is not always feasible or convenient to give manual identification;

c) that sources of harmful interference often remain unidentified for long periods, with consequential delay in measures that might be taken to minimize the interference;

d) that automatic identification procedures, where appropriate, may help overcome some of the disadvantages of manual identification;

e) that automatic transmission of a call sign or other signals may provide a means of identifying some stations for which identification is not always possible, e.g. radio relay and space systems;

f) the desirability of fostering a common automatic identification method to facilitate effective implementation of the provisions of Article **25**, as an alternative to the proliferation of many different systems and modulation techniques that might be used for this purpose;

recommends

that the CCIR study the matter of automatic identification of stations with a view to recommending technical characteristics and methods of implementing a common universal system, including standard modulation techniques, for application in accordance with Article **25**, with due consideration to the needs of the different services and types of stations.

RECOMMENDATION No. 9

Relating to the Measures to Be Taken to Prevent the Operation of Broadcasting Stations on Board Ships or Aircraft Outside National Territories [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the operation of broadcasting stations on board ships or aircraft outside national territories is in conflict with the provisions of Nos. **2665** and **3603** of the Radio Regulations;

b) that such operation is contrary to the orderly use of the radio frequency spectrum and may result in chaotic conditions;

c) that the operation of such broadcasting stations may take place outside the jurisdiction of Member countries, thereby making the direct application of national laws difficult;

d) that a particularly difficult legal situation arises when such broadcasting stations are operated on board ships or aircraft not duly registered in any country;

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[1] Replaces Recommendation No. 16 of the Administrative Radio Conference, Geneva, 1959.

REC9-2

recommends

1. that administrations ask their governments to study possible means, direct or indirect, to prevent or suspend such operations and, where appropriate, take the necessary action;

2. that administrations inform the Secretary-General of the results of these studies and submit any other information which may be of general interest, so that the Secretary-General can inform Members accordingly.

RECOMMENDATION No. 10

Relating to the Presentation of Draft Amendments to the Radio Regulations [1]

The World Administrative Radio Conference, Geneva, 1979,

having noted

a) that in the proposals submitted by some administrations a uniform method has been utilized for the presentation of modified texts (e.g. underlining of new texts, and crossing out of suppressed texts);

b) that this uniform method of presentation has proved itself to be very effective during the consideration of the proposed texts;

c) that if such a uniform method of presentation were followed in the different stages of preparing conference documents (sub-working groups, working groups) it would facilitate the work of delegations and may facilitate the work of the conference;

d) that the Secretary-General has taken steps to provide guidelines to administrations to assist them in the presentation of their proposals to administrative conferences in accordance with the provisions of the International Telecommunication Convention and in their coordinated presentation to conferences;

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[1] Replaces Recommendation No. **Mar2** – 20 of the World Maritime Administrative Radio Conference, Geneva, 1974.

REC10-2

recommends

1. that administrations be invited to present their proposals in a uniform manner;

2. that guidelines be issued by the Secretary-General to facilitate this presentation and that they should also be applied for future conferences;

3. that a uniform presentation be used, through the different stages of preparing texts at least up to working group level, at forthcoming administrative radio conferences.

RECOMMENDATION No. 11

Relating to the Marginal Numbering of the Radio Regulations

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the Radio Regulations have a logical paragraph and sub-paragraph numbering system within each article and that consecutive marginal numbering is added to each provision mainly for ease of reference;

b) that this marginal numbering is extensively used by administrations and the permanent organs of the Union;

c) that blocks of spare marginal numbers have been made available at the end of each article of the revised Radio Regulations (Geneva, 1979) to facilitate the addition by world administrative radio conferences of new provisions and in particular of new articles;

recognizing

a) that familiarization with new marginal numbers requires considerable effort and that, therefore, possible changes of marginal numbers by a world administrative radio conference undertaking a partial revision of the Radio Regulations could cause difficulties;

b) the fact that revision of the marginal numbering system should only be necessary at a future world administrative radio conference convened to undertake a general revision of the Radio Regulations;

REC11-2

recommends

1. that a future world administrative radio conference undertaking a partial revision of the Radio Regulations should use the spare marginal numbers only when it is appropriate to insert additional provisions at the end of articles;

2. that where it is necessary to insert one or more additional provisions within an article, supplementary alpha references should be used as a suffix to existing marginal numbers;

3. that when an existing provision is suppressed, the marginal number should not be re-used.

RECOMMENDATION No. 12

Relating to the Convening of Future Administrative Radio Conferences to Deal with Specific Services

The World Administrative Radio Conference, Geneva, 1979,

noting

a) that item 2.10 of its terms of reference calls on the Conference to propose to the Administrative Council and to the Plenipotentiary Conference a programme for the convening of future administrative radio conferences to deal with specific services;

b) that several Resolutions and Recommendations of this Conference call for, or refer to, the convening of such future conferences;

considering

a) that, in drawing up a programme of future world administrative radio conferences, account needs to be taken of other conferences involving Members of the Union, including regional and sub-regional conferences, the Plenipotentiary Conference, and the meetings of the CCIR;

b) that conferences need to be spaced out sufficiently to allow adequate time for preparation for each conference by administrations and by the permanent organs of the Union;

c) that a number of individual subjects raised in the Resolutions and Recommendations referred to in *noting b)* should be treated by a competent conference and that it will be for the Administrative Council to take the necessary action at the appropriate time for each matter concerned to be included in the agenda of such a conference;

recommends that the Administrative Council and, as appropriate, the Plenipotentiary Conference

1. include the following world administrative radio conferences in the programme of future conferences:

- world administrative radio conference for the mobile services (see Resolution **202**);
- world administrative radio conference for the planning of the HF bands allocated to the broadcasting service (see Resolution **508** and Recommendations **500** and **501**);
- world administrative radio conference on the use of the geostationary-satellite orbit and the planning of space services utilizing it (see Resolution **3**);

2. include the following regional administrative radio conferences, some of which are already arranged, in the programme of future conferences:

- final session, Region 2, medium frequency broadcasting conference (already arranged for November 1981);
- Region 2 broadcasting-satellite planning conference (already arranged for the second quarter of 1983 – see Resolution **701**);
- planning conference for sound broadcasting in the band 87.5 - 108 MHz for Region 1 and certain countries concerned in Region 3 (see Resolution **510**);
- conference to draw up agreements and associated plans for feeder links to broadcasting satellites operating in the 12 GHz band in Regions 1 and 3 (see Resolution **101**);
- regional administrative radio conference to establish criteria for the shared use of the VHF and UHF bands allocated to fixed, broadcasting and mobile services in Region 3 (see Resolution **702**);

- conference to revise the Plan annexed to the Copenhagen Convention, 1948, for the European Maritime Area – Region 1 (see also Recommendation **300** on this subject);
- conference to review and revise the provisions of the Final Acts of the African VHF/UHF Broadcasting Conference, Geneva, 1963 (see Resolution **509**);
- planning conference for broadcasting in the band 1 605 - 1 705 kHz in Region 2 (see Recommendation **504**);

3. take the necessary steps to convene each of these conferences as soon as practicable after the completion, in each case, of the necessary preparatory work, bearing in mind:

a) the timing of the conferences, as expressed in the Recommendations and Resolutions mentioned in *recommends* 1 and 2;

b) the need for the conferences to be adequately spaced so as to allow administrations and the permanent organs of the Union adequate time for preparation;

c) the programme of planned or foreseen conferences, other than administrative radio conferences, involving Members of the Union;

d) the resources which will need to be devoted by individual administrations and by the Union as a whole to the completion of this programme of conferences.

RECOMMENDATION No. 13

Relating to a World Administrative Radio Conference to Carry Out a General or Partial Revision of the Radio Regulations

The World Administrative Radio Conference, Geneva, 1979,

considering

that it has drawn up a programme of specialized world administrative radio conferences for the coming decade;

considering

the very rapid development of telecommunication technology and the consequences of the application of that technology, particularly with regard to the efficient use of the radio spectrum;

considering

the need for a general or partial revision of the Radio Regulations to ensure the harmonious development of several services not covered by the specialized conferences scheduled by this Conference;

recommends that the Administrative Council

consider, as from 1990, whether it is necessary to convene a world administrative radio conference to undertake a general or partial revision of the Radio Regulations.

RECOMMENDATION No. 14 (Mob-87)

Identification and Location of Special Vessels, such as Medical Transports, by Means of Standard Maritime Radar Transponders

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) the desirability of implementing modern techniques in standard maritime radar transponders for the identification and location of vessels at sea;

b) Radio Regulations Nos. **3219A** and **N 3223**, which provide that the identification and location of medical transports at sea may be effected by means of appropriate standard maritime radar transponders;

c) that transponders designed to be compatible with radiolocation radars are not necessarily compatible with radars used by the maritime and aeronautical radionavigation services; nor is their coding for identification technically defined;

d) that if maritime radar transponders of the type described in CCIR Report 775-2 and CCIR Recommendations 628 and 630, or using the technology described in CCIR Report 774-2, were to be encoded for the identification of special vessels such as medical transports, they would probably be incompatible with most radiolocation radars;

invites the CCIR

to study the question of the identification and location of special vessels such as medical transports by means of standard maritime radar transponders, taking into account also the technical and economic impact of their introduction;

invites administrations

to provide the CCIR with information on this question;

requests the Administrative Council

to include this Recommendation in the agenda of the next competent world administrative radio conference for review and, if appropriate, to amend the Radio Regulations.

RECOMMENDATION No. 15 (Orb-88)

Review of Article 14 of the Radio Regulations and Further Development of Technical Criteria for its Application

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that Article **14** of the Radio Regulations in many instances does not contain provisions relating to time limits and the steps to be taken in the case of continuing disagreement between administrations;

b) that, because the provisions of Article **14** are in many cases applicable to terrestrial services in shared bands and, in some cases, to terrestrial services only, the general revision of the Article is beyond the competence of the Conference, even though the space services are more frequently affected and have experienced some difficulty in its application;

c) that in some cases in the application of Article **14** there exist no technical criteria to identify the affected administrations;

d) that recent administrative radio conferences have used extensively the reference to Article **14** when revising existing footnotes to the Table of Frequency Allocations or developing new ones;

e) that there is a need to review the provisions of Article **14** and to consider any consequential changes to the Radio Regulations necessary for an efficient and simplified application of this Article;

noting

that this Conference has reviewed the provisions of Article **14** which refer to space services, and has made the minimal necessary changes to the procedures, until a more extensive revision can be made, covering all services;

recommends

that a future competent world administrative radio conference should review and revise, as appropriate, the provisions of Article **14** and make consequential changes arising from such a revision;

instructs the IFRB

to prepare an updated report on the application of the procedure of Article **14** and on any difficulties encountered in its application and submit it to a competent world administrative radio conference;

invites the CCIR

1. to continue appropriate studies of the development of sharing criteria for the different services which are involved in the application of Article **14**;

2. to provide technical criteria permitting administrations to evaluate the effect on their services of the application of Article **14** with respect to a given assignment;

urges administrations

to study this matter and, on the basis of their experience in the application of Article **14**, to submit proposals for consideration by a future competent world administrative radio conference;

instructs the Secretary-General

to bring this Recommendation to the attention of the Administrative Council.

RECOMMENDATION No. 30

Relating to International Monitoring [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the desirability of achieving a more effective use of the radio spectrum in order to assist administrations to satisfy their frequency requirements, and, to that end, the desirability of taking steps to make the International Frequency List reflect more accurately the actual use being made of the radio spectrum;

b) the provisions of the Radio Regulations (Geneva, 1979), under which the International Frequency Registration Board shall review the entries in the Master International Frequency Register with a view to bringing them into conformity, to the maximum extent practicable, with the actual use being made of the radio spectrum;

c) that monitoring information should assist the Board in discharging that function;

recognizing

a) that an international monitoring system cannot be fully effective unless it covers all areas of the world;

b) that, at present, in certain areas of the world, monitoring facilities are either non-existent or insufficient to provide effective coverage;

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[1] Replaces Recommendation No. 5 of the Administrative Radio Conference, Geneva, 1959.

invites the CCIR

in collaboration with the Board, to study and make technical recommendations concerning the additional facilities required to provide adequate coverage of the world with a view to implementing the Radio Regulations, more especially Articles **10**, **11**, **12**, **13**, **14** and **20**;

and invites administrations

1. to make every effort to develop monitoring facilities as envisaged in Article **20** of the Radio Regulations bearing in mind the means which may be made available through the appropriate technical assistance organs of the United Nations;

2. to inform the Board of the extent to which they are prepared to cooperate in such monitoring programmes as may be requested by the Board.

RECOMMENDATION No. 31

Relating to a Handbook for Computer-Aided Techniques in Radio Frequency Management

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that, due to the growing demands on the radio frequency spectrum, there is a need to improve spectrum utilization;

b) that the solution of radio frequency management problems requires data storage, data retrieval, and analysis capabilities, and consequently is amenable to the application of computer methods;

c) that administrations are facing increasingly voluminous and complex tasks in radio frequency management;

d) that technological developments have made powerful computers and mini-computers available at reasonable cost;

e) that guidance is required by many administrations with respect to computer-aided techniques in radio frequency management;

f) that a certain degree of compatibility is desirable to facilitate coordination between administrations and the exchange of data with the IFRB;

g) that many administrations are interested in, and some are actively developing, computer systems for use in radio frequency management;

h) that the General Secretariat makes available computer resources and advice to all permanent organs of the Union and provides advice, as appropriate, to administrations;

recommends that the CCIR

1. prepare a handbook by 1982 describing the various aspects involved in applying computer-aided techniques to radio frequency management, discussing the approaches which have been made, providing guidelines for various levels of practical application and making recommendations for those aspects involving international cooperation;

2. periodically review and revise the handbook;

invites the General Secretariat and the IFRB

to participate in the preparation of this handbook.

RECOMMENDATION No. 32 (Orb-88)

International Monitoring of Emissions Originating from Space Stations

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the geostationary-satellite orbit and the radio-frequency spectrum are limited natural resources and are being increasingly utilized by space services;

b) that it is desirable to ensure efficient and economical use of the radio-frequency spectrum and geostationary-satellite orbit and also to eliminate harmful interference;

c) the provisions of the Radio Regulations, under which the IFRB shall review the entries in the Master International Frequency Register with a view to bringing them into conformity, to the maximum extent practicable, with the actual use being made of the radio spectrum;

d) that monitoring information obtained should assist the IFRB in discharging that function;

e) Recommendation **2** of the World Administrative Radio Conference, 1979, relating to the examination by world administrative radio conferences of the situation with regard to occupation of the frequency spectrum in space radiocommunications;

f) that facilities for monitoring of emissions originating from space stations may be expensive;

noting

that the CCIR is studying the question of monitoring of radio emissions from spacecraft at fixed monitoring stations and CCIR Report 276-5 contains current results of these studies;

invites the CCIR

to continue the studies in collaboration with the IFRB, and to provide technical guidelines concerning the space monitoring facilities;

recommends administrations

1. to participate in the CCIR studies concerning the possible development of guidelines for space monitoring facilities;

2. to consider the various aspects of monitoring the emissions originating from space stations to enable the provisions of Article **20** of the Radio Regulations to be applied.

RECOMMENDATION No. 60

Relating to the Technical Standards of the IFRB [1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

that the Technical Standards of the International Frequency Registration Board (IFRB) are in daily use in the technical examination of frequency assignment notices;

urges the CCIR

to expedite all phases of the programme of studies which will assist the IFRB in the further refinement of its Technical Standards;

and invites administrations,

in their participation in the work of the CCIR and its Study Groups, to give special priority to those studies.

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[1] Replaces Recommendation No. 2 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 61

Relating to Technical Standards for the Assessment of Harmful Interference in the Frequency Bands above 28 MHz [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the definition of harmful interference (No. **163** of the Radio Regulations), being of a qualitative nature, leads to a purely subjective estimation of the nuisance;

b) that, for the accomplishment of its regulatory tasks, the IFRB has adopted in its Technical Standards, for the frequency bands below 28 MHz, values for the ratio between the wanted signal and the interfering signal, below which harmful interference may be expected;

c) that "harmful interference" implies a considerable degree, or probability, of interference;

d) that, as a consequence, it is desirable to determine the level of interference by which any emission, radiation or induction affects a radiocommunication service beyond specific limits established to ensure the quality and reliability of performance required by the nature of the service;

e) that the assessment of interference levels is related to various factors such as the nature of the services concerned, number of interference sources, percentages of time during which the interfering signal affects the wanted signal;

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[1] Replaces Recommendation No. **Spa2** – 12 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

noting

a) that the IFRB has been considering the maximum allowable values of interference given in the pertinent CCIR Recommendations to be values which ensure a satisfactory service;

b) that, however, the IFRB does not possess data on the extent to which these recommended values and the associated percentages of time may be exceeded without affecting a service beyond the specific limits established to ensure the quality and reliability of performance required by the nature of the service;

invites the CCIR

to continue to study this subject and to recommend the technical criteria for the frequency bands above 28 MHz, allocated to space radiocommunication, radio astronomy, and the terrestrial radiocommunication services concerned, in order to enable the IFRB and administrations to apply such criteria for these bands.

