Edition of 1976

RADIO REGULATIONS

2

Appendices to the Radio Regulations. Resolutions and Recommendations.

Published by the General Secretariat
of the International Telecommunication Union
Geneva, 1976

ISBN 92-61-00181-5

Printed in Switzerland

APPENDICES

TO THE RADIO REGULATIONS

APPENDIX 1

Spa Spa2 Aer

(See Article 9)

Section A. Basic Characteristics to be Furnished for Notification under No. 486 of the Regulations

Column 1 Assigned frequency.

Column 2c Date of putting into use.

Column 3 Call sign (Identification).

This is not a basic characteristic for stations referred to in No. **735.1**.

Column 4a Name of the transmitting station.

Column 4b Country in which the transmitting station is located.

Column 4c Longitude and latitude of the transmitter site.

Column 5a Locality(ies) or area(s) with which communication is established.

This is not a basic characteristic for land, radionavigation land, radiolocation land or standard frequency stations, or for ground-based stations in the meteorological aids service.

Column 5b Length of circuit (km).

This is a basic characteristic only for land, radionavigation land, radiolocation land and standard frequency stations.

Column 6 Class of station and nature of service.

Column 7 Class of emission, necessary bandwidth and description of transmission.

Column 8 Power (in kW).

Column 9a Azimuth of maximum radiation.

Column 10 Maximum hours of operation of the circuit to each locality or area (G.M.T.).

Column 11 Megacycle order of the other frequencies normally utilized for the same circuit.

This is a basic characteristic only for fixed stations within the range 4 000 kHz to 28 000 kHz.

Supplementary information:

a) reference frequency, if any, and any co-ordination required by No. **492A**;

b) the name of any administration with which an agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Section B. Basic Characteristics to be Furnished for Notification under No. 487 of the Regulations

Column 1 Assigned frequency.

Column 2c Date of putting into use.

Column 4a The letter " R ".

Column 4b Country in which the receiving land station is located.

Column 4c Longitude and latitude of the site of the receiving land station.

Column 5a Name of the receiving land station.

Column 5b Maximum distance in km between mobile stations and the receiving land station.

Column 6 Class of mobile stations and nature of service.

Column 7 Class of emission of mobile stations and necessary bandwidth.

Column 8 Highest power used by the mobile stations.

Column 10 Maximum hours of operation of the mobile stations (G.M.T.).

Supplementary information:

a) any co-ordination required by No. **492A**;

b) the name of any administration with which an agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Section C. Basic Characteristics to be Furnished for Notification under No. 490 of the Regulations

Column 1 Assigned frequency.

Column 2c Date of putting into use.

Column 4b Country in which the transmitting station is located.

Column 5a Locality(ies) or area(s) with which communication is established.

Column 6 Class of station and nature of service.

Column 7 Class of emission, necessary bandwidth and description of transmission.

Column 8 Power (in kW).

Column 10 Maximum hours of operation of the circuit to each locality or area (G.M.T.).

Supplementary information:

a) any co-ordination required by No. **492A**;

b) the name of any administration with which an agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Form of Notice*

For Use when Notifying to the International Frequency Registration Board a Frequency Assignment or a Change to an Assignment Recorded in the Master International Frequency Register

(see Article 9)

(a) _____
Notifying administration

(e) Notice No. _____
Date _____

_____ kHz
_____ MHz
1 Assigned frequency

☐ (b) New assignment

☐ (c) Change of characteristics of a recorded assignment in the Master Register

☐ (d) Deletion of an assignment

_____ For I.F.R.B. use

2c _____
Date of putting into use

3 _____
Call sign (Identification)

4a _____
Name of transmitting station

4b _____
Country

4c _____
Longitude and latitude of the transmitter site

Locality(ies) or area(s) with which communication is established	Length of circuit (km)	Class of station and nature of service	Class of emission, necessary bandwidth and description of transmission	Power (in kW)	Transmitting antenna characteristics			Maximum hours of operation of the circuit to each locality or area (G.M.T.)	Megahertz order of the other frequencies normally utilized for the same circuit	Supplementary information
				P_c P_m P_p e	Azimuth of maximum radiation	Angular width of radiation main lobe	Antenna gain (dB)			
5a	5b	6	7	8	9a	9b	9c	10	11	

12a _____ Operating Administration or Company

12b _____ Name and postal address } of administration (Article 15)

_____ Telegraphic address

Regional or service agreement _____ COORD/ _____

Other information:

* The actual size of the notice is a matter for individual administrations.

Section E. General Instructions

1. A separate notice shall be sent to the International Frequency Registration Board for notifying :

— Each new frequency assignment,

— Any change in the characteristics of a frequency assignment recorded in the Master International Frequency Register (hereinafter called the *Master Register*),

— Any total deletion of a frequency assignment recorded in the Master Register.

2. Frequencies prescribed by these Regulations for common use, such as 500 kHz or 2 182 kHz should not be notified (see No. **488**).

3. Separate entries, in Columns 5a to 10, should be made for the various characteristics when they do not apply to the assignment as a whole, for instance when the class of emission or the power differ according to the localities or areas of reception.

4. When submitting notices for television broadcasting stations in Region 1, separate notices shall be submitted for the sound and vision channels. In such cases, the notice shall relate to the sound and vision carrier frequencies.

I. General Notes

(a) The name of the notifying administration should be indicated.

(b) Indicate in this box by the letter " X " when the notice reflects :

— the first use of a frequency by a station,

or

— the first use of an additional frequency by a station.

(c) Indicate in this box by the letter " X " when the notice reflects a change in the characteristics of a frequency assignment recorded in the Master Register.

(1) In the case where existing particulars (including the frequency) are changed, the new characteristics in the appropriate place should

be underlined ; the original characteristics which have been changed should be shown in brackets underneath or at the side.

(2) In the case where the change is an addition to existing particulars, the additional characteristics should be shown in the appropriate place and should be underlined.

(3) In the case where the change is a cancellation of a particular characteristic or characteristics, this should be shown in the appropriate place by a dash and, underneath or at the side, the characteristics which have been cancelled should be shown in brackets.

(d) Indicate in this box by the letter "X" when the notice reflects a deletion of an assignment, in all of its notified characteristics.

(e) The serial number of the notice and the date on which the notice is sent to the Board shall be shown here.

II. Notes Concerning Information to be Entered in the Notice Pertaining to Specific Columns of the Master Register

Column 1 Assigned frequency

1. Indicate the assigned frequency as defined in Article 1 *, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz.

2. *This information is a basic characteristic.*

Column 2c Date of putting into use

1. In the case of a new assignment, insert the date (actual or foreseen, as appropriate) of putting the frequency assignment into use.

2. Whenever the assignment is changed in any of its basic characteristics, as defined in this Appendix except in the case of a change in Columns 3, 4a or 11, then the date to

* For television broadcasting stations in Region 1, the frequencies to be notified are those of the sound and vision carriers.

be indicated shall be that of the latest change (actual or foreseen, as appropriate).

3. *This information is a basic characteristic.*

Column 3 Call sign (Identification)

1. Indicate the call sign or other identification used in accordance with Article 19.

2. *This information is a basic characteristic,* except for stations referred to in Nos. **490** and **735.1** or when the frequency assignment is used for reception in the circumstances described in No. **487**.

Column 4 Name and location of transmitting station

4a Indicate the name of the locality by which the transmitting station is known or in which it is situated.

4b Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.

4c Indicate the geographical co-ordinates (in degrees and minutes) of the transmitter site.

However, when the frequency assignment is used for reception in the circumstances described in No. **487**, the indication to be given in Column 4 is as follows :

4a The letter " R ".

4b The country in which the receiving land station is located.

4c The geographical co-ordinates (in degrees and minutes) of the site of the receiving land station.

The information to be supplied for Columns 4a, 4b and 4c is a basic characteristic. However, for stations referred to

in No. **490** *only the information to be supplied in Column 4b is a basic characteristic.*

Column 5a Locality(ies) or area(s) with which communication is established

1. Indicate in this column only the locality(ies) or area(s) to which the frequency is normally used.

2. For fixed stations, indicate the name of the locality by which the receiving station is known or in which it is situated.

   a) Reception points may be grouped and entered collectively as areas in this column if all other basic characteristics of the frequency assignment are the same with respect to each such point and provided the area is well defined and sufficiently small to make it easy to forecast the conditions of the use of the frequency from the propagation point of view.

   b) Similarly, in the case of one-way simultaneous transmissions to multiple points, representative points outlining the area being served may be indicated, but it should be specified as supplementary information that this is a simultaneous transmission.

   c) In the case of a network composed of stations intercommunicating on the same frequency, the symbol ZN shall be entered in Column 5a. When the same frequency is used for two or more networks of the same administration, each network should be identified by a separate letter following the network symbol ZN, e.g. ZN-A, ZN-B, etc.

   d) In the case of a network, as well as in the case where a frequency is used in a specific area by numerous stations under the jurisdiction of the same administration, it is necessary to notify only sufficient stations to define the

area of operation, provided that that area is well defined and sufficiently small to make it easy to forecast the conditions of the use of the frequency from the propagation point of view.

3. For land, radionavigation land, radiolocation land and standard frequency stations, and ground-based stations in the meteorological aids service, it is not necessary to indicate any information in this column.

4. For broadcasting stations, the areas of reception should be indicated. Each area should be either a country or one of the zones indicated on the map annexed to this Appendix.

5. For reception in the circumstances described in No. **487**, the name of the locality by which the receiving land station is known or in which it is situated should be indicated.

6. In the case of a notification under No. **490** in a frequency band above 28 000 kHz, each area in which the particular frequency is used should be clearly defined in order to assist co-ordination with other administrations.

7. *This information is a basic characteristic*, except for paragraph 3 above.

Column 5b Length of circuit (km)

1. The length of the circuit in km should be indicated in this column.

2. For reception in the circumstances described in No. **487**, the maximum distance between the mobile stations and the receiving land station should be indicated.

3. This information is not a basic characteristic *except in the case of paragraph 2 above, and in the case of land, radio-navigation land, radiolocation land and standard frequency stations. In these latter cases, the distances shown shall represent the service ranges.*

Column 6 Class of station and nature of service

1. Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.
2. When the frequency assignment is used for reception in the circumstances described in No. **487**, the class of station and nature of service applicable to the mobile stations should be indicated.
3. *This information is a basic characteristic.*

Column 7 Class of emission, necessary bandwidth and description of transmission.

1. Indicate, for each locality or area of reception shown in Column 5a, the class of emission, necessary bandwidth and description of transmission, in accordance with Article 2 and Appendix 5.
2. When the frequency assignment is used for reception in the circumstances described in No. **487**, the particulars to be indicated are those applicable to the mobile stations.
3. *This information is a basic characteristic.*

Column 8 Power (in kW)

1. The power supplied to the antenna transmission line shall be notified as follows, according to the class of emission :

a) Carrier power (P_c) for A3 sound broadcasting (see No. **97**) ;

b) Mean power (P_m) for other amplitude modulated emissions using unkeyed full carrier, and for all frequency modulated emissions (see No. **96**) ;

c) Peak envelope power (P_p) for all classes of emission other than those referred to in *a)* or *b)*, including A5 television (vision) (see No. **95**).

2. In the frequency bands above 28 000 kHz, except for the notices referred to in No. **490**, the power notified may be either the effective radiated power (see No. **98**) or the power supplied to the antenna transmission line. In the latter case, the antenna gain (Column 9c) is a basic characteristic.

3. The appropriate symbol P_c, P_m or P_p shall follow the indication of the value of the power. In cases where the effective radiated power is notified, this symbol shall be followed by the letter " e ".

4. The power normally used to each locality or area of reception shown in Column 5a shall be indicated.

5. When the frequency assignment is used for reception in the circumstances described in No. **487**, the power of the mobile stations should be indicated. If not all of the stations use the same power, the highest power should be indicated.

6. *This information is a basic characteristic.*

Column 9 Transmitting antenna characteristics

Column 9a Azimuth of maximum radiation

1. If a directive transmitting antenna is used, indicate the azimuth of maximum radiation of the transmitting antenna in degrees (clockwise) from True North.
2. If a transmitting antenna with non-directional characteristics is used, insert " ND " in this column.
3. *This information is a basic characteristic,* except for stations referred to in No. **490** or when the frequency assignment is used for reception in the circumstances described in No. **487.**

Columns 9b and 9c

If the radiation characteristics of the antenna concerned differ from those recommended by the C.C.I.R., the following information should be notified in Columns 9b and 9c :

Column 9b Angular width of radiation main lobe

The total angle in the horizontal plane, in degrees, within which the power radiated in any direction does not fall more than 6 dB below the power radiated in the direction of maximum radiation, should be indicated.

Column 9c Antenna gain (dB)

1. The relative gain of the antenna in the direction of maximum radiation for the assigned frequency should be indicated (see No. **101**).
2. *In the frequency bands above 28 000 kHz, the antenna gain is a basic characteristic in the case where the power notified in Column 8 is the power supplied to the antenna transmission line.*
   It is not a basic characteristic if the effective radiated power is notified in Column 8.

Column 10 **Maximum hours of operation of the circuit to each locality or area (G.M.T.)**

1. When the frequency assignment is used for reception in the circumstances described in No. **487**, the maximum hours of operation are those relating to the mobile stations.

2. As complementary information, indicate by the letter " I " any part of the period during which the operation of the circuit is intermittent.

3. *This information is a basic characteristic,* except for paragraph 2 above.

Column 11 Megahertz order of the other frequencies normally utilized for the same circuit.

1. If the notified frequency is the only frequency used for the particular circuit, the indication " Nil " shall be inserted in this column.

2. In the case of a meteorological or press broadcast transmission intended to cover a large area, the separate notice made for each frequency assignment required for transmission to each specific part of this area should indicate " Nil " in this column, subject to the condition that the specific area notified in Column 5a satisfies the conditions laid down in sub-paragraph 2*a)* relating to that column.

3. In cases other than those mentioned in paragraphs 1 and 2, the megahertz order of the other frequencies normally used for the circuit over the whole of the solar cycle shall be indicated. For this purpose, the megahertz order shall be calculated according to the following ranges :

Range	Megahertz Order
4 000 - 5 999 kHz	5
6 000 - 7 999 kHz	7
⋮	⋮
26 000 - 27 999 kHz	27

4. *This information is a basic characteristic for fixed stations between 4 000 and 28 000 kHz.*

Column 12a Operating Administration or Company *

This information is not a basic characteristic, *but it is recommended it be supplied in cases where the same agency operates in more than one country.*

Column 12b Postal and telegraphic address of the administration responsible for the station *

1. The addresses required are those to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the circuit (see Article 15).

2. This information is not a basic characteristic.

Supplementary Information

Any supplementary information supplied by the administration should be indicated within the frame provided on the notice.

1. If the assignment is made in application of a regional or service agreement, the relevant agreement shall be indicated in the appropriate place; otherwise, insert the indication " Nil ".

2. Indicate after the symbol COORD/---- the name of any administration with which co-ordination has been effected for the use of the frequency; if no co-ordination has been effected, the indication " Nil " should be inserted. In the case of a notification under No. **490** in a frequency band above 28 000 kHz, the area or areas of the actual agreed use to which the co-ordination refers should be indicated.

* Where this information already appears in the Preface to the International Frequency List, the appropriate reference number or letter may be used.

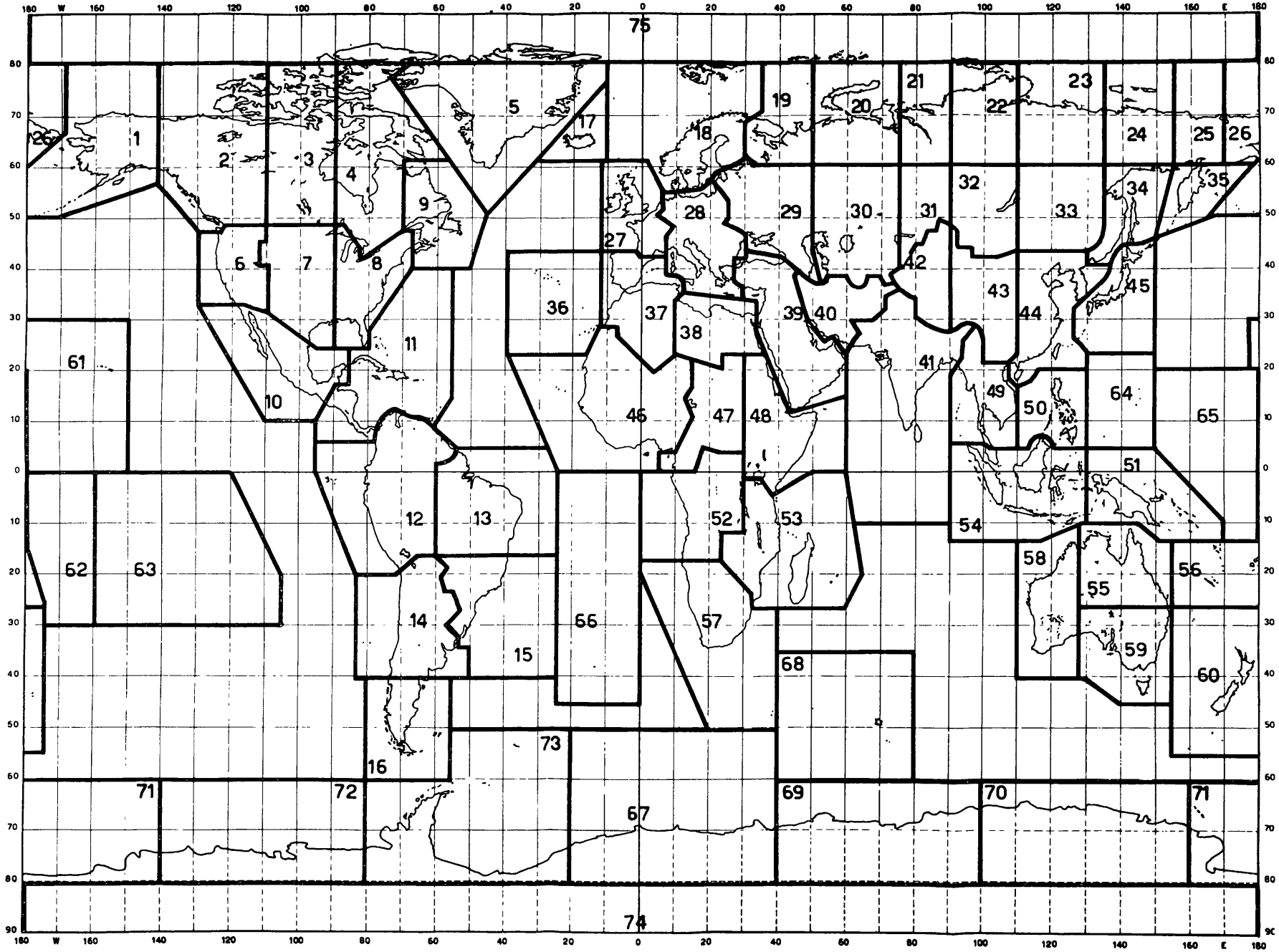
3. In any case where there are one or more reference frequencies in a particular transmission (e.g. in the case of (a) the frequency of the reduced carrier in an independent or single sideband emission, and (b) the frequencies of the sound and vision carriers in a television emission), such reference frequencies shall be supplied. In the case of television broadcasting stations in Region 1, each notice shall include, as supplementary information, both the frequency of the other carrier and the assigned frequency. For stations in the Aeronautical Mobile (R) Service using permitted emissions other than DSB, the reference frequency together with the appropriate centre frequency of the channel listed in the Allotment Plan in Appendix 27 shall be supplied as supplementary information.

4. Any other information which the administration considers to be relevant should be indicated, such as, for example, an indication that the assignment concerned would be operating in accordance with No. **115** of these Regulations, or information concerning the use of the notified frequency if such use is restricted or if the frequency is not used during all the time which is possible according to propagation conditions.

5. *Only the information specified in paragraph 3 above is a basic characteristic; it is recommended, however, that the information under paragraphs 1 and 2 above be supplied. However, in the case of stations in the fixed or mobile service referred to in No.* **492A**, *the name of any administration with which co-ordination of the use of the frequency has been sought and the name of any administration with which such co-ordination has been effected are basic characteristics.*

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK



ZONES GÉOGRAPHIQUES POUR LA RADIODIFFUSION

GEOGRAPHICAL ZONES FOR BROADCASTING

ZONAS GEOGRÁFICAS PARA RADIODIFUSIÓN

APPENDIX 1A

Spa Spa2

Notices relating to Space Radiocommunications and Radio Astronomy Stations

(See Article 9A)

Section A. General Instructions

1. A separate notice shall be sent to the International Frequency Registration Board for notifying:

— each new frequency assignment;

— any change in the characteristics of a frequency assignment recorded in the Master International Frequency Register (hereinafter called the *Master Register*);

— any total deletion of a frequency assignment recorded in the Master Register.

2. When submitting notices under No. **639BA** for earth and space transmitting assignments and under No. **639BB** for space and earth receiving assignments, separate notices shall be submitted to the Board for each assignment to an earth or space station. In the case of a passive satellite system, only earth transmitting and receiving assignments shall be notified.

3. In the case of a satellite system employing multiple space stations with the same general characteristics, a separate notice shall be submitted for each space station:

— when it is aboard a geostationary satellite; or

— when it is aboard a non-geostationary satellite except when a number of satellites have the same radio frequency characteristics and orbital characteristics (excluding the ascending node position); in the latter case, one notice covering all such space stations may be submitted.

4. The following basic information shall be shown on the notice:

a) the serial number of the notice and the date on which the notice is sent to the Board;

b) the name of the notifying administration;

c) sufficient data to identify the particular satellite network in which the earth or space station will operate;

d) whether the notice reflects:

1) the first use of a frequency by a station;

2) a change in the characteristics of a frequency assignment recorded in the Master Register (indicate whether the change is a replacement, addition or deletion of existing characteristics); or

3) a deletion of an assignment in all of its notified characteristics;

e) reference to the I.F.R.B. weekly circular providing the advance publication information required in accordance with No. **639AA**;

f) basic characteristics as outlined in Section B, C, D, E, or F as appropriate;

g) any other information which the administration considers to be relevant, e.g., any factors taken into account when applying Appendix 28 for determination of the co-ordination area and also any indication that the assignment concerned would be operating

in accordance with No. **115**, information concerning the use of the notified frequency if such use is restricted, or, in the case of notices pertaining to space stations, if the transmissions of the station are to be permanently switched off after a certain period.

Section B. Basic Characteristics to be furnished in Notices relating to Frequencies used by Earth Stations for Transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in kHz up to 30000 kHz inclusive, and in MHz above 30000 kHz (see No. **85**).

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. **89**).

Item 3 Date of bringing into use

a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of bringing the frequency assignment into use.

b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4 *a)*), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity and location of the transmitting earth station

a) Indicate the name by which the station is known or the name of the locality in which it is situated.

b) Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.

c) Indicate the geographical co-ordinates (in degrees and minutes) of the transmitter site.

Item 5 Station(s) with which communication is to be established

Identify the associated receiving space station(s) by reference to the notification thereof or in any other appropriate manner, or, in the case of a passive satellite, the identity of the satellite and the location of the associated receiving earth station(s).