RECOMMENDATION No. 62

Supplementing the Additional Characteristics for Classifying Emissions and Providing Additional Examples for the Full Designation of Emissions, Both as Given in Appendix 6 [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that this Conference has adopted in Article **4** a new method for designating emissions based on CCIR Recommendation 507;

b) that an essential part of this new method is the classification of emissions;

c) that the new method of classifying emissions distinguishes between basic characteristics (first, second and third symbol) the use of which is mandatory, and additional characteristics (fourth and fifth symbol) the use of which is optional;

d) that the full classification of emissions consists of all of these five symbols;

e) that the list of the additional characteristics given in Appendix **6**, Part A, may not be sufficiently complete to take account of future new technologies and may require relatively frequent supplementing;

f) that a CCIR Recommendation would provide a suitable means for such supplementing;

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[1] Replaces Recommendation No. 8 of the Administrative Radio Conference, Geneva, 1959.

considering further

a) that a list of examples for the full designation of emissions is given in Appendix **6**, Part B;

b) that this list, however, is not exhaustive and that for this reason No. **265** of the Radio Regulations stipulates that further examples may appear in the latest CCIR Recommendations and that these examples may also be published in the Preface to the International Frequency List;

invites the CCIR

1. to continue its studies on the classification of emissions with a view to supplementing the list of additional characteristics in order to cater for new technologies without, however, changing those additional characteristics which have already been agreed upon and which are contained in Appendix **6**, Part A;

2. to provide examples for the full designation of emissions which are not contained in Appendix **6**, Part B, also taking account of the supplementing mentioned in *invites* 1 above;

requests the International Frequency Registration Board

to publish the supplementary additional characteristics and the additional examples mentioned in *invites* 1 and 2 above in the Preface to the International Frequency List as soon as they are available in relevant CCIR Recommendations;

and recommends

that administrations use the additional characteristics referred to in *invites* 1 above where appropriate.

RECOMMENDATION No. 63

Relating to the Provision of Formulae and Examples for the Calculation of Necessary Bandwidths

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that Article **4** of the Radio Regulations requires that the necessary bandwidth be part of the full designation of emissions;

b) that Appendix **6**, Part B, gives a partial list of examples and formulae for the calculation of the necessary bandwidth of some typical emissions;

c) that sufficient information is not available for the determination of the K-factors used throughout the table of examples of the necessary bandwidth in Appendix **6**;

d) that, especially with regard to the efficient utilization of the radio frequency spectrum, monitoring and the notification of emissions, it is required that necessary bandwidths for the individual classes of emission be known;

e) that for reasons of simplification and international uniformity it is desirable that measurements for determining the necessary bandwidth be made as seldom as possible;

recommends that the CCIR

1. provide, from time to time, additional formulae for the determination of necessary bandwidth for common classes of emission, as well as examples to supplement those given in Appendix **6**, Part B;

2. study and provide values of supplementary K-factors required for the calculation of the necessary bandwidth for common classes of emission;

invites the IFRB

to publish examples of such calculations in the Preface to the International Frequency List.

RECOMMENDATION No. 64

Relating to Protection Ratios and Minimum Field Strengths Required [1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

that the available information on protection ratios and minimum field strengths required for each one of the services needs further refinement in order to permit the most efficient planning of the use of the radio frequency spectrum;

invites the CCIR

1. to continue to study the protection ratios which define the threshold of harmful interference for the several services;

2. to continue to study the signal-to-noise ratios and the minimum field strengths required for satisfactory reception of the different classes of emission in the several services;

3. to continue the study of fading allowances for the several services;

4. to give particular attention to those studies which will assist in the further refinement of the Technical Standards used by the IFRB.

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[1] Replaces Recommendation No. 3 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 65

Relating to the Technology for New Spectrum Sharing and Band Utilization Schemes

The World Administrative Radio Conference, Geneva, 1979,

recognizing

a) that advances in technology, particularly digital radio techniques and new encoding, modulation and access schemes, are making practicable new sharing schemes that offer economical as well as technological advantages for increasing the efficiency of spectrum sharing and band utilization;

b) that rapid advances are being made in the associated technology;

invites the CCIR

1. to carry out studies of the digital radio techniques and new encoding, modulation and access schemes; examples of areas for such studies are packet radiocommunication, spread-spectrum and multifunction techniques;

2. to develop new concepts in the use of a carrier on a time-sharing basis for different radiocommunication services, i.e. use of the same part of the spectrum by multiple services;

3. to submit Recommendations to appropriate future world administrative radio conferences relating to:

- the technical criteria and specifications of the most efficient spectrum sharing schemes for the various services;
- the technical and performance criteria for ensuring compatibility and interworking of systems;
- the criteria on which to base spectrum management for these new technology systems.

RECOMMENDATION No. 66

Relating to Studies of the Maximum Permitted Levels of Spurious Emissions

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that Appendix **8** to the Radio Regulations specifies the maximum permitted levels of spurious emissions, in terms of the mean power level of any spurious component supplied by a transmitter to the antenna transmission line, for the frequency bands below 17.7 GHz;

b) that the principal objective of Appendix **8** is to specify the maximum permitted levels of spurious emissions that, while being achievable, provide protection against harmful interference;

c) that excessive levels of spurious emissions may give rise to harmful interference;

d) that while Appendix **8** applies only to the mean power of the transmitter and the spurious emissions, there are a variety of emissions where the interpretation of the term "mean power" and its consequential measurement are difficult;

e) that whilst the CCIR is studying this problem, it has not yet furnished adequate Recommendations pertaining to Appendix **8** for frequency bands above 960 MHz;

f) that spurious emissions from transmitters operating in space stations may cause harmful interference, particularly in regard to intermodulation components from wide-band amplifiers which cannot be adjusted after launch;

g) that spurious emissions from earth stations also require particular study;

h) that no information is available from the CCIR regarding spurious emissions from stations employing digital modulation techniques in the frequency bands above 960 MHz;

noting

that in large metropolitan areas radio spectrum usage above 960 MHz is extensive and rapidly growing and that much of this growth in urban areas is now taking place above 10 GHz;

recommends that the CCIR

1. study as a matter of urgency the question of spurious emissions resulting from space services transmissions, and, on the basis of those studies, develop Recommendations for maximum permitted levels of spurious emissions in terms of mean power of spurious components supplied by the transmitter to the antenna transmission line;

2. continue the study of spurious emission levels in all frequency bands, emphasizing the study of those frequency bands, services and modulation techniques not presently covered by Appendix **8**;

3. establish appropriate measurement techniques for spurious emissions, including the determination of reference levels for wide-band transmissions as well as the applicability of reference measurement bandwidths;

4. study the categorizing of emissions and spurious emissions in terms of "mean power" and develop appropriate Recommendations to facilitate the interpretation and measurement of "mean power" as it applies to the various classes of emissions.

RECOMMENDATION No. 67

Relating to the Definitions of "Service Area" and "Coverage Area"

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the terms "service area" and "coverage area" are often used in the official texts of the ITU;

b) that these two terms are used with the same meaning or with different meanings according to the different services;

c) that there are no definitions of the terms "service area" and "coverage area" in Article **1** of the Radio Regulations;

noting

a) that the term "service area" is already used in the texts of the Appendices **1**, **3**, **4**, **5** and **25** of the Radio Regulations;

b) that a definition of "service area" for broadcasting, based on the usable field strength, exists in CCIR Recommendation 499-1;

c) that a definition very similar to that of Recommendation 499-1 is given in Annex 2 to the Final Acts of the Regional Administrative LF/MF Broadcasting Conference (Regions 1 and 3), Geneva, 1975;

d) that a definition of "service area" for satellite broadcasting is given in Annex 8 to the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977. This definition is of an administrative nature. It is accompanied by a technical note, in which reference is made to an appropriate power flux-density and protection against interference based on the agreed protection ratio;

e) that technical and administrative aspects are sometimes involved in the definition of "service area" and cannot easily be separated;

f) that a definition of "coverage area" for satellite broadcasting is given in the above-mentioned Annex 8, based on the value of a certain power flux-density which permits the wanted quality of reception in the absence of interference;

recognizing

that the existing definitions of "service area" and "coverage area" are related to the definitions of usable field strength or usable power flux-density, either in the presence or in the absence of interfering signals;

invites the CCIR

1. to specify a general definition for "coverage area";

2. to specify the technical basis for a general definition of "service area" which takes into account the present usage of this term throughout all official ITU texts in order to enable future administrative conferences to determine the administrative aspects of such a definition.

RECOMMENDATION No. 68

Relating to Studies and Prediction of Radio Propagation and Radio Noise [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the efficient utilization of radio frequencies depends upon the use of the most reliable technical data and standards, especially in those parts of the radio frequency spectrum which are most congested;

b) that the satisfaction of new frequency requirements and the development of radiocommunication services can be facilitated by improvements, where these are necessary, in the Technical Standards at present used by the IFRB;

c) that former Appendix A of the Radio Regulations, 1968 edition, entitled "Studies and Prediction of Radio Propagation and Radio Noise", recognized the importance of radio propagation and radio noise data as vital for the maximum utilization of radio frequencies and efficient planning of radiocommunication services;

d) that a principal objective of that Appendix had been the establishment and operation of worldwide systems of observation stations to obtain data on radio noise and on ionospheric, tropospheric and other phenomena affecting radio propagation;

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[1] Replaces Recommendation No. 4 of the Administrative Radio Conference, Geneva, 1959.

e) that administrations provide, by the best means possible, for the study, coordination and rapid dissemination of such data and of the predictions relating to these data; and endeavour as well to promote further studies on radio propagation and radio noise through the medium of the CCIR;

f) that the CCIR has adopted programmes of studies covering many of these problems;

g) that no radio propagation or radio noise measurements have been carried out in some parts of the world;

requests the CCIR

1. to encourage and assist in initiating the study of radio propagation and radio noise in those areas where an adequate system of observation stations has not yet been established;

2. to continue the studies of radio propagation and radio noise and to take measures for the coordination of the results of these studies carried out in different countries;

3. to give particular attention to those studies which will assist in the further refinement of the Technical Standards used by the IFRB;

4. to report regularly on these matters, even if the studies have not been completed;

5. to continue regular consultation with other organizations undertaking studies of propagation and radio noise, such as the International Scientific Radio Union, in order to attain the maximum possible degree of coordination;

recommends that administrations

1. initiate the study of radio propagation and radio noise in those areas where an adequate system of observation stations has not yet been established, and communicate the results of their studies to the CCIR;

2. continue to establish and to operate a worldwide system of observation stations to obtain data on radio noise and on ionospheric, tropospheric and other phenomena affecting radio propagation;

3. continue to provide, by the best means possible, for the study, coordination and rapid dissemination of such data and of the predictions relating to them;

4. take note, in formulating and carrying out their radio propagation and radio noise work, of the relevant CCIR Recommendations, Reports, Questions and Study Programmes, particularly regarding the conclusions so far reached, the planning of future studies and the recommended forms of presentation contained in these documents.

RECOMMENDATION No. 69

Relating to the Frequency Tolerances of Transmitters [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that Appendix 7 to the Radio Regulations specifies the frequency tolerances for transmitters;

b) that the principal objective of Appendix 7 has been the reduction of frequency space required per channel by means of the tightening of frequency tolerances, and that in many cases considerable improvement in spectrum utilization can continue to be obtained by further tightening of frequency tolerances;

c) that for some services an improvement in frequency tolerance to the most stringent value possible in keeping with the state of the technique would be useful in order to increase the signal-to-noise ratio, improve intelligibility and reduce errors;

d) that in certain cases a more stringent frequency tolerance would not in practice increase the number of available channels;

e) that in particular frequency bands the frequency tolerances specified in Appendix 7 may already approach the minimum useful value for certain categories of station when using existing techniques and methods of operation;

f) that it will be of considerable assistance to administrations, in the future planning of services and provision of equipment, to know those frequency tolerances which can be considered to be the ultimate useful minimum value for stations when using existing techniques and methods of operation;

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[1] Replaces Recommendation No. 1 of the Administrative Radio Conference, Geneva, 1959.

g) that in certain cases the achievement of more stringent frequency tolerances is subject to economic limitations, which should be known and taken into account;

invites the CCIR

1. to continue its study of frequency tolerances with a view to the reduction of the frequency space required for a given channel;

2. to consider whether or not in certain cases it is possible to predict ultimate values of tolerances, which it would not be necessary to make more stringent under currently known conditions of operation, and to state what these tolerance values might be;

3. to report upon the possibility of achieving such ultimate values of tolerances consistent with economic and design requirements and other practical considerations;

4. to indicate which, if any, of the tolerances specified in Appendix 7 have already attained these ultimate values.

RECOMMENDATION No. 70

Relating to Studies of the Technical Characteristics of Equipment [1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

that the available technical information concerning the various types of apparatus used for the reception of the different classes of emission in the several services needs to be more complete and more precise in order to permit the most efficient planning of the use of the radio frequency spectrum;

invites the CCIR

1. to continue to study, and to make Recommendations for the bandwidth, selectivity, sensitivity and stability characteristics of various types of apparatus used for the reception of the different classes of emission in the several services;

2. to continue to study practical methods of achieving the recommended characteristics;

3. to study the minimum practicable spacing between adjacent channels for the different classes of emission for the several services in the various bands;

4. to study other desirable conditions to be fulfilled by the complete systems employed by the different services in order to determine the required technical performance of the equipment, including the station terminal apparatus and the antennae;

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[1] Replaces Recommendation No. 6 of the Administrative Radio Conference, Geneva, 1959.

5. to study methods for determining whether the equipment satisfies the recommended requirements;

6. to give particular attention to those studies which will assist in the further refinement of the Technical Standards used by the IFRB.

RECOMMENDATION No. 71

Relating to the Standardization of the Technical and Operational Characteristics of Radio Equipment

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that administrations are confronted with the necessity of allocating increasing resources to the regulation of radio equipment performance;

b) that administrations, and in particular those in developing countries, often have difficulty in providing such resources;

c) that it would be of advantage to apply, as far as practicable, any mutually agreed standards and associated type approvals;

d) that a number of international bodies including the CCIR, ICAO, IMCO, CISPR and the IEC already provide recommendations and standards for technical and operating characteristics applicable to equipment performance and its measurement;

e) that in this context the specific requirements of developing countries have not always been taken fully into account;

recommends

1. that administrations endeavour to cooperate with a view to establishing international performance specifications and associated measuring methods that could be used as models for domestic standards for radio equipment;

2. that such international performance specifications and associated measuring methods respond to widely representative conditions including specific requirements of developing countries;

3. that, when such international performance specifications for radio equipment exist, administrations, as far as practicable, adopt these specifications as a basis for their national standards;

4. that administrations consider as far as practicable mutual acceptance for the type approval of equipment which conforms to such performance specifications.

RECOMMENDATION No. 72

Relating to Terminology

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the discussions concerning certain technical terms and definitions in Article **1** have shown the existence of various problems which it has not been possible to settle in a fully satisfactory manner during this Conference;

b) that technological development and modes of expression may call for the addition, amendment or possibly the deletion of particular definitions;

invites the CCIR and the CCITT,

each in its own field, to examine the definitions of technical terms in Article **1** and to propose any amendments they deem useful;

instructs the Secretary-General

to send the proposals prepared by the two organs to the administrative conferences concerned for consideration within the framework of their terms of reference.

RECOMMENDATION No. 73

Relating to the Use of the Term "Channel" in the Radio Regulations

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the term "channel" has been used extensively in the Radio Regulations in the frequency allotment plans of Appendices **16**, **18**, **25**, **26**, **27**, **27 Aer2**, **32**, **33** and **34**;

b) that the term "channel" has a different meaning in other provisions of the Radio Regulations and for the various radiocommunication services;

c) that there should not be any ambiguity in the meaning of the term "channel" in its usage throughout the Radio Regulations;

invites the CCIR

to define the term "channel" so that it may be used consistently and without confusion in the Radio Regulations in all working languages of the ITU.

RECOMMENDATION No. 74

Relating to the Use of the Rationalized "Système International d'Unités" (SI) [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that many difficulties associated with older systems of units are remedied by the SI system;

b) that the International Organization for Standardization has approved the SI system and recommends it for general adoption;

recognizing

a) that the SI system, already adopted by many international organizations, is recommended by the CCIR and the CCITT and widely used by the permanent organs of the Union;

b) that the SI system has the status of a national standard in many countries;

c) that, in countries where the SI system has not yet been adopted as the national standard, the SI system is also widely used by radio engineers, scientists and authors of radio publications;

d) that the use of the SI system is continuing to spread in all parts of the world;

recommends

that administrations should use the SI system in their relations with the Union and its organs.

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[1] Replaces Recommendation No. 9 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 100

Relating to Preferred Frequency Bands for Systems Using Tropospheric Scatter

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, requested the CCIR to study the preferred frequency bands for tropospheric scatter systems and proposed that a future world administrative radio conference should consider this matter;

b) the technical and operational difficulties pointed out by the CCIR (Report of the Special Preparatory Meeting, Geneva, 1978) in the bands shared by tropospheric scatter systems, space systems and other terrestrial systems;

c) the additional allocation of frequency bands which this Conference has made for the space services in view of their increasing development;

d) that the IFRB requires administrations to supply specific information on systems using tropospheric scatter in order to verify compliance with certain provisions of the Radio Regulations (such as Nos. **763**, **2560** and **2564**);

recognizing nevertheless

that, to meet certain telecommunication requirements, administrations will wish to continue using tropospheric scatter systems;

noting

that the proliferation of such systems in all frequency bands and particularly in those shared with the space systems is bound to aggravate an already difficult situation;

recommends that the CCIR

1. continue studies, as a matter of urgency, of the frequency bands presenting more appropriate propagation features for systems using tropospheric scatter;

2. continue studying the possibilities and criteria for sharing between systems using tropospheric scatter and other systems, particularly space systems;

3. prepare, on the basis of these studies, and if possible before its next Plenary Assembly, a Recommendation concerning the specific frequency bands found preferable for such systems. The choice of these bands should take into account allocations to other services, particularly allocations to the space services;

recommends that administrations

1. collaborate with the CCIR, as a matter of urgency and within the limits of their possibilities, by sending it contributions relating to the aforementioned studies;

2. for the assignment of frequencies to new stations in systems using tropospheric scatter, take into account the latest information prepared by the CCIR to ensure that systems established in the future use a limited number of certain frequency bands;

3. in frequency assignment notifications to the IFRB, indicate expressly whether they relate to stations of tropospheric scatter systems;

invites the Administrative Council

to make the necessary arrangements for a future world administrative radio conference to consider the frequency bands of the fixed service which shall be used in preference by the new tropospheric scatter systems, taking into account the allocations to the space radiocommunication services and the relevant CCIR Recommendations.

RECOMMENDATION No. 101

Relating to Feeder Links for the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the need for ample information on the characteristics of feeder links for planning the broadcasting-satellite service;

b) the studies being pursued by the CCIR under the appropriate Study Programme;

c) that the carrier-to-noise ratios for the feeder links to broadcasting satellites should be of the order of ten times greater than those for the down-links;

d) that, as regards feeder 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;

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[1] Replaces Recommendation No. **Sat** – 5 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

e) that, where planning is based on isolation parameters such as radiation patterns for space station transmitting antennae, carrier interleaving, 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 purity of their on-beam polarization;

f) 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 feeder 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 feeder 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 feeder 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 feeder links for (a) satellite(s) in the broadcasting-satellite service occupying a given position in the geostationary-satellite orbit.

RECOMMENDATION No. 102

Relating to the Study of Modulation Methods for Radio-Relay Systems in Relation to Sharing with Fixed-Satellite Service Systems [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that Article **8** of the Radio Regulations permits the sharing of certain frequency bands by the fixed-satellite service and the fixed service;

b) that the sharing criteria to avoid mutual interference between the stations in these two services have been established in Articles **27** and **28**;

c) that among many factors of overall efficiency of utilization of frequency bands it seems that the reduction of interference between two services is most important;

noting

a) that the overall efficiency of utilization of the frequency bands shared by the two services depends on the methods of modulation used by the systems concerned;

b) that studies of the preferred modulation characteristics for fixed-satellite service systems are to be carried out under Study Programme 2D-1/4 of the CCIR;

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[1] Replaces Recommendation No. **Spa** 4 of the Extraordinary Administrative Radio Conference, Geneva, 1963.

recommends that the CCIR

should study especially, under the general framework of Question 2-3/4, modulation methods (such as pulse-code modulation using phase or frequency modulation) in particular for line-of-sight radio-relay systems in relation to sharing with fixed-satellite service systems.

RECOMMENDATION No. 103

Relating to Carrier Energy Dispersal in Systems in the Fixed-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that use of carrier energy dispersal techniques in systems in the fixed-satellite service can result in a substantial reduction of interference to stations of a terrestrial service operating in the same frequency bands;

b) that the use of such techniques can result in a substantial reduction in the level of interference between systems in the fixed-satellite service operating in the same frequency bands and in a corresponding increase of efficiency in the utilization of the geostationary-satellite orbit;

c) that such techniques are being regularly and successfully employed in systems in the fixed-satellite service without noticeable deterioration of the quality of operation;

recommends

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

2. that systems in the fixed-satellite service employing digital modulation should use carrier energy dispersal techniques when this becomes technically feasible and is practical.

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[1] Replaces Recommendation No. **Spa2** – 11 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

RECOMMENDATION No. 104 (Mob-87)

Provision of Frequency Bands for Feeder Links in the Fixed-Satellite Service for the Mobile-Satellite Service or for the Aeronautical, Land, or Maritime Mobile-Satellite Services in the Bands 1 530 - 1 559 MHz and 1 626.5 - 1 660.5 MHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that No. **726** of the Radio Regulations provides that the allocation to the maritime mobile-satellite service in the band 1 530 - 1 535 MHz shall be effective from 1 January 1990, and that up to that date the fixed service shall be on a primary basis in Regions 1 and 3;

b) that feeder links are required for the aeronautical mobile-satellite service, the land mobile-satellite service, the maritime mobile-satellite service and the mobile-satellite service operating in the bands 1 530 - 1 559 MHz and 1 626.5 - 1 660.5 MHz;

c) that, although No. **27** of the Radio Regulations provides that such feeder links may be part of the mobile-satellite service, No. **22** of the Radio Regulations indicates that the fixed-satellite service may also include feeder links for the mobile-satellite services;

d) that the majority of such feeder links are in the bands 3 400 - 4 200 MHz and 5 925 - 7 075 MHz;

e) that the bands mentioned in *considering d)* above are becoming increasingly congested, thus causing some difficulties during the coordination process;

f) that the lack of homogeneity of the technical characteristics of the feeder links of the mobile-satellite services and the links of the fixed-satellite service results in coordination difficulties;

g) that distress and safety traffic is carried on feeder links of the mobile-satellite services;

h) that the extension of the spectrum necessary for feeder links in contiguous frequency bands would be desirable from a technical and economic point of view, but may cause significant problems of sharing or allocation, or both;

noting

that, at this Conference, certain administrations made proposals for sub-bands in the frequency bands 3 400 - 4 200 MHz and 5 925 - 7 075 MHz in which the feeder links for the aeronautical, land, maritime and mobile-satellite services would have priority over other assignments to the fixed-satellite service, while other administrations considered that the frequency spectrum required for the feeder links for the mobile-satellite services can more readily be provided in the fixed-satellite service bands by the normal coordination process;

recommends

that the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and on the Planning of the Space Services Utilizing It (WARC Orb-88) take note of the concerns expressed in the *considerings* and *noting* above in its decisions with respect to feeder links for the aeronautical mobile-satellite service, the land mobile-satellite service, the maritime mobile-satellite service and the mobile-satellite service in the bands 1 530 - 1 559 MHz and 1 626.5 - 1 660.5 MHz;

invites the CCIR

to continue its study relating to this matter;

instructs the Secretary-General

to forward this Recommendation to WARC Orb-88.

RECOMMENDATION No. 205 (Mob-87)

Future Public Land Mobile Telecommunication Systems

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that present techniques used by land mobile cellular systems allow for a significant degree of spectrum efficiency;

b) that new applications involving digital techniques are being introduced in public switched networks and that these applications will also be introduced in the land mobile service;

c) that there is a need for world-wide interoperability, especially for hand-portable (personal) terminals;

d) that the demand for mobile services will continue to increase, making it necessary to develop techniques to improve spectrum utilization;

e) that the spectrum needs will be relatively small for systems serving short-range, low-power, hand-portable (personal) terminals due to the high spectrum efficiency inherent to the small cells in such systems;

f) that a high degree of equipment standardization is desirable;

g) that land mobile system techniques may also be used to provide telecommunications services for fixed service applications in remote areas;

h) that future systems which provide service to hand-portable (personal) terminals may evolve from existing or currently planned systems;

noting

a) Recommendation **310** of the World Administrative Radio Conference, Geneva, 1979, relating to an automated UHF maritime mobile radiocommunication system;

b) CCIR Question 39/8 and Study Programme 39A/8 on public land mobile telephone systems;

c) CCIR Decision 69 initiating a study of future public land mobile telecommunication systems within the current study period;

d) relevant CCITT studies and Recommendations;

recommends

that the next competent world administrative radio conference should consider designating a suitable band or bands for international use by future public land mobile telecommunication systems taking into account the relevant CCIR Recommendations and Reports;

invites the CCIR

to continue to study, as a matter of urgency, the technical characteristics and suitable frequency bands for the equipment and systems providing public land mobile services;

invites the CCITT

to pursue studies to permit the interworking of future public land mobile telecommunication systems with the public switched telecommunication networks;

invites the Administrative Council

to take the necessary action to place this matter on the agenda of the next competent world administrative radio conference.

RECOMMENDATION No. 302 (Rev.Mob-87)

Improved Use of the HF Radiotelephone Channels for Coast Stations in the Bands Allocated Exclusively to the Maritime Mobile Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that a large number of requests for HF radiotelephony allotments was submitted to the World Maritime Administrative Radio Conference, Geneva, 1974;

b) that the number of channels resulting from the revision of Appendix **16** by that Conference has not been sufficient to satisfy those requirements in optimum conditions;

c) that the resulting sharing patterns have been formed mainly by operational considerations;

d) that since the World Administrative Radio Conference, Geneva, 1979, the optimum use of the HF radiotelephony channels in the bands allocated exclusively to the maritime mobile service has been of even greater importance;

e) that, on each channel, administrations should afford one another an equivalent quality of service;

f) that the efforts to develop technical means to facilitate the common use of frequencies by neighbouring coast stations of different administrations, or by a coast station operating on behalf of more than one administration, should be continued;

g) that this Conference has provided a number of additional channels for radiotelephony in the HF bands allocated exclusively to the maritime mobile service (see Resolution **325 (Mob-87)**), but that these additional channels may not be sufficient to satisfy all requirements;

recommends that administrations

1. make every effort to reach mutually satisfactory operational arrangements, which may include:

- different time-sharing arrangements;
- differentiated hours of opening;
- on a voluntary and regional basis, the use of HF radiotelephone channels in an order of overflow priority;

2. employ every practicable means, which may include those mentioned above, to ensure that the best possible use is made of the HF coast radiotelephone channels in the bands allocated to the maritime mobile service;

invites administrations

1. when assigning frequencies in the HF bands to coast stations, to take into account the special rules contained in No. **954** and the provisions of No. **1804** of the Radio Regulations;

2. to ensure that coast stations:

- use the frequency band and the minimum power appropriate to the propagation conditions and the nature of the service;
- use directional antennae whenever possible;

– give appropriate instructions to ship stations in accordance with No. **5056** of the Radio Regulations;

invites the CCIR

to continue its study with a view to improving all technical and operational sharing criteria relating to the use of HF coast radiotelephone channels in the bands allocated exclusively to the maritime mobile service, including the choice of available channels by electronic or other means to facilitate multiple access to the channels.

RECOMMENDATION No. 303 (Rev.Mob-87)

Use of the Carrier Frequencies 4 125 kHz and 6 215 kHz to Supplement the Carrier Frequency 2 182 kHz for Distress and Safety and for Call and Reply Purposes

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that in some areas of the world it is not practicable to provide reliable coverage for distress and safety purposes on the international radiotelephony distress frequency 2 182 kHz, because of the great distances between coast stations keeping watch on this frequency;

b) that a large number of ships equipped only for radiotelephony make voyages in these areas during which they are often out of range of coast stations keeping watch on the carrier frequency 2 182 kHz;

c) that to overcome this problem many administrations in the above-mentioned areas have established watches at their coast stations for distress and safety and for call and reply purposes on the carrier frequencies 4 125 kHz and 6 215 kHz; and that these watches have proved to be effective supplements to those kept on 2 182 kHz;

d) that provision is made in the Radio Regulations for the carrier frequencies 4 125 kHz and 6 215 kHz to be used as supplementary frequencies to 2 182 kHz for distress and safety and for call and reply purposes;

e) that it could be in the interests of ships equipped only for radiotelephony and operating in these areas to have facilities to send and receive on the carrier frequencies 4 125 kHz and 6 215 kHz when calls on 2 182 kHz might be ineffective;

recommends

1. that administrations bring to the notice of the operators of ships under their jurisdiction which are equipped only for radiotelephony that certain land stations as indicated in the List of Coast Stations provide facilities for distress and safety and for call and reply purposes on the carrier frequencies 4 125 kHz and 6 215 kHz to supplement the carrier frequency 2 182 kHz;

2. that administrations whose ships are equipped only for radiotelephony consider that, although it is not mandatory for ship and coast stations to provide facilities for sending and receiving on the carrier frequencies 4 125 kHz and 6 215 kHz, it may be essential for the safety of radiotelephony ships to have such facilities.

RECOMMENDATION No. 304

Relating to the Frequencies in Appendix 16, Section B, of the Radio Regulations, Provided for Worldwide Use by Ships of All Categories and by Coast Stations [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the frequencies indicated in the table of single-sideband transmitting frequencies for simplex (single-frequency) operation and for inter-ship cross-band (two-frequency) operation are not yet in worldwide use for communications between ship and coast stations;

b) that there is a worldwide need for ocean-going vessels to be able to communicate with coast stations of any administration;

recommends

that, as far as possible, administrations provide a service on these frequencies at their main coast radiotelephone stations and notify to the Secretary-General the particulars of these services for publication in the List of Coast Stations.

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[1] Replaces Recommendation No. **Mar2** – 6 of the World Maritime Administrative Radio Conference, Geneva, 1974.

RECOMMENDATION No. 305

Relating to the Use of Channels 15 and 17 of Appendix 18 by On-Board Communication Stations [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that channels 15 and 17 of Appendix **18** were provided by the World Administrative Radio Conference, Geneva, 1967, for use for internal operational communications on board ships within territorial waters and with an effective radiated power not in excess of 0.1 W, and that this power limit was raised to 1 W by the World Maritime Administrative Radio Conference, Geneva, 1974;

b) that considerable use is made of these channels by a number of administrations;

c) that some administrations have not used these channels for on-board communication because of the shortage of VHF channels for other maritime mobile needs;

d) that, for the same reason, these administrations wish to have the use of these channels for on-board communication discontinued;

e) that the present Conference has retained the relevant provisions in the Table of Frequency Allocations;

noting

that the CCIR has adopted Recommendation 542 and Report 589-1;

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[1] Replaces Recommendation No. **Mar2** – 11 of the World Maritime Administrative Radio Conference, Geneva, 1974.

recognizing

a) that several common channels for on-board communication are necessary internationally to meet worldwide requirements in the future;

b) that there may be a need for frequencies to provide for the use of repeater stations on large vessels, such as container ships, tankers, etc.;

c) that additional experience concerning the application and effectiveness of the UHF channels maintained for this purpose by the present Conference may be required;

recommends

1. that the next competent world administrative radio conference determine whether the use of channels 15 and 17 of Appendix **18** is still necessary for on-board communication and, if it is not, the date by which such use should cease;

2. that the same conference review the UHF channels being used for on-board communication stations to determine whether the number of channels and their location in the radio spectrum are satisfactory and meet the requirements of such stations;

3. that the same conference consider the need for additional allocations for use by on-board communication stations on a worldwide basis, including the territorial waters of all countries;

4. that due consideration be given by administrations to the technical standards and functioning of such stations to ensure their mutual compatibility in an effective international system of operation.

RECOMMENDATION No. 306

Relating to the Establishment of a Watch by Coast Stations for Distress Purposes on the Frequency 156.8 MHz [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the frequency 156.8 MHz has been designated as the international distress frequency for stations in the maritime mobile service operating in the authorized bands between 156 MHz and 174 MHz;

b) that this frequency is most useful for short-range communication and its use in distress situations will materially improve the safety of life at sea, particularly in areas of heavy traffic where an efficient listening watch can be maintained;

c) that many administrations already provide radio coverage of their coasts on frequencies in the band 156 - 174 MHz;

d) that, however, it would be impracticable or unnecessary for some administrations in their prevailing circumstances to provide sufficient coverage of their coasts in the band 156 - 174 MHz to enable an effective watch to be kept on 156.8 MHz for distress purposes;

recommends

that administrations, where they consider it necessary and practicable, take steps to establish a watch for distress purposes on the coasts of their countries on the frequency 156.8 MHz.

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[1] Replaces Recommendation No. **Mar2** – 10 of the World Maritime Administrative Radio Conference, Geneva, 1974.

RECOMMENDATION No. 310

Relating to an Automated UHF Maritime Mobile Radiocommunication System

The World Administrative Radio Conference, Geneva, 1979,

recognizing

a) the continued growth of world population and the associate need for safe and efficient transportation of foodstuffs and other essential goods;

b) the need for a rapid and effective worldwide economic growth;

c) that the maritime fleets are increasingly engaged in trade and these fleets are growing substantially;

considering

a) that the international maritime mobile VHF band (Appendix **18**) has become congested in many areas of the world;

b) that the future requirements for additional UHF radio telephone channels for port operations, ship movements and public correspondence in the maritime mobile service have been estimated to be as many as 200 to 240 duplex channels in some congested areas;

c) that it is highly desirable for the UHF maritime and other international mobile public correspondence systems to become fully automated to ensure the efficient utilization of the channels and the economic operation of the services, to the benefit of the users;

d) that standardization is of great importance in the international mobile services;

e) that administrations may wish to use some or all of the channels designated for maritime use for other automated mobile services. Examples of such usage are joint or combined radiocommunications in ports, waterways and adjacent piers. In other areas where there is no need for mobile services, these channels could be used for other radio services;

noting

a) CCIR Report 587-1 on this subject in response to Question 23-2/8;

b) CCIR Decision 30 directing Interim Working Party 8/5 to study this subject further on the basis of Question 23-2/8, taking into account the results of studies in Report 587-1;

c) Inter-Governmental Maritime Consultative Organization (IMCO) COM Circular 73 stating short-range telecommunications requirements for 10 MHz of bandwidth for automated international maritime services;

recommends

that the next competent world administrative radio conference:

1. designate suitable bands having sufficient spectrum for a maritime mobile radiocommunication system, including public correspondence, from those allocated on a worldwide basis to the mobile service;

2. identify the means for establishing, as required, regional assignment plans which take into account the worldwide needs of the maritime mobile service and allow for compatibility with other radio services;

invites the CCIR

1. to study, as a matter of urgency, bands which are preferred from operational and sharing aspects and to issue a Recommendation or a Report before the next competent world administrative radio conference;

2. to study, in consultation with the CCITT, the technical and operational aspects of an integrated and automated maritime and land mobile system;

requests the Secretary-General

to communicate this Recommendation to the Inter-Governmental Maritime Consultative Organization (IMCO) for consideration and comments.