Item 6 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

Item 7 Class of emission, necessary bandwidth and description of transmission

In accordance with Article 2 and Appendix 5:

a) indicate the class of emission;

b) [1] indicate the carrier frequency or frequencies of the emission(s);

c) [1] indicate for each carrier, the class of emission, necessary bandwidth and description of transmission.

Item 8 Power characteristics of the transmission

a) [1] Indicate for each carrier, the peak power supplied to the input of the antenna.

b) Indicate the total peak power and the maximum power density per Hz supplied to the input of the antenna averaged over the worst 4 kHz band for carriers below 15 GHz, or averaged over the worst 1 MHz band for carriers above 15 GHz.

---

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 9 Transmitting antenna characteristics

a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see No. **100**).

b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).

c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for co-ordination.

d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.

e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation.

f) Indicate in degrees, clockwise from true north, the planned range of operating azimuthal angles for the direction of maximum radiation.

g)[1] Indicate the type of polarization of the transmitted wave in the direction of maximum radiation; also indicate the sense in the case of circular polarization and the plane in the case of linear polarization.

h) Indicate the altitude (metres) of the antenna above mean sea level.

Item 10[1] Modulation characteristics

For each carrier, according to the nature of the signal modulating the carrier and the type of modulation, indicate the following characteristics:

---

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

a) carrier frequency modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband: indicate the lowest and highest frequencies of the baseband and the r.m.s. frequency deviation of the test tone as a function of baseband frequency;

b) carrier frequency modulated by a television signal: indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristic and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals;

c) carrier phase-shift modulated by a pulse code modulation signal (PCM/PSK): indicate the bit rate and the number of phases;

d) amplitude modulated carrier (including single sideband): indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used;

e) for all other types of modulation, provide such particulars as may be useful for an interference study;

f) for any type of modulation as applicable, indicate the characteristics of energy dispersal.

Item 11 Maximum hours of operation

Indicate in G.M.T. the maximum hours of operation on the frequency of each carrier.

Item 12 Co-ordination

Give the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance

with Nos. **639AJ** and **639AN** and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 13 Agreements

Give, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 14 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic address of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section C. Basic Characteristics to be furnished in Notices relating to Frequencies to be received by Earth Stations

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz (see No. **85**).

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. **89**).

Item 3 Date of bringing into use

a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.

b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4 *a)*), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity and location of the receiving earth station

a) Indicate the name by which the receiving earth station is known or the name of the locality in which it is situated.

b) Indicate the country in which the receiving earth station is located. Symbols from the Preface to the International Frequency List should be used.

c) Indicate the geographical co-ordinates (in degrees and minutes) of the receiver site.

Item 5 Station(s) with which communication is to be established

Identify the associated transmitting space station(s) by reference to the notification thereof or in any other appropriate manner, or, in the case of a passive satellite, the identity of the satellite and the associated transmitting earth station(s).

Item 6 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

Item 7 Class of emission, necessary bandwidth and description of the transmission to be received

In accordance with Article 2 and Appendix 5:

a) indicate the class of emission of the transmission to be received;

b) [1] indicate the carrier frequency or frequencies of the transmission to be received;

c) [1] indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission.

Item 8 Earth station receiving antenna characteristics

a) Indicate the isotropic gain (dB) of the antenna in the direction of maximum radiation (see No. **100**).

b) Indicate the beamwidth in degrees between the half power points (describe in detail if not symmetrical).

c) Either attach the measured radiation diagram of the antenna (taking as a reference the direction of maximum radiation) or indicate the reference radiation diagram to be used for co-ordination.

d) Indicate graphically the horizon elevation angle for each azimuth around the earth station.

e) Indicate in degrees from the horizontal plane the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation.

f) Indicate in degrees, clockwise, from True North, the planned range of operating azimuthal angles for the direction of maximum radiation.

g) Indicate the altitude (metres) of the antenna above mean sea level.

Item 9 Noise temperature

Indicate the lowest equivalent satellite link noise temperature in kelvins (see No. **103A**) under "quiet sky conditions". This

---

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

value shall be indicated for the nominal value of the angle of elevation when the associated transmitting station is aboard a geostationary satellite and, in other cases, for the minimum value of angle of elevation.

Item 10 Maximum hours of reception

Indicate in G.M.T. the maximum hours of reception of the frequency of each carrier.

Item 11 Co-ordination

Give the name of any administration with which the use of this frequency has been successfully co-ordinated in accordance with Nos. **639AJ** and **639AN** and, if appropriate, the name of any administration with which co-ordination has been sought but not effected.

Item 12 Agreements

Give also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations, and the contents of such agreement.

Item 13 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

Section D. Basic Characteristics to be furnished in Notices relating to Frequencies used by Space Stations for Transmitting

Item 1 Assigned frequency

Indicate the assigned frequency as defined in Article 1, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz (see

No. **85**). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. **89**).

Item 3 Date of bringing into use

a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) of bringing the frequency assignment into use.

b) Whenever the assignment is changed in any of its basic characteristics as shown in this Section (except in the case of a change in Item 4), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity of the space station(s)

Indicate the identity of the space station(s).

Item 5 Orbital information

a) In the case of a space station aboard a geostationary satellite indicate the nominal geographical longitude on the geostationary satellite orbit and the longitudinal and inclination tolerances. Indicate also:

1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the Earth's surface, from its associated earth stations or service areas; and

2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and

3) in the event that the arc defined in paragraph 2) above is less than the arc defined in paragraph 1) above, provide the reasons therefor.

Note: The arcs specified in 1) and 2) will be indicated by the geographical longitude of the extremes of these arcs on the geostationary satellite orbit.

b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period, the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Service area

Indicate the service area or areas on the Earth or the name of the locality and country in which the associated receiving station(s) is (are) located.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

Item 8 Class of emission, necessary bandwidth and description of transmission

In accordance with Article 2 and Appendix 5:

a) indicate the class of emission of the transmission;

b) [1] indicate the carrier frequency or frequencies of the transmission;

c) [1] indicate, for each carrier, the class of emission, necessary bandwidth and description of transmission.

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 9 Power characteristics of the transmission

a) [1] Indicate for each carrier the peak power supplied to the input of the antenna.

b) Indicate the total peak power and the maximum power density per Hz at the input of the antenna averaged over the worst 4 kHz band for carriers below 15 GHz or averaged over the worst 1 MHz band for carriers above 15 GHz.

Item 10 Space station transmitting antenna characteristics

For each service area:

a) in the case of a space station aboard a geostationary satellite, indicate the gain of the space station transmitting antenna by means of gain contours plotted on a map of the Earth's surface. The isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated;

b) in the case of a space station aboard a non-geostationary satellite, indicate the isotropic gain of the space station transmitting antenna in the main direction of radiation and indicate the antenna radiation pattern in those directions which can intersect with the Earth's surface, taking the gain in the main direction of radiation as a reference;

c) [1] indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization; also indicate the worst case axial ratio in the half power beam;

d) for a geostationary satellite, indicate the pointing accuracy of the antenna.

---

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 11[1] Modulation characteristics

For each carrier, according to the nature of the signal modulating the carrier and the type of modulation, indicate the following characteristics:

a) carrier frequency modulated by a frequency-division multichannel telephony baseband (FDM-FM) or by a signal that can be represented by a multichannel telephony baseband: indicate the lowest and highest frequencies of the baseband and the r.m.s. frequency deviation of the test tone as a function of baseband frequency;

b) carrier frequency modulated by a television signal: indicate the standard of the television signal (including, where appropriate, the standard used for colour), the frequency deviation for the reference frequency of the pre-emphasis characteristic and the pre-emphasis characteristic itself. Also indicate, where applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals;

c) carrier phase-shift-modulated by a pulse code modulation signal (PCM/PSK): indicate the bit rate and the number of phases;

d) amplitude modulated carrier (including single sideband): indicate as precisely as possible the nature of the modulating signal and the kind of amplitude modulation used;

e) for all other types of modulation, provide such particulars as may be useful for an interference study;

f) for any type of modulation as applicable, indicate the characteristics of energy dispersal.

---

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 12 Maximum hours of operation

Indicate in G.M.T. the maximum hours of operation on the frequency of each carrier.

Item 13 Co-ordination

Give the name of any administration or group of administrations with which the use of the satellite network to which the space station belongs has been successfully co-ordinated in accordance with No. **639AJ**.

Item 14 Agreements

Give also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 15 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of stations (see Article 15).

Section E. Basic Characteristics to be furnished in Notices relating to Frequencies to be received by Space Stations

Item 1 Assigned frequency

Indicate the assigned frequency of the emission to be received, as defined in Article 1, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz (see No. **85**). At least one separate assignment notice should be made out for each antenna radiation beam.

Item 2 Assigned frequency band

Indicate the bandwidth of the assigned frequency band in kHz (see No. **89**).

Item 3 Date of bringing into use

a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) when reception of the assigned frequency begins.

b) Whenever the assignment is changed in any of its basic characteristics, as shown in this Section (except in the case of a change in Item 4) the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 4 Identity of the receiving space station(s)

Indicate the identity of the receiving space station(s).

Item 5 Orbital information

a) In the case of a space station aboard a geostationary satellite, indicate the planned nominal geographical longitude on the geostationary satellite orbit and the planned longitudinal and inclination tolerances. Indicate also:

1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the Earth's surface, from its associated earth stations or service areas; and

2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and

3) in the event that the arc defined in paragraph 2) above is less than the arc defined in paragraph 1) above, provide the reasons therefor.

Note: The arcs specified in 1) and 2) will be indicated by the geographical longitude of the extremes of these arcs on the geostationary satellite orbit.

b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period, the altitudes in kilometres of the apogee and perigee of the space station(s) and the number of satellites used.

Item 6 Associated transmitting earth station(s)

Identify the associated transmitting earth station(s) by reference to the notification thereof or in any other appropriate manner.

Item 7 Class of station and nature of service

Indicate the class of station and nature of service performed, using the symbols shown in Appendix 10.

Item 8 Class of emission, necessary bandwidth and description of the transmission(s) to be received

In accordance with Article 2 and Appendix 5:

a) indicate the class of emission of the transmission(s) to be received;

b) [1] indicate the carrier frequency or frequencies of the transmission(s) to be received;

c) [1] indicate, for each carrier to be received, the class of emission, necessary bandwidth and description of the transmission(s) to be received.

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 9 Space station receiving antenna characteristics

For each receiving beam:

a) in the case of a space station aboard a geostationary satellite, indicate the gain of the space station receiving antenna by means of gain contours plotted on a map of the Earth's surface. The isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated;

b) in the case of a space station aboard a non-geostationary satellite, indicate the isotropic gain of the space station receiving antenna in the main direction of radiation and indicate the antenna radiation pattern in those directions which can intersect with the Earth's surface, taking the gain in the main direction of radiation as a reference;

c) [1] indicate the type of polarization of the antenna, the sense in the case of circular polarization, and the plane in the case of linear polarization, also indicate the worst case axial ratio in the half power beam;

d) indicate, for a geostationary satellite, the pointing accuracy of the antenna.

Item 10 Noise temperature

Indicate the total receiving system noise temperature (in kelvins) at the input of the space station receiver.

Item 11 Maximum hours of reception

Indicate in G.M.T. the maximum hours of reception of the frequency of each carrier.

---

[1] This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

Item 12 Co-ordination

Give the name of any administration or group of administrations with which the use of the satellite network to which the space station belongs has been successfully co-ordinated in accordance with No. **639AJ**.

Item 13 Agreements

Give also, if appropriate, the name of any administration with which agreement has been effected to exceed the limits prescribed in these Regulations and the contents of such agreement.

Item 14 Operating administration or company

Give the name of the operating administration or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

Section F. Basic Characteristics to be furnished in Notices relating to Frequencies to be received by Radio Astronomy Stations

Item 1 Observed frequency

Indicate the centre of the frequency band observed, in kHz up to 30 000 kHz inclusive, and in MHz above 30 000 kHz.

Item 2 Date of bringing into use

a) Indicate the date (actual or foreseen, as appropriate) when reception of the frequency band begins.

b) Whenever there is a change in any of the basic characteristics, as shown in this Section (except in the case of a change in Item 3 *b)*), the date to be given shall be that of the latest change (actual or foreseen, as appropriate).

Item 3 Name and location of the station

a) Indicate the letters "RA".

b) Indicate the name by which the station is known or the name of the locality in which it is situated or both.

c) Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.

d) Indicate the geographical co-ordinates (in degrees and minutes) of the station site.

Item 4 Bandwidth

Indicate the width of the frequency band (in kHz) observed by the station.

Item 5 Antenna characteristics

Indicate the antenna type and dimensions, effective area and angular coverage in azimuth and elevation.

Item 6 Maximum hours of reception

Indicate in G.M.T. the maximum hours of reception of the frequency band shown in Item 4.

Item 7 Noise temperature

Indicate the over-all receiving system noise temperature (in kelvins).

Item 8 Class of observations

Indicate the class of observations to be taken on the frequency band shown in Item 4. Class A observations are those in which the sensitivity of the equipment is not a primary factor. Class B

observations are those of such a nature that they can be made only with advanced low-noise receivers using the best techniques.

Item 9 Operating administration or company

Indicate the identity of the operating administration or company and the postal and telegraphic addresses of the administration to which communication should be sent on urgent matters regarding interference and questions referring to the technical operation of stations (see Article 15).

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

Section G. Form of Notice (Earth Station)

Form of Notice (1)

for use when notifying to the International Frequency Registration Board a Frequency Assignment or a Change to an Assignment recorded in the Master International Frequency Register (see Article 9A)

EARTH STATION { for transmitting (E), see Section B of Appendix 1A / for receiving (R), see Section C of Appendix 1A

(a) Notice No. / Date

(b) Notifying administration

(c) Identity of satellite network

(d1) New assignment [ ] (d2) Change [ ] (d3) Deletion of an assignment [ ]

(e) Reference of weekly circular relating to No. 639AA

1 Assigned frequency ..... kHz / MHz

2 Assigned frequency band in kHz

3 Date of bringing into use

4a Name of earth station

4b Country

4c Longitude and latitude of earth station site

For I.F.R.B. use

Space station(s) with which communication is to be established 5	Class of station and nature of service performed 6	Class of emission of assignment 7a	Carrier frequency (frequencies) (2) 7b	Class of emission, necessary bandwidth and description of transmission (2) 7c	Power characteristics: Peak power (2) 8a(E)	Power characteristics: Total peak power 8b(E)	Power characteristics: Maximum power density 8b(E)	Antenna characteristics (3): Isotropic gain 8a(R) 9a(E)	Antenna characteristics (3): Half power beam-width 8b(R) 9b(E)	Antenna characteristics (3): Minimum angle of elevation 8e(R) 9e(E)	Antenna characteristics (3): Azimuthal limits 8f(R) 9f(E)	Antenna characteristics (3): Polarization (2) 9g(E)	Antenna characteristics (3): Altitude (m) 8g(R) 9h(E)	Modulation characteristics (2) 10(E)	Lowest equivalent satellite link noise temperature 9(R)	Maximum hours of operation on each carrier (G.M.T.) 10(R) 11(E)	(g) Supplementary information

13(R), 14(E) { Operating administration or company / Name and address of administration

(2) This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

(3) NOTE: For *radiation diagram* 8c(R), 9c(E) and *horizon elevation angle diagram* 8d(R), 9d(E), attach the relevant information to this form.

11(R), 12(E) COORD/

12(R), 13(E) Agreements/

(g) Other information:

(1) The actual size of the notice is a matter for individual administrations.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

Form of Notice (1)

for use when notifying to the International Frequency Registration Board a Frequency Assignment or a Change to an Assignment recorded in the Master International Frequency Register (see Article 9A)

(b) Notifying administration

kHz

MHz

1 Assigned frequency

2 Assigned frequency band in kHz

3 Date of bringing into use

SPACE STATION { for transmitting (E), see Section D of Appendix 1A; for receiving (R), see Section E of Appendix 1A

(d1) New assignment (d2) Change (d3) Deletion of an assignment

4 Name of space station

(a) Notice No. / Date

(c) Identity of satellite network

(e) Reference of weekly circular relating to No. 639AA

For I.F.R.B. use

5 Orbital information

Satellite's nominal longitude and longitudinal and inclination tolerances 5a (3)		Angle of inclination of orbit 5b	Period of object in space 5b	Altitudes of apogee and perigee (km) 5b	Number of space stations 5b
Longitude	Tolerances				

Service area(s) or station(s) with which communication is to be established 6	Class of station and nature of service performed 7	Class of emission of assignment 8a	Carrier frequency (frequencies) (2) 8b	Class of emission, necessary bandwidth and description of transmission (2) 8c	Power characteristics: Peak power (2) 9a(E)	Power characteristics: Total peak power 9b(E)	Power characteristics: Maximum power density 9b(E)	Antenna characteristics (4): Polarization (2) 9c(R) 10c(E)	Antenna characteristics (4): Geo-stationary satellite pointing accuracy 9d(R) 10d(E)	Modulation characteristics (2) 11(E)	Receiving system noise temperature 10(R)	Maximum hours of operation on each carrier (G.M.T.) 11(R) 12(E)	(g) Supplementary information

14(R), 15(E) { Operating administration or company / Name and address of administration

(1) The actual size of the notice is a matter for individual administrations.

(2) This information need only be furnished when such information has been used as a basis to effect co-ordination with another administration.

(3) Information on *visible arc*, *service arc* and reasons if service arc is less than visible are to be attached (5a.1, 5a.2, 5a.3).

(4) NOTE: For *antenna characteristics* 10a(E) or 10b(E) and 9a(R) or 9b(R), attach the relevant information to this form.

12(R), 13(E) COORD/

13(R), 14(E) Agreements/

(g) Other information:

APPENDIX 1B

Spa2

Advance Publication Information to be furnished for a Satellite Network

(see Article 9A)

Section A. General Instructions

Item 1 Information shall be provided separately for each satellite network.

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

Section B. General Characteristics to be furnished for a Satellite Network

Item 1 Identity of the satellite network

Clearly identify the satellite network and, if applicable, identify the satellite system of which it will form a part.

Item 2 Date of bringing into use

Indicate the date by which the satellite network is expected to be brought initially into use.

Item 3 Administration or group of administrations submitting the advance information

Give the name of the administration or the names of the administrations in the group submitting the advance information on the satellite network and the postal and telegraphic addresses of the administration(s) to which any communication should be sent.

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

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

1) the arc of the geostationary satellite orbit over which the space station is visible, at a minimum angle of elevation of 10° at the Earth's surface, from its associated earth stations or service areas;

2) the arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas; and

3) in the event that the arc defined in paragraph 2) above is less than the arc defined in paragraph 1) above, provide the reasons therefor.

Note: The arcs specified in 1) and 2) will be indicated by the geographical longitude of the extremes of these arcs on the geostationary satellite orbit.

b) In the case of space station(s) aboard non-geostationary satellite(s), indicate the angle of inclination of the orbit, the period, the altitudes in kilometres of the apogee and perigee

of the space station(s) and the number of satellites used having the same characteristics.

Section C. Characteristics of the Satellite Network in the Earth-to-Space direction

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

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

Item 2 Class of stations and nature of service

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

Item 3 Frequency range

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

Item 4 Power characteristics of the transmitted wave

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

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

Item 5 Characterisitcs of space station receiving antennae

For each Earth-to-space service area:

a) in the case of a space station aboard a geostationary satellite, indicate the estimated gain of the space station receiving antenna by means of gain contours plotted on a map of the Earth's surface; the isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated;

b) in the case of a space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station receiving antenna in the main direction of reception and indicate the antenna radiation pattern in those directions which can intersect with the Earth's surface, taking the gain in the main direction of radiation as a reference.

Item 6 Noise temperature of the receiving space station

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

Section D. Characteristics of the Satellite Network in the Space-to-Earth Direction

Item 1 Space-to-Earth service area(s)

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

Item 2 Class of stations and nature of service

For each spacc-to-Earth service area, indicate the class of the stations in the satellite network and the nature of the service to be performed, using the symbols shown in Appendix 10.

Item 3 Frequency range

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

Item 4 Power characteristics of the transmission

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

Item 5 Characteristics of space station transmitting antennae

For each space-to-Earth service area:

a) in the case of a space station aboard a geostationary satellite, indicate the estimated gain of the space station transmitting antenna by means of gain contours plotted on a map of the Earth's surface; the isotropic gain at each contour which corresponds to a gain of 2, 4, 6, 10 and 20 dB and at 10 dB intervals thereafter as necessary, below the maximum gain, shall be indicated;

b) in the case of space station aboard a non-geostationary satellite, indicate the estimated isotropic gain of the space station transmitting antenna in the main direction of transmission and indicate the antenna radiation pattern in those directions which can intersect with the Earth's surface, taking the gain in the main direction of transmission as a reference.

Item 6 Characteristics of receiving earth stations

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

For each space-to-Earth service area and for each projected usage [1], when simple frequency changing transponders are used on the space station, indicate the lowest equivalent satellite link noise temperature and the associated value of transmission gain evaluated from the output of the receiving antenna of the space station to the output of the receiving antenna of the earth station. For each projected usage, indicate also the receiving antenna(e) of the space station to which each simple frequency changing transponder will be connected.

b) If available, indicate for each space-to-Earth service area the actual radiation pattern (relative to isotropic) of the receiving earth station antenna having the highest off beam level. When simple frequency changing transponders are used on the space station, indicate also, if available, the pattern associated with each equivalent satellite link noise temperature indicated above.

Section E. Characteristics to be furnished for Space-to-Space Relay

Where the satellite network is connected to one or more satellite networks by means of space-to-space relay, indicate the following:

a) identity or identities of the other satellite network(s) to which the satellite network is connected;

b) transmit and receive frequency bands;

c) classes of emission;

d) nominal equivalent isotropically radiated power(s) on the beam axis.

---

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

APPENDIX 1C

Mar2

Information to be supplied in Accordance with No. 639DY

(See Article 9B)

☐	☐	☐
Initial allotment	Additional allotment	Replacement allotment (No. **639EW**)

1. Country or area of allotment .....

2. 2.1 Proposed frequency { Carrier ..... kHz / Assigned ..... kHz }

   2.2 Alternative proposed frequency { Carrier ..... kHz / Assigned ..... kHz }

   2.3 Frequency to be replaced (No. **639EW**) { Carrier ..... kHz / Assigned ..... kHz }

3. 3.1 Main service area .....

   3.2 Maximum length of circuit in kilometres .....

4. Nature of service (e.g. CP, CO, CV or OT) .....

5. Class of emission .....

6. Peak envelope power in kW .....

7. Transmitting antenna characteristics (for details see Appendix 1):

   7.1 In the case of a non-directional antenna, insert the symbol "ND" .....

   7.2 In the case of a directional antenna, indicate:

   a) the azimuth of maximum radiation .....

   b) the angular width of main lobe .....

   c) relative gain of the antenna in dB .....

8. Planned scheduled hours of operation of the proposed frequency ..... to ..... hrs (GMT)

9. Indicate, if possible:

   a) the estimated peak hours of traffic ..... to ..... hrs (GMT)

   b) the estimated daily volume of traffic in minutes .....

10. Planned date of first use of channel ....
(month) (year)

APPENDIX 2
(See Article 10)

Section A. Form of Notice

BC

Form of Notice *

For Use when Submitting to the International Frequency Registration Board
a Seasonal High Frequency Broadcasting Schedule
or a Change thereto
(see Article 10)

(a) Notifying administration

6 Class of station

(b) Assignment for the particular season

(c) Change of characteristics of an assignment for the season

(d) Deletion of an assignment for the season

(e) Notice No.: _____
Date : _____

1a Assigned frequency ____ kHz

1b Alternative frequency ____ kHz

1c Frequency band ____ MHz

2c Date of putting into use in the particular season
Season. MARCH MAY SEPT NOV.
Year :
Other date:

3 Call sign (Identification)

4a Name of transmitting station

4b Country

4c Longitude and latitude of the transmitter site

Zone(s) or area(s) of reception	Class of emission and necessary bandwidth	Power (kW)	Transmitting antenna characteristics					Hours of operation (G.M.T.)	Other frequencies simultaneously utilized for same programme to the same area(s)	Supplementary information
			Azimuth of max. radiation	Angular width of radiation main lobe	Antenna gain in dB	Angle of elevation	Type of antenna			
5a	7	8	9a	9b	9c	9d	9e	10	11	

12b _____ Name and postal address
_____ Telegraphic address
} of administration (Article 15)

COORD/ _____

Other information:

* The actual size of the notice is a matter for individual administrations.

Section B. General Instructions

1. A separate notice shall be sent to the I.F.R.B. for notifying :

   — Each frequency assignment to be put into use for a particular season ;

   — any change in the characteristics of a frequency assignment in the High Frequency Broadcasting Schedule, for the season ;

   — any deletion of a frequency assignment in the High Frequency Broadcasting Schedule, for the season.

2. Separate entries, in Columns 5a and 8 to 11, should be made for the various characteristics when they do not apply to the assignment as a whole, for instance when the power, antennna characteristics or hours of operation differ according to the zones or areas of reception.

I. General Notes

(a) The name of the notifying administration should be indicated.

(b) Indicate in this box by the letter " X " when the notice reflects the first frequency usage by a station in a particular season.

(c) Indicate in this box by the letter " X " when the notice reflects a change in the characteristics of a frequency assignment in the High Frequency Broadcasting Schedule, for the season.

   1) In the case where existing particulars are changed, the new characteristics in the appropriate place should be underlined ; the original characteristics which have been changed should be shown in brackets underneath or at the side.

   2) In the case where the change is an addition to existing particulars, the additional characteristics should be shown in the appropriate place and should be underlined.

   3) In the case where the change is a cancellation of a particular characteristic or characteristics, this should be shown in the appropriate place by a dash and, underneath or at the side, the characteristics which have been cancelled should be shown in brackets.

(d) Indicate in this box by the letter "X" when the notice reflects a deletion of an assignment, in all of its notified characteristics, for the season.

(e) The serial number of the notice and the date on which the notice is sent to the Board shall be shown here.

II. Notes Concerning Information to be Entered in the Specific Columns of the Notice

Column 1 Frequency

1a Indicate the assigned frequency as defined in Article 1, in kHz;

1b indicate any suggested alternative frequency or frequencies in kHz, or

1c the desired band in MHz, if a specific frequency is not given under 1a and 1b above.

Column 2c Date of putting into use, in the particular season

1. If the assignment is to be brought into use on the implementation date of the seasonal schedule, indicate the last two digits of the year in the box(es) of the season(s) for which the assignment is to be used.

2. If the assignment is to be brought into use or changed by any date other than the implementation date of the particular seasonal schedule, this date shall be entered in the space provided.

Column 3 Call sign (Identification)
Indicate the call sign or other station identification used in accordance with Article 19.

Column 4 Name and location of transmitting station

4a Indicate the name of the locality by which the transmitting station is known or in which it is situated.

4b Indicate the country in which the station is located. Symbols from the Preface to the International Frequency List should be used.

4c Indicate the geographical co-ordinates (in degrees and minutes) of the transmitter site.

Column 5a Zone(s) or area(s) of reception

1. Indicate in this column the zone(s) of reception as shown in the map annexed to Appendix 1.
2. If the reception area is smaller than an entire zone, it should be indicated as a country or part of a country using symbols from the Preface to the International Frequency List, as far as possible.
3. Indicate, as supplementary information, the maximum service range (in km) when this is considered necessary.

Column 7 Class of emission and necessary bandwidth

Indicate the class of emission and necessary bandwidth in accordance with Article 2 and Appendix 5.

Column 8 Power (in kW)

Indicate the carrier power supplied to the transmission line.

Transmitting Antenna Characteristics

Column 9a Azimuth of maximum radiation

1. If a directive transmitting antenna is used, indicate the azimuth of maximum radiation of the transmitting antenna in degrees (clockwise) from True North.

2. If a transmitting antenna with non-directional characteristics is used, insert " ND " in this column.

Column 9b Angular width of radiation main lobe

The total angle in the horizontal plane, in degrees, within which the power radiated in any direction does not fall more than 6 dB below the power radiated in the direction of maximum radiation, should be indicated.

Column 9c Antenna gain (dB)

The relative gain of the antenna in the direction of maximum radiation for the assigned frequency should be indicated.

Column 9d Angle of elevation

The angle of the direction of maximum radiation in the vertical plane in degrees should be indicated.

Column 9e Type of antenna

The nomenclature of the C.C.I.R. book of " Antenna Diagrams " should be used wherever it is applicable as shown in a list at the end of this instruction (see III of this Section).

Column 10 Hours of operation (G.M.T.)

Column 11 Other frequencies simultaneously used for the same programme to the same area(s)

1. If the notified frequency is the only frequency used for the particular schedule, the indication " Nil " shall be inserted in this column.

2. In other cases, the other frequencies simultaneously used for the same programme to the same area shall be indicated.

Column 12b Postal and telegraphic address of administration responsible for the station*

The addresses required are those to which communication should be sent on urgent matters regarding interference, quality of emissions, and questions referring to the technical operation (see Article 15).

Supplementary Information

Any other information supplied by the administration should be indicated in the space provided.

1. Indicate after the symbol COORD/--- the name of any administration with which co-ordination has been effected for the use of the frequency; if no co-ordination has been effected, the indication "Nil" should be inserted.

2. Any other information which the administration considers to be relevant should be indicated, such as, for example, the maximum service range when this is less than 2 000 kms; or information concerning the use of the notified frequency if such use is restricted; or if the frequency is not used during all the hours indicated in Column 10, or on certain days of the week only; or if synchronizing techniques are used.

III. Symbols for Type of Antenna

HOR	Horizontal non-directive antenna
VER	Vertical non-directive antenna

---

* Where this information already appears in the Preface to the International Frequency List, the appropriate reference number or letter may be used.

DP	Dipole
H	Horizontal
V	Vertical
R	With reflector

(Example: DPHR means: Horizontal dipole with reflector)

H	Horizontal dipole curtain antenna
R	With reflector curtain
S	Slewed antenna
/..	Number of half wave elements in each row
/..	Number of half wave elements in each stack (one above the other)
/..	Height above ground in full wavelengths of the bottom row of elements
S..	Angle of slew, if any

(Example: HRS/4/3/2S15 means: Horizontal array with reflector curtain, 4 half wave elements in each row, 3 stacks of dipoles, bottom element 2 wavelengths above the ground, slewed with an angle of 15 degrees)

RHO	Rhombic antenna
/..	Length of one side of the rhombus, in wavelengths
/..	Height of rhombus above ground, in wavelengths
/..	One half of the interior side angle of rhombus

(Example: RHO/2·5/0·4/65 means: Rhombic antenna, length of one side 2·5 wavelengths, height above ground 0·4 wavelengths, one half of the interior side angle 65 degrees)

TRO	Tropical broadcasting antenna
/..	Number of rows
/..	Height above the ground in wavelengths

(Example: TRO/4/0·2 means: Tropical BC antenna with 4 rows (and 4 dipoles in each row) in a height of 0·2 wavelengths above the ground)

APPENDIX 3

Mar Mar2

Table of Frequency Tolerances*

(See Article 12)

1. Frequency tolerance is defined in Article 1 and is expressed in parts in 10^6 or, in some cases, in hertz.

2. The power shown for the various categories of stations is the mean power as defined in Article 1.

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
Band: **10 to 535 kHz**		
1. *Fixed Stations:*		
— 10 to 50 kHz	1 000	1 000
— 50 to 535 kHz	200	200
2. *Land Stations:*		
a) Coast Stations:		
— power 200 W or less	500	500 *l)*
— power above 200 W	200	200 *l)*
b) Aeronautical Stations	200 *	100 *

* Certain services may need tighter tolerances for technical and operational reasons.

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
3. *Mobile Stations :*		
a) Ship Stations	1 000	1 000 *k)*
b) Ship's Emergency Transmitters	5 000	5 000
c) Survival Craft Stations	5 000	5 000
d) Aircraft Stations	500	500
4. *Radiodetermination Stations*	200 *	100 *
5. *Broadcasting Stations*	20 Hz	10 Hz
Band : **535 to 1 605 kHz**		
Broadcasting Stations	20 Hz	10 Hz *b)*
Band: **1 605 to 4 000 kHz**		
1. *Fixed Stations :*		
— power 200 W or less	100	100
— power above 200 W	50	50
2. *Land Stations*		
— power 200 W or less	100	100 *h) l)*
— power above 200 W	50	50 *h) l)*
3. *Mobile Stations*		
a) Ship Stations	200	200 *i) k)*

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
b) Survival Craft Stations	—	300
b A) Emergency Position-Indicating Radiobeacons	—	300
c) Aircraft Stations	200 *	100 *
d) Land Mobile Stations	200	200
4. *Radiodetermination Stations :*		
—power 200 W or less	100	100
—power above 200 W	50	50
5. *Broadcasting Stations*	50	20
Band: 4 to 29·7 MHz		
1. *Fixed Stations :*		
—power 500 W or less	100	50
—power above 500 W	30	15
2. *Land Stations:*		
a) Coast Stations:		
— power 500 W or less	50	50 *h) l)*
— power above 500 W and less than or equal to 5 kW	50 *	30 * *h) l)*
— power above 5 kW	50	15 *h) l)*

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
b) Aeronautical Stations:		
—power 500 W or less	100	100
—power above 500 W	50	50
c) Base Stations:		
—power 500 W or less	100	100
—power above 500 W	50	50
3. *Mobile Stations:*		
a) Ship Stations:		
1) Class A1 emissions	200	50 *p) q)*
2) Emissions other than Class A1	50	50 *i) k)*
— power 50 W or less	50 *c)*	50 *c) i) k)*
— power above 50 W	50	50 *i) k)*
b) Survival Craft Stations	200	200
c) Aircraft Stations	200 *	100 *
d) Land Mobile Stations	200	200
4. *Broadcasting Stations*	30	15

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966 * to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
Band : **29·7 to 100 MHz**		
1. *Fixed Stations :*		
—power 200 W or less	200 *	50 *
—power above 200 W	200	30
2. *Land Stations :*		
—power 15 W or less	200	50
—power above 15 W	200	20
3. *Mobile Stations :*		
—power 5 W or less	200	100
—power above 5 W	200	50
4. *Radiodetermination Stations*	200	200
5. *Broadcasting Stations (other than television) :*		
—power 50 W or less	50	50
—power above 50 W	30	20
6. *Broadcasting Stations (television sound and vision):*		
—power 50 W or less	100	100
—power above 50 W	30	1 000 Hz

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
Band: **100 to 470 MHz**		
1. *Fixed Stations:*		
—power 50 W or less	100 *	50 *
—power above 50 W	100 *	20 *
2. *Land Stations:*		
a) Coast Stations	100	20 *n)*
b) Aeronautical Stations	100	50
c) Base Stations :		
—power 5 W or less	100	50
—power above 5 W	100	20
3. *Mobile Stations:*		
a) Ship Stations and Survival Craft Stations:		
— in the band 156-174 MHz	100	20 *n)*
— outside the band 156-174 MHz	100 *d)*	50 *d) o)*
b) Aircraft Stations	100	50
c) Land Mobile Stations:		
—power 5 W or less	100	50
—power above 5 W	100	20

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966 * to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
4. *Radiodetermination Stations*	200 * *d) e)*	50 * *d) e)*
5. *Broadcasting Stations (other than television)*	30	20
6. *Broadcasting Stations (television sound and vision):*		
—power 100 W or less	100	100
—power above 100 W	30	1 000 Hz
Band : **470 to 2 450 MHz**		
1. *Fixed Stations :*		
—power 100 W or less	7 500	300 *f)*
—power above 100 W	7 500	100 *g)*
2. *Land Stations*	7 500	300
3. *Mobile Stations*	7 500	300
4. *Radiodetermination Stations*	7 500 *e)*	500 *e)*
5. *Broadcasting Stations (other than television)*	7 500	100

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966 * to transmitters in use and to those to be installed before 1st January, 1964	Tolerances applicable to new transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1966*
	* 1st January, 1970 in the case of all tolerances marked with an asterisk.	
6. *Broadcasting Stations (television, sound and vision)* in the band 470-960 MHz		
—power 100 W or less	7 500	100
—power above 100 W	7 500	1 000 Hz
***Band :* 2 450 to 10 500 MHz**		
1. *Fixed Stations :*		
—power 100 W or less	7 500	300 *f)*
—power above 100 W	7 500	100 *g)*
2. *Land Stations*	7 500	300
3. *Mobile Stations*	7 500	300
4. *Radiodetermination Stations*	7 500 *e)*	2 000 *e)*
***Band :* 10·5 to 40 GHz**		
1. *Fixed Stations*	—	500
2. *Radiodetermination Stations*	—	7 500 *e)*

Notes referring to Table of Frequency Tolerances

a) SUP

b) In the area covered by the North American Regional Broadcasting Agreement (NARBA) the tolerance of 20 Hz may continue to be applied.

c) SUP

d) This tolerance is not applicable to survival craft stations operating on the frequency 243 MHz.

e) Where specific frequencies are not assigned to radar stations, the bandwidth occupied by the emissions of such stations shall be maintained wholly within the band allocated to the service and the indicated tolerance does not apply.

f) For transmitters using time division multiplex the tolerance of 300 may be increased to 500.

g) This tolerance applies only to such emissions for which the necessary bandwidth does not exceed 3 000 kHz; for larger bandwidth emissions a tolerance of 300 applies.

h) For coast station single sideband radiotelephone transmitters the tolerance is 20 Hz.

i) For ship station single sideband radiotelephone transmitters the tolerance is:

1) in the band 1 605 – 4 000 kHz:
   100 Hz for transmitters in use or to be installed before 1 January 1982;
   50 Hz for transmitters installed after 1 January 1982;
2) in the band 4 000 – 23 000 kHz:
   100 Hz for transmitters in use or to be installed before 1 January 1978;
   50 Hz for transmitters installed after 1 January 1978.

(See also Appendix 17A).

j) SUP

k) For ship station transmitters used for direct-printing telegraphy or for data transmissions, the tolerance is 40 Hz. This tolerance is applicable to equipment installed after 1 January 1976 and to all equipment after 1 January 1985. For equipment installed before 2 January 1976 the tolerance is 100 Hz (with a maximum deviation of 40 Hz for short periods of the order of 15 minutes).

l) For coast station transmitters used for direct-printing telegraphy and for data transmission the tolerance is 15 Hz. This tolerance is applicable to equipment installed after 1 January 1976 and to all equipment after 1 January 1985. For equipment installed before 2 January 1976 the tolerance is 40 Hz.

m) SUP

n) For coast and ship station transmitters in the band 156–174 MHz put into service after 1 January 1973 a tolerance of 10 parts in 10^6 shall apply. This tolerance is applicable to all transmitters, including survival craft stations, after 1 January 1983.

o) For transmitters used by on-board communication stations a tolerance of 5 parts in 10^6 shall apply.

p) Applicable from 1 June 1977. However, in the A1 Morse working frequency bands a frequency tolerance of 200 parts in 10^6 may be applicable to existing transmitters after 1 June 1977, provided that the emissions are contained within the band in question.

q) In the A1 Morse calling frequency bands frequency tolerances of 40 parts in 10^6 in the bands between 4 and 23 MHz and of 30 parts in 10^6 in the 25 MHz band are recommended as far as possible.

APPENDIX 4

Table of Tolerances for the Levels of Spurious Emissions

(See Article 12)

1. The following table indicates the tolerances which shall apply to the mean power of any spurious emission supplied by a transmitter to the antenna transmission line.

2. Furthermore, spurious radiation from any part of the installation other than the antenna system, i.e., the antenna and its transmission line, shall not have an effect greater than would occur if this antenna system were supplied with the maximum permissible power at that spurious emission frequency.

3. These tolerances shall not, however, apply to ship's emergency transmitters or survival craft stations.

4. For technical or operational reasons, specific services may demand tolerances tighter than those specified in the Table.

5. The final date by which all equipment shall meet the tolerances specified in Column B is 1st January, 1970. Nevertheless, all administrations recognize the urgent need to implement Column B tolerances for all equipment at the earliest possible dates and will endeavour to ensure that necessary changes are made to all transmitters under their jurisdiction well before this date and wherever possible by 1st January, 1966.

6. No tolerance is specified for transmitters operating on fundamental frequencies above 235 MHz. For these transmitters the levels of spurious emissions shall be as low as practicable.

Fundamental Frequency Band	The mean power of any spurious emission supplied to the antenna transmission line shall not exceed the values specified as tolerances in Columns A and B below	
	A	B
	Tolerances applicable until 1st January, 1970 to transmitters now in use and to those installed before 1st January, 1964	Tolerances applicable to transmitters installed after 1st January, 1964 and to all transmitters after 1st January, 1970
Below 30 MHz	40 decibels below the mean power of the fundamental without exceeding the power of 200 milliwatts	40 decibels below the mean power of the fundamental without exceeding the power of 50 milliwatts [1 2 3]
30 MHz to 235 MHz: for transmitters having mean power:		
— greater than 25 watts		60 decibels below the mean power of the fundamental without exceeding 1 milliwatt [4]
— 25 watts or less		40 decibels below the mean power of the fundamental without exceeding 25 microwatts and without the necessity for reducing this value below 10 microwatts [4]

[1] For transmitters of mean power exceeding 50 kilowatts and which operate below 30 MHz over a frequency range approaching an octave or more, a reduction below 50 milliwatts is not mandatory, but a minimum attenuation of 60 decibels shall be provided and every effort should be made to keep within the 50 milliwatts limit.

[2] For hand-portable equipment of mean power less than 5 watts which operates in the frequency band below 30 MHz, the attenuation shall be at least 30 decibels, but every effort should be made to attain 40 decibels attenuation.

[3] For mobile transmitters which operate below 30 MHz any spurious emission shall be at least 40 decibels below the fundamental without exceeding the value of 200 milliwatts, but every effort should be made to keep within the 50 milliwatts limit wherever practicable.

[4] For frequency modulated maritime mobile radio-telephone equipment which operates above 30 MHz, the mean power of any spurious emission falling in any other international maritime mobile channel, due to products of modulation, shall not exceed a limit of 10 microwatts and the mean power of any other spurious emission on any discrete frequency within the international maritime mobile band shall not exceed a limit of 2·5 microwatts. Where, exceptionally, transmitters of mean power above 20 watts are employed, these limits may be increased in proportion to the mean power of the transmitter.

APPENDIX 5

Examples of Necessary Bandwidths and Designations of Emissions

(See Article 2, Section II)

The necessary bandwidth may be determined by one of the following methods :

a) use of the formulae included in the following Table which also gives examples of necessary bandwidths and designation of corresponding emissions ;

b) computation in accordance with C.C.I.R. Recommendations ;

c) measurement, in cases not covered by *a)* or *b)* above.

The value so determined should be used when the full designation of an emission is required.

However, the necessary bandwidth so determined is not the only characteristic of an emission to be considered in evaluating the interference that may be caused by that emission.

In the formulation of the Table, the following terms have been employed :

B_n = Necessary bandwidth in hertz.

B = Telegraph speed in bauds.

N = Maximum possible number of black plus white elements to be transmitted per second, in facsimile and television.

M = Maximum modulation frequency in hertz.

C = Sub-carrier frequency in hertz.

D = Half the difference between the maximum and minimum values of the instantaneous frequency. Instantaneous frequency is the rate of change of phase.

t = Pulse duration in seconds.

K = An overall numerical factor which varies according to the emission and which depends upon the allowable signal distortion.