RECOMMENDATION No. 312 (Rev.Mob-87)

Studies of the Interconnection of Maritime Mobile Radiocommunication Systems with the International Telephone and Telegraph Networks

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that it is desirable that there be interconnection of radiocommunication systems in the maritime mobile service with the international public telephone and telegraph networks to permit automatic routing of ship-shore traffic to and from national networks;

b) that such interconnection would greatly improve maritime radiocommunications;

urges the CCIR and the CCITT

to continue all required studies relating to compatibility between the maritime mobile radiocommunication systems and the international telephone and telegraph systems, including various quality-of-service criteria, to permit the full interconnection of the maritime mobile services with the international telephone and telegraph networks;

and recommends administrations

to give priority to these studies in their participation in the work of the CCIR and the CCITT.

RECOMMENDATION No. 316 (Rev.Mob-87)

Use of Ship Earth Stations Within Harbours and Other Waters Under National Jurisdiction

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

recognizing

that permitting the use of ship earth stations within harbours and other waters under national jurisdiction belongs to the sovereign right of countries concerned;

recalling

that the World Administrative Radio Conference, Geneva, 1979, allocated the bands 1 530 - 1 535 MHz (with effect from 1 January 1990), 1 535 - 1 544 MHz and 1 626.5 - 1 645.5 MHz to the maritime mobile-satellite service and the bands 1 544 - 1 545 MHz and 1 645.5 - 1 646.5 MHz to the mobile-satellite service;

noting

that the International Agreement on the use of INMARSAT ship earth stations within the Territorial Sea and Ports has been adopted and this Agreement is open to accession, ratification, approval or acceptance, as appropriate;

considering

a) that the maritime mobile-satellite service, which is at present in operation worldwide, has improved maritime communications greatly and has contributed much to the safety and efficiency of ship navigation, and that fostering and developing the use of that service in future will contribute further to their improvement;

b) that the maritime mobile-satellite service will play an important role in the Global Maritime Distress and Safety System (GMDSS);

c) that the use of the maritime mobile-satellite service will be beneficial not only to the countries having ship earth stations at present but also to those considering the introduction of that service;

is of the opinion

that all administrations should be invited to consider permitting, to the extent possible, ship earth stations to operate within harbours and other waters under national jurisdiction in the bands 1 530 - 1 535 MHz (with effect from 1 January 1990), 1 535 - 1 545 MHz and 1 626.5 - 1 646.5 MHz;

recommends

1. that all administrations should consider permitting, to the extent possible, ship earth stations to operate within harbours and other waters under national jurisdiction, in the above-mentioned frequency bands;

2. that administrations should consider the adoption, where required, of international agreements on this matter.

RECOMMENDATION No. 317 (Rev.Mob-87)

Use of a Priority Indicator Signal for Alerting Ships to Send Overdue Position Reports and for Other Ships to Report Sightings

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the International Convention on Maritime Search and Rescue, 1979, provides for the establishment of ship reporting systems by States for the search and rescue regions for which they are responsible;

b) that some administrations have already established such ship reporting systems;

c) that verification of the safety of vessels which have failed to report is required;

d) that standard procedures need to be adopted;

recommends

1. that a priority indicator signal with the following meaning be adopted:

> «A position report to the ship reporting system of (name of administration) was expected from the vessel indicated by the call sign (· · ·) but has not been received. This vessel or any vessel or shore station that has been in communication with or sighted this vessel should immediately communicate with the station which has sent this signal.»;

2. that a suitable signal for this purpose would be the alphabetic characters "JJJ" in the Morse code for radiotelegraphy and the spoken words "REPORT IMMEDIATE" for radiotelephony;

3. that the name and call sign of the vessel would be broadcast with ships' traffic lists or in marine safety information broadcasts, followed by the above signal when an expected position report is overdue for a period specified by administrations;

invites administrations

to consider this matter and submit proposals to the next competent conference for the implementation of this signal, taking into account the views of the International Maritime Organization (IMO);

instructs the Secretary-General

to communicate this Recommendation to IMO for consideration.

RECOMMENDATION No. 318 (Mob-87)

Improved Efficiency in the Use of the Appendix 18 VHF Frequency Spectrum for Maritime Mobile Communications

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that growth in the use of Appendix **18** VHF maritime mobile channels is expected to continue;

b) that in many parts of the world significant congestion already exists;

c) that increases in congestion could be harmful to the safe movement and operation of vessels and port operations and are a matter of concern to the International Association of Lighthouse Authorities (IALA), the International Maritime Organization (IMO) and many administrations;

noting

a) that it may be possible to make more efficient use of the VHF maritime mobile spectrum with the development of existing or new technologies such as narrow-band FM, single sideband, compandored single sideband, use of interleaved channels separated by 12.5 kHz, reduced channel spacing, etc.;

b) that a great number of mariners using low-cost transceivers rely on this band and the safety services that are thereby provided;

c) that any modification to Appendix **18** shall take account of the distress and safety utilization;

invites the CCIR

urgently to undertake studies to determine the most appropriate means of promoting a more efficient use of the frequency spectrum in the VHF maritime mobile band and to develop Recommendations covering the technical and operational characteristics of systems using this band;

invites administrations

to participate in these studies actively;

recommends

that a future competent administrative radio conference review and revise, if appropriate, the provisions of Appendix **18**, taking into account the relevant CCIR Recommendations;

instructs the Secretary-General

to communicate this Recommendation to the IALA and IMO.

RECOMMENDATION No. 319 (Mob-87)

The Need for Technical Improvements to Minimize the Risk of Adjacent Channel Harmful Interference Between Assignments Used for Narrow-Band Direct-Printing Telegraphy and Data Transmission Systems in Accordance with Appendix 32 and Resolution 300 (Rev.Mob-87)

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that Appendix **32** of the Radio Regulations contains the channelling arrangement for narrow-band direct-printing telegraphy and data transmission systems (paired frequencies);

b) that the use of these frequency pairs is subject to the provisions of Article **60** of the Radio Regulations and Resolution **300 (Rev.Mob-87)**;

c) that the spacing between the frequencies listed in Appendix **32** is 500 Hz;

d) that the present Conference has decided to adopt No. **4321B** which specifies the maximum mean powers to be used by coast stations for F1B and J2B emissions in bands exclusively allocated to the maritime mobile service between 4 000 kHz and 27 500 kHz;

recommends

that administrations cooperate to the fullest extent possible in resolving harmful interference from adjacent channels used for narrow-band direct-printing telegraphy and data transmission systems (paired frequencies);

invites the CCIR

1. to study the question of technical compatibility between adjacent channels and make appropriate Recommendations;

2. to take into account, in the study, the maximum mean powers for coast radiotelegraph stations employing class F1B or J2B emissions in the bands exclusively allocated to the maritime mobile service between 4 000 kHz and 27 500 kHz (see No. **4321B**);

3. to present the results of its study to the next competent conference.

RECOMMENDATION No. 401

Relating to the Efficient Use of Aeronautical Mobile (R) Worldwide Frequencies [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

that the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978, allotted a limited number of worldwide frequencies for exercising control over regularity of flight and for safety of aircraft;

recommends to administrations

1. that the number of HF aeronautical stations on the worldwide channels should be kept to a minimum consistent with the economic and efficient use of frequencies;

2. that, if possible and practicable, one such station should serve aircraft operating agencies in adjacent countries and there should not normally be more than one station per country.

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[1] Replaces Recommendation No. **Aer2** – 2 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

RECOMMENDATION No. 402

Relating to Cooperation in the Efficient Use of Worldwide Frequencies in the Aeronautical Mobile (R) Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the need to make the most efficient use of worldwide frequencies in the aeronautical mobile (R) service;

b) that a Plan has been adopted for the allotment by areas of worldwide frequencies in the aeronautical mobile (R) service;

c) the desirability of coordination between administrations within the areas to which the Allotment Plan applies;

d) the right of an administration to select and notify to the IFRB for recording in the Master International Frequency Register any frequency assignment in a channel allotted to the area in which its country is located;

e) the role played by the IFRB in regulatory procedures under Article **12** of the Radio Regulations;

f) the role played by the International Civil Aviation Organization (ICAO) in the field of international aeronautical operations;

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[1] Replaces Recommendation No. **Aer2** – 3 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

invites

1. *administrations within a worldwide allotment area*, as they consider it appropriate, *and the ICAO*, to seek the advice of the IFRB in determining the best choice of frequencies from a technical viewpoint in order to make the most efficient use of aeronautical mobile (R) worldwide frequencies;

2. *administrations within a worldwide allotment area*, as they consider it appropriate, to coordinate mutually the use of these frequencies from the viewpoint of aeronautical operations and, in this connection, to bear in mind the benefit that could be gained by obtaining the advice of ICAO in this process;

3. *the IFRB* to assist any administration or group of administrations in a worldwide allotment area wishing to coordinate their requirements for worldwide frequencies and to continue its cooperation with ICAO for this purpose;

requests the Secretary-General

to bring this Recommendation to the attention of the International Civil Aviation Organization.

RECOMMENDATION No. 403

Relating to the Development of Techniques Which Would Help to Reduce Congestion in the High Frequency Bands Allocated to the Aeronautical Mobile (R) Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that several administrations are actively engaged in the development of communication techniques the wider use of which, in the aeronautical mobile (R) service, would help to reduce congestion in the high frequency bands allocated to that service; such developments include the use of higher frequencies with remotely controlled stations, directional antennae, space radiocommunication techniques and automatic data transmission;

b) that knowledge of these developments would be useful to other administrations in considering the application of these techniques to their aeronautical mobile (R) communication services;

c) that the International Civil Aviation Organization (ICAO) is actively engaged in coordinating the operational development of such techniques;

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[1] Replaces Recommendation No. **Aer2** – 1 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

recommends

that administrations engaged in the development of techniques which would help to reduce congestion in the HF bands inform the IFRB periodically of the progress achieved;

instructs the IFRB

to circulate periodically the information so obtained to administrations and to the ICAO.

RECOMMENDATION No. 405

Relating to a Study of the Utilization of the Aeronautical Mobile-Satellite (R) Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the continuing efforts of the aeronautical mobile (R) service to obtain improvements in communications commensurate with increases in the number, size and speed of aircraft;

b) the efforts of the International Telecommunication Union to reduce congestion in the bands between 4 MHz and 27.5 MHz;

c) the need to effect conservation in the use of the high frequency spectrum;

noting

a) that successful application of space radiocommunication techniques to the communication needs of international civil aviation offers the possibility of substantially improving aeronautical mobile (R) service communications while avoiding congestion in the bands between 4 MHz and 27.5 MHz;

b) that tests have demonstrated the capability of effecting communication between aircraft and aeronautical stations by relay via a geostationary satellite;

c) that the state of the art in space radiocommunication techniques is rapidly advancing;

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[1] Replaces Recommendation No. **Aer** 2 of the Extraordinary Administrative Radio Conference, Geneva, 1966.

d) that the technical potential is such that space radiocommunication techniques could provide a capability for accommodating, in the near future, many of the aeronautical mobile (R) service communication requirements over major world air routes on all but the polar routes;

e) that before administrations will be willing to undertake a programme to implement space radiocommunication techniques they will need a comprehensive investigation into those techniques and a statement of the measures that need to be taken;

f) that the ability of administrations to undertake such a programme is intimately linked to the economic implications involved;

g) that the International Civil Aviation Organization (ICAO) is the international body primarily concerned with the establishment of standards and recommended practices governing radiocommunication systems and techniques used to support international civil aviation;

h) that the CCIR has studied the application of space radiocommunication techniques in the aeronautical mobile (R) service but these studies may need revision;

invites the CCIR

to continue its studies on the application of space radiocommunication techniques in the aeronautical mobile (R) service in cooperation with ICAO;

recommends

1. that administrations, bearing in mind the economic and operational aspects involved, should take account of the possibilities of satisfying the communication needs of the aeronautical mobile (R) service on major world air routes by the use of space radiocommunication techniques;

2. that administrations should give further study to these questions taking as a basis for their consideration the factors listed in the Annex hereto.

ANNEX TO RECOMMENDATION No. 405

Note: The list of factors which follows is not claimed to be exhaustive nor is it intended to limit consideration of any other aspects pertinent to the use of the aeronautical mobile-satellite (R) service.

1. The technical parameters of the satellite and aircraft receiving and transmitting system, including:

a) required received (carrier) power at the satellite (from the aircraft);

b) required received (carrier) power at the aircraft (from the satellite);

c) satellite effective radiated power (per channel);

d) aircraft effective radiated power (per channel);

e) type of emission which should be employed;

f) bandwidth of each channel;

g) channelling arrangement;

h) polarization requirements;

i) need for omni-directional aircraft antennae; sea/ground reflections;

j) required separation between transmit and receive frequencies at the satellite;

k) requirement on the satellite for capability of aircraft to use each channel independently (multiple/random access);

l) requirements in relation to system reliability;

m) other considerations.

2. The number and location of satellites, including:

a) in regard to provision of service, disposition of air routes and the number of flights over each air route;

b) group of air routes which may be served via a common satellite;

c) number of satellites needed to provide service to each group of air routes;

d) location of each of the satellites;

e) number of channels needed aboard each satellite;

f) other considerations.

3. Technical performance requirements for aeronautical earth stations, including:

a) suitable transmitting and receiving antennae characteristics: gain, beamwidth, siting, etc.;

b) minimum effective radiated power;

c) development and utilization of low-cost earth station (terminal) facilities;

d) need for a selective calling system (SELCAL);

e) other considerations.

4. Method of operation and location of aeronautical earth stations, including:

a) the method of operation: where multiple frequencies are provided on the satellite, the need, or absence of need, to continue the present practice of providing route separation by use of different/separate frequencies; that is:

- should all (R) frequencies on the satellite be available at all earth stations; *or*
- should the communication load be distributed between available frequencies, each of which is limited to a specific geographic area; *or*
- some other arrangement;

b) as appropriate, to list (by frequency) each of the earth stations which should employ each satellite frequency;

c) other considerations.

5. Provisions for handling aeronautical point-to-point communications:

a) technical system performance parameters of the terminal equipment;

b) technical system performance parameters of the satellite equipment;

c) requirement on the satellite for capability of terminals to have independent access to relay channels through the satellite (multiple/random access);

d) frequency bands to be used;

e) required separation between transmit and receive frequencies on the satellite;

f) development and utilization of low-cost terminal facilities;

g) the entity or entities which should provide, own or operate the satellites and terminal facilities as well as the extent to which aeronautical point-to-point communications should be handled;

h) other considerations.

6. Estimated costs of a satellite system to include: land-based, airborne and satellite-borne facilities.

7. Operational aspects of a satellite system, including all facilities mentioned in paragraph 6 above, particularly:

a) the environment within which the system must work;

b) the evolutionary process of introducing the system.

RECOMMENDATION No. 406

Relating to the Revision of the Frequency Allotment Plan for the Aeronautical Mobile (OR) Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the Frequency Allotment Plans for the aeronautical mobile service prepared by the International Administrative Aeronautical Radio Conference (IAARC), Geneva, 1949, and adopted by the Extraordinary Administrative Radio Conference, Geneva, 1951, were substantially adopted by the Administrative Radio Conference, Geneva, 1959, and included in the Radio Regulations;

b) that the Extraordinary Administrative Radio Conference responsible for revising the Allotment Plan for the Aeronautical Mobile (R) Service, Geneva, 1966, decided to include this Plan as Appendix **27**;

c) that the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978, adopted technical principles for establishing the Frequency Allotment Plan for the Aeronautical Mobile (R) Service, in particular the use of the 3 kHz separation between carrier frequencies for certain classes of emission and powers which can be directly applied in establishing the allotment plan for the aeronautical mobile (OR) service;

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[1] Replaces Resolution No. 13 of the Administrative Radio Conference, Geneva, 1959, and Recommendation No. **Aer2** – 8 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

d) that the Allotment Plan for the Aeronautical Mobile (OR) Service has not been revised since the Administrative Radio Conference, Geneva, 1959;

e) that, since 1959, many countries have become Members of the Union;

f) that this Conference has adopted Resolution **403** relating to the use of the frequencies 3 023 kHz and 5 680 kHz common to the aeronautical mobile (R) and (OR) services;

g) that the International Telecommunication Convention (Malaga-Torremolinos, 1973) in Article 7, No. 44, provides that a world administrative radio conference may partially revise the Radio Regulations;

is of the opinion

that the Plan for the Aeronautical Mobile (OR) Service contained in Appendix **26** to the Radio Regulations will have to be reviewed and that administrations should urgently study the communication requirements of their national and international air operations in order to establish when, in the best interests of aviation, such a review shall be carried out;

recommends

that the Administrative Council should convene a world administrative radio conference to review Appendix **26** and the related provisions of the Radio Regulations.

RECOMMENDATION No. 407

Relating to No. 27/123 of Appendix 27 Aer2 – Sub-Area 5B [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the discussions which took place on the proposed modification of No. **27/123** of Appendix **27 Aer2**;

b) that the interested administrations have agreed to continue consultations between themselves on the matter of Sub-Area 5B;

recommends

1. that consultations should be carried out by the interested administrations in order to arrive at a satisfactory solution;

2. that the administrations concerned report on the results of their consultations to the next competent world administrative radio conference in order to enable that conference to arrive at a definitive solution on No. **27/123**.

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[1] Replaces Recommendation No. **Aer2** – 7 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.

RECOMMENDATION No. 408 (Mob-87)

Development of a World-Wide System for Public Correspondence with Aircraft

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that studies and operational experience in some areas indicate a demand for a world-wide system of public correspondence with aircraft (APC);

b) that although some terrestrial APC systems operate in the band 862 - 960 MHz, it is not allocated to the aeronautical mobile service on a world-wide basis;

c) that it could be beneficial to extend and supplement a satellite APC system by additionally developing a terrestrial APC system to provide a spectrally efficient cost effective system over the more densely populated areas of the world;

d) that two bands of 1 MHz would appear to provide sufficient capacity for pre-operational and experimental APC systems;

e) that studies are required to determine the optimum technical and operational characteristics to be adopted for a terrestrial APC system, together with studies concerning the conditions for sharing with other services utilizing the same frequency bands, particularly safety services;

f) that consideration must be given to electromagnetic compatibility problems in the operation of APC radiocommunication equipment and radionavigation equipment in aircraft;

noting

1. that the bands 1 593 - 1 594 MHz and 1 625.5 - 1 626.5 MHz have been allocated under certain conditions to the aeronautical mobile service to provide the initial allocations for pre-operational and experimental APC systems;

2. that in some countries the use of those bands for APC systems would cause considerable difficulties;

recommends

that administrations continue their studies relating to technical and experimental matters concerning a terrestrial APC system and to report their results to the CCIR, CCITT, International Civil Aviation Organization (ICAO) and other interested bodies;

invites the CCIR

1. to study urgently the necessary sharing criteria between terrestrial APC systems operating in the bands mentioned in *noting* 1 above and other services in the same and adjacent frequency bands;

2. to study the operational and technical characteristics of a terrestrial APC system and related matters;

3. to identify technically preferred alternative frequency bands for a future world-wide terrestrial aeronautical public correspondence system;

invites the CCITT

to study the interworking of a world-wide APC system with the public switched telecommunication networks, including tariff principles, accounting and numbering schemes;

invites administrations

to take note of this Recommendation and, as appropriate, to consider various aspects relating to the implementation of terrestrial APC systems;

invites the Administrative Council

to take note of this Recommendation and, if appropriate following the conclusion of the CCIR studies, place this subject on the agenda of a future world administrative radio conference;

instructs the Secretary-General

to bring this Recommendation to the attention of ICAO, the International Maritime Satellite Organization (INMARSAT) and the International Air Transport Association (IATA) and other appropriate organizations having an interest in the subject of APC.

RECOMMENDATION No. 502

Relating to Specifications of Low-Cost Television Receivers

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the potential of the television medium as an instrument for national development is being increasingly recognized;

b) that direct reception of television broadcasting from satellites is demonstrated to be technically feasible and economically attractive;

c) that, within the limited resources available to them, many developing countries might wish to exploit the television medium to the maximum advantage;

d) that the availability of an efficient, low-cost television receiver would be an important factor in the setting up and expansion of television broadcast services in developing countries;

e) that the need for both monochrome and colour receiver sets can be foreseen for receiving terrestrial and satellite transmissions;

f) that the CCIR is already studying specifications for low-cost monochrome television receivers for home and community use, as well as the characteristics of a receiving system for a broadcasting-satellite service (television);

g) that general agreement on the performance of suitable television receivers would considerably assist TV receiver manufacturers to produce suitable receivers of the desired types and adequate standards of performance at the lowest possible cost;

h) that the design and production of television receivers has to take account of rapid advances in technology as well as obsolescence;

invites the CCIR

1. to draw up performance specifications for one or more types of low-cost television receivers as in *considering e)* above, suitable for quantity production;

2. to collaborate as necessary, with other international bodies working in this field, with a view to finalizing the specifications for such low-cost sets in the shortest possible time;

requests the Secretary-General

to send the results of this work, together with suggestions as to the action to be taken, to the Secretary-General of the United Nations, in particular for the attention of the Director of the United Nations Industrial Development Organization, as well as to the Director-General of UNESCO for information.

RECOMMENDATION No. 503 (Rev.HFBC-87)

HF Broadcasting

The World Administrative Radio Conference, for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) the congestion of the HF broadcasting bands;

b) the extent of adjacent channel interference;

noting

the possibility of improving the situation by implementing pertinent CCIR Recommendations;

recommends that administrations

1. pay special attention to the provisions for "out-of-band spectrum" contained in CCIR Recommendation 328-6;

2. encourage, to the maximum extent possible, manufacturers to design and build HF broadcasting receivers that conform to CCIR Recommendation 332-4 concerning the selectivity of receivers;

invites administrations

to take advantage, to the maximum extent practicable, of synchronized frequency transmitter operation, taking into account CCIR Recommendation 205-2;

invites the CCIR

to carry out further studies in relation to the Recommendations mentioned above, taking into account the requirements of HF broadcasting, with a view to updating these three Recommendations whenever necessary.

RECOMMENDATION No. 504

Relating to the Preparation of a Broadcasting Plan in the Band 1 605 - 1 705 kHz in Region 2

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the band 1 605 - 1 705 kHz has been allocated to the broadcasting service in Region 2 by this Conference;

b) that in accordance with No. **480**, the use of this band by the broadcasting service is subject to a broadcasting plan to be established by a regional administrative radio conference;

c) that, in the Table of Frequency Allocations in Region 2, the band 1 605 - 1 625 kHz is allocated exclusively to the broadcasting service, and the band 1 625 - 1 705 kHz is allocated to the broadcasting service on a shared basis with other services;

recognizing

the provisions of No. **346** of the Radio Regulations;

recommends

1. that a regional administrative radio conference be convened to establish a plan for the broadcasting service in the band 1 605 - 1 705 kHz in Region 2;

2. that such a conference be convened in 1985 at the latest;

3. that the exact dates of coming into force of the plan be decided at the said regional administrative radio conference. Nevertheless, the use of these bands by the broadcasting service should not commence before

1 July 1987 for the frequencies between 1 625 kHz and 1 665 kHz, and 1 July 1990 for the frequencies between 1 665 kHz and 1 705 kHz;

invites

1. *the Administrative Council* to take the necessary steps for the convening of a Region 2 administrative radio conference to plan the use of the band 1 605 - 1 705 kHz by the broadcasting service;

2. *the CCIR* to perform the necessary technical studies relating to the Region 2 broadcasting conference bearing in mind the allocations to other services in Regions 1 and 3 and the need for sharing criteria;

encourages administrations of Region 2

to promote the development and availability of receivers suitable for the broadcast band extended to 1 705 kHz.

RECOMMENDATION No. 505

Relating to Studies of Propagation at 12 GHz for the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the technical criteria adopted at the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, which drew up an assignment plan for the broadcasting-satellite service in Regions 1 and 3, included a maximum margin of 2 dB, at an elevation angle of 45°, for rainfall attenuation;

b) that some studies have indicated that the necessary margin in the Tropical Zone could be higher than 2 dB;

c) that the Special Preparatory Meeting of the CCIR, Geneva, 1978, recognized that, for the application of the technique suggested in CCIR Report 721, the available rain rate data are likely to underestimate the attenuation which will occur in tropical regions;

d) that there is also a need for ample information on the various other propagation factors to be taken into account in the planning of the broadcasting-satellite service;

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[1] Replaces Recommendation No. **Sat** – 3 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

recommends that the CCIR

1. expedite the studies of the effects of rainfall attenuation in the tropical regions and specify, as early as possible, the attenuation values necessary for ensuring a satisfactory broadcasting-satellite service;

2. continue the studies of the effects of precipitation attenuation at low angles of incidence in all rain-climatic zones;

3. continue the studies of the effects of sand and dust storms;

4. examine the relationship between the propagation characteristics for 99% of the worst month and those for the year;

5. examine, for emissions using circular polarization, the level of the depolarized component relative to the polarized component;

requests that the Director of the CCIR

bring such values of rainfall attenuation as may be specified to the notice of all administrations.

RECOMMENDATION No. 506

Relating to the Harmonics of the Fundamental Frequency of Broadcasting-Satellite Stations [1]

The World Administrative Radio Conference, Geneva, 1979,

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 level of this harmonic;

in view of

the provisions of No. **306** 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 level of the second harmonic below the values indicated in the relevant CCIR Recommendations.

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[1] Replaces Recommendation No. **Sat** – 2 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

RECOMMENDATION No. 507

Relating to Spurious Emissions in the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

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 to acceptable levels the interference to:

- the services operating in the bands adjacent to the lower and upper edges of the 12 GHz band allocated to the broadcasting service;
- the radio astronomy service, which has an allocation at 23.6 - 24 GHz;

c) 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.

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[1] Replaces Recommendation No. **Sat** – 6 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

RECOMMENDATION No. 508

Relating to Transmitting Antennae for the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the need for ample information on transmitting antennae for the planning of the broadcasting-satellite service;

b) 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 continue the study of the technical characteristics designed to achieve a pointing accuracy for transmitting antennae 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°.

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[1] Replaces Recommendation No. **Sat** – 4 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

RECOMMENDATION No. 509 (HFBC-87)

Participation by Administrations in the Improvement of the Planning System for the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that it has improved the planning method and instructed the IFRB to modify the HFBC Planning System accordingly;

b) that the work assigned to the IFRB is to be carried out in the years which follow the Conference;

c) that the steps of the planning method relate to technical and operational constraints which may vary from country to country and from region to region;

d) that the IFRB can only obtain information on these constraints through contacts with administrations;

e) that administrations from all the regions must have an opportunity to take part in the improvement process through the participation of qualified experts;

f) that administrations need to be informed periodically on the progress made and on the planning exercises and need to have the opportunity to comment on them;

g) that to promote the participation of countries from all the regions it may be necessary to defray the expenses involved from the Union budget,

recommends the Administrative Council

1. to establish a group of experts selected from among individuals proposed by administrations to assist the IFRB in carrying out the tasks relating to the HFBC Planning System entrusted to it by the Conference;

2. that the group shall comprise 27 experts from countries belonging to the five administrative regions, distributed as follows:

Region A	(Americas): 5
Region B	(Western Europe): 5
Region C	(Eastern Europe and Northern Asia): 3
Region D	(Africa): 7
Region E	(Asia and Australasia): 7

3. that the experts shall hold one annual meeting of one week on the initiative of the Board, and that a second meeting could be organized if necessary;

4. that in order to keep all administrations informed of the progress made and the results of the experts meetings, it will be necessary to organize annual meetings to exchange information to which all administrations shall be invited;

5. that such meetings to exchange information should be held in conjunction with the experts meetings for a duration of two or three days,

also recommends the Administrative Council

1. taking into account the ordinary budget of the Union and the availability of other financial resources, to provide the necessary resources for the above activities including resources to defray the costs of participation in the group of experts meetings of one expert from each administration for the years 1988 and 1989;

2. should the experts have to meet after 1989, to include in its Report to the Plenipotentiary Conference a request for the provision of financial resources in the ordinary budget of the Union,

instructs the Secretary-General

1. to consult administrations and request them, if they so wish, to nominate an expert with the necessary experience in the HF broadcasting field to participate in the group of experts;

2. to forward the list of candidates to the 42nd Session of the Administrative Council for consideration.

RECOMMENDATION No. 510 (HFBC-87)

Planning Parameters for the Double-Sideband (DSB) System in the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the Conference has considered in detail the planning and technical parameters used for HF broadcasting;

b) that certain DSB system characteristics for HF broadcasting are contained in Appendix **45** to the Radio Regulations;

c) that the RF protection ratio, minimum usable field strength and signal fading allowance are basic planning parameters which may be improved as a result of further studies;

d) that the Conference has adopted Resolution **514 (HFBC-87)** relating to the procedure to be applied by the IFRB in the revision of relevant parts of its Technical Standards used for HF broadcasting,

recommends

that, subject to the procedure to be applied by the IFRB in the revision of relevant parts of its Technical Standards used for HF broadcasting given in Resolution **514 (HFBC-87)**, the values of the planning

parameters given in the Annex to this Recommendation be used by the IFRB in its Technical Standards relating to the DSB system in the HF bands allocated exclusively to the broadcasting service,

invites the CCIR

to continue to study the values of the parameters contained in the Annex to this Recommendation,

invites administrations

to participate actively in these studies.

ANNEX TO RECOMMENDATION No. 510 (HFBC-87)

Planning Parameters

1. *Radio-frequency protection ratios*

1.1 *Protection ratio for unsynchronized transmissions*

The HFBC Planning System shall endeavour to satisfy the requirements with a minimal co-channel RF protection ratio of 17 dB without taking account of the fading allowances and multiple interference entries. In cases of congestion this ratio may be lowered until the congestion is resolved.

1.2 *Protection ratio for synchronized transmissions*

The co-channel protection ratio between synchronized transmissions in the same network should be:

Distance L between synchronized transmitters (km)	Protection ratio (dB)
$L \leqslant 700$	0
$700 < L \leqslant 2\,500$	4
$2\,500 < L$	8

1.3 *Relative radio-frequency protection ratios*

The relative RF protection ratios (α) for carrier frequency separations[1] (Δf), with reference to the co-channel protection ratio, should be:

Δf	α
0 kHz	0 dB
± 5 kHz	−3 dB
± 10 kHz	−35 dB
± 15 kHz	−49 dB
± 20 kHz	−54 dB

[1] Frequency separations, $\Delta f < -20$ kHz, as well as $\Delta f > +20$ kHz, need not be considered.

2. *Minimum usable field strength*

The minimum usable field strength should be determined by adding 34 dB to the greater of:

- the field strength due to atmospheric radio noise as contained in CCIR Report 322-2;
- 3.5 dB(μV/m), which is the intrinsic receiver noise level.

3. *Signal fading allowance*

3.1 *Short-term (within the hour) fading*

The upper-decile amplitude deviation from the median of a single signal is to be taken as 5 dB and the lower-decile deviation is to be taken as −8 dB.

3.2 *Long-term (day-to-day) fading*

The magnitude of the long-term fading, as determined by the ratio of the operating frequency to the basic MUF, is given in Table III of CCIR Report 266-6.

For synchronized transmissions, the fading allowance associated with the predominant signal should be used. In cases where the contributing wanted field strengths are equal and Note 1 of Table III of CCIR Report 266-6 applies to at least one of the paths, the values for geomagnetic latitudes $\geqslant 60°$ should be used.

3.3 *Combined distribution of fading applicable to wanted and unwanted signals*

The fading allowances for 10% and 90% of the time are each to be taken as 10 dB, except where the provisions of the following Note apply. In the latter case, 14 dB is to be used.

Note:

a) If any point on that part of the great circle which passes through the transmitter and the receiver, and which lies between control points located 1 000 km from each end of the path reaches a corrected geomagnetic latitude of 60° or more, the values for latitudes ⩾ 60° must be used.

b) These values relate to the path of the wanted signal only.

c) For synchronized emissions, the fading allowance associated with the predominant wanted signal is to be used. For those conditions where the constituent wanted field strengths are equal and point *a)* above applies to at least one of the paths, the value of 14 dB is to be used for the decile values.

RECOMMENDATION No. 511 (HFBC-87)

Possibility of Extending the Frequency Spectrum Allocated Exclusively to HF Broadcasting at a Future Competent World Administrative Radio Conference

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) Resolution **508** of the World Administrative Radio Conference (Geneva, 1979) inviting the Administrative Council to convene a conference in two sessions with a view to the planning of the HF bands allocated to the broadcasting service;

b) the Report of the First Session to the Second Session of the Conference;

c) that, at its 39th Session (1984), the Administrative Council adopted Resolution No. 912 establishing the agenda of the Second Session of this Conference;

d) the results of the planning exercises carried out by the IFRB during the intersessional period;

e) that this Conference, to achieve more efficient use of the HF bands allocated exclusively to the broadcasting service, has adopted a programme of action relating to the improvement, testing, adoption and practical implementation of the Planning System for these bands, and an associated timetable (see Resolution **511 (HFBC-87)**), as well as a programme of action for the introduction of single-sideband techniques (see Resolution **517 (HFBC-87)**), but has concluded that these measures might be insufficient to meet the current and future needs of HF broadcasting,

recognizing

that a possible extension of the frequency spectrum allocated for HF broadcasting would have an impact on other radio services operating in accordance with the Table of Frequency Allocations contained in Article **8** of the Radio Regulations,

recommends to the Administrative Council

to take the necessary steps to request the Plenipotentiary Conference (Nice, 1989) to consider whether or not to hold a world administrative radio conference, the agenda of which should include the possibility of extending the HF frequency spectrum allocated exclusively to the broadcasting service with the aim of planning that spectrum within the framework of the improved HFBC Planning System,

instructs the Secretary-General

to bring this Recommendation to the attention of all administrations and of the 42nd Session of the Administrative Council, 1987.