Description and Class of Emission	Necessary Bandwidth in hertz	Examples	
		Details	Designation of Emission
I. AMPLITUDE MODULATION			
Continuous wave Telegraphy, A1	$B_n = BK$ $K = 5$ for fading circuits $K = 3$ for non-fading circuits	Morse code at 25 words per minute, $B = 20$, $K = 5$; Bandwidth: 100 Hz.	0·1A1
		Four-channel time-division multiplex, 7-unit code, 42·5 bauds per channel, $B = 170$, $K = 5$; Bandwidth: 850 Hz.	0·85A1
Telegraphy modulated by an audio frequency, A2	$B_n = BK + 2M$ $K = 5$ for fading circuits $K = 3$ for non-fading circuits	Morse code at 25 words per minute, $B = 20$, $M = 1\,000$, $K = 5$; Bandwidth: 2 100 Hz.	2·1A2
Telephony, A3	$B_n = M$ for single sideband $B_n = 2M$ for double sideband	Double sideband telephony, $M = 3\,000$; Bandwidth: 6 000 Hz.	6A3
		Single sideband telephony, reduced carrier, $M = 3\,000$; Bandwidth: 3 000 Hz.	3A3A
		Telephony, two independent sidebands, $M = 3\,000$; Bandwidth: 6 000 Hz.	6A3B

Description and Class of Emission	Necessary Bandwidth in hertz	Examples	
		Details	Designation of Emission
Sound Broadcasting, A3	$B_n = 2\,M$ M may vary between 4 000 and 10 000 depending on the quality desired.	Speech and music, $M = 4\,000$; Bandwidth: 8 000 Hz.	8A3
Facsimile, carrier modulated by tone and by keying. A4	$B_n = KN + 2M$ $K = 1{\cdot}5$	The total number of picture elements (black plus white) transmitted per second is equal to the circumference of the cylinder multiplied *by* the number of lines per unit length *and by* the speed of rotation of the cylinder in revolutions per second. Diameter of cylinder = 70 mm, number of lines per mm = 5, speed of rotation = 1 r.p.s., $N = 1\,100$, $M = 1\,900$; Bandwidth: 5 450 Hz.	5·45A4
Television (Vision and Sound), A5 and F3	Refer to relevant C.C.I.R. documents for the bandwidths of the commonly used television systems.	Number of lines = 625; Number of lines per second = 15 625; Video bandwidth: 5 MHz; Total vision bandwidth: 6·25 MHz.; FM sound bandwidth including guard bands: 0·75 MHz, Total bandwidth: 7 MHz.	6 250A5C 750F3

Description and Class of Emission	Necessary Bandwidth in hertz	Examples	
		Details	Designation of Emission
II. FREQUENCY MODULATION			
Frequency-shift Telegraphy F1	$B_n = 2{\cdot}6D + 0{\cdot}55\,B$ for $1{\cdot}5 < \frac{2D}{B} < 5{\cdot}5$ $B_n = 2{\cdot}1D + 1{\cdot}9\,B$ for $5{\cdot}5 \leqslant \frac{2D}{B} \leqslant 20$	Four-channel time-division multiplex with 7-unit code, 42·5 bauds per channel, $B = 170$, $D = 200$; $\frac{2D}{B} = 2{\cdot}35$, therefore the first formula in Column 2 applies; Bandwidth: 613 Hz.	0·6F1
Commercial Telephony, F3	$B_n = 2M + 2DK$ K is normally 1 but under certain conditions a higher value may be necessary.	For an average case of commercial telephony, $D = 15\,000$, $M = 3\,000$; Bandwidth: 36 000 Hz.	36F3
Sound Broadcasting, F3	$B_n = 2M + 2DK$	$D = 75\,000$, $M = 15\,000$ and assuming $K = 1$; Bandwidth: 180 000 Hz.	180F3

Description and Class of Emission	Necessary Bandwidth in hertz	Examples	
		Details	Designation of Emission
Facsimile, F4	$B_n = KN + 2M + 2D$ $K = 1{\cdot}5$	(See facsimile, amplitude modulation). Diameter of cylinder = 70 mm, number of lines per mm = 5, speed of rotation = 1 r.p.s., $N = 1\,100$, $M = 1\,900$, $D = 10\,000$; Bandwidth: 25 450 Hz.	25·5F4
Four-frequency diplex Telegraphy, F6	If the channels are not synchronized, $B_n = 2{\cdot}6D + 2{\cdot}75B$ where B is the speed of the higher speed channel. If the channels are synchronized the bandwidth is as for F1, B being the speed of either channel.	Four-frequency diplex system with 400 Hz spacing between frequencies, channels not synchronized, 170 bauds keying in each channel, $D = 600$, $B = 170$; Bandwidth: 2 027 Hz.	2·05F6

Description and Class of Emission	Necessary Bandwidth in hertz	Examples	
		Details	Designation of Emission
III. PULSE MODULATION			
Unmodulated Pulse, P0	$B_n = \frac{2K}{t}$ K depends upon the ratio of pulse duration to pulse rise time. Its value usually falls between 1 and in 10 and many cases it does not need to exceed 6.	$t = 3 \times 10^{-6}$, $K = 6$; Bandwidth: 4×10^{6} Hz.	4 000 P0
Modulated Pulse, P2 or P3	The bandwidth depends on the particular types of modulation used, many of these being still in the development stage.	—	—

APPENDIX 6

Reports of Monitoring Data

(See Article 13)

1. Reports of measurements of frequency should contain as much as necessary of the following information :

   a) identification of the monitoring station (administration or organization, and location);

   b) date of measurement;

   c) time of measurement (G.M.T.);

   d) call sign or other means of identification, or both, of the station measured;

   e) class of emission;

   f) assigned frequency or reference frequency;

   g) frequency tolerance;

   h) measured frequency;

   i) accuracy of measurement;

   j) departure from assigned or reference frequency;

   k) additional information (e.g., period covered by measurement, drift of measured frequency during that period, quality of received signal and conditions of reception);

   l) remarks.

2. Reports of measurements of field strength should contain as much as necessary of the following information :

   a) identification of the monitoring station (administration or organization, and location);

   b) date of measurement;

   c) time of measurement (G.M.T.);

   d) call sign or other means of identification, or both, of the station measured;

   e) class of emission;

   f) assigned frequency;

   g) value of measured field;

   h) estimated accuracy of measurement;

   i) component of polarisation measured;

   j) other elements or characteristics of the measurement;

   k) remarks.

3. Reports of observations of spectrum occupancy should as far as practicable be made in the form recommended by the International Frequency Registration Board and contain the following information:

   a) identification of the monitoring station (administration or organization, and location);

   b) date of the measurement;

   c) time of measurement (G.M.T.);

   d) call sign or other means of identification, or both, of the station monitored;

   e) class of emission;

   f) class of station;

   g) measured frequency;

   h) signal strength according to the QSA scale;

   i) bandwidth occupied;

   j) information as to the locality or area in which reception is intended;

   k) remarks.

4. In providing these data, the symbols contained in the Radio Regulations or in the Preface to the International Frequency List should be used as far as possible.

APPENDIX 7

Report of an Irregularity or of an Infringement of the Convention or the Radio Regulations

(See Articles 15 and 16)

Particulars concerning the station infringing the Regulations :

1. Name[1] if known (in BLOCK letters) .....
2. Call sign or other identification (in BLOCK letters) .....
3. Nationality, if known .....
4. Frequency used (kHz or MHz) .....
5. Class of emission [2] .....

Particulars concerning the station, the centralizing office or inspection service reporting the irregularity or infringement :

6. Name (in BLOCK letters) .....
7. Call sign or other identification (in BLOCK letters) .....
8. Nationality .....
9. Approximate position [3], [8] .....

Particulars of the irregularity or infringement :

10. Name [4] of the station (in BLOCK letters) in communication with the station committing the irregularity or infringement .....
11. Call sign or other identification (in BLOCK letters) of the station in communication with the station committing the irregularity or infringement .....
12. Time [5] and date .....
13. Nature of the irregularity or infringement [6] .....
14. Extracts from ship log and other documents supporting the report (to be continued on the back of the form if necessary) .....

Particulars concerning the transmitting station interfered with [7] :

15. Name of the station (in BLOCK letters) .....
16. Call sign or other identification (in BLOCK letters) .....

17. Frequency assigned (kHz or MHz) .....
18. Frequency measured at the time of the interference .....
19. Class of emission and bandwidth .....
20. Receiving location [3] [8] (in BLOCK letters) where the interference was troublesome .....
21. Certificate:
    I certify that the foregoing report represents, to the best of my knowledge, a complete and accurate account of what took place.

Signatures [9] ..... Dates .....

....

Instructions for filling in this form

[1] Each report shall refer only to one station (see note [4]).

[2] See Article 2.

[3] Applicable only to ships and aircraft; the position shall be expressed either in latitude and longitude (Greenwich) or by a true bearing in degrees and distance in nautical miles, or in kilometres, from some well-known place.

[4] If both communicating stations infringe the Regulations, a separate report shall be made for each of these stations.

[5] The time must be expressed as Greenwich Mean Time (G.M.T.) by a group of four figures (0001 to 2400). If the infringement is prolonged or repeated, the times shall be shown.

[6] A separate report is required for each irregularity or infringement, unless they have obviously all been made by the same person and within a short time. All reports shall be forwarded in duplicate, and whenever practicable should be typewritten (indelible pencil and carbon paper may be used).

[7] This information is to be given only in case of a complaint about interference.

[8] In the case of land or fixed stations, the position shall be expressed in latitude and longitude (Greenwich).

[9] This report shall be signed by the operator who has reported the infringement and countersigned by the Master of the ship or aircraft, or the officer in charge of the station in the case of an infringement reported by a station of the mobile service. When the report originates from a centralizing office or from an inspection service, it shall be signed by the head of that office or service and countersigned by an official of the administration transmitting it.

For use of Administrations only

1. Company controlling the installation of the station against which complaint is made .....
2. Name of operator of the station held responsible for the irregularity or infringement of the Regulations .....
3. Action taken .....

APPENDIX 8

Report of Harmful Interference

(See Article 15)

Particulars concerning the station causing the interference :

A. Name or call sign and category of station .....
B. Frequency measured .....
C. Class of emission .....
D. Bandwidth .....
E. Field strength .....
F. Nature of interference .....

Particulars concerning the transmitting station interfered with :

G. Name or call sign and category of station .....
H. Frequency assigned .....
I. Frequency measured .....
J. Class of emission .....
K. Bandwidth .....
L. Field strength .....

Particulars furnished by the receiving station experiencing the interference :

M. Name of station .....
N. Geographic location of station .....
O. Dates and times of occurrence of harmful interference .....
P. Other particulars .....
Q. Requested action .....

(For convenience and brevity, telegraphic reports shall be in the format above, using the letters in the order listed in lieu of the explanatory titles, and an " X " after any such letter if no information on this particular item is reported.)

APPENDIX 9

Spa Mar Spa2 Mar2

Service Documents

(See Articles 8, 9, 9A, 10 and 20)

List I. International Frequency List

	Dates					Location of transmitting station			Reception					Transmitting Antenna Characteristics [4]								Remarks		
	2					4			5					9								13		
Assigned frequency (kHz or MHz) [1]	Of registration [2]	Of notification [2]	Of putting into use	Of receipt of the notice by the I.F.R.B. when columns 2a or 2b are not to be used [3]	Call sign (Identification)	Name of the transmitting station	Country in which the transmitting station is located	Geographical co-ordinates of the transmitter site (longitude and latitude) in degrees and minutes	Locality(ies) or area(s) with which communication is established	Length of circuit (km)	Class of station and nature of service	Class of emission, necessary bandwidth and description of transmission	Power (kW)	Azimuth of maximum radiation (ND if a transmitting antenna with non-directional characteristics is used)	Angular width of radiation main lobe	Antenna gain (dB)	Maximum hours of operation of the circuit to each locality or area (G.M.T.)	Megahertz order of the other frequencies normally utilized for the same circuit [4]	Operating Administration or Company [5]	Postal and telegraphic address of the administration responsible for the station [5]	Results of examination [6] and investigations [7] by the I.F.R.B.	Remarks related to the finding by the I.F.R.B.	Other remarks [8]
1	2a	2b	2c	2d	3	4a	4b	4c	5a	5b	6	7	8	9a	9b	9c	10	11	12a	12b	13a	13b	13c

[1] In the case of television broadcasting stations in Region 1, the frequency in this column is that of the sound and vision carriers (See Appendix 1 to the Radio Regulations) [2] See Nos **607** and **608** of the Radio Regulations [3] A symbol instead of a date indicates an assignment notified pursuant to No. **272** of the Extraordinary Administrative Radio Conference Agreement (Geneva, 1951), or, in the frequency bands above 27 500 kHz, an assignment for which the notice was received by the I.F.R.B. before 1st April 1952 [4] See Appendix 1 to the Radio Regulations. [5] Columns 12a and 12b contain numbers or letters which are explained in the Preface to the International Frequency List [6] See Article 9, Section II and Article 9A, Section IV, of the Radio Regulations. [7] See Nos. **516, 517, 621, 622, 639BS, 639DM, 639DO** and **639DP** of the Radio Regulations. [8] Including dates referred to in Section II of Article 9 and Section IV of Article 9A of the Radio Regulations.

List II. List of Fixed Stations Operating International Circuits

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

Name of the transmitting station	Call Sign (Identification)	Assigned Frequency (kHz or MHz)	Locality(ies) or Area(s) with which communication is established	Remarks
1	2	3	4	5

List III A. List of Broadcasting Stations Operating in Bands below 5 950 kHz

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

Name of the transmitting station	Assigned frequency in kHz	Call sign (Identification)	Geographical co-ordinates of the transmitter site (longitude and latitude in degrees and minutes)	Zones or areas of reception	Power (kW)	Azimuth of maximum radiation (ND if a transmitting antenna with non-directional characteristics is used)	Maximum hours of operation (G.M.T.)	Operating Administration or Company	Other remarks
1	2	3	4	5	6	7	8	9	10

List III B. List of Broadcasting Stations Operating in Bands between 5 950 and 26 100 kHz

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

Name of the transmitting station	Geographical co-ordinates of the transmitter site (longitude and latitude in degrees and minutes)	Assigned frequency (kHz)	Call sign (Identification)	Zone(s) or area(s) of reception	Power (kW)	Transmitting antenna characteristics					Hours of operation (G.M.T.)	Name, postal and telegraphic address of Administration	Remarks
						Azimuth of maximum radiation	Angular width of radiation main lobe	Antenna gain in dB	Angle of elevation	Type of antenna			
1	2	3	4	5	6	7	8	9	10	11	12	13	14

List IV. List of Coast Stations

Part I. Tables of general or specific interest

Part II. Alphabetical index of coast stations

Name of the station	See Part III page	Name of the station	See Part III page	Name of the station	See Part III page

Part III. Particulars of coast stations

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

Name of the station [1]	Call sign [7]	Emission				Service		Charges [4, 5]	Geographical coordinates of the transmitting antenna (longitude and latitude in degrees, minutes and seconds)	Remarks [6]
		Frequencies kHz or MHz		Class	Power kW [3]	Nature [6A, 6B]	Hours of service (GMT)			
1	2	3a [2]	3b [2A]	4	5	6	7	8	9	10

[1] Indicate for each country the coast station or coast stations to which radiotelegrams intended for high-frequency transmission to ship stations should be sent.

[2] Transmitting frequencies. The normal working frequency is printed in heavy type.

[2A] Watch and/or receiving frequencies or channels.

[3] In the case of directive antennae, indicate under the power, the azimuth of the direction or directions of maximum gain, in degrees, beginning from True North clockwise.

4 The internal telegraph charge of the country to which the coast station is subject and the charge applied by this country to telegrams destined for adjacent countries are given in Part IV of this List.

5 If the accounts for charges are settled by a private enterprise, the name and address of such private enterprise should, if necessary, be stated.

6 Indicate if radar service is provided.

6 A Indicate if selective calling is provided and, if so, the system employed.

6 B Indicate if narrow-band direct-printing telegraphy is provided.

7 The call sign of the station shall be followed, where appropriate, by the identification number or signal, in brackets, that the station uses when sending selective calling signals.

The list should contain information concerning the times of transmission of traffic lists, and the hours of watchkeeping of the coast station on the various frequencies, etc. Coast stations open to public correspondence and providing service for transmission and reception of radiotelegrams by radiotelephony shall be indicated in the List of Coast Stations.

8 SUP

Part IV. Inland telegraph rates, limitrophic rates, etc.

List V. List of Ship Stations

Particulars of ship stations

The information concerning these stations shall be published as shown below:

Name of ship	Call sign	Country	Auxiliary installations	Class of ship	Nature of service	Hours of service	Telegraph transmission frequency bands	Telephone transmission frequency bands	Ship charge per word for radiotelegrams	Ship charge for a radiotelephone call of three minutes	Remarks
1	2	3	4	5	6	7	8	9	10	11	12

Column 1 The stations shall be arranged in alphabetical order of the names of the ships, irrespective of nationality. In the case of duplication of names, the name of the ship shall be followed by the call sign (separated from the name by a fraction bar).

Column 2 Call sign. This column also contains the selective call number or signal, where appropriate.

Column 3 Country having jurisdiction over the station (indicated by the appropriate symbol).

Column 4 Auxiliary installations, including information concerning:

a) number of lifeboats fitted with radio apparatus, and

b) types and number of emergency position-indicating radiobeacons (optional), the operating frequency being indicated by one of the following letters:

A = 2 182 kHz
B = 121·5 MHz
C = 243 MHz

A figure following the letter indicates the number of radiobeacons. The letter "X" signifies that the number of radiobeacons has not been communicated.

Columns 5 to 7 In the form of service symbols (see Appendix 10). In addition, the list of the symbols used in column 5 to designate the class of ship is given in the Preface to the List.

Columns 8 and 9 Indication of the frequency bands and class of emission by means of the following symbols:

Radiotelegraphy	*Radiotelephony*
W = 110 - 150 kHz	T = 1 605 - 4 000 kHz
X = 405 - 535 kHz	U = 4 000 - 23 000 kHz
Y = 1 605 - 3 800 kHz	V = 156 - 174 MHz
Z = 4 000 - 25 110 kHz	

These symbols should, if necessary, be followed by references to brief notes and indications of the frequencies for which the transmitters are adjusted, which shall appear at the end of the List.

Column 10 Basic ship charge per word for radiotelegrams [1].

Column 11 Minimum charge for a radiotelephone call of three minutes [1]. The information in columns 10 and 11 shall be followed by

[1] These charges are fixed or approved by each administration.

a note reference to indicate the administration or private enterprise to which the accounts should be sent. In case of a change of address of the operating authority, a second note reference after the charge should give the new address and the date from which the change will take effect.

Column 12 When two or more ship stations of the same nationality bear the same name, or if the accounts for charges should be sent direct to the owner of the ship, the name of the shipping line or the firm to which the ship belongs shall be given in this column.

In addition, if there is no room in the appropriate column, further information relating to columns 1 to 11 may be given in column 12 by means of a note reference. This column may comprise several lines.

Indicate if selective calling is provided and, if so, the system employed.

Indicate if narrow-band direct-printing telegraphy is provided.

List VI. List of Radiodetermination and Special Service Stations

(For navigational purposes, this list should be used with caution. See Article 43 of the Radio Regulations.)

Part A. Alphabetical index of stations.

Name of the station	Call sign	Nature of the service	See part B, page
1	2	3	4

Part B. Particulars of stations.

1. Direction-finding stations

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Geographical co-ordinates (longitude and latitude in degrees, minutes and seconds) of: *a)* the receiving antenna of the direction-finding station *b)* the transmitting antenna of the direction-finding station *c)* the transmitting antenna of the station mentioned in Column 8	Call sign	Frequencies (kHz or MHz) and classes of emission			Power (kW)	Name and call sign of the station with which communication should be established if the direction-finding station is not equipped with a transmitter	Charges	Remarks *a)* sectors in which bearings are normally accurate and references to national or international publications other than the present list *b)* hours of service (G.M.T.), etc.
			For calling the direction-finding station	For transmitting to the direction-finding station the signals necessary for taking bearings	For the transmission of the bearings by the direction-finding station				
1	2	3	4	5	6	7	8	9	10

2. *Radiobeacon stations*

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Geographical co-ordinates of the transmitting antenna of the radiobeacon (longitude and latitude in degrees, minutes and seconds)	Characteristic signal of the radiobeacon	Call sign of the radiobeacon (if any)	Emission			Normal range in nautical miles	Name and call sign of the station to which requests for the emission of beacon signals may be addressed	Frequency to be used to call the station indicated in column 9 (kHz or MHz)	Remarks
				Frequency (kHz or MHz)	Class	Frequency of modulation (if any) (Hz)				*a)* sectors normally reliable and references to national or international publications other than this list; *b)* hours of service (G.M.T.); *c)* description of the emission; *d)* charges, etc.
1	2	3	4	5	6	7	8	9	10	11

3. *Ocean-station vessels*

Ocean Regions in alphabetical order.
Names of stations in alphabetical order.

Name of the station	Geographical position assigned to the station	Call sign of the station vessel	Frequency for calling the station (kHz or MHz)	Radiobeacon					Direction-finding			Remarks
				Characteristic signal	Transmitting frequency (kHz or MHz)	Class of emission	Frequency of modulation (if any) (Hz)	Normal range in nautical miles	Frequency for transmitting to the station the signals necessary for taking bearings (kHz or MHz)	Frequency for the transmission by the station of the bearings (kHz or MHz)	Power of the transmitter (kW)	*a)* references to national or international publications other than this list; *b)* hours of service (G.M.T.); *c)* description of the radiobeacon emission
1	2	3	4	5	6	7	8	9	10	11	12	13

4. *Direction-finder calibration stations*

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Geographical co-ordinates of the transmitting antenna of the radiobeacon (longitude and latitude in degrees, minutes and seconds)	Characteristic signal	Call sign of the radiobeacon (if any)	Emission			Normal range in nautical miles	Name and call sign of the station to which requests may be addressed	Frequency to be used to call the station mentioned in column 9 (kHz or MHz)	Remarks
				Frequency (kHz or MHz)	Class	Frequency of modulation (if any) (Hz)				*a)* sectors normally reliable and references to national or international publications other than this list; *b)* hours of service (G.M.T.); *c)* description of the emission; *d)* charges, etc.
1	2	3	4	5	6	7	8	9	10	11

5. *Stations transmitting time signals*

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Call sign	Frequencies (kHz or MHz)	Class of Emission	Times of Emission (G.M.T.)	Method [1]
1	2	3	4	5	6

[1] General instructions concerning time signals.

6. *Stations transmitting standard frequencies*

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Call sign	Frequencies (kHz or MHz)	Class of Emission	Times of Emission (G.M.T.)	Remarks
1	2	3	4	5	6

7. *Stations transmitting regular meteorological bulletins*

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Call sign	Frequencies (kHz or MHz)	Class of Emission	Times of Emission (G.M.T.)	Remarks [1]
1	2	3	4	5	6

[1] General instructions concerning meteorological bulletins including code used.

8. *Stations transmitting notices to navigators*

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Call sign	Frequencies (kHz or MHz)	Class of Emission	Times of Emission (G.M.T.)	Remarks
1	2	3	4	5	6

9. Stations transmitting medical advice

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Call sign	Frequencies (kHz or MHz)	Class of Emission	Hours of Service (G.M.T.)	Remarks
1	2	3	4	5	6

10. Stations transmitting epidemiological bulletins

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Call sign	Frequencies (kHz or MHz)	Class of Emission	Times of Emission (G.M.T.)	Remarks
1	2	3	4	5	6

11. Stations transmitting Ursigrams

Names of the countries arranged in alphabetical order of abbreviations.
Names of the stations in alphabetical order.

Name of the station	Call sign	Frequencies (kHz or MHz)	Class of Emission	Times of Emission (G.M.T.)	Remarks and nature of information
1	2	3	4	5	6

12. Fixed earth stations in the maritime radiodetermination-satellite service

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations in alphabetical order.

Name by which station is known	Geographical coordinates (in degrees and minutes) of the transmitter site	Transmission of radio-determination information			Reception of radio-determination information		Identity of associated space station(s)	Operating administration or company	Remarks
		Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (kW)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			Special methods of modulation, charges, etc.
1	2	3a	3b	3c	4a	4b	5	6	7

13. Space stations in the maritime radiodetermination-satellite service

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations by alphabetical and/or numerical order of designation of stations.

Identity of the station	Transmission of radiodetermination information to ships			Reception of radio-determination information from ships		Service area or areas on the Earth	Name of locality and country in which the associated fixed earth station(s) is (are) located	Operating administration or company	Remarks
	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (W)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission				Orbital information, special channelling arrangements, special modulation methods, charges, etc.
1	2a	2b	2c	3a	3b	4	5	6	7

Note : The Secretary General, if he considers it necessary, may introduce in this list additional sections to cover new systems that may be developed and used.

List VIII. List of International Monitoring Stations

(See Article 13)

Part I. Centralizing offices.

Names of countries arranged in alphabetical order of abbreviations.

— National centralizing office (postal and telegraphic address, telephone number, any other information).

Part II

A. Particulars of monitoring stations carrying out frequency measurements.

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

— Name and geographical co-ordinates of the station (longitude and latitude in degrees and minutes).

— Hours of service (G.M.T.).

— Ranges of measurable frequencies (kHz or MHz).

— Accuracy of measurements. [1]

— Remarks.

B. Particulars of monitoring stations carrying out field strength measurements.

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

— Name and geographical co-ordinates of the station (longitude and latitude in degrees and minutes).

— Hours of service (G.M.T.).

---

[1] Indicates the maximum attainable accuracy for each frequency range.

— Ranges of frequencies (kHz or MHz).

— Maximum and minimum values of measurable field strengths.

— Accuracy of measurements in dB.[1]

— Remarks.

C. Particulars of monitoring stations carrying out direction-finding measurements.

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

— Name and geographical co-ordinates of the station (longitude and latitude in degrees, minutes and seconds).