RECOMMENDATION No. 512 (HFBC-87)

Propagation Prediction Method to be Used in the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the First Session of the Conference (Geneva, 1984) established a propagation prediction method to be used for the planning of the HF bands allocated exclusively to the broadcasting service;

b) the intersessional work of the CCIR in improving some aspects of the method adopted;

c) that the IFRB has developed and used software based on the propagation prediction method established by the First Session and the further work by the CCIR, and has used this software for its intersessional work;

d) that the propagation prediction method and the associated software used by the IFRB constitute the basis for any further improvements;

e) Recommendation **514 (HFBC-87)** relating to improvements to the propagation prediction method to be used for the HF bands allocated exclusively to the broadcasting service,

recommends

1. that the propagation prediction method and the associated software to be used in application of Recommendation **514 (HFBC-87)** shall be those applied by the IFRB during the intersessional period;

2. that the IFRB prepare detailed documentation on the propagation prediction method, summarized in the annex to this Recommendation, for inclusion in its Technical Standards;

3. that the procedure to be applied by the IFRB in the revision of relevant parts of its Technical Standards, as established in Resolution **514 (HFBC-87)**, be used for any further improvement to this method.

ANNEX TO RECOMMENDATION No. 512 (HFBC-87)

Summary of the Propagation Prediction Method[1] to be Used for Determining the Sky-Wave Field Strength

1. *Introduction*

The propagation prediction method, implemented by the IFRB and to be used as a basis in the post-conference period, was established by the First Session. It is based on CCIR studies prior to the First Session, and on further CCIR studies of particular aspects of the method.

The method is used for the prediction of field strength for HF broadcasting purposes and is composed of three parts:

a) for path lengths up to 7 000 km;

b) for path lengths greater than 9 000 km;

c) an interpolation procedure for path lengths between 7 000 and 9 000 km.

[1] This summary does not modify in any way the propagation prediction method implemented by the IFRB.

2. *Ionospheric parameters*

Values of the ionospheric parameters foF2, M(3000)F2 and foE are obtained from the numerical maps (the Oslo coefficients) and the procedures set out in CCIR Report 340, at the locations of the control points required by the short- and long-range methods. The basic MUFs[1] for the required distances are obtained from these parameters, again using the procedures of Report 340. Appropriate interpolations are made for the level of sunspot activity.

3. *Distances up to 7 000 km*

The short-range prediction method, based partly on CCIR Report 252-2, is used for path lengths up to 7 000 km. Calculations are also made by this method for path lengths between 7 000 and 9 000 km and the results are used in the interpolation procedure described later.

The method assumes great-circle propagation with reflection from the E-layer (for ranges up to 4 000 km) and from the F2-layer. The path is divided into a number of hops of equal length, each less than 4 000 km, for F2-modes, and 2 000 km, for E-modes. The hops are assumed to have mirror reflections in the ionosphere at their mid-points. The equivalent reflection height is taken as 110 km for E-modes, and is a variable, depending upon the values of the ionospheric parameters, for F2-modes.

For path lengths up to 4 000 km, screening of F2 propagation modes by the lower E-layer is applied when appropriate.

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[1] *Basic MUF:* The highest frequency at which a radio wave can propagate between given terminals, on a specified occasion, by ionospheric refraction alone.

The central feature of the method is the prediction of the median field strength using the formula:

$$E_{ts} = 96.85 + P_t + G_t - 20 \log P' - L_t - L_m - L_g - L_h \quad \text{dB}(\mu\text{V/m})$$

- P_t is the transmitter output power in dB relative to 1 kW;

- G_t is the isotropic antenna gain corresponding to the azimuth of the great-circle path and the elevation angle computed for the path geometry and the number of hops considered;

- P' is the virtual slant range in km, calculated along the ray paths;

- L_t, L_m, L_g and L_h are loss terms which account for the absorption loss (calculated for each hop and the results added), the "above the MUF" loss, the ground reflection loss and the auroral plus other signal losses, respectively.

The numerical constant term includes, *inter alia*, an allowance for those effects of sky-wave propagation which would not otherwise be included in this simplified method.

Although, for an isotropic antenna, the predicted field strength would be greatest for propagation modes with the minimum number of hops, this is not necessarily the case for antennas used in practice. The calculation is repeated with progressively greater numbers of hops, taking account of the corresponding antenna gain in each case, until a maximum value is reached. To facilitate the calculation for the large number of cases considered by the IFRB, in practice, field strength values have been pre-calculated and stored as tables for six F2-modes and six E-modes for the paths between all transmitter locations and all test points. During the consideration of each case, reference is made to the appropriate entries in these tables and the antenna gains are applied.

The method selects the two strongest F2-modes (i.e., the modes with the highest field strengths) and, where appropriate, the strongest E-mode, the corresponding field-strength values being combined by r.s.s. addition.

4. *Distances greater than 9 000 km*

For distances greater than 9 000 km, the method is no longer based on geometric ray hops but on hypothetical ray paths with a number of equal hops each less than 4 000 km. This method is also used to calculate field strengths for path lengths between 7 000 and 9 000 km and the results are used in the interpolation procedure described later.

In the method, it is assumed that the field strength in the "transmission frequency range", i.e., between the lower limit frequency f_L and the upper frequency limit f_M, is determined by non-deviative absorption (near f_L) and deviative absorption (near f_M). The empirical fit to observations determines the shape of the curve between f_L and f_M as a function of the solar zenith angle, the path geometry, etc. The overall median field strength is given by

$$E_{tl} = E_0 \left[1 - \frac{(f_M + f_H)^2}{(f_M + f_H)^2 + (f_L + f_H)^2} \left(\frac{(f_L + f_H)^2}{(f + f_H)^2} + \frac{(f + f_H)^2}{(f_M + f_H)^2} \right) \right] + P_t + G_{tl} + G_{ap} - 32.5 \quad \text{dB}(\mu\text{V/m})$$

- $E_0 = 139.6 - 20 \log P'$ is the free space field strength where P' is the slant range assuming that the height of the ionosphere is 300 km.
- f is the frequency at which the prediction is made;
- f_M is the upper limit frequency; it is determined separately for the first and last hop of the path and the lower value is taken;

  $f_M = K \cdot f_b$, where f_b is the basic MUF and K is a correction factor taking into account the diurnal variation and the absolute value of f_b;

- f_L is the lower limit frequency and is mainly dependent on the solar zenith angle;

- f_H is the gyro-frequency;

- P_t is the transmitter output power in dB relative to 1 kW;

- G_{tl} is the isotropic antenna gain, taken as the highest value in the range of vertical radiation angles from 0° to 8° at the corresponding azimuth;

- G_{ap} is the antipodal focusing gain, taking into account the increase in field strength at distances greater than 10 000 km.

The numerical constant term includes, *inter alia*, an allowance for those effects of sky-wave propagation which are not otherwise included in the method.

5. *Distances between 7 000 and 9 000 km*

In this distance range, the field strengths E_{ts} and E_{tl} are determined by both of the above procedures and the resultant median field strength is obtained by linear interpolation, in dB, as follows:

$$E_{tt} = E_{ts} + \frac{D - 7\,000}{2\,000}\,(E_{tl} - E_{ts}) \qquad \text{dB}(\mu\text{V/m})$$

where D is the path length in kilometres.

Note: The constant terms in the equations for E_{ts} and E_{tl} include the values of -7.3 dB and $+3.9$ dB for the short- and long-range parts of the method, respectively, which were determined in CCIR Recommendation 621 following intersessional studies.

RECOMMENDATION No. 513 (HFBC-87)

Broadcasting for National Coverage in the HF Bands

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) the Report to the Second Session of this Conference;

b) that the First Session of the present Conference (Geneva, 1984) decided that all the broadcasting requirements, national and international, shall be treated on an equal basis, with due consideration of the differences between these two kinds of broadcasting requirements;

c) that the HFBC Planning System should take account in particular, of the way in which administrations' requirements for longer transmission periods, mainly for national broadcasting purposes, can best be accommodated;

d) that continuity for national broadcasting requirements must be guaranteed by appropriate means;

e) that the two types of broadcasting, national and international, in the HF bands, differ as to their technical and operating conditions;

f) that the needs of national broadcasting in countries in the Tropical Zone are covered partially in the bands allocated to the broadcasting service for use in the Tropical Zone and partially in the HF bands allocated exclusively to the broadcasting service;

g) that the Second Session of the present Conference did not consider the question in detail,

noting

that an HF broadcasting use is considered as being for purposes of national coverage when the transmitting station and its associated required service area are both located within the territory of the same country,

recommends

that the Administrative Council should take the necessary steps to ensure that the agenda of the next world administrative radio conference competent to deal with HF broadcasting includes the consideration of national broadcasting, under the conditions set out in the preamble of this Recommendation.

RECOMMENDATION No. 514 (HFBC-87)

Improvements to the Propagation Prediction Method to be Used for the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the First Session of this Conference (Geneva, 1984) adopted a method for the prediction of HF field strength which was based upon studies by the CCIR;

b) that during the intersessional period the CCIR undertook further studies in accordance with the request of the First Session of the Conference;

c) that recent additional studies by administrations have indicated that further improvements in the method are required;

d) that the possibility of further improvement will depend, in part, on the collection and analysis of additional data of field strength measurements,

invites the CCIR

to undertake studies of the HF propagation prediction method adopted by the Conference and to recommend both improvements in the method and later, if necessary, an improved method to be used in the future for the HF bands allocated exclusively to the broadcasting service,

recommends administrations

1. to conduct HF field strength measurement programmes;

2. to contribute data, in a form suitable for study, to the CCIR.

RECOMMENDATION No. 515 (HFBC-87)

Introduction of Transmitters and Receivers Capable of Both Double-Sideband (DSB) and Single-Sideband (SSB) Modes of Operation

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) Resolution **517 (HFBC-87)** relating to the introduction of SSB[1] techniques;

b) that the First Session of the present Conference (Geneva, 1984), in its Report to the Second Session, dealt with the progressive introduction of SSB emissions;

c) that incentives clearly need to be provided to industry to manufacture receivers with synchronous demodulation, and appropriate transmitters;

d) Appendix **45** to the Radio Regulations relating to the SSB system specification for the HF bands allocated to the broadcasting service,

considering further

e) that the introduction of SSB techniques can be accelerated by the appropriate transmitting equipment being more widely available in good time;

f) that lead-time is necessary for manufacturers to produce equipment capable of working either in both modes, SSB[1] and DSB, or in the SSB[1] mode alone,

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[1] With the possibility of both a 6 dB and a 12 dB carrier reduction relative to peak envelope power.

recommends to administrations

that new transmitters which are installed after 31 December 1990 should, as far as possible, be capable of working either in both modes, SSB[1] and DSB, or in the SSB[1] mode alone,

invites the CCIR

to complete its studies into receivers for SSB,

invites administrations

to bring to the notice of the receiver manufacturers the most recent results of relevant CCIR studies as well as the information referred to in *considering d)* and to encourage them to start to produce, by 31 December 1990, low-cost receivers having synchronous demodulators capable of receiving both DSB and SSB[1] broadcasting emissions,

instructs the Secretary-General

to transmit this Recommendation to the International Electrotechnical Commission (IEC).

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[1] With the possibility of both a 6 dB and a 12 dB carrier reduction relative to peak envelope power.

RECOMMENDATION No. 516 (HFBC-87)

Use of Synchronized Transmitters in the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the use of synchronized transmitters, where technically appropriate, is an efficient means of economizing frequency spectrum;

b) Recommendation **503** of the World Administrative Radio Conference (Geneva, 1979), relating to HF broadcasting;

c) that, where the path location is unfavourable, a Doppler frequency difference greater than 0.1 Hz may occur at certain hours of the day;

d) CCIR Recommendation 205-2 relating to synchronized transmitters in HF broadcasting,

recognizing

that further studies are needed on the use of synchronized transmitters for broadcasting in the HF bands,

invites the CCIR

to accelerate the studies defined in its Study Programme 44L/10 with a view to making comprehensive Recommendations on this subject,

recommends administrations

to participate actively in these studies.

RECOMMENDATION No. 517 (HFBC-87)

Relative RF Protection Ratio Values for Single-Sideband (SSB) Emissions in the HF Bands Allocated Exclusively to the Broadcasting Service

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that the Conference has adopted a method for the planning of the HF bands allocated exclusively to the broadcasting service;

b) that this method is based on the use of double-sideband (DSB) emissions;

c) that the RF co-channel protection ratio is one of the fundamental planning parameters;

d) that the Conference has adopted Resolution **517 (HFBC-87)** relating to the transition from DSB to SSB emissions in the HF bands allocated exclusively to the broadcasting service and Recommendation **515 (HFBC-87)** relating to the introduction of transmitters and receivers capable of both DSB and SSB modes of operation;

e) that the SSB system characteristics for HF broadcasting are contained in Appendix **45** to the Radio Regulations;

f) that, however, due to their provisional nature, the values of the relative RF protection ratio to be applied for all relevant combinations of wanted and unwanted DSB and SSB emissions have not been included in the Appendix mentioned in *e)* above;

g) that preliminary studies have shown that SSB emissions may require a lower RF co-channel protection ratio for the same reception quality;

h) Resolution **514 (HFBC-87)** relating to the procedure to be applied by the IFRB in the revision of relevant parts of its Technical Standards used for HF broadcasting,

recommends

that, subject to the procedure to be applied by the IFRB in the revision of relevant parts of its Technical Standards used for HF broadcasting given in Resolution **514 (HFBC-87)**, the values of relative RF protection ratio given in the Annex to this Recommendation be used by the IFRB in its Technical Standards relating to SSB emissions in the HF bands allocated exclusively to the broadcasting service,

invites the CCIR

to continue to study the values of relative RF protection ratio for the different cases and frequency separations covered in the Annex to this Recommendation,

and recommends administrations

to participate actively in these studies.

ANNEX TO RECOMMENDATION No. 517 (HFBC-87)

Relative RF Protection Ratio Values

1. The values of relative RF protection ratio given in the table should be used whenever SSB emissions in conformity with the specification in Appendix **45** to the Radio Regulations are involved in the use of the HF bands allocated exclusively to the broadcasting service.

2. The values given refer to the case of co-channel DSB wanted and unwanted signals for the same reception quality.

3. For the reception of DSB and SSB (6 dB carrier reduction relative to peak envelope power) wanted signals, a conventional DSB receiver with envelope detection designed for a channel spacing of 10 kHz is assumed.

4. For the reception of an SSB wanted signal (12 dB carrier reduction relative to peak envelope power), the reference receiver as specified in Appendix **45**, part B, section 3, to the Radio Regulations is assumed.

5. SSB signals with 6 dB carrier reduction relative to peak envelope power assume equivalent sideband power as specified in Appendix **45**, part B, paragraph 1.2, to the Radio Regulations.

6. The figures for case 2 in the following table relate to a situation where the centre frequency of the intermediate frequency pass-band of the DSB receiver is tuned to the carrier frequency of the wanted SSB signal. If this is not the case, the value for a difference of +5 kHz may increase to −1 dB.

Relative RF protection ratio values with reference to the co-channel RF protection ratio for DSB wanted and unwanted signals (dB)[1] *for use in the HF bands allocated exclusively to the broadcasting service*

	Wanted signal	Unwanted signal	Carrier frequency separation f unwanted − f wanted, Δf (kHz)								
			−20	−15	−10	−5	0	+5	+10	+15	+20
1	DSB	SSB (6 dB carrier reduction relative to p.e.p.)	−51	−46	−32	+1	3	−2	−32	−46	−51
2	SSB (6 dB carrier reduction relative to p.e.p.)	DSB	−54	−49	−35	−3	0	−3	−35	−49	−54
3	SSB (6 dB carrier reduction relative to p.e.p.)	SSB (6 dB carrier reduction relative to p.e.p.)	−51	−46	−32	+1	0	−2	−32	−46	−51
4	SSB (12 dB carrier reduction relative to p.e.p.)	SSB (12 dB carrier reduction relative to p.e.p.)	−57	−57	−57	−45	0	−20	−47	−52	−57

[1] Frequency separations Δf less than −20 kHz, as well as Δf greater than 20 kHz, need not be considered.

RECOMMENDATION No. 518 (HFBC-87)

HF Broadcast Receivers

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

a) that a large number of receivers fail to tune over all the HF bands allocated exclusively to the broadcasting service or have imprecise analogue displays for broadcasting frequencies (a subject of complaint by numerous HF broadcasters);

b) that to reduce congestion in certain bands and to improve spectrum utilization, the appropriate HF bands, including the highest bands (21 and 26 MHz), should be used;

c) that a precise frequency display facilitates the tuning of receivers and so encourages the public to listen to HF broadcasts,

recommends administrations

to draw the attention of manufacturers to this matter, to ensure that future low-cost broadcast receivers are equipped to cover all HF broadcasting bands and, if possible, to provide digital frequency display,

instructs the Secretary-General

to communicate this Recommendation to the International Electrotechnical Commission (IEC).