— Hours of service (G.M.T.).

— Ranges of frequencies (kHz or MHz).

— Type of antennae in use.

— Remarks.

D. Particulars of monitoring stations carrying out bandwidth measurements.

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

— Name and geographical co-ordinates of the station (longitude and latitude in degrees and minutes).

— Hours of service (G.M.T.).

— Ranges of frequencies (kHz or MHz).

[1] Indicates the maximum attainable accuracy for each frequency range.

— Method(s) of measurement. [1]

— Resolution at −60 dB (if appropriate)

— Remarks.

E. Particulars of monitoring stations carrying out automatic spectrum occupancy surveys.

Names of countries arranged in alphabetical order of abbreviations.
Names of stations in alphabetical order.

— Name and geographical co-ordinates of the station (longitude and latitude in degrees and minutes).

— Hours of service (G.M.T.).

— Ranges of frequencies (kHz or MHz).

— Method(s) employed.

— Remarks.

[1] See the Recommendations and relevant Reports of the C.C.I.R.

List VIIIA. – List of Space Radiocommunication Stations and Radio Astronomy Stations[1]

1 — Earth stations in the fixed-satellite service

Names of the countries notifying the stations in alphabetical order of country symbols. Names of stations in alphabetical order.

Name by which the station is known or the name of the locality in which it is situated	Geographical co-ordinates (in degrees and minutes) of the transmitter site	Transmission						Reception						Identity of the associated space station(s) with which communication is to be established	Operating administration or company	Remarks
		Telecommand where appropriate			Communications			Telemetering		Tracking		Communications				
		Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (kW)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (kW)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			1. Special channelling arrangements for: *a)* telegraphy; *b)* telephony; *c)* other types of communication, as appropriate. 2. Special methods of modulation.
1	2	3a	3b	3c	4a	4b	4c	5a	5b	6a	6b	7a	7b	8	9	10

[1] For the cases where these data must be supplied, see Nos. **639BA**, **639BB** and **639BC**.

2 — *Space stations in the fixed-satellite service*

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations by alphabetical and/or numerical order of designation of station.

Identity of the station	Transmission									Reception				Service area or areas on the Earth or the name of the locality and country in which the associated earth station(s) is (are) located	Operating administration or company	Remarks
	Telemetering			Tracking			Communications			Telecommand where appropriate		Communications				
	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			1. Orbital information: *a)* angle of inclination of the orbit; *b)* period of the object in space; *c)* altitude of apogee (km) *d)* altitude of perigee (km) *e)* number of satellites used, if appropriate; *f)* in the case of geostationary satellite: – nominal geographical longitude on the geostationary satellite orbit; – arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas. 2. Special channelling arrangements for: *a)* telegraphy; *b)* telephony; *c)* other types of communication, as appropriate. 3. Special methods of modulation.
1	2a	2b	2c	3a	3b	3c	4a	4b	4c	5a	5b	6a	6b	7	8	9

3 — Earth stations in the earth exploration-satellite service

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations in alphabetical order.

Name by which the station is known or the name of the locality in which it is situated	Geographical co-ordinates (in degrees and minutes) of the transmitter site	Transmission			Reception						Identity of the associated space station(s) with which communication is to be established	Operating administration or company	Remarks
		Telecommand where appropriate			Telemetering		Tracking		Reception of earth exploration information				
		Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (kW)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			
1	2	3a	3b	3c	4a	4b	5a	5b	6a	6b	7	8	9
													Special methods of modulation.

4 — Space stations in the earth exploration-satellite service

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations by alphabetical and/or numerical order of designation of station.

Identity of the station	Transmission									Reception		Service area or areas on the Earth or the name of the locality and country in which the associated earth station(s) is (are) located	Operating administration or company	Remarks
	Telemetering			Tracking			Transmission of earth exploration information			Telecommand where appropriate				
	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			1. Orbital information: *a)* angle of inclination of the orbit; *b)* period of the object in space; *c)* altitude of apogee (km); *d)* altitude of perigee (km); *e)* number of satellites used, if appropriate; *f)* in the case of a geostationary satellite: – nominal geographical longitude on the geostationary satellite orbit; – arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas. 2. Special channelling arrangements for: *a)* telegraphy; *b)* telephony; *c)* other types of communication, as appropriate. 3. Special methods of modulation.
1	2a	2b	2c	3a	3b	3c	4a	4b	4c	5a	5b	6	7	8

5 — Earth stations in the radiodetermination-satellite service

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations in alphabetical order.

Name by which the station is known or the name of the locality in which it is situated	Geographical co-ordinates (in degrees and minutes) of the transmitter site	Transmission			Reception						Identity of the associated space station(s) with which communication is to be established	Operating administration or company	Remarks
				Telecommand where appropriate			Telemetering		Tracking		Supplementary inform. necessary for the operation of the radiodetermination system		
		Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (kW)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			
1	2	3a	3b	3c	4a	4b	5a	5b	6a	6b	7	8	9
													Special methods of modulation.

6 — Space stations in the radiodetermination-satellite service

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations by alphabetical and/or numerical order of designation of stations.

Identity of the station	Transmission									Reception		Service area or areas on the Earth or the name of the locality and country in which the associated earth station(s) is (are) located	Operating administration or company	Remarks
	Telemetering			Tracking			Transmission of radiodetermination information			Telecommand where appropriate				
	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			1. Orbital information: *a)* angle of inclination of the orbit; *b)* period of the object in space; *c)* altitude of apogee (km); *d)* altitude of perigee (km); *e)* number of satellites used, if appropriate; *f)* in the case of a geostationary satellite: – nominal geographical longitude on the geostationary satellite orbit; – arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas. 2. Special channelling arrangements for: *a)* telegraphy; *b)* telephony; *c)* other types of communication, as appropriate. 3. Special methods of modulation.
1	2a	2b	2c	3a	3b	3c	4a	4b	4c	5a	5b	6	7	8

7 — *Earth stations in the space research service*

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations in alphabetical order.

Name by which the station is known or the name of the locality in which it is situated	Geographical co-ordinates (in degrees and minutes) of the transmitter site	Transmission			Reception						Identity of the associated space station(s) with which communication is to be established	Operating administration or company	Remarks
			Telecommand where appropriate		Telemetering		Tracking		Reception of research information				
		Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (kW)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission			
1	2	3a	3b	3c	4a	4b	5a	5b	6a	6b	7	8	9
													Any special characteristics of the station and scope of research.

8 — *Space stations in the space research service*

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations by alphabetical and/or numerical order of designation of station.

		Transmission									Reception				
		Telemetering			Tracking			Transmission of information			Telecommand where appropriate				
Identity of the station		Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Power (watts)	Frequency (MHz or GHz)	Class of emission, necessary bandwidth and description of transmission	Service area or areas on the Earth or the name of the locality and country in which the associated earth station(s) is (are) located	Operating administration or company	Remarks
1		2a	2b	2c	3a	3b	3c	4a	4b	4c	5a	5b	6	7	8
															1. In the case of an earth satellite, orbital information: *a)* angle of inclination of the orbit; *b)* period of the object in space; *c)* altitude of apogee (km); *d)* altitude of perigee (km); *e)* number of satellites used, if appropriate; *f)* In the case of geostationary satellite: – nominal geographical longitude on the geostationary satellite orbit; – arc of the geostationary satellite orbit within which the space station could provide the required service to its associated earth stations or service areas. 2. In the case of a space probe, general indication of its trajectory. 3. Special methods of modulation.

9 — Stations in the radio astronomy service

Names of the countries notifying the stations in alphabetical order of country symbols.
Names of stations in alphabetical order.

Name by which the station is known or the name of the locality in which it is situated	Geographical co-ordinates (in degrees and minutes) of the station	Centre of the frequency band observed (MHz or GHz)	Width of the frequency band observed	Antenna characteristics	Maximum hours of reception (G.M.T.)	Noise temperature (°K)	Class of observation	Operating administration or company	Remarks
1	2	3	4	5	6	7	8	9	10
									Any special additional characteristics of the station including: 1) altitude in metres above sea level, 2) main particulars of antenna, 3) scope of observations.

Radiocommunication Statistics

Part I. Number of Stations							Part II. Traffic			
Maritime mobile						Amateurs	Of coast stations transmitting public correspondence			
Coast stations transmitting public correspondence			Ship stations				Number of			
Radiotelegraph	Radiotelephone	Mixed	Radiotelegraph	Radiotelephone	Mixed		Radiotelegrams transmitted	Radiotelegrams received	Radiotelephone calls	Radio medical advices

APPENDIX 10

Spa **Mar**
Spa2 **Mar2**

Service Document Symbols

(See Article 20 and Appendix 9)

■	Station classified as situated in a region of heavy traffic (Article 32) ("TI")[1]
o	By day ("HJ")[1]
●	By night ("HN")[1]
[ ]	A ship which carries lifeboats fitted with radio apparatus; a number inside the square brackets shows the number of such lifeboats ("S")[1]
△	High-traffic ship ("HS")[1]
AL	Aeronautical radionavigation land station
AM	Aeronautical radionavigation mobile station
AT	Amateur station
AX	Aeronautical fixed station
BC	Broadcasting station, sound
BT	Broadcasting station, television
C	Continuous operation during hours shown
CA	Cargo ship
CO	Station open to official correspondence exclusively
CP	Station open to public correspondence
CR	Station open to limited public correspondence
CV	Station open exclusively to correspondence of a private agency

[1] The symbol shown in parenthesis may be used in notifications and service documents.

D30°	Directive antenna having maximum radiation in the direction of 30° (expressed in degrees from True North, from 0 to 360 clockwise)
DR	Directive antenna provided with a reflector
EA	Space station in the amateur-satellite service
EB	Space station in the broadcasting-satellite service (sound broadcasting)
EC	Space station in the fixed-satellite service
ED	Space telecommand space station
EG	Space station in the maritime mobile-satellite service
EH	Space research space station
EK	Space tracking space station
EM	Meteorological-satellite space station
EN	Radionavigation-satellite space station
ER	Space telemetering space station
EV	Space station in the broadcasting-satellite service (television)
EX	Experimental station
FA	Aeronautical station
FB	Base station
FC	Coast station
FE	SUP (Spa2)
FL	Land station
FP	Port station
FR	Receiving station only, connected with the general network of telecommunication channels
FS	Land station established solely for the safety of life
FX	Fixed station

GMT	Greenwich Mean Time
GS	Station on board a warship or a military or naval aircraft
H	Scheduled operation
H8	8-hour service provided by a ship station of the third category
H16	16-hour service provided by a ship station of the second category
H24	Continuous throughout the twenty-four hours
HJ	Day service
HN	Night service
HT	Transition period service
HX	Intermittent throughout the twenty-four hours, or station having no specific working hours
I	Intermittent operation during the time indicated
LR	Radiolocation land station
MA	Aircraft station
ME	Space station
ML	Land mobile station
MO	Mobile station
MR	Radiolocation mobile station
MS	Ship station
ND	Non-directional antenna
NL	Maritime radionavigation land station
OD	Oceanographic data station
OE	Oceanographic data interrogating station
OT	Station open exclusively to operational traffic of the service concerned
PA	Passenger ship
RA	Radio astronomy station
RC	Non-directional radiobeacon
RD	Directional radiobeacon
RG	Radio direction-finding station

RM	Maritime radionavigation mobile station
RT	Revolving radiobeacon
SM	Meteorological aids station
SS	Standard frequency station
TA	Space operation earth station in the amateur-satellite service
TC	Earth station in the fixed-satellite service
TD	Space telecommand earth station
TE	Transmitting earth station
TF	Fixed earth station in the radiodetermination-satellite service
TG	Mobile earth station in the maritime mobile-satellite service
TH	Earth station in the space research service
TI	Earth station in the maritime mobile-satellite service at a specified fixed point
TK	Space tracking earth station
TL	Mobile earth station in the radiodetermination-satellite service
TM	Earth station in the meteorological-satellite service
TN	Earth station in the radionavigation-satellite service
TP	Receiving earth station
TR	Space telemetering earth station
TS	Television, sound channel
TT	Earth station in the space operation service
TV	Television, vision channel

APPENDIX 11

Mar Mar2

Documents with which Ship and Aircraft Stations shall be Provided

(See Articles 18, 20, 21, 23, 28, and Appendix 9)

Section I. Ship Stations for which a Radiotelegraph Installation is Required by International Agreement

These stations shall be provided with :

1. licence prescribed by Article 18 ;
2. certificates of the operator or operators ;
3. log (diary of the radio service) in which the following are recorded as they occur, together with the time of their occurrence ;
   - *a)* all communications relating to distress traffic in full,
   - *b)* urgency and safety communications,
   - *ba)* observance of watch on the international distress frequency during silence periods,
   - *c)* communications exchanged between the ship station and land or mobile stations,
   - *d)* service incidents of all kinds,
   - *e)* if the ship's rules permit, the position of the ship at least once a day ;
   - *f)* the opening and closing of each period of service;
4. Alphabetical List of Call Signs of Stations used in the Maritime Mobile Service ;
5. List of Coast Stations ;
6. List of Ship Stations(the carriage of the supplement is optional);
7. List of Radiodetermination and Special Service Stations ;

8. Manual for Use by the Maritime Mobile and Maritime Mobile Satellite Service;

9. telegraph tariffs of the countries for which the station most frequently accepts radiotelegrams ;

10. if administrations concerned consider it necessary, the Telegraph Regulations.

Section II. Other Ship Radiotelegraph Stations

These stations shall be provided with the documents mentioned in items 1 to 6, 8 and 9 of Section I.

Section III. Ship Stations for which a Radiotelephone Installation is Required by International Agreement

These stations shall be provided with :

1. licence prescribed by Article 18 ;

2. certificates of the operator or operators ;

3. the log (diary of the radio service) in which the following are recorded as they occur, together with the time of their occurrence :

   a) a summary of all communications relating to distress, urgency and safety traffic,

   b) a summary of communications exchanged between the ship station and land or mobile stations,

   c) a reference to important service incidents,

   d) if the ship's rules permit, the position of the ship at least once a day ;

4. a list of coast stations with which communications are likely to be conducted, showing watchkeeping hours, frequencies and charges ;

5. the provisions of the Radio Regulations and Additional Radio Regulations applicable to the maritime mobile radiotelephone service, or the Manual for Use by the Maritime Mobile and Maritime Mobile Satellite Service.

Section IV. Other Ship Radiotelephone Stations

These stations shall be provided with :

1. the documents mentioned in items 1 and 2 of Section III ;
2. the documents mentioned in items 3, 4 and 5 of Section III, in accordance with the requirements of the administrations concerned.

Section V. Ship Stations Equipped with Multiple Installations

These stations shall be provided with :

1. for each installation, if necessary, the documents mentioned in items 1 to 3 of Section I, or in items 1, 2 and 3 of Section III ;
2. for only one installation, the other documents mentioned in Sections I or III, as appropriate.

Section VI. Aircraft Stations

These stations shall be provided with :

1. the documents mentioned in items 1 and 2 of Section I ;
2. the log (diary of the radio service) as defined in item 3 of Section I, unless administrations have adopted other arrangements for recording all information which the log should contain ;
3. the documents containing official information relating to stations which the aircraft station may use for the execution of its service.

APPENDIX 12

Mar Mar2

Hours of Service for Ship Stations of the Second and Third Categories

(See Articles 20 and 25)

Section I. Table

Hours of Service Ship's Time or Zone Time (See Nos. **934** and **934A**)	
16 hours (H16)	8 hours (H8)
from to 0000 - 0400 h 0800 - 1200 h 1600 - 1800 h 2000 - 2200 h plus 4 hours (see No. **934**)	from to 0800 - 1200 h 1800 - 2200 h [a] plus 2 hours (see No. **934A**)

[a] Two continuous hours of service between 1800 and 2200 hours, ship's time or zone time, at times decided by the administration, master or responsible person.

Section II. Diagram and Map

Note a: This diagram indicates the *fixed* and *elected* hours of service maintained by ships of the second and third categories in terms of zone time. (The hours of service shown exclude those which are determined by the administration, master, or responsible person.)

The *fixed* hours of watch are shown thus:

I) for ships of the second category:

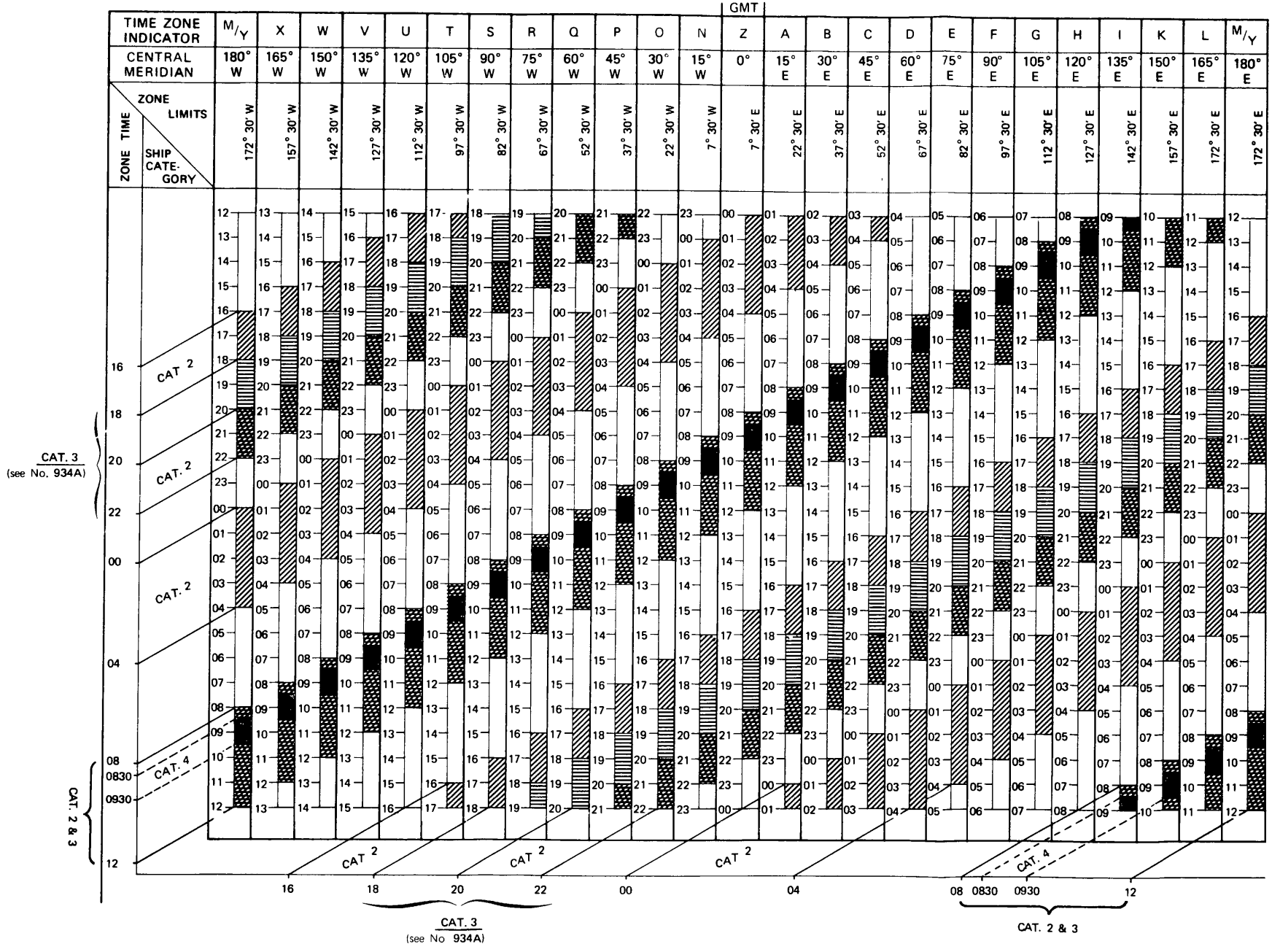
II) for ships of the second and third categories:

III) for ships of the third category, period over which two continuous hours of service may be elected:

Note b: Also shown (in black) is the specific service period 0830 – 0930 that ships of the fourth category are encouraged to provide (see No. **935A**).

GRAPHIC

TIME ZONES AND HOURS OF SERVICE OF SHIP STATIONS

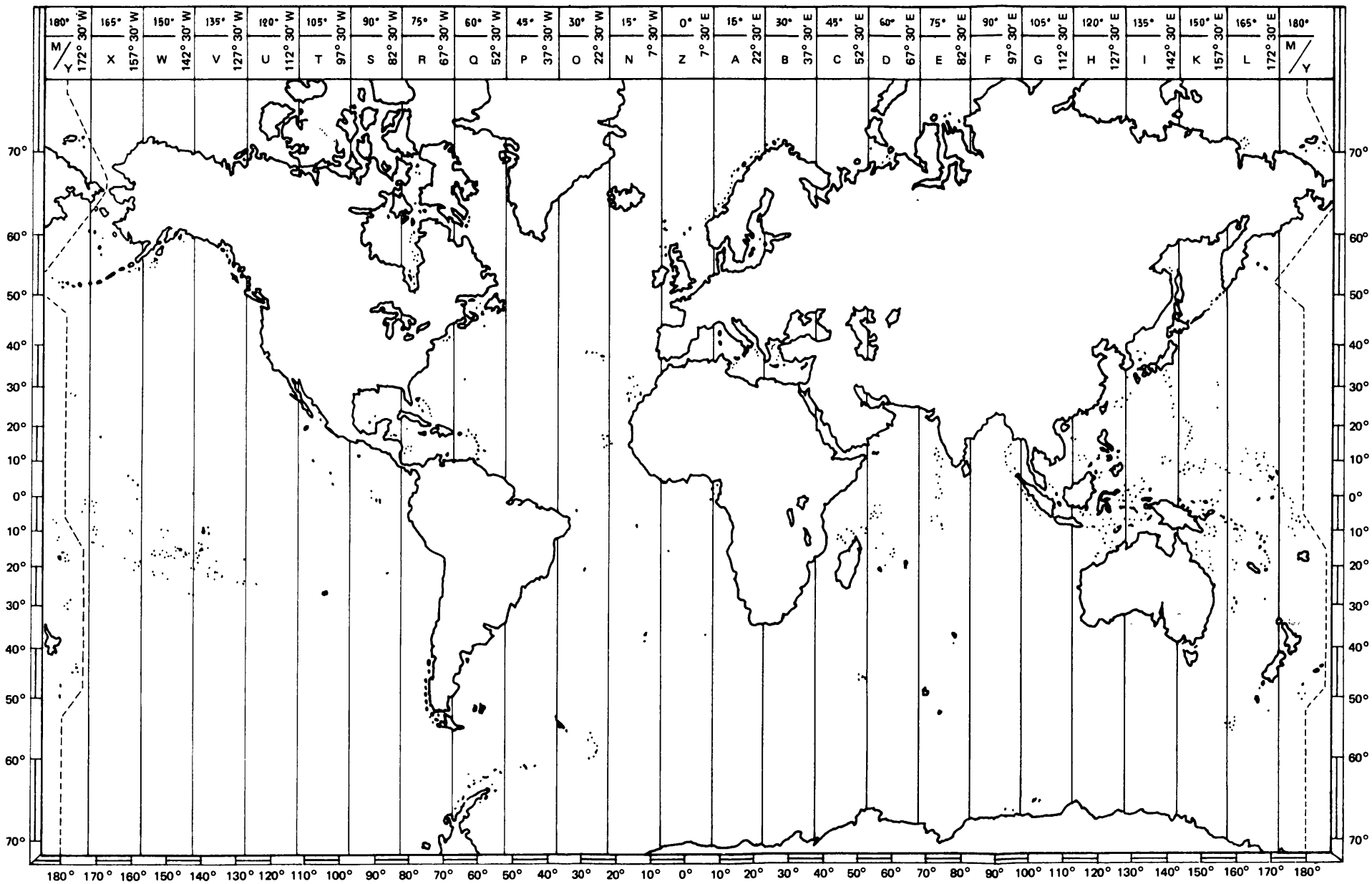


PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

MAP

TIME ZONES



APPENDIX 13
Mar

Miscellaneous Abbreviations and Signals to be used in Radiotelegraphy Communications except in the Maritime Mobile Service

(See Article 29)

SECTION I. Q CODE

Introduction

1. The series of groups QRA to QUZ, listed in this Appendix, are for use by all services.

2. The QAA to QNZ series are reserved for the aeronautical service and the QOA to QQZ series are reserved for the maritime services. These series are not listed in these Regulations.*)

3. Certain Q code abbreviations may be given an affirmative or negative sense by sending YES or NO respectively, immediately following the abbreviation.

4. The meanings assigned to Q code abbreviations may be amplified or completed by the addition of appropriate other groups, call signs, place names, figures, numbers, etc. It is optional to fill in the blanks shown in parentheses. Any data which is filled in where blanks appear shall be sent in the same order as shown in the text of the following tables.

5. Q code abbreviations are given the form of a question when followed by a question mark. When an abbreviation is used as a question and is followed by additional or complementary information, the question mark should follow this information.

6. Q code abbreviations with numbered alternative significations shall be followed by the appropriate figure to indicate the exact meaning intended. This figure shall be sent immediately following the abbreviation.

7. All times shall be given in Greenwich Mean Time (G.M.T.) unless otherwise indicated in the question or reply.

*) *Note by the General Secretariat:* Series QOA to QQZ are now shown in Appendix 13A.

Abbreviations Available for All Services

A. List of Abbreviations in Alphabetical Order

Abbreviation	Question	Answer or Advice
QRA	What is the name of your station?	The name of my station is . . .
QRB	How far approximately are you from my station?	The approximate distance between our stations is.... nautical miles (*or* kilometres)
QRC	By what private enterprise (*or* State Administration) are the accounts for charges for your station settled?	The accounts for charges of my station are settled by the private enterprise . . . (*or* State Administration).
QRD	Where are you bound for and where are you from?	I am bound for . . . from . . .
QRE	What is your estimated time of arrival at... (*or* over...) *(place)*?	My estimated time of arrival at... (*or* over...) *(place)* is... hours.
QRF	Are you returning to . . . *(place)*?	I am returning to . . . *(place)*. *or* Return to . . . *(place)*.
QRG	Will you tell me my exact frequency (*or* that of . . .)?	Your exact frequency (*or* that of . . .) is . . . kHz (*or* MHz).
QRH	Does my frequency vary?	Your frequency varies.
QRI	How is the tone of my transmission?	The tone of your transmission is . . . 1. good 2. variable 3. bad.
QRJ	How many radiotelephone calls have you to book?	I have . . . radiotelephone calls to book.

Abbre-viation	Question	Answer or Advice
QRK	What is the intelligibility of my signals (*or* those of . . .)?	The intelligibility of your signals (*or* those of . . .) is . . . 1. bad 2. poor 3. fair 4. good 5. excellent.
QRL	Are you busy?	I am busy (*or* I am busy with . . .). Please do not interfere.
QRM	Are you being interfered with?	I am being interfered with (1. nil 2. slightly 3. moderately 4. severely 5. extremely).
QRN	Are you troubled by static?	I am troubled by static (1. nil 2. slightly 3. moderately 4. severely 5. extremely).
QRO	Shall I increase transmitter power?	Increase transmitter power.
QRP	Shall I decrease transmitter power?	Decrease transmitter power.
QRQ	Shall I send faster?	Send faster (. . . words per minute).
QRR	Are you ready for automatic operation?	I am ready for automatic operation. Send at . . . words per minute.
QRS	Shall I send more slowly?	Send more slowly (. . . words per minute).

Abbre-viation	Question	Answer or Advice
QRT	Shall I stop sending?	Stop sending.
QRU	Have you anything for me?	I have nothing for you.
QRV	Are you ready?	I am ready.
QRW	Shall I inform . . . that you are calling him on . . . kHz (*or* MHz)?	Please inform . . . that I am calling him on . . . kHz (*or* MHz).
QRX	When will you call me again?	I will call you again at . . . hours (on . . . kHz (*or* MHz)).
QRY	What is my turn? *(Relates to communication)*	Your turn is Number . . . *(or according to any other indication). (Relates to communication).*
QRZ	Who is calling me?	You are being called by . . . (on . . kHz (*or* MHz)).
QSA	What is the strength of my signals (*or* those of . . .)?	The strength of your signals (*or* those of . . .) is . . . 1. scarcely perceptible 2. weak 3. fairly good 4. good 5. very good.
QSB	Are my signals fading?	Your signals are fading.
QSC	Are you a cargo vessel? *(see Article 32, Section V)*	I am a cargo vessel.
QSD	Is my keying defective?	Your keying is defective.
QSE	What is the estimated drift of the survival craft?	The estimated drift of the survival craft is . . . *(figures and units)*

Abbre-viation	Question	Answer or Advice
QSF	Have you effected rescue?	I have effected rescue and am proceeding to . . . base (with . . . persons injured requiring ambulance).
QSG	Shall I send . . . telegrams at a time?	Send . . . telegrams at a time.
QSH	Are you able to home on your D/F equipment?	I am able to home on my D/F equipment (on station . . .).
QSI		I have been unable to break in on your transmission. *or* Will you inform . . . *(call sign)* that I have been unable to break in on his transmission (on . . . kHz (*or* MHz)).
QSJ	What is the charge to be collected to . . . including your internal charge?	The charge to be collected to . . . including my internal charge is . . . francs.
QSK	Can you hear me between your signals and if so can I break in on your transmission?	I can hear you between my signals; break in on my transmission.
QSL	Can you acknowledge receipt?	I am acknowledging receipt.
QSM	Shall I repeat the last telegram which I sent you (*or* some previous telegram)?	Repeat the last telegram which you sent me (*or* telegram(s) number(s) . . .).
QSN	Did you hear me (*or* . . . *(call sign)*) on . . . kHz (*or* MHz)?	I did hear you (*or* . . . *(call sign)*) on . . . kHz (*or* MHz).
QSO	Can you communicate with . . . direct (*or* by relay)?	I can communicate with . . . direct (*or* by relay through . . .).

Abbreviation	Question	Answer or Advice
QSP	Will you relay to . . . free of charge?	I will relay to . . . free of charge.
QSQ	Have you a doctor on board (*or* is... *(name of person)* on board)?	I have a doctor on board (*or* . . . *(name of person)* is on board).
QSR	Shall I repeat the call on the calling frequency?	Repeat your call on the calling frequency; did not hear you (*or* have interference).
QSS	What working frequency will you use?	I will use the working frequency . . . kHz *(normally only the last three figures of the frequency need be given)*.
QSU	Shall I send or reply on this frequency (*or* on . . . kHz (*or* MHz) (with emissions of class . . .)?	Send or reply on this frequency (*or* on . . . kHz (*or* MHz) (with emissions of class . . .).
QSV	Shall I send a series of V's on this frequency (*or* . . . kHz (*or* MHz)?	Send a series of V's on this frequency (*or* . . . kHz (*or* MHz).
QSW	Will you send on this frequency (*or* on . . . kHz (*or* MHz) (with emissions of class . . .)?	I am going to send on this frequency (*or* on . . . kHz (*or* MHz) (with emissions of class . . .).
QSX	Will you listen to . . . *(call sign (s))* on . . . kHz (*or* MHz)?	I am listening to . . . *(call sign (s))* on . . . kHz (*or* MHz)).
QSY	Shall I change to transmission on another frequency?	Change to transmission on another frequency (*or* on . . . kHz (*or* MHz)).
QSZ	Shall I send each word or group more than once?	Send each word or group twice (*or* . . . times).
QTA	Shall I cancel telegram number . . . ?	Cancel telegram number . . .
QTB	Do you agree with my counting of words?	I do not agree with your counting of words; I will repeat the first letter or digit of each word or group.

Abbre-viation	Question	Answer or Advice
QTC	How many telegrams have you to send?	I have . . . telegrams for you (*or* for . . .).
QTD	What has the rescue vessel or rescue aircraft recovered?	. . . *(identification)* has recovered. . . 1. . . . *(number)* survivors 2. wreckage 3. . . . *(number)* bodies.
QTE	What is my TRUE bearing from you? *or*	Your TRUE bearing from me is . . . degrees at . . . hours. *or*
	What is my TRUE bearing from . . . *(call sign)*? *or*	Your TRUE bearing from . . . *(call sign)* was . . . degrees at . . . hours. *or*
	What is the TRUE bearing of . . . *(call sign)* from . . *(call sign)*?	The TRUE bearing of . . . *(call sign)* from . . . *(call sign)* was . . . degrees at . . . hours.
QTF	Will you give me the position of my station according to the bearings taken by the D/F stations which you control?	The position of your station according to the bearings taken by the D/F stations which I control was . . . latitude . . . longitude *(or other indication of position)*, class . . . at . . . hours.
QTG	Will you send two dashes of ten seconds each followed by your call sign (repeated . . . times) (on . . . kHz (*or* MHz))? *or*	I am going to send two dashes of ten seconds each followed by my call sign (repeated . . . times) (on . . . kHz (*or* MHz)). *or*
	Will you request . . . to send two dashes of ten seconds followed by his call sign (repeated . . . times) on . . . kHz (*or* MHz)?	I have requested . . . to send two dashes of ten seconds followed by his call sign (repeated . . . times) on . . . kHz (*or* MHz).

Abbreviation	Question	Answer or Advice
QTH	What is your position in latitude and longitude *(or according to any other indication)*?	My position is . . . latitude . . . longitude *(or according to any other indication)*.
QTI	What is your TRUE track?	My TRUE track is . . . degrees.
QTJ	What is your speed?	My speed is . . . knots (*or* . . . kilometres per hour *or* . . . statute miles per hour).
	(Requests the speed of a ship or aircraft through the water or air respectively.)	*(Indicates the speed of a ship or aircraft through the water or air respectively.)*
QTK	What is the speed of your aircraft in relation to the surface of the earth?	The speed of my aircraft in relation to the surface of the earth is . . . knots (*or* . . . kilometres per hour *or* . . . statute miles per hour).
QTL	What is your TRUE heading?	My TRUE heading is . . . degrees.
QTM	What is your MAGNETIC heading?	My MAGNETIC heading is . . . degrees.
QTN	At what time did you depart from . . . *(place)*?	I departed from . . . *(place)* at . . . hours.
QTO	Have you left dock (*or* port)? *or*	I have left dock (*or* port). *or*
	Are you airborne?	I am airborne.
QTP	Are you going to enter dock (*or* port)? *or*	I am going to enter dock (*or* port). *or*
	Are you going to alight (*or* land)?	I am going to alight (*or* land).
QTQ	Can you communicate with my station by means of the International Code of Signals?	I am going to communicate with your station by means of the International Code of Signals.
QTR	What is the correct time?	The correct time is . . . hours.

Abbre-viation	Question	Answer or Advice
QTS	Will you send your call sign for tuning purposes or so that your frequency can be measured now (*or* at . . . hours) on . . . kHz (*or* MHz)?	I will send my call sign for tuning purposes or so that my frequency may be measured now (*or* at . . . hours) on . . . kHz (*or* MHz).
QTT		The identification signal which follows is superimposed on another transmission.
QTU	What are the hours during which your station is open?	My station is open from . . . to . . . hours.
QTV	Shall I stand guard for you on the frequency of . . . kHz (*or* MHz) (from . . . to . . . hours)?	Stand guard for me on the frequency of . . . kHz (*or* MHz) (from . . . to . . hours).
QTW	What is the condition of survivors?	Survivors are in . . . condition and urgently need . . .
QTX	Will you keep your station open for further communication with me until further notice (*or* until . . . hours)?	I will keep my station open for further communication with you until further notice (*or* until . . . hours).
QTY	Are you proceeding to the position of incident and if so when do you expect to arrive ?	I am proceeding to the position of incident and expect to arrive at . . . hours (on . . . *date*).
QTZ	Are you continuing the search?	I am continuing the search for . . . (aircraft, ship, survival craft, survivors or wreckage).
QUA	Have you news of . . . *(call sign)* ?	Here is news of . . . *(call sign)*.
QUB	Can you give me in the following order information concerning: the direction in degrees TRUE and speed of the surface wind; visibility; present weather; and amount, type and height of base of cloud above surface elevation at . . . *(place of observation)* ?	Here is the information requested : . . . *(The units used for speed and distances should be indicated.)*

Abbreviation	Question	Answer or Advice
QUC	What is the number *(or other indication)* of the last message you received from me (*or* from . . . *(call sign)*)?	The number *(or other indication)* of the last message I received from you (*or* from . . . *(call sign)*) is . . .
QUD	Have you received the urgency signal sent by . . . *(call sign of mobile station)*?	I have received the urgency signal sent by . . . *(call sign of mobile station)* at . . . hours.
QUE	Can you use telephony in . . . *(language)*, with interpreter if necessary; if so, on what frequencies?	I can use telephony in . . . *(language)* on . . . kHz (*or* MHz).
QUF	Have you received the distress signal sent by . . . *(call sign of mobile station)*?	I have received the distress signal sent by . . . *(call sign of mobile station)* at . . . hours.
QUG	Will you be forced to alight (*or* land)?	I am forced to alight (*or* land) immediately. *or* I shall be forced to alight (*or* land) at . . . *(position or place)* at . . . hours.
QUH	Will you give me the present barometric pressure at sea level?	The present barometric pressure at sea level is . . . *(units)*.
QUI	Are your navigation lights working?	My navigation lights are working.
QUJ	Will you indicate the TRUE track to reach you (*or* . . .)?	The TRUE track to reach me (*or*...) is . . . degrees at . . . hours.
QUK	Can you tell me the condition of the sea observed at . . . *(place or co-ordinates)*?	The sea at . . . *(place or co-ordinates)* is . . .

Abbreviation	Question	Answer or Advice
QUL	Can you tell me the swell observed at . . . *(place or co-ordinates)*?	The swell at . . . *(place or co-ordinates)* is . . .
QUM	May I resume normal working?	Normal working may be resumed.
QUN	Will vessels in my immediate vicinity . . . *or* (in the vicinity of . . . latitude . . . longitude) *or* (in the vicinity of . . .) please indicate their position, TRUE course and speed?	My position, TRUE course and speed are . . .
QUO	Shall I search for . . . 1. aircraft 2. ship 3. survival craft in the vicinity of . . . latitude . . . longitude *(or according to any other indication)*?	Please search for . . . 1. aircraft 2. ship 3. survival craft in the vicinity of . . . latitude . . . longitude *(or according to any other indication)*.
QUP	Will you indicate your position by . . . 1. searchlight 2. black smoke trail 3. pyrotechnic lights?	My position is indicated by . . . 1. searchlight 2. black smoke trail 3. pyrotechnic lights.
QUQ	Shall I train my searchlight nearly vertical on a cloud, occulting if possible and, if your aircraft is seen, deflect the beam up wind and on the water (*or* land) to facilitate your landing?	Please train your searchlight on a cloud, occulting if possible and, if my aircraft is seen or heard, deflect the beam up wind and on the water (*or* land) to facilitate my landing.

Abbre-viation	Question	Answer or Advice
QUR	Have survivors . . . 1. received survival equipment 2. been picked up by rescue vessel 3. been reached by ground rescue party?	Survivors . . . 1. are in possession of survival equipment dropped by . . . 2. have been picked up by rescue vessel 3. have been reached by ground rescue party.
QUS	Have you sighted survivors or wreckage? If so, in what position?	Have sighted . . . 1. survivors in water 2. survivors on rafts 3. wreckage in position . . . latitude . . . longitude *(or according to any other indication)*.
QUT	Is position of incident marked?	Position of incident is marked by. . . 1. flame or smoke float 2. sea marker 3. sea marker dye 4. . . . *(specify other marking)*.
QUU	Shall I home ship or aircraft to my position?	Home ship or aircraft . . . *(call sign)* . . . 1. to your position by transmitting your call sign and long dashes on . . . kHz (*or* MHz) 2. by transmitting on . . . kHz (*or* MHz) TRUE track to reach you.
QUW	Are you in the search area designated as . . . *(designator or latitude and longitude)*?	I am in the . . . *(designation)* search area.
QUY	Is position of survival craft marked?	Position of survival craft was marked at . . . hours by. . . 1. flame or smoke float 2. sea marker 3. sea marker dye 4. . . . *(specify other marking)*.

B. Lists of Signals According to the Nature of Questions, Answer or Advice

Abbre-viation	Question	Answer or Advice
	Name	
QRA	What is the name of your station ?	The name of my station is . . .
	Route	
QRD	Where are you bound for and where are you from ?	I am bound for . . . from . . .
	Position	
QRB	How far approximately are you from my station ?	The approximate distance between our stations is . . . nautical miles (*or* kilometres).
QTH	What is your position in latitude and longitude *(or according to any other indication)* ?	My position is . . . latitude . . . longitude *(or according to any other indication)*.
QTN	At what time did you depart from . . . *(place)* ?	I departed from . . . *(place)* at . . . hours.
	Quality of Signals	
QRI	How is the tone of my transmission ?	The tone of your transmission is . . . 1. good 2. variable 3. bad.
QRK	What is the intelligibility of my signals (*or* those of . . .) ?	The intelligibility of your signals (*or* those of . . .) is . . . 1. bad 2. poor 3. fair 4. good 5. excellent.

Abbre-viation	Question	Answer or Advice
	Strength of Signals	
QRO	Shall I increase transmitter power ?	Increase transmitter power.
QRP	Shall I decrease transmitter power ?	Decrease transmitter power.
QSA	What is the strength of my signals (*or* those of . . .) ?	The strength of your signals (*or* those of . . .) is . . . 1. scarcely perceptible 2. weak 3. fairly good 4. good 5. very good.
QSB	Are my signals fading ?	Your signals are fading.
	Keying	
QRQ	Shall I send faster ?	Send faster (. . . words per minute).
QRR	Are you ready for automatic operation ?	I am ready for automatic operation. Send at . . . words per minute.
QRS	Shall I send more slowly ?	Send more slowly (. . . . words per minute).
QSD	Is my keying defective ?	Your keying is defective.
	Interference	
QRM	Are you being interfered with ?	I am being interfered with (1. nil 2. slightly 3. moderately 4. severely 5. extremely).

Abbreviation	Question	Answer or Advice
QRN	Are you troubled by static ?	I am troubled by static (1. nil 2. slightly 3. moderately 4. severely 5. extremely).
	Adjustment of Frequency	
QRG	Will you tell me my exact frequency (*or* that of . . .) ?	Your exact frequency (*or* that of . . .) is . . . kHz (*or* MHz).
QRH	Does my frequency vary ?	Your frequency varies.
QTS	Will you send your call sign for tuning purposes or so that your frequency can be measured now (*or* at . . . hours) on . . . kHz (*or* MHz) ?	I will send my call sign for tuning purposes or so that my frequency may be measured now (*or* at . . . hours) on . . . kHz (*or* Mc/s).
	Choice of Frequency and/or Class of Emission	
QSN	Did you hear me (*or* . . . *(call sign)*) on . . . kHz (*or* MHz)?	I did hear you (*or* . . . *(call sign)*) on . . . kHz (*or* MHz).
QSS	What working frequency will you use?	I will use the working frequency . . . kHz *(normally only the last three figures of the frequency need be given)*.
QSU	Shall I send or reply on this frequency (*or* on . . . kHz (*or* MHz)) (with emissions of class . . .)?	Send or reply on this frequency (*or* on . . . kHz (*or* MHz)) (with emissions of class . . .).
QSV	Shall I send a series of V's on this frequency (*or* . . . kHz (*or* MHz)) ?	Send a series of V's on this frequency (*or* . . . kHz (*or* MHz)).

Abbreviation	Question	Answer or Advice
QSW	Will you send on this frequency (*or* on . . . kHz (*or* MHz)) (with emissions of class . . .)?	I am going to send on this frequency (*or* on . . . kHz (*or* MHz)) (with emissions of class . . .).
QSX	Will you listen to . . . *(call sign(s))* on . . . kHz (*or* MHz)?	I am listening to . . . *(call sign(s))* on . . . kHz (*or* MHz).
	Change of Frequency	
QSY	Shall I change to transmission on another frequency?	Change to transmission on another frequency (*or* on . . . kHz (*or* MHz)).
	Establishing Communication	
QRL	Are you busy?	I am busy (*or* I am busy with . . .). Please do not interfere.
QRV	Are you ready?	I am ready.
QRX	When will you call me again?	I will call you again at . . . hours (on . . . kHz (*or* MHz)).
QRY	What is my turn? *(Relates to communication.)*	Your turn is Number . . . *(or according to any other indication). (Relates to communication.)*
QRZ	Who is calling me?	You are being called by . . . (on . . . kHz (*or* MHz)).
QSC	Are you a cargo vessel? *(See Article 32, Section V.)*	I am a cargo vessel.
QSR	Shall I repeat the call on the calling frequency?	Repeat your call on the calling frequency; did not hear you (*or* have interference).
QTQ	Can you communicate with my station by means of the International Code of Signals?	I am going to communicate with your station by means of the International Code of Signals.

Abbre-viation	Question	Answer or Advice
QUE	Can you use telephony in . . . *(language)*, with interpreter if necessary; if so, on what frequencies?	I can use telephony in . . . *(language)* on . . . kHz (*or* MHz).
	Time	
QTR	What is the correct time?	The correct time is . . . hours.
QTU	What are the hours during which your station is open?	My station is open from . . . to . . . hours.
	Charges	
QRC	By what private enterprise (*or* State Administration) are the accounts for charges for your station settled?	The accounts for charges of my station are settled by the private enterprise . . . (*or* State Administration).
QSJ	What is the charge to be collected to . . . including your internal charge?	The charge to be collected to . . . including my internal charge is . . . francs.
	Transit	
QRW	Shall I inform . . . that you are calling him on . . . kHz (*or* MHz)?	Please inform . . . that I am calling him on . . . kHz (*or* MHz).
QSO	Can you communicate with . . . direct (*or* by relay)?	I can communicate with . . . direct (*or* by relay through . . .).
QSP	Will you relay to . . . free of charge?	I will relay to . . . free of charge.
QSQ	Have you a doctor on board (*or* is... *(name of person)* on board)?	I have a doctor on board (*or* . . . *(name of person)* is on board).
QUA	Have you news of . . . *(call sign)*?	Here is news of . . . *(call sign)*.