RECOMMENDATION No. 601

Concerning the Matter of Providing a Suitable Frequency Allocation for a Collision Avoidance System in the Aeronautical Radionavigation Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the ever-increasing speed of modern aircraft and taking into account that an adequate collision avoidance system providing a means of enhancing safety in the air has not been developed but is urgently required;

b) that if such a collision avoidance system, when developed, requires the use of radio frequencies, it should be accommodated in one of the frequency bands allocated to the aeronautical radionavigation service;

c) that it is impossible to forecast at this time whether the bands allocated to the aeronautical radionavigation service will prove to be suitable for such a system;

recommends

that administrations and the International Civil Aviation Organization (ICAO) pay especial attention to the progress being made in developing a suitable collision avoidance system, noting that if radio frequencies are required, and if the bands allocated to the aeronautical radionavigation service are not suitable for such a system, international consideration of this matter will be necessary.

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[1] Replaces Recommendation No. 20 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 602 (Rev.Mob-83)

Relating to the Planning of Frequencies in the Band 283.5 - 315 kHz Used by Maritime Radiobeacons in the European Maritime Area

The World Administrative Radio Conference for the Mobile Services, Geneva, 1983,

considering

a) that the "Regional Arrangement for Maritime Radiobeacons in the European Area of Region 1, Paris, 1951", referred to hereinafter as the "Paris Arrangement, 1951" is largely based on the geographical disposition of radiobeacons existing before 1939 and on the state of maritime navigation at that time;

b) that, since the conclusion of the Paris Arrangement, 1951, the geographical disposition and certain characteristics of maritime radiobeacons have been changed by bilateral or multilateral agreements, particularly to take into account the changes which have occurred in the rules and procedures of maritime navigation;

c) that the Paris Arrangement, 1951, is based essentially on the use of aural direction-finding receivers;

d) that studies conducted by administrations, the International Association of Lighthouse Authorities (IALA) and the CCIR have demonstrated the need to review the provisions of the Paris Arrangement, 1951;

e) that the parts of those studies relating to adjacent channel spacing and modulation characteristics should be clarified;

f) that the frequency band 283.5 - 315 kHz used by maritime radiobeacons is also allocated, on a permitted basis, to the aeronautical radionavigation service;

noting

a) the existence in Chapter **VIII** of the Radio Regulations (Article **35**, Section IV, paragraph C "Maritime Radiobeacons") of provisions Nos. **2860** to **2865**;

b) the existence in Chapter **III** (Article **8**, Section I) of No. **405**, which defines the European Maritime Area;

recommends

that a regional administrative conference for the European Maritime Area should be convened to revise the provisions of the Paris Arrangement, 1951, and prepare a plan of maritime radiobeacons in the European Maritime Area in the band 283.5 - 315 kHz;

invites the Administrative Council

to take the necessary steps to convene a regional administrative conference on the basis of Articles 7 and 54 of the International Telecommunication Convention (Malaga-Torremolinos, 1973), at an early date, if possible early in 1985;

invites the CCIR

to establish the technical bases needed for the work of that conference;

requests the Secretary-General

to communicate this Recommendation to the International Maritime Organization (IMO), the International Association of Lighthouse Authorities (IALA) and the International Civil Aviation Organization (ICAO).

RECOMMENDATION No. 603 (Rev.Mob-87)

Technical Provisions for Maritime Radiobeacons in the African Area

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

the need to facilitate the planning for new maritime radiobeacons in the band 283.5 - 315 kHz, particularly in the neighbouring localities of the European and African Areas;

recommends

that the administrations of the countries of the African Area adopt provisions similar to those contained in the Regional Agreement concerning the planning of the maritime radionavigation service (radiobeacons) in the European Maritime Area, Geneva, 1985.

RECOMMENDATION No. 604 (Rev.Mob-87)

Future Use and Characteristics of Emergency Position-Indicating Radiobeacons (EPIRBs)[1]

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that the essential purpose of EPIRB signals is to help locate survivors in search and rescue operations;

b) that requirements for carriage of EPIRBs operating on the frequencies 121.5 and 243 MHz have been included in the 1983 Amendments to the International Convention for the Safety of Life at Sea (1974);

c) that the International Maritime Organization (IMO) has been considering various types of EPIRBs;

d) that the IMO has stressed in its Resolution A.279 (VIII) the urgent need for unification of the characteristics of EPIRBs;

recognizing

a) that there are provisions in the Radio Regulations for EPIRBs on the frequencies 2 182 kHz, 121.5 MHz, 156.525 MHz, 243 MHz, and in the bands 406 - 406.1 MHz and 1 645.5 - 1 646.5 MHz;

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[1] For the purpose of this Recommendation, references to EPIRBs include references to satellite EPIRBs as appropriate.

b) that Appendix **37A** was established in order to facilitate the application of a universal standard for EPIRBs operating on the frequencies 121.5 MHz and 243 MHz;

c) that for EPIRBs operating on 121.5 MHz and 243 MHz, there is a need to improve their function of being detected and located by satellite systems;

recommends

1. that, in view of their mutual interest in this matter, IMO and the International Civil Aviation Organization (ICAO) be invited, as a matter of urgency, to review and align their concepts for EPIRBs in regard to search and rescue operations and the safety of life at sea;

2. that the CCIR continue to study technical and operating questions for EPIRBs, in consideration of concepts stated by the IMO and ICAO;

3. that the CCIR and ICAO study, as a matter of urgency, the technical and operational questions arising from paragraph *d)* of Appendix **37A**;

instructs the Secretary-General

to communicate this Recommendation to the IMO and ICAO.

RECOMMENDATION No. 605 (Rev.Mob-87)

Technical Characteristics and Frequencies for Shipborne Transponders[1]

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that merchant ships of the world are increasing in size and speed;

b) that every year a significant number of collisions occur involving merchant vessels with resultant loss of life and property and that collisions have a high potential for endangering the natural environment;

c) that there is a need to correlate radar targets with vessels making VHF radiotelephone transmissions;

d) that studies and experiments have shown that shipborne transponders can enhance and supplement radar target images as compared with normal radar images;

e) that current studies and experimentation relating to shipborne transponders indicate that development of equipment can be expected in the near future which will offer adequate radar image enhancement and target identification and, possibly, data transfer capabilities;

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[1] A receiver-transmitter which emits a signal automatically when it receives the proper interrogation.

f) that such shipborne transponders may require protection from interference;

g) that the selection of technical characteristics for these transponders should be coordinated with other users of the radio frequency spectrum whose operations might be affected;

requests the CCIR

to recommend, after consultation with appropriate international organizations, the most suitable order of magnitude of frequencies and bandwidth required for this purpose, and the technical parameters to be met by such devices, taking into account both electromagnetic compatibility with other services having allocations in the same frequency band and the need to ensure that the response of a transponder of the system studied should not be capable of interpretation as being from a radar beacon of whatever type;

invites administrations and the International Maritime Organization (IMO)

to continue to evaluate the operational benefits which could result from the widespread use of transponders on ships and to consider whether there would be advantage in adopting an internationally approved system for future implementation;

recommends

that, pending further technical and operational developments and evaluation, administrations be prepared at the next competent world administrative radio conference to make the necessary provisions for the use of such devices.

RECOMMENDATION No. 606 (Mob-87)

The Possibility of Reducing the Band 4 200 - 4 400 MHz Used by Radio Altimeters in the Aeronautical Radionavigation Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that there is a demand for additional frequency allocations for the mobile service, particularly the land mobile service;

b) that all systems utilizing the radio-frequency spectrum should be efficient in their use of that scarce resource;

c) that the allocation of the band 4 200 - 4 400 MHz to the aeronautical radionavigation service appeared in the Radio Regulations (Atlantic City, 1947) and has not been changed despite technological advances;

d) that it has decided not to change the frequency allocations in that band;

e) that studies carried out by the International Civil Aviation Organization (ICAO) on this question indicate that the operation of the existing radio altimeter equipment necessitates the whole band;

f) that it might be possible to operate radio altimeters in this band with sufficient accuracy with a necessary bandwidth of less than 200 MHz;

g) that the frequency tolerance of such devices might be improved;

recommends

1. that the next competent world administrative conference should consider, if appropriate, a reduction of the band 4 200 - 4 400 MHz allocated to the aeronautical radionavigation service;

2. that any reduction should be based on a detailed technical evaluation of the systems in question, taking into account ICAO reports on the evaluation of future world traffic of aircraft using this band;

3. that the conference mentioned in *recommends* 1 above should consider reallocating to the land mobile service any portion of the band currently available for the aeronautical radionavigation service which is identified as being suitable on the basis of technical considerations;

invites the CCIR

to study the necessary bandwidth and frequency tolerance requirements for systems operating in the aeronautical radionavigation service in the frequency band 4 200 - 4 400 MHz;

invites the Administrative Council

to place this Recommendation on the agenda of the next competent world administrative radio conference;

instructs the Secretary-General

to refer this Recommendation to ICAO, inviting it to consider the possibility of reducing the band 4 200 - 4 400 MHz for the aeronautical radionavigation service and to make appropriate recommendations to assist administrations in this matter.

RECOMMENDATION No. 607 (Mob-87)

Future Requirements of the Band 5 000 - 5 250 MHz for the Aeronautical Radionavigation Service

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that there is a demand for additional frequency allocations for the mobile service, particularly the land mobile service;

b) that all systems utilizing the radio frequency spectrum should be efficient in their use of this scarce resource;

c) that within the band 5 000 - 5 250 MHz the internationally agreed microwave landing system (MLS) is presently in the process of implementation;

d) that the protection of this vital aeronautical radionavigation system is paramount;

e) that the final MLS may not require at all locations the complete band 5 000 - 5 250 MHz for its full implementation;

f) that the International Civil Aviation Organization (ICAO) is studying the requirements of this band for MLS and other aeronautical radionavigation systems and has come to the conclusion that no change should be made;

recommends

1. that a future competent world administrative radio conference consider the requirements of the aeronautical radionavigation service in the band 5 000 - 5 250 MHz and, if appropriate, the possibility of sharing a portion of the band with other services;

2. that any sharing should be based on a detailed technical evaluation of the systems in this band, taking into account the ICAO reports on the evaluation of future world traffic of aircrafts using this band;

3. that the Conference mentioned in *recommends* 1 above should consider an allocation to the mobile service in any portion of the band considered to be capable of being shared;

invites the CCIR

to study the possibility of sharing a portion of the 5 000 - 5 250 MHz band which may not be required by the MLS system and any other aeronautical radionavigation system;

invites the Administrative Council

to place this Recommendation on the agenda of the appropriate future competent world administrative radio conference;

instructs the Secretary-General

to refer this Recommendation to ICAO inviting their consideration of the requirements of the aeronautical radionavigation service in the band 5 000 - 5 250 MHz and to make appropriate Recommendations to assist administrations in this matter.

RECOMMENDATION No. 620

Relating to the Meteorological Aids Service in the Band 27.5 - 28 MHz [1]

The World Administrative Radio Conference, Geneva, 1979,

recommends

that administrations whose stations in the meteorological aids service operate in the band 27.5 - 28 MHz should arrange, as soon as possible, for the transfer of these operations to higher frequency bands which are allocated to the meteorological aids service;

invites the World Meteorological Organization

to study this question and to proceed with such coordination among administrations as appears necessary.

[1] Replaces Recommendation No. 33 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 700

Relating to the Utilization and Sharing of Frequency Bands Allocated to Space Radiocommunications [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

Resolutions 1721 (XVI) part D and 1802 (XVII) part IV paragraph 3 of the United Nations General Assembly which refer, *inter alia*, to the unanimous belief of the Members of the United Nations that communication satellites should be organized on a global basis with non-discriminatory access for all nations;

considering further

the economic and social implications for all nations of global communications by satellites expressed in the report prepared for Members and Associate Members of UNESCO in accordance with the decision of the 12th session of its General Conference in December 1962;

recognizing

that all Members of the International Telecommunication Union have an interest in and a right to an equitable and rational use of frequency bands allocated to space radiocommunications;

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[1] Replaces Recommendation No. **Spa** 10 of the Extraordinary Administrative Radio Conference, Geneva, 1963.

recommends to the Members of the Union

that the utilization and exploitation of the frequency bands allocated to space radiocommunications be subject to international agreements based on principles of justice and equity permitting the use and sharing of these bands in the mutual interest of all nations.

RECOMMENDATION No. 701

Relating to the Use of the Frequency Band 1 330 - 1 400 MHz by the Radio Astronomy Service

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the observations of radiations from neutral hydrogen atoms within the band 1 330 - 1 400 MHz are of prime importance in understanding the structure of distant galaxies, and subsequently of the evolution of the universe;

b) that recognition has been given to the radio astronomy service in the band 1 330 - 1 400 MHz within the Table of Frequency Allocations;

c) that the radio astronomy service is devoted to the reception of extremely low-level electromagnetic radiations of extraterrestrial origin, and needs therefore to be protected from radiations of man-made origin, to the maximum degree practicable;

d) that the ability of the radio astronomy service to share frequency bands with other radio services is limited;

recommends that administrations,

1. when preparing for the next competent administrative radio conference, should consider the question of making provisions in the 1 330 - 1 400 MHz band to provide the radio astronomy service with increased protection from services that radiate;

2. when drawing up frequency assignment plans, should bear in mind radio astronomy observations being carried out in the band 1 330 - 1 400 MHz.

RECOMMENDATION No. 702

Relating to the Use of the Frequency Bands 1 400 - 1 727 MHz, 101 - 120 GHz and 197 - 220 GHz for Search for Intentional Emissions of Extraterrestrial Origin

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that it is of special importance to mankind to determine the existence of extraterrestrial civilizations;

b) that there is a maximum probability of detecting radiation from extraterrestrial civilizations in the frequency bands 1 400 - 1 727 MHz, 101 - 120 GHz and 197 - 220 GHz because these frequency bands contain the spectral lines of basic physical interest and are related to the universal phenomena;

c) that in the bands mentioned in *considering b)* there is a probability of detecting radiation, with a maximum signal-to-noise ratio, from extraterrestrial civilizations;

d) that recognition has been given to the search for extraterrestrial civilizations in the bands 1 400 - 1 727 MHz, 101 - 120 GHz and 197 - 220 GHz within the Table of Frequency Allocations;

e) that the attempt to recognize signals from extraterrestrial civilizations requires the reception of extremely low-level radiations and that such reception needs to be protected, to the maximum degree practicable, from radiations of man-made origin;

f) that, for receiving radiations from extraterrestrial civilizations, the possibilities of sharing frequency bands with active radio services are limited;

recommends

that, when preparing for the next competent administrative radio conference, administrations should consider the desirability of making provisions so as to provide a controlled environment suitable for the reception of extraterrestrial radiations in the 1 400 - 1 727 MHz, 101 - 120 GHz and 197 - 220 GHz bands;

invites organizations concerned with the search for extraterrestrial civilizations

to take into account the following:

1. the relevant provisions of the Radio Regulations;

2. the need to maintain close coordination with their national administrations on matters of frequency usage;

3. the need to select, for observations, locations for receiving facilities that are as remote as possible from sources of radio interference;

4. the appropriate Reports and Recommendations of the CCIR.

RECOMMENDATION No. 704

Relating to the Compatibility Between the Broadcasting Service in the Band 100 - 108 MHz and the Aeronautical Radionavigation Service in the Band 108 - 117.975 MHz

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the increasing use of VHF broadcasting, with relatively high powers, in the band 100 - 108 MHz;

b) that the band 108 - 117.975 MHz is used on a worldwide basis for internationally agreed aeronautical radionavigation systems;

c) that the portion of the band 108 - 111.975 MHz is used for Instrument Landing Systems (ILS) which are used by aircraft for automatic landing purposes;

d) that the band 108 - 117.975 MHz is used for the VHF Omnidirectional Radio Range (VOR) system;

e) that interference problems between the broadcasting and aeronautical radionavigation services have occurred in parts of Regions 2 and 3;

recognizing

a) that intermodulation products from combinations of broadcasting transmissions may fall in the aeronautical radionavigation band 108 - 117.975 MHz;

b) that intermodulation products may be formed in the radionavigation receiver;

c) that high power broadcasting transmissions could result in blocking of the radionavigation receivers;

d) that the emissions of the aeronautical radionavigation service may cause interference to the broadcasting service;

requests the CCIR

1. to study, as a matter of urgency, the problem of interference between the two services;

2. to establish suitable criteria for the protection of both services;

invites the International Civil Aviation Organization (ICAO) and other appropriate international organizations

to study the problem, as a matter of urgency, and communicate the results of these studies to the CCIR;

recommends

that administrations, in assigning frequencies to the broadcasting service in the band 100 - 108 MHz and to the aeronautical radionavigation service in the band 108 - 117.975 MHz, should take note of the potential interference problems that could exist and apply appropriate protective measures.