Abbreviation	Question	Answer or Advice
QUC	What is the number *(or other indication)* of the last message you received from me (*or* from . . . *(call sign)*)?	The number *(or other indication)* of the last message I received from you (*or* from . . . *(call sign)*) is . . .
	Exchange of Correspondence	
QRJ	How many radiotelephone calls have you to book?	I have . . . radiotelephone calls to book.
QRU	Have you anything for me?	I have nothing for you.
QSG	Shall I send . . . telegrams at a time?	Send . . . telegrams at a time.
QSI		I have been unable to break in on your transmission. *or* Will you inform . . . *(call sign)* that I have been unable to break in on his transmission (on . . . kHz (*or* MHz)).
QSK	Can you hear me between your signals and if so can I break in on your transmission?	I can hear you between my signals; break in on my transmission.
QSL	Can you acknowledge receipt?	I am acknowledging receipt.
QSM	Shall I repeat the last telegram which I sent you (*or* some previous telegram)?	Repeat the last telegram which you sent me (*or* telegram(s) number(s) . . .).
QSZ	Shall I send each word or group more than once?	Send each word or group twice (*or* . . . times).
QTA	Shall I cancel telegram number . . .?	Cancel telegram number . . .

Abbre-viation	Question	Answer or Advice
QTB	Do you agree with my counting of words?	I do not agree with your counting of words; I will repeat the first letter or digit of each word or group.
QTC	How many telegrams have you to send?	I have ... telegrams for you (*or* for ...).
QTV	Shall I stand guard for you on the frequency of ... kHz (*or* MHz) (from ... to ... hours)?	Stand guard for me on the frequency of ... kHz (*or* MHz) (from ... to ... hours).
QTX	Will you keep your station open for further communication with me until further notice (*or* until ... hours)?	I will keep my station open for further communication with you until further notice (*or* until ... hours).
	Movement	
QRE	What is your estimated time of arrival at ... (*or* over) ...) *(place)*?	My estimated time of arrival at ... (*or* over ...) *(place)* is ... hours.
QRF	Are you returning to ... *(place)*?	I am returning to ... *(place)*. *or* Return to ... *(place)*.
QSH	Are you able to home on your D/F equipment?	I am able to home on my D/F equipment (on station ...).
QTI	What is your TRUE track?	My TRUE track is ... degrees.
QTJ	What is your speed?	My speed is ... knots (*or* ... kilometres per hour *or* ... statute miles per hour).
	(Requests the speed of a ship or aircraft through the water or air respectively.)	*(Indicates the speed of a ship or aircraft through the water or air respectively.)*

Abbreviation	Question	Answer or Advice
QTK	What is the speed of your aircraft in relation to the surface of the earth?	The speed of my aircraft in relation to the surface of the earth is ... knots (*or* ... kilometres per hour *or* ... statute miles per hour).
QTL	What is your TRUE heading?	My TRUE heading is ... degrees.
QTM	What is your MAGNETIC heading?	My MAGNETIC heading is ... degrees.
QTN	At what time did you depart from ... *(place)*?	I departed from ... *(place)* at ... hours.
QTO	Have you left dock (*or* port)? *or* Are you airborne?	I have left dock (*or* port). *or* I am airborne.
QTP	Are you going to enter dock (*or* port)? *or* Are you going to alight (*or* land)?	I am going to enter dock (*or* port) *or* I am going to alight (*or* land).
QUG	Will you be forced to alight (*or* land)?	I am forced to alight (*or* land) immediately. *or* I shall be forced to alight (*or* land) at ... *(position or place)* at ... hours.
QUJ	Will you indicate the TRUE track to reach you (*or* ...)?	The TRUE track to reach me (*or*...) is ... degrees at ... hours.
QUN	Will vessels in my immediate vicinity ... *or* (in the vicinity of ... latitude ... longitude) *or* (in the vicinity of ...) please indicate their position, TRUE course and speed?	My position, TRUE course and speed are ...

Abbre-viation	Question	Answer or Advice
	Meteorology	
QUB	Can you give me in the following order information concerning: the direction in degrees TRUE and speed of the surface wind; visibility; present weather; and amount, type and height of base of cloud above surface elevation at ... *(place of observation)*?	Here is the information requested ... *(The units used for speed and distances should be indicated.)*
QUH	Will you give me the present barometric pressure at sea level?	The present barometric pressure at sea level is ... *(units)*.
QUK	Can you tell me the condition of the sea observed at ... *(place* or *co-ordinates)*?	The sea at... *(place or co-ordinates)* is ...
QUL	Can you tell me the swell observed at ... *(place or co-ordinates)*	The swell at ... *(place or co-ordinates)* is ...
	Radio Direction-Finding	
QTE	What is my TRUE bearing from you? *or* What is my TRUE bearing from ... *(call sign)*? *or* What is the TRUE bearing of ... *(call sign)* from .. *(call sign)*?	Your TRUE bearing from me is ... degrees at ... hours. *or* Your TRUE bearing from ... *(call sign)* was ... degrees at ... hours. *or* The TRUE bearing of ... *(call sign)* from ... *(call sign)* was ... degrees at ... hours.
QTF	Will you give me the position of my station according to the bearings taken by the D/F stations which you control?	The position of your station according to the bearings taken by the D/F stations which I control was ... latitude ... longitude *(or other indication of position)*, class ... at ... hours.

Abbre-viation	Question	Answer or Advice
QTG	Will you send two dashes of ten seconds each followed by your call sign (repeated . . . times) (on . . . kHz (*or* MHz))? *or* Will you request . . . to send two dashes of ten seconds followed by his call sign (repeated . . . times) on . . . kHz (*or* MHz)?	I am going to send two dashes of ten seconds each followed by my call sign (repeated . . . times) (on . . . kHz (*or* MHz)). *or* I have requested . . . to send two dashes of ten seconds followed by his call sign (repeated . . . times) on . . . kHz (*or* MHz).
	Suspension of Work	
QRT	Shall I stop sending?	Stop sending.
QUM	May I resume normal working?	Normal working may be resumed.
	Urgency	
QUD	Have you received the urgency signal sent by . . . *(call sign of mobile station)*?	I have received the urgency signal sent by . . . *(call sign of mobile station)* at . . . hours.
QUG	Will you be forced to alight (*or* land)?	I am forced to alight (*or* land) immediately. *or* I shall be forced to alight (*or* land) at . . . *(position or place)* at . . . hours.
	Distress	
QUF	Have you received the distress signal sent by . . . *(call sign of mobile station)*?	I have received the distress signal sent by . . . *(call sign of mobile station)* at . . . hours.
QUM	May I resume normal working?	Normal working may be resumed.
	Search and Rescue	
QSE	What is the estimated drift of the survival craft?	The estimated drift of the survival craft is . . . *(figures and units)*.

Abbre-viation	Question	Answer or Advice
QSF	Have you effected rescue?	I have effected rescue and am proceeding to . . . base (with . . . persons injured requiring ambulance).
QTD	What has the rescue vessel or rescue aircraft recovered?	. . . *(identification)* has recovered . . . 1. . . . *(number)* survivors 2. wreckage 3. . . . *(number)* bodies.
QTW	What is the condition of survivors?	Survivors are in . . . condition and urgently need . . .
QTY	Are you proceeding to the position of incident and if so when do you expect to arrive?	I am proceeding to the position of incident and expect to arrive at . . . hours (on . . . date).
QTZ	Are you continuing the search?	I am continuing the search for . . . (aircraft, ship, survival craft, survivors or wreckage).
QUI	Are your navigation lights working?	My navigation lights are working.
QUN	Will vessels in my immediate vicinity . . . *or* (in the vicinity of . . . latitude longitude . . .) *or* (in the vicinity of . . .) please indicate their position, TRUE course and speed?	My position, TRUE course and speed are . . .
QUO	Shall I search for . . . 1. aircraft 2. ship 3. survival craft in the vicinity of . . . latitude . . . longitude *(or according to any other indication)*?	Please search for . . . 1. aircraft 2. ship 3. survival craft in the vicinity of . . . latitude . . . longitude *(or according to any other indication)*.

Abbreviation	Question	Answer or Advice
QUP	Will you indicate your position by . . . 1. searchlight 2. black smoke trail 3. pyrotechnic lights?	My position is indicated by . . . 1. searchlight 2. black smoke trail 3. pyrotechnic lights.
QUQ	Shall I train my searchlight nearly vertical on a cloud, occulting if possible and, if your aircraft is seen, deflect the beam up wind and on the water (*or* land) to facilitate your landing?	Please train your searchlight on a cloud, occulting if possible and, if my aircraft is seen or heard, deflect the beam up wind and on the water (*or* land) to facilitate my landing.
QUR	Have survivors . . . 1. received survival equipment 2. been picked up by rescue vessel 3. been reached by ground rescue party?	Survivors . . . 1. are in possession of survival equipment dropped by . . . 2. have been picked up by rescue vessel 3. have been reached by ground rescue party.
QUS	Have you sighted survivors or wreckage? If so, in what position?	Have sighted . . . 1. survivors in water 2. survivors on rafts 3. wreckage in position . . . latitude . . . longitude *(or according to any other indication)*.
QUT	Is position of incident marked?	Position of incident is marked by... 1. flame or smoke float 2. sea marker 3. sea marker dye 4. . . . *(specify other marking)*.

Abbre-viation	Question	Answer or Advice
QUU	Shall I home ship or aircraft to my position?	Home ship or aircraft ... *(call sign)* ... 1. to your position by transmitting your call sign and long dashes on . . . kHz (*or* MHz) 2. by transmitting on . . . kHz (*or* MHz) TRUE track to reach you.
QUW	Are you in the search area designated as ... *(designator or latitude and longitude)*?	I am in the . . . *(designation)* search area.
QUY	Is position of survival craft marked?	Position of survival craft was marked at . . . hours by . . . 1. flame or smoke float 2. sea marker 3. sea marker dye 4. . . . *(specify other marking)*.
	Identification	
QTT		The identification signal which follows is superimposed on another transmission.

SECTION II. MISCELLANEOUS ABBREVIATIONS AND SIGNALS

Abbreviation or Signal	Definition
AA	All after . . . *(used after a question mark to request a repetition).*
AB	All before . . . *(used after a question mark to request a repetition).*
ADS	Address *(used after a question mark to request a repetition).*
$\overline{\text{AR}}$	End of transmission *(. — . — . to be sent as one signal).*
$\overline{\text{AS}}$	Waiting period *(. — . . . to be sent as one signal).*
BK	Signal used to interrupt a transmission in progress.
BN	All between . . . and . . . *(used after a question mark to request a repetition).*
BQ	A reply to an RQ.
CFM	Confirm (*or* I confirm).
CL	I am closing my station.
COL	Collate (*or* I collate).
CP	General call to two or more specified stations *(see Article 31).*
CQ	General call to all stations *(see Article 31).*
CS	Call sign *(used to request a call sign).*
$\overline{\text{DDD}}$	Used to identify the transmission of the distress message by a station not itself in distress *(see No.* **1459***).*
DE	From *(used to precede the call sign of the calling station).*
DF	Your bearing at . . . hours was . . . degrees, in the doubtful sector of this station, with a possible error of . . . degrees.
DO	Bearing doubtful. Ask for another bearing later (*or* at . . . hours).
E	East (Cardinal).
ER	Here . . .
ETA	Estimated time of arrival.
ITP	The punctuation counts.
K	Invitation to transmit.
KMH	Kilometers per hour.
KTS	Nautical miles per hour *(Knots).*
MIN	Minute (*or* Minutes).

Abbreviation or Signal	Definition
MPH	Statute miles per hour.
MSG	Prefix indicating a message to or from the master of a ship concerning its operation or navigation.
N	North (Cardinal).
NIL	I have nothing to send to you.
NO	No *(Negative)*.
NW	Now.
OK	We agree (*or* It is correct).
OL	Ocean Letter.
P	Prefix indicating a private radiotelegram.
PBL	Preamble *(used after a question mark to request a repetition)*.
R	Received.
REF	Reference to . . . (*or* Refer to . . .).
RPT	Repeat (*or* I repeat) (*or* Repeat . . .).
RQ	Indication of a request.
S	South (Cardinal).
SIG	Signature *(used after a question mark to request a repetition)*.
SLT	Radiomaritime Letter.
$\overline{\text{SOS}}$	Distress Signal *(. . . — — — . . . to be sent as one signal)*.
SS	Indicator preceding the name of a ship station.
SVC	Prefix indicating a service telegram.
SYS	Refer to your service telegram.
TFC	Traffic.
TR	Used by a land station to request the position and next port of call of a mobile station *(see No.* **1083***)*; used also as a prefix to the reply.
TTT	This group when sent three times constitutes the safety signal *(see No.* **1488***)*.
TU	Thank you.
TXT	Text *(used after a question mark to request a repetition)*.
$\overline{\text{VA}}$	End of work *(. . . — . — to be sent as one signal)*.
W	West (Cardinal).

Abbreviation or Signal	Definition
WA	Word after . . . *(used after a question mark to request a repetition)*.
WB	Word before . . . *(used after a question mark to request a repetition)*.
WD	Word(s) *or* Group(s).
XQ	Prefix used to indicate an operating communication in the fixed service.
XXX	This group when sent three times constitutes the urgency signal *(see No.* **1477***)*.
YES	Yes *(Affirmative)*.

APPENDIX 13A

Mar **Mar2**

Miscellaneous Abbreviations and Signals to be used for Radiocommunications in the Maritimé Mobile Service

(See Articles 29, 33 and 36)

SECTION I. Q CODE

Introduction

1. The series of groups listed in this Appendix range from QOA to QUZ.

2. The QOA to QQZ series are reserved for the maritime mobile service.

3. Certain Q code abbreviations may be given an affirmative or negative sense by sending, immediately following the abbreviation, the letter C or the letters NO (in radiotelephony spoken as : CHARLIE or NO).

4. The meanings assigned to Q code abbreviations may be amplified or completed by the appropriate addition of other groups, call signs, place names, figures, numbers, etc. It is optional to fill in the blanks shown in parentheses. Any data which is filled in where blanks appear shall be sent in the same order as shown in the text of the following tables.

5. Q code abbreviations are given the form of a question when followed by a questionmark in radiotelegraphy and RQ (ROMEO QUEBEC) in radiotelephony. When an abbreviation is used as a question and is followed by additional or complementary information, the question mark (or RQ) should follow this information.

6. Q code abbreviations with numbered alternative significations shall be followed by the appropriate figure to indicate the exact meaning intended. This figure shall be sent immediately following the abbreviation.

7. All times shall be given in Greenwich Mean Time (G.M.T.) unless otherwise indicated in the question or reply.

8. An asterisk * following a Q code abbreviation means that this signal has a meaning similar to a signal appearing in the International Code of Signals.

Abbreviations Available for the Maritime Mobile Service

A. List of Abbreviations in Alphabetical Order

Abbreviation	Question	Answer or Advice
QOA	Can you communicate by radiotelegraphy (500 kHz)?	I can communicate by radiotelegraphy (500 kHz).
QOB	Can you communicate by radiotelephony (2 182 kHz)?	I can communicate by radiotelephony (2 182 kHz).
QOC	Can you communicate by radiotelephony (channel 16 - frequency 156·80 MHz)?	I can communicate by radiotelephony (channel 16 - frequency 156·80 MHz).
QOD	Can you communicate with me in... 0. Dutch 5. Italian 1. English 6. Japanese 2. French 7. Norwegian 3. German 8. Russian 4. Greek 9. Spanish?	I can communicate with you in... 0. Dutch 5. Italian 1. English 6. Japanese 2. French 7. Norwegian 3. German 8. Russian 4. Greek 9. Spanish.
QOE	Have you received the safety signal sent by... *(name and/or call sign)*?	I have received the safety signal sent by... *(name and/or call sign)*.
QOF	What is the commercial quality of my signals?	The quality of your signals is... 1. not commercial 2. marginally commercial 3. commercial.
QOG	How many tapes have you to send?	I have... tapes to send.
QOH	Shall I send a phasing signal for... seconds?	Send a phasing signal for... seconds.
QOI	Shall I send my tape?	Send your tape.
QOJ	Will you listen on... kHz (*or* MHz) for signals of emergency position-indicating radiobeacons?	I am listening on... kHz (*or* MHz) for signals of emergency position-indicating radiobeacons.

Abbre-viation	Question	Answer or Advice
QOK	Have you received the signals of an emergency position-indicating radiobeacon on...kHz (*or* MHz)?	I have received the signals of an emergency position-indicating radiobeacon on... kHz (*or* MHz).
QOL	Is your vessel fitted for reception of selective calls? If so, what is your selective call number or signal?	My vessel is fitted for the reception of selective calls. My selective call number or signal is ...
QOM	On what frequencies can your vessel be reached by a selective call?	My vessel can be reached by a selective call on the following frequency/ies ... (periods of time to be added if necessary).
QOT	Do you hear my call; what is the approximate delay in minutes before we may exchange traffic?	I hear your call; the approximate delay is ... minutes.
QRA	What is the name of your vessel (*or* station)?	The name of my vessel (*or* station) is...
QRB	How far approximately are you from my station?	The approximate distance between our stations is... nautical miles (*or* kilometres).
QRC	By what private enterprise (*or* State Administration) are the accounts for charges for your station settled?	The accounts for charges of my station are settled by the private enterprise... (*or* State Administration).
QRD	Where are you bound for and where are you from?	I am bound for... from...
QRE	What is your estimated time of arrival at...(*or* over...) *(place)*?	My estimated time of arrival at... (*or* over...) *(place)* is... hours.
QRF	Are you returning to... *(place)*?	I am returning to... *(place)*. *or* Return to... *(place)*.

Abbre-viation	Question	Answer or Advice
QRG	Will you tell me my exact frequency (*or* that of...)?	Your exact frequency (*or* that of...) is... kHz (*or* MHz).
QRH	Does my frequency vary?	Your frequency varies.
QRI	How is the tone of my transmission?	The tone of your transmission is... 1. good 2. variable 3. bad.
QRJ	How many radiotelephone calls have you to book?	I have... radiotelephone calls to book.
QRK	What is the intelligibility of my signals (*or* those of... *(name and/or call sign)*)?	The intelligibility of your signals (*or* those of... *(name and/or call sign)*) is... 1. bad. 2. poor 3. fair 4. good 5. excellent.
QRL	Are you busy?	I am busy (*or* I am busy with... *(name and/or call sign)*). Please do not interfere.
QRM	Is my transmission being interfered with?	Your transmission is being interfered with... 1. nil 2. slightly 3. moderately 4. severely 5. extremely.

Abbre-viation	Question	Answer or Advice
QRN	Are you troubled by static?	I am troubled by static... 1. nil 2. slightly 3. moderately 4. severely 5. extremely
QRO	Shall I increase transmitter power?	Increase transmitter power.
QRP	Shall I decrease transmitter power?	Decrease transmitter power.
QRQ	Shall I send faster?	Send faster (... words per minute).
QRR	Are you ready for automatic operation?	I am ready for automatic operation. Send at... words per minute.
QRS	Shall I send more slowly?	Send more slowly (... words per minute).
QRT	Shall I stop sending?	Stop sending.
QRU	Have you anything for me?	I have nothing for you.
QRV	Are you ready?	I am ready.
QRW	Shall I inform... that you are calling him on...kHz (*or* MHz)?	Please inform... that I am calling him on...kHz (*or* MHz).
QRX	When will you call me again?	I will call you again at... hours (on...kHz (*or* MHz)).
QRY	What is my turn? *(Relates to communication)*	Your turn is Number... *(or according to any other indication). (Relates to communication).*
QRZ	Who is calling me?	You are being called by... (on ...kHz (*or* MHz)).

Abbre-viation	Question	Answer or Advice
QSA	What is the strength of my signals (*or* those of... *(name and/or call sign)*)?	The strength of your signals (*or* those of... *(name and/or call sign)*) is... 1. scarcely perceptible 2. weak 3. fairly good 4. good 5. very good.
QSB	Are my signals fading?	Your signals are fading.
QSC	Are you a low traffic ship station? *(see Article 32, Section V)*	I am a low traffic ship station.
QSD	Are my signals mutilated?	Your signals are mutilated.
QSE*	What is the estimated drift of the survival craft?	The estimated drift of the survival craft is... *(figures and units)*.
QSF*	Have you effected rescue?	I have effected rescue and am proceeding to... base (with... persons injured requiring ambulance).
QSG	Shall I send... telegrams at a time?	Send... telegrams at a time.
QSH	Are you able to home with your direction-finding equipment?	I am able to home with my direction-finding equipment (on... *(name and/or call sign)*).
QSI		I have been unable to break in on your transmission. *or* Will you inform... *(name and/or call sign)* that I have been unable to break in on his transmission (on... kHz (*or* MHz)).

Abbre-viation	Question	Answer or Advice
QSJ	What is the charge to be collected to... including your internal charge?	The charge to be collected to... including my internal charge is... francs.
QSK	Can you hear me between your signals and if so may I break in on your transmission?	I can hear you between my signals; break in on my transmission.
QSL	Can you acknowledge receipt?	I am acknowledging receipt.
QSM	Shall I repeat the last telegram which I sent you (*or* some previous telegram)?	Repeat the last telegram which you sent me (*or* telegram(s) number(s)...).
QSN	Did you hear me (*or*... *(name and/or call sign)*) on... kHz (*or* MHz)?	I did hear you (*or*... *(name and/or call sign)*) on... kHz (*or* MHz).
QSO	Can you communicate with... *(name and/or call sign)* direct (*or* by relay)?	I can communicate with... *(name and/or call sign)* direct (*or* by relay through...).
QSP	Will you relay to... *(name and/or call sign)* free of charge?	I will relay to... *(name and/or call sign)* free of charge.
QSQ	Have you a doctor on board (*or* is... *(name of person)* on board)?	I have a doctor on board (*or*... *(name of person)* is on board).
QSR	Shall I repeat the call on the calling frequency?	Repeat your call on the calling frequency; did not hear you (*or* have interference).
QSS	What working frequency will you use?	I will use the working frequency ... kHz (*or* MHz) (*in the high frequency bands normally only the last three figures of the frequency need be given*).
QSU	Shall I send or reply on this frequency (*or* on... kHz (*or* MHz)) (with emissions of class...)?	Send or reply on this frequency (*or* on... kHz (*or* MHz)) (with emissions of class...).

Abbre-viation	Question	Answer or Advice
QSV	Shall I send a series of V's (*or* signs) for adjustment on this frequency (*or* on... kHz (*or* MHz))?	Send a series of V's (*or* signs) for adjustment on this frequency (*or* on... kHz (*or* MHz)).
QSW	Will you send on this frequency (*or* on... kHz (*or* MHz)) (with emissions of class...)?	I am going to send on this frequency (*or* on... kHz (*or* MHz)) (with emissions of class...).
QSX	Will you listen to ... *(name and/or call sign(s))* on ... kHz *(or* MHz*)*, or in the bands .../channels ...?	I am listening to ... *(name and/or call sign(s))* on ... kHz *(or* MHz*)*, or in the bands .../channels ...
QSY	Shall I change to transmission on another frequency?	Change to transmission on another frequency (*or* on ... kHz (*or* MHz)).
QSZ	Shall I send each word or group more than once?	Send each word or group twice (*or*... times).
QTA	Shall I cancel telegram (*or* message) number...?	Cancel telegram (*or* message) number...
QTB	Do you agree with my counting of words?	I do not agree with your counting of words; I will repeat the first letter or digit of each word or group.
QTC	How many telegrams have you to send?	I have... telegrams for you (*or* for... *(name and/or call sign)*).
QTD*	What has the rescue vessel or rescue aircraft recovered?	... *(identification)* has recovered... 1. ... *(number)* survivors 2. wreckage 3. ... *(number)* bodies.

Abbre-viation	Question	Answer or Advice
QTE	What is my TRUE bearing from you? *or* What is my TRUE bearing from... *(name and/or call sign)*? *or* What is the TRUE bearing of... *(name and/or call sign)* from... *(name and/or call sign)*?	Your TRUE bearing from me is... degrees at... hours. *or* Your TRUE bearing from... *(name and/or call sign)* was... degrees at... hours. *or* The TRUE bearing of... *(name and/or call sign)* from... *(name and/or call sign)* was... degrees at... hours.
QTF	Will you give me my position according to the bearings taken by the direction-finding stations which you control?	Your position according to the bearings taken by the direction-finding stations which I control was... latitude... longitude *(or other indication of position)*, class... at... hours.
QTG	Will you send two dashes of ten seconds each (*or* carrier) followed by your call sign (*or* name) (repeated... times) on... kHz (*or* MHz)? *or* Will you request... *(name and/or call sign)* to send two dashes of ten seconds each (*or* carrier) followed by his call sign (and/*or* name) (repeated... times) on... kHz (*or* MHz)?	I am going to send two dashes of ten seconds each (*or* carrier) followed by my call sign (*or* name) (repeated... times) on... kHz (*or* MHz). *or* I have requested... *(name and/or call sign)* to send two dashes of ten seconds each (*or* carrier) followed by his call sign (and/*or* name) (repeated... times) on... kHz (*or* MHz).

Abbreviation	Question	Answer or Advice
QTH	What is your position in latitude and longitude *(or according to any other indication)*?	My position is... latitude... longitude *(or according to any other indication)*.
QTI*	What is your TRUE course?	My TRUE course is... degrees.
QTJ*	What is your speed? *(Requests the speed of a ship or aircraft through the water or air respectively)*.	My speed is... knots (*or* kilometres per hour *or*... statute miles per hour). *(Indicates the speed of a ship or aircraft through the water or air respectively)*.
QTK*	What is the speed of your aircraft in relation to the surface of the earth?	The speed of my aircraft in relation to the surface of the earth is... knots (*or*... kilometres per hour *or*... statute miles per hour).
QTL*	What is your TRUE heading?	My TRUE heading is... degrees.
QTM*	What is your MAGNETIC heading?	My MAGNETIC heading is... degrees.
QTN	At what time did you depart from ... *(place)*?	I departed from... *(place)* at... hours.
QTO	Have you left dock (*or* port)? *or* Are you airborne?	I have left dock (*or* port). *or* I am airborne.
QTP	Are you going to enter dock (*or* port)? *or* Are you going to alight (*or* land)?	I am going to enter dock (*or* port). *or* I am going to alight (*or* land).
QTQ	Can you communicate with my station by means of the International Code of Signals (INTERCO)?	I am going to communicate with your station by means of the International Code of Signals (INTERCO).

Abbreviation	Question	Answer or Advice
QTR	What is the correct time?	The correct time is... hours.
QTS	Will you send your call sign *(and/or* name*)* for... seconds?	I will send my call sign *(and/or* name*)* for... seconds.
QTT		The identification signal which follows is superimposed on another transmission.
QTU	What are the hours during which your station is open?	My station is open from... to... hours.
QTV	Shall I stand guard for you on the frequency of...kHz (*or* MHz) (from... to... hours)?	Stand guard for me on the frequency of...kHz (*or* MHz) (from ... to... hours).
QTW*	What is the condition of survivors?	Survivors are in... condition and urgently need...
QTX	Will you keep your station open for further communication with me until further notice (*or* until ...hours)?	I will keep my station open for further communication with you until further notice (*or* until... hours).
QTY*	Are you proceeding to the position of incident and if so when do you expect to arrive?	I am proceeding to the position of incident and expect to arrive at... hours (on... *date*).
QTZ*	Are you continuing the search?	I am continuing the search for... (aircraft, ship, survival craft, survivors or wreckage).
QUA	Have you news of... *(name and/or call sign)*?	Here is news of... *(name and/or call sign)*.
QUB*	Can you give me in the following order information concerning: the direction in degrees TRUE and speed of the surface wind; visibility; present weather; and amount, type and height of base of cloud above surface elevation at... *(place of observation)*?	Here is the information requested: ... *(The units used for speed and distances should be indicated)*.

Abbre-viation	Question	Answer or Advice
QUC	What is the number *(or other indication)* of the last message you recei ed from me (*or* from... *(name and/or call sign)*?	The number *(or other indication)* of the last message I received from you (*or* from... *(name and/or call sign)*) is...
QUD	Have you received the urgency signal sent by... *(name and/or call sign)*?	I have received the urgency signal sent by... *(name and/or call sign)* at... hours.
QUE	Can you speak in... *(language)*, with interpreter if necessary; if so, on what frequencies?	I can speak in... *(language)* on ... kHz (*or* MHz).
QUF	Have you received the distress signal sent by... *(name and/or call sign)*?	I have received the distress signal sent by... *(name and/or call sign)* at... hours.
QUH*	Will you give me the present barometric pressure at sea level?	The present barometric pressure at sea level is... *(units)*.
QUM	May I resume normal working?	Normal working may be resumed.
QUN	1. *When directed to all stations:* Will vessels in my immediate vicinity... *or* (in the vicinity of... latitude... longitude) *or* (in the vicinity of...) please indicate their position, TRUE course and speed? 2. *When directed to a single station:* Please indicate your position, TRUE course and speed?	My position, TRUE course and speed are...
QUO*	Shall I search for... 1. aircraft 2. ship 3. survival craft in the vicinity of... latitude... longitude *(or according to any other indication)*?	Please search for... 1. aircraft 2. ship 3. survival craft in the vicinity of... latitude... longitude *(or according to any other indication)*.

Abbre-viation	Question	Answer or Advice
QUP*	Will you indicate your position by... 1. searchlight 2. black smoke trail 3. pyrotechnic lights?	My position is indicated by... 1. searchlight 2. black smoke trail 3. pyrotechnic lights.
QUR*	Have survivors... 1. received survival equipment 2. been picked up by rescue vessel 3. been reached by ground rescue party?	Survivors... 1. are in possession of survival equipment dropped by... 2. have been picked up by rescue vessel 3. have been reached by ground rescue party.
QUS*	Have you sighted survivors or wreckage? If so, in what position?	Have sighted... 1. survivors in water 2. survivors on rafts 3. wreckage in position... latitude... longitude *(or according to any other indication)*.
QUT*	Is position of incident marked?	Position of incident is marked by... 1. flame or smoke float 2. sea marker 3. sea marker dye 4. ... *(specify other marking)*.
QUU*	Shall I home ship or aircraft to my position?	Home ship or aircraft... *(name and/or call sign)*... 1. to your position by sending your call sign and long dashes on...kHz (*or* MHz) 2. by sending on...kHz (*or* MHz) TRUE track to reach you.
QUW*	Are you in the search area designated as... *(designator or latitude and longitude)*?	I am in the... *(designation)* search area.
QUX	Do you have any navigational warnings or gale warnings in force?	I have the following navigational warning(s) or gale warning(s) in force.

Abbre-viation	Question	Answer or Advice
QUY*	Is position of survival craft marked?	Position of survival craft was marked at... hours by... 1. flame or smoke float 2. sea marker 3. sea marker dye 4. ... *(specify other marking)*.
QUZ	May I resume restricted working?	Distress phase still in force, restricted working may be resumed.

B. List of Signals according to the Nature of Questions, Answer or Advice

Abbre-viation	Question	Answer or Advice
	Name	
QRA	What is the name of your vessel (*or* station)?	The name of my vessel (*or* station) is...
	Route	
QRD	Where are you bound for and where are you from?	I am bound for... from...
	Position	
QRB	How far approximately are you from my station?	The approximate distance between our stations is... nautical miles (*or* kilometres).
QTH	What is your position in latitude and longitude *(or according to any other indication)*?	My position is... latitude... longitude *(or according to any other indication)*.
QTN	At what time did you depart from ... *(place)*?	I departed from... *(place)* at... hours.
	Quality of Signals	
QOF	What is the commercial quality of my signals?	The quality of your signals is... 1. not commercial 2. marginally commercial 3. commercial.
QRI	How is the tone of my transmission?	The tone of your transmission is... 1. good 2. variable 3. bad.
QRK	What is the intelligibility of my signals (*or* those of... *(name and/or call sign)*)?	The intelligibility of your signals (*or* those of... *(name and/or call sign)*) is... 1. bad 2. poor 3. fair 4. good 5. excellent.

Abbre-viation	Question	Answer or Advice
	Strength of Signals	
QRO	Shall I increase transmitter power?	Increase transmitter power.
QRP	Shall I decrease transmitter power?	Decrease transmitter power.
QSA	What is the strength of my signals (*or* those of... *(name and/or call sign)*)?	The strength of your signals (*or* those of... *(name and/or call sign)*) is... 1. scarcely perceptible 2. weak 3. fairly good 4. good 5. very good.
QSB	Are my signals fading?	Your signals are fading.
	Keying	
QRQ	Shall I send faster?	Send faster (... words per minute).
QRR	Are you ready for automatic operation?	I am ready for automatic operation. Send at... words per minute.
QRS	Shall I send more slowly?	Send more slowly (... words per minute).
QSD	Are my signals mutilated?	Your signals are mutilated.
	Interference	
QRM	Is my transmission being interfered with?	Your transmission is being interfered with... 1. nil 2. slightly 3. moderately 4. severely 5. extremely.

Abbre-viation	Question	Answer or Advice
	Interference (cont.)	
QRN	Are you troubled by static?	I am troubled by static... 1. nil 2. slightly 3. moderately 4. severely 5. extremely.
	Adjustment of Frequency	
QRG	Will you tell me my exact frequency (*or* that of...)?	Your exact frequency (*or* that of...) is... kHz (*or* MHz).
QRH	Does my frequency vary?	Your frequency varies.
QTS	Will you send your call sign (and/*or* name) for... seconds?	I will send my call sign (and/*or* name) for... seconds.
	Choice of Frequency and / or Class of Emission	
QSN	Did you hear me (*or*... *(name and/or call sign)*) on...kHz (*or* MHz)?	I did hear you (*or*... *(name and/or call sign)*) on...kHz (*or* MHz).
QSS	What working frequency will you use?	I will use the working frequency ...kHz (*or* MHz) *(in the high frequency bands normally only the last three figures of the frequency need be given)*.
QSU	Shall I send *or* reply on this frequency (*or* on...kHz (*or* MHz)) (with emissions of class...)?	Send or reply on this frequency (*or* on.. kHz (*or* MHz)) (with emissions of class...).
QSV	Shall I send a series of V's (*or* signs) for adjustment on this frequency (*or*...kHz (*or* MHz))?	Send a series of V's (*or* signs) for adjustment on this frequency (*or*...kHz (*or* MHz)).

Abbreviation	Question	Answer or Advice
	Choice of Frequency and/or Class of Emission (cont.)	
QSW	Will you send on this frequency (*or* on... kHz (*or* MHz)) (with emissions of class...)?	I am going to send on this frequency (*or* on... kHz (*or* MHz)) (with emissions of class...).
QSX	Will you listen to ... *(name and/or call sign(s))* on ... kHz *(or* MHz*)*, or in the bands .../channels ...?	I am listening to ... *(name and/or call sign(s))* on ... kHz *(or* MHz*)*, or in the bands .../channels ...
	Change of Frequency	
QSY	Shall I change to transmission on another frequency?	Change to transmission on another frequency (*or* on ... kHz (*or* MHz)).
	Establishing Communication	
QOA	Can you communicate by radiotelegraphy (500 kHz)?	I can communicate by radiotelegraphy (500 kHz).
QOB	Can you communicate by radiotelephony (2 182 kHz)?	I can communicate by radiotelephony (2 182 kHz).
QOC	Can you communicate by radiotelephony (channel 16-frequency 156·80 MHz)?	I can communicate by radiotelephony (channel 16-frequency 156·80 MHz).
QOD	Can you communicate with me in... 0. Dutch 5. Italian 1. English 6. Japanese 2. French 7. Norwegian 3. German 8. Russian 4. Greek 9. Spanish?	I can communicate with you in... 0. Dutch 5. Italian 1. English 6. Japanese 2. French 7. Norwegian 3. German 8. Russian 4. Greek 9. Spanish.
QOT	Do you hear my call; what is the approximate delay in minutes before we may exchange traffic?	I hear your call; the approximate delay is ... minutes.

Abbre-viation	Question	Answer or Advice
	Establishing Communication (cont.)	
QRL	Are you busy?	I am busy (*or* I am busy with... *(name and/or call sign)*). Please do not interfere.
QRV	Are you ready?	I am ready.
QRX	When will you call me again?	I will call you again at... hours (on...kHz (*or* MHz)).
QRY	What is my turn? *(Relates to communication)*	Your turn is Number... *(or according to any other indication). (Relates to communication)*
QRZ	Who is calling me?	You are being called by... (on .... kHz (*or* MHz)).
QSC	Are you a low traffic ship station? *(see Article 32, Section V)*	I am a low traffic ship station.
QSR	Shall I repeat the call on the calling frequency?	Repeat your call on the calling frequency; did not hear you (*or* have interference).
QTQ	Can you communicate with my station by means of the International Code of Signals (INTERCO)?	I am going to communicate with your station by means of the International Code of Signals (INTERCO).
QUE	Can you speak in... *(language)*, with interpreter if necessary; if so, on what frequencies?	I can speak in... *(language)* on...kHz (*or* MHz).
	Selective Calls	
QOL	Is your vessel fitted for reception of selective calls? If so, what is your selective call number or signal?	My vessel is fitted for the reception of selective calls. My selective call number or signal is ...

Abbre-viation	Question	Answer or Advice
	Selective calls (cont.)	
QOM	On what frequencies can your vessel be reached by a selective call?	My vessel can be reached by a selective call on the following frequency/ies . . . (periods of time to be added if necessary).
	Time	
QTR	What is the correct time?	The correct time is... hours.
QTU	What are the hours during which your station is open?	My station is open from... to... hours.
	Charges	
QRC	By what private enterprise (*or* State Administration) are the accounts for charges for your station settled?	The accounts for charges of my station are settled by the private enterprise... (*or* State Administration).
QSJ	What is the charge to be collected to... including your internal charge?	The charge to be collected to... including my internal charge is... francs.
	Transit	
QRW	Shall I inform... that you are calling him on... kHz (*or* MHz)?	Please inform... that I am calling him on... kHz (*or* MHz).
QSO	Can you communicate with... *(name and/or call sign)* direct (*or* by relay)?	I can communicate with... *(name and/or call sign)* direct (*or* by relay through...).
QSP	Will you relay to... *(name and/or call sign)* free of charge?	I will relay to... *(name and/or call sign)* free of charge.
QSQ	Have you a doctor on board (*or* is... *(name of person)* on board)?	I have a doctor on board (*or*... *(name of person)* is on board).
QUA	Have you news of... *(name and/or call sign)*?	Here is news of... *(name and/or call sign)*.

Abbre-viation	Question	Answer or Advice
	Transit (cont.)	
QUC	What is the number *(or other indication)* of the last message you received from me (*or* from... *(name and/or call sign)*)?	The number *(or other indication)* of the last message I received from you (*or* from... *(name and/or call sign)*) is...
	Exchange of Correspondence	
QOG	How many tapes have you to send?	I have... tapes to send.
QOH	Shall I send a phasing signal for... seconds?	Send a phasing signal for... seconds.
QOI	Shall I send my tape?	Send your tape.
QRJ	How many radiotelephone calls have you to book?	I have... radiotelephone calls to book.
QRU	Have you anything for me?	I have nothing for you.
QSG	Shall I send... telegrams at a time?	Send... telegrams at a time.
QSI		I have been unable to break in on your transmission. *or* Will you inform... *(name and/or call sign)* that I have been unable to break in on his transmission (on... kHz (*or* MHz)).
QSK	Can you hear me between your signals and if so may I break in on your transmission?	I can hear you between my signals; break in on my transmission.
QSL	Can you acknowledge receipt?	I am acknowledging receipt.
QSM	Shall I repeat the last telegram which I sent you (*or* some previous telegram)?	Repeat the last telegram which you sent me (*or* telegram(s) number(s)...).

Abbre-viation	Question	Answer or Advice
	Exchange of Correspondence (cont.)	
QSZ	Shall I send each word or group more than once?	Send each word or group twice (*or*... times).
QTA	Shall I cancel telegram (*or* message) number...?	Cancel telegram (*or* message) number...
QTB	Do you agree with my counting of words?	I do not agree with your counting of words; I will repeat the first letter or digit of each word or group.
QTC	How many telegrams have you to send?	I have... telegrams for you (*or* for... *(name and/or call sign)*).
QTV	Shall I stand guard for you on the frequency of...kHz (*or* MHz) (from... to... hours)?	Stand guard for me on the frequency of...kHz (*or* MHz) (from ... to... hours).
QTX	Will you keep your station open for further communication with me until further notice (*or* until ...hours)?	I will keep my station open for further communication with you until further notice (*or* until... hours).
	Movement	
QRE	What is your estimated time of arrival at...(*or* over...) *(place)*?	My estimated time of arrival at... (*or* over...) *(place)* is... hours.
QRF	Are you returning to... *(place)*?	I am returning to... *(place)*. *or* Return to... *(place)*.
QSH	Are you able to home with your direction-finding equipment?	I am able to home with my direction-finding equipment (on... *(name and/or call sign)*).
QTI*	What is your TRUE course?	My TRUE course is... degrees.

Abbre-viation	Question	Answer or Advice
	Movement (cont.)	
QTJ*	What is your speed? *(Requests the speed of a ship or aircraft through the water or air respectively.)*	My speed is... knots (*or*... kilometres per hour *or*... statute miles per hour). *(Indicates the speed of a ship or aircraft through the water or air respectively.)*
QTK*	What is the speed of your aircraft in relation to the surface of the earth?	The speed of my aircraft in relation to the surface of the earth is... knots (*or*... kilometres per hour *or*... statute miles per hour).
QTL*	What is your TRUE heading?	My TRUE heading is... degrees.
QTM*	What is your MAGNETIC heading?	My MAGNETIC heading is... degrees.
QTN	At what time did you depart from ... *(place)*?	I departed from... *(place)* at... hours.
QTO	Have you left dock (*or* port)? *or* Are you airborne?	I have left dock (*or* port). *or* I am airborne.
QTP	Are you going to enter dock (*or* port)? *or* Are you going to alight (*or* land)?	I am going to enter dock (*or* port). *or* I am going to alight (*or* land).
QUN	1. *When directed to all stations:* Will vessels in my immediate vicinity... *or* (in the vicinity of... latitude... longitude) *or* (in the vicinity of...) please indicate their position, TRUE course and speed? 2. *When directed to a single station:* Please indicate your position, TRUE course and speed?	My position, TRUE course and speed are...

Abbre-viation	Question	Answer or Advice
	Meteorology	
QUB*	Can you give me in the following order information concerning: the direction in degrees TRUE and speed of the surface wind; visibility; present weather; and amount, type and height of base of cloud above surface elevation at... *(place of observation)*?	Here is the information requested: ... *(The units used for speed and distances should be indicated).*
QUH*	Will you give me the present barometric pressure at sea level?	The present barometric pressure at sea level is... *(units).*
QUX	Do you have any navigational warnings or gale warnings in force?	I have the following navigational warning(s) or gale warning(s) in force:
	Radio Direction-Finding	
QTE	What is my TRUE bearing from you?	Your TRUE bearing from me is... degrees at... hours.
	or	*or*
	What is my TRUE bearing from... *(name and/or call sign)*?	Your TRUE bearing from... *(name and/or call sign)* was... degrees at... hours.
	or	*or*
	What is the TRUE bearing of. . *(name and/or call sign)* from... *(name and/or call sign)*?	The TRUE bearing of... *(name and/or call sign)* from... *(name and/or call sign)* was... degrees at... hours.
QTF	Will you give me my position according to the bearings taken by the direction-finding stations which you control?	Your position according to the bearings taken by the direction-finding stations which I control was... latitude... longitude *(or other indication of position)*, class... at... hours.

Abbre-viation	Question	Answer or Advice
	Radio Direction-Finding (cont.)	
QTG	Will you send two dashes of ten seconds each (*or* carrier) followed by your call sign (*or* name) (repeated... times) (on . kHz (*or* MHz))? *or*	I am going to send two dashes of ten seconds each (*or* carrier) followed by my call sign (*or* name) (repeated... times) (on... kHz (*or* MHz)). *or*
	Will you request... *(name and/or call sign)* to send two dashes of ten seconds each (*or* carrier) followed by his call sign (and/*or* name) (repeated... times) on... kHz (*or* MHz)?	I have requested... *(name and/or call sign)* to send two dashes of ten seconds each (*or* carrier) followed by his call sign (and/*or* name) (repeated... times) on... kHz (*or* MHz).
	Suspension of Work	
QRT	Shall I stop sending?	Stop sending.
QUM	May I resume normal working?	Normal working may be resumed.
QUZ	May I resume restricted working?	Distress phase still in force, restricted working may be resumed.
	Safety	
QOE	Have you received the safety signal sent by... *(name and/or call sign)*?	I have received the safety signal sent by... *(name and/or call sign)*.
QUX	Do you have any navigational warnings or gale warnings in force?	I have the following navigational warning(s) or gale warning(s) in force:
	Urgency	
QUD	Have you received the urgency signal sent by... *(name and/or call sign)*?	I have received the urgency signal sent by... *(name and/or call sign)* at... hours.

Abbre-viation	Question	Answer or Advice
	Distress	
QOJ	Will you listen on... kHz (*or* MHz) for signals of emergency position-indicating radiobeacons?	I am listening on... kHz (*or* MHz) for signals of emergency position-indicating radiobeacons.
QOK	Have you received the signals of an emergency position-indicating radiobeacon on... kHz (*or* MHz)?	I have received the signals of an emergency position-indicating radiobeacon on... kHz (*or* MHz)
QUF	Have you received the distress signal sent by... *(name and/or call sign)*?	I have received the distress signal sent by... *(name and/or call sign)* at... hours.
QUM	May I resume normal working?	Normal working may be resumed.
QUZ	May I resume restricted working?	Distress phase still in force, restricted working may be resumed.
	Search and Rescue	
QSE*	What is the estimated drift of the survival craft?	The estimated drift of the survival craft is... *(figures and units)*.
QSF*	Have you effected rescue?	I have effected rescue and am proceeding to... base (with... persons injured requiring ambulance).
QTD*	What has the rescue vessel or rescue aircraft recovered?	... *(identification)* has recovered... 1. ... *(number)* survivors 2. wreckage 3. ... *(number)* bodies.
QTW*	What is the condition of survivors?	Survivors are in... condition and urgently need...
QTY*	Are you proceeding