RECOMMENDATION No. 705

Relating to the Criteria to Be Applied for Frequency Sharing Between the Broadcasting-Satellite Service and the Terrestrial Broadcasting Service in the Band 620 - 790 MHz [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that, within the band 620 - 790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service;

b) that it is necessary to have a power flux-density limit which will provide adequate protection to the terrestrial broadcasting service;

taking into account

a) that the conclusions of the Special Joint Meeting of the CCIR, Geneva, 1971, indicated that the following power flux-density limits are necessary to protect the terrestrial broadcasting service:

-121 dB(W/m^2)	for $\delta \leqslant 20°$
$-121 + 0.4\,(\delta - 20)$ dB(W/m^2)	for $20° < \delta \leqslant 60°$
-105 dB(W/m^2)	for $60° < \delta \leqslant 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

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[1] Replaces Recommendation No. **Spa2** – 10 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

b) that additional tests carried out by one administration after the Special Joint Meeting of the CCIR indicated that the following more conservative power flux-density limits may be necessary:

-130 dB(W/m^2)	for $\delta \leqslant 20°$
$-130 + 0.4\,(\delta - 20)$ dB(W/m^2)	for $20° < \delta \leqslant 60°$
-114 dB(W/m^2)	for $60° < \delta \leqslant 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

c) that CCIR Report 631-1 gives the results of studies carried out up to 1978;

d) that additional information is required on the protection ratio for interference from an FM television signal into a VSB television signal for both the 625- and 525-line systems;

e) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in CCIR Recommendation 417-2;

f) that account may have to be taken of ground reflections;

g) that energy dispersal techniques may reduce the required protection ratio and should be used if shown to be effective;

recommends

1. that in view of the absence of sufficient information on tests under operational conditions and in order to provide sharing criteria, on a provisional basis, the maximum power flux-density produced at the surface of the Earth within the service area of a terrestrial broadcasting station (see CCIR Recommendation 417-2) by a space station in the broadcasting-satellite service in the band 620 - 790 MHz should not exceed:

-129 dB(W/m^2)	for $\delta \leqslant 20°$
$-129 + 0.4\,(\delta - 20)$ dB(W/m^2)	for $20° < \delta \leqslant 60°$
-113 dB(W/m^2)	for $60° < \delta \leqslant 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

2. that these limits be not exceeded on the territory of a country except with the agreement of its administration;

3. that the transmission of unmodulated carriers should be avoided;

4. that the CCIR urgently study the sharing criteria to be applied to frequency sharing between the broadcasting-satellite service, and the terrestrial broadcasting service in the band 620 - 790 MHz and prepare a Recommendation on power flux-densities to be used in lieu of the above provisional limits;

5. that in its studies the CCIR consider in particular the following aspects:

5.1 the required protection ratio for both 525- and 625-line systems for interference from an FM television signal into a VSB television signal;

5.2 the minimum field strength to be protected for the terrestrial television service taking into account the current state of the art;

5.3 the effect of ground reflections;

5.4 the number of broadcasting satellites that may be visible from a terrestrial broadcasting receiver;

5.5 the effect of polarization discrimination;

5.6 the effect of antenna directivity;

6. that in its studies the CCIR should consider the advantages of energy dispersal techniques in the broadcasting-satellite service (television).

RECOMMENDATION No. 706

Relating to Frequency Sharing by the Earth Exploration-Satellite Service (Passive Sensors) and the Space Research Service (Passive Sensors) with the Fixed, Mobile Except Aeronautical Mobile, and Fixed-Satellite Services in the Band 18.6 - 18.8 GHz

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that allocations have been made in various frequency bands to the earth exploration-satellite and space research services for the operation of passive sensors on board spacecraft;

b) that the allocations made in the band 18.6 - 18.8 GHz are shared with the fixed, mobile except aeronautical mobile and fixed-satellite services;

c) that application of the sharing criteria contained in CCIR Report 694 could restrict the development of the fixed, mobile except aeronautical mobile and fixed-satellite services;

invites the CCIR

1. to review the content of CCIR Report 694 by all the Study Groups concerned (particularly Study Groups 4 and 9);

2. to continue the studies which gave rise to Report 609-1, taking into account the requirements of the earth exploration-satellite service (passive sensors) and the space research service (passive sensors);

3. to study the minimum restrictions which could be applied to the fixed, mobile except aeronautical mobile, and fixed-satellite (space-to-Earth) services in order to ensure the satisfactory operation of passive sensors;

4. to study the maximum restrictions which might be tolerated by the fixed, mobile except aeronautical mobile, and fixed-satellite services without jeopardizing the operation of all the services likely to use this frequency band.

RECOMMENDATION No. 707

Relating to the Use of the Frequency Band 32 - 33 GHz Shared Between the Inter-Satellite Service and the Radionavigation Service

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the band 32 - 33 GHz is allocated to the inter-satellite service and the radionavigation service;

b) that there are safety aspects associated with the radionavigation service;

c) that No. **893** has been incorporated into Article **8**;

recommends

that, as a matter of urgency, studies should be made of the sharing criteria for these two services in the frequency band listed above;

requests the CCIR

to carry out these studies;

recommends further

that a future competent world administrative radio conference review the CCIR Recommendations with a view to the inclusion of such sharing criteria in Article **28**.

RECOMMENDATION No. 708

Relating to Frequency Bands Shared Between Space Radiocommunication Services and Between Space and Terrestrial Radiocommunication Services [1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

a) the value to the Conference of the material contained in the Report of the CCIR Special Preparatory Meeting, Geneva, 1978;

b) that further studies on a wide range of problems dealing with space radiocommunications form the subject of CCIR Questions and Study Programmes approved by the XIVth Plenary Assembly;

considering however

a) that certain CCIR Recommendations, listed below, call for further work and study:

Recommendation 355-2	"Frequency sharing between systems in the fixed-satellite service and terrestrial radio services in the same frequency bands"
Recommendation 465-1	"Reference earth station radiation pattern for use in coordination and interference assessment in the frequency range from 2 to about 10 GHz"

[1] Replaces Recommendation No. **Spa2** – 15 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

Recommendation 466-2	"Maximum permissible level of interference in a telephone channel of a geostationary satellite network in the fixed-satellite service employing frequency modulation with frequency-division multiplex, caused by other networks of this service";

b) that the deliberations of this Conference, particularly in relation to the provisions of Articles **27**, **28** and **29**, and of other relevant Articles of the Radio Regulations, have shown that further information is required to reply to the following current Questions and Study Programmes of the CCIR:

Question 1-2/4	"Antennae for systems in the fixed-satellite service"
Question 2-3/4	"Technical characteristics of systems in the fixed-satellite service"
Study Programme 2A-3/4	"Feasibility of frequency sharing between systems in the fixed-satellite service and terrestrial services"
Study Programme 2J-2/4	"Technical factors influencing the efficiency of use of the geostationary-satellite orbit by radiocommunication satellite networks sharing frequency bands allocated to the fixed-satellite service";

c) that it would be useful to have specific numerical values of power flux-density from space stations of the broadcasting-satellite service which would permit differentiation between "individual reception" and "community reception" in the broadcasting-satellite service;

d) that frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) has been adopted in the frequency band 14 - 14.3 GHz;

recommends

1. that administrations, recognized private operating agencies, and other participants in the work of the CCIR consider as a matter of priority the submission of contributions on these subjects, so that draft Recommendations on them can be prepared at the meetings of the relevant Study Groups for consideration by the Plenary Assembly of the CCIR;

2. that the CCIR study or, as appropriate, continue to study:

2.1 the reference antenna patterns for earth station antennae, which may be appropriate for setting minimum standards of performance with a view to recommending specific patterns for this purpose, in order to improve utilization of the bands shared between the fixed-satellite service and terrestrial radiocommunication services, and of the bands shared by space radiocommunication services, and to improve the utilization of the geostationary-satellite orbit;

2.2 the reference antenna patterns for satellite antennae, which may be appropriate for setting minimum standards of performance, particularly outside the main beam, in order to improve the utilization of the geostationary-satellite orbit and to increase the possibilities for frequency re-use;

2.3 the reference cross-polarization antenna patterns which may be appropriate for setting minimum standards of performance and, in this connection, further study:

2.3.1 the portions of the spectrum within which linear-orthogonal or circular-orthogonal polarizations might be most appropriate;

2.3.2 the relative desirability, taking into account technical and orbit utilization factors, of using orthogonal polarizations within a single satellite as against with two satellites;

2.4 the necessary limitation of spurious emissions and the frequency tolerances to be observed in both the terrestrial and space

radiocommunication services insofar as they may affect sharing of frequency bands;

2.5 the criteria of permissible interference for the various space radiocommunication services and terrestrial radiocommunication services sharing the frequency bands allocated by this Conference, in order to permit the determination of:

2.5.1 the coordination distance and the probability of interference between stations within that distance;

2.5.2 the necessary limits of power flux-density set up at the Earth's surface by space stations;

2.6 the maximum permissible level of interference into a geostationary-satellite link from any other single interfering geostationary-satellite network and from the aggregate of all other geostationary-satellite networks, particularly in the case of:

2.6.1 frequency-modulated telephony signals,

2.6.2 frequency-modulated television signals,

2.6.3 digitally-modulated signals,

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

2.7 the interference criteria applicable to frequency sharing between non-geostationary-satellite networks and geostationary-satellite networks;

2.8 the possibility of establishing a technical criterion for expressing the efficiency of use of the geostationary-satellite orbit;

2.9 the possibility of improving and simplifying the method of determining the coordination area as described in Appendix **28** to the Radio Regulations;

2.10 the conditions for frequency sharing in those bands allocated to the broadcasting-satellite service by this Conference with a view

to issuing appropriate Recommendations as soon as possible so that administrations and the IFRB shall have the necessary technical data required to carry out examination procedures, in particular regarding Articles **11**, **12** and **13** of the Radio Regulations and those in Resolution **33**;

2.11 the power flux-densities required for individual and community reception in the broadcasting-satellite service, with a view to specifying numerical values which will differentiate between these types of reception;

2.12 the criteria for frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) in the frequency band 14 - 14.3 GHz.

RECOMMENDATION No. 709

Relating to Sharing Frequency Bands Between the Aeronautical Mobile Service and the Inter-Satellite Service

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the bands 54.25 - 58.2 GHz, 59 - 64 GHz, 116 - 134 GHz, 170 - 182 GHz and 185 - 190 GHz are allocated to the inter-satellite service and the mobile service;

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

c) that, nevertheless, the atmospheric absorption alone may not prevent harmful interference to stations of the inter-satellite service from stations on aircraft flying at high altitude;

d) that for this reason aircraft stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **909**, the text of which is reproduced below) [1];

recommends

that, as a matter of urgency, studies should be made of the sharing criteria for these two services in the frequency bands listed above;

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[1] **909** In the bands 54.25 - 58.2 GHz, 59 - 64 GHz, 116 - 134 GHz, 170 - 182 GHz and 185 - 190 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **435**).

requests the CCIR

to carry out these studies;

recommends further

that a future competent world administrative radio conference review the allocations of these bands, taking into account the results of the CCIR studies.

RECOMMENDATION No. 710

Relating to the Use of Airborne Radars in the Frequency Bands Shared Between the Inter-Satellite Service and the Radiolocation Service

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the bands 59 - 64 GHz and 126 - 134 GHz are allocated to the inter-satellite service and the radiolocation service;

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

c) that, nevertheless, the atmospheric absorption alone may not prevent harmful interference to stations of the inter-satellite service from radars operating on aircraft flying at high altitude;

d) that for this reason airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **910**, the text of which is reproduced below) [1];

recommends

that, as a matter of urgency, studies should be made of the sharing criteria for these two services in the frequency bands listed above;

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[1] **910** In the bands 59 - 64 GHz and 126 - 134 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **435**).

requests the CCIR

to carry out these studies;

recommends further

that a future competent world administrative radio conference review the allocations of these bands, taking into account the results of the CCIR studies.

RECOMMENDATION No. 711

Relating to the Coordination of Earth Stations [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that under the terms of Article **11** of the Radio Regulations, frequency assignments to earth stations in certain bands shared with equal rights between terrestrial radiocommunication services and space radiocommunication services must be coordinated with a view to preventing mutual harmful interference;

b) that the calculation method described in Appendix **28** to the Radio Regulations applies solely to frequencies in the 1 GHz to 40 GHz range;

c) that Tables I and II of this Appendix do not show numerical values for all the necessary parameters of certain space radiocommunication services and terrestrial radiocommunication services sharing frequency bands with equal rights;

invites the CCIR

to continue as a matter of urgency its study:

a) of data not included in Tables I and II of Appendix **28** to the Radio Regulations, relating to the space radiocommunication services and terrestrial radiocommunication services sharing frequency bands with equal rights;

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[1] Replaces Recommendation No. **Spa2** – 9 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

b) of the formulation of calculation methods for determining the coordination area of earth stations at frequencies below 1 GHz and above 40 GHz;

recommends to administrations

that until the next competent world administrative radio conference they should use:

a) any CCIR Recommendation, if applicable, for the values missing from Tables I and II of Appendix **28** to the Radio Regulations;

b) the methods of determining the coordination area for frequencies below 1 GHz and above 40 GHz, which may be the subject of a CCIR Recommendation.

RECOMMENDATION No. 712

Relating to the Interdependence of Receiver Design, Channel Grouping and Sharing Criteria in the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

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.

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[1] Replaces Recommendation No. **Sat** – 7 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

RECOMMENDATION No. 714 (Mob-87)

Compatibility Between the Aeronautical Mobile (R) Service in the Band 117.975 - 137 MHz and Sound Broadcasting Stations in the Band 87.5 - 108 MHz

The World Administrative Radio Conference for the Mobile Services, Geneva, 1987,

considering

a) that VHF air/ground communications play a vital role for aircraft operations and safety, which could be prejudiced by interference;

b) that compatibility problems have arisen in various parts of the world between the aeronautical mobile (R) service in the band 117.975 - 137 MHz and FM sound broadcasting stations in the band 87.5 - 108 MHz;

c) that the Regional Administrative Conference for the Planning of VHF Sound Broadcasting (Region 1 and Part of Region 3) (Geneva, 1984) did not consider the aspects of compatibility between these two services in preparation of the sound broadcasting plan;

d) that the CCIR and the International Civil Aviation Organization (ICAO) have studied the problem and the CCIR has recommended technical criteria which can be used by administrations for coordination between the two services concerned;

e) that ICAO has adopted standards, to come into effect on 1 January 1998, relating to the immunity characteristics of future aeronautical VHF receivers and incorporating the agreed immunity levels for intermodulation and desensitization;

invites the CCIR

to continue studying compatibility between these two services from the standpoint of possible interference to the aeronautical mobile service;

requests ICAO

to continue studying these problems and communicate the results of its studies to the CCIR;

recommends administrations

a) to participate actively in these studies and provide the CCIR with expert guidance on this matter;

b) to take all possible steps to give the required protection to the aeronautical mobile (R) service, taking into account the information contained in relevant CCIR Recommendations and Reports;

instructs the Secretary-General

to communicate this Recommendation to ICAO.

RECOMMENDATION No. 715 (Orb-88)

Multi-band and/or Multiservice Satellite Networks Using the Geostationary-Satellite Orbit

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that, for economic and practical reasons, administrations may find it desirable to utilize multi-band and/or multiservice satellite networks using the geostationary-satellite orbit (for example: fixed-satellite, broadcasting-satellite and mobile-satellite services);

b) that there may be several different regulatory mechanisms covering the services provided by multi-band and/or multiservice satellites and that some of these regulatory mechanisms are associated with plans that include fixed orbital positions;

c) that the need to apply separate regulatory procedures may lead to incompatible results for the different bands or services concerned;

d) that the application of these procedures to bands and services with equal category of allocation shall normally result in equal rights for the networks concerned;

recognizing

a) that an administration having a satellite network subject to more than one procedure will need to apply the procedures independently;

b) that an administration attempting to bring into use a satellite network subject to more than one procedure may find that the process can be difficult to complete but may be facilitated by the sequence in which the coordination procedures are initiated;

c) that additionally there is less flexibility when one of the procedures includes a plan with fixed orbital positions;

d) that, when one or more of these services are planned, it may be practicable to use the modification provisions of those plans as aids in the resolution of difficulties;

e) that it is desirable to simplify the process for bringing into use multi-band and/or multiservice satellite networks;

recommends

1. that administrations should take into account the above *considering* and *recognizing* when planning and implementing multi-band and/or multi-service satellite networks;

2. that administrations cooperate to overcome the particular problems of bringing into use multi-band and/or multiservice satellite networks, subject to multiple procedures;

invites

1. the CCIR to continue its technical studies into the efficient use of the geostationary-satellite orbit as it pertains to multi-band and/or multi-service satellite networks;

2. the Administrative Council, in the light of experience with the bringing into use of multi-band and/or multiservice satellites, to place on the agenda of a future competent world administrative radio conference, if necessary, a review of the process for bringing into use multi-band and multiservice satellite networks.

instructs the Secretary-General

to bring this Recommendation to the attention of the Plenipotentiary Conference, Nice, 1989, and of the Administrative Council.

RECOMMENDATION No. 716 (Orb-88)

Use of Certain Frequency Bands Below 3 000 MHz by the Space Research and Space Operation Services

The World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Second Session – Geneva, 1988),

considering

a) that the bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz are allocated to the space research and space operation services, subject to the provisions of Article **14** of the Radio Regulations;

b) that both this Conference and the World Administrative Radio Conference for the Mobile Services (Geneva, 1987) have requested the convening of a future competent world administrative radio conference to address allocation issues in certain frequency bands below 3 000 MHz;

recognizing

a) that there is increasing use of these bands by the space research and space operation services, leading to increased coordination difficulties in view of the provisions of Article **14**;

b) that the task of obtaining the agreements required for the development of space systems in the bands mentioned in *considering a)* above has therefore become more difficult;

invites the Administrative Council

to place this matter on the agenda of the next competent world administrative radio conference, in order to examine the difficulties referred to in *recognizing a)* and *b)* above;

invites the CCIR

to continue its studies of sharing criteria for the services in these bands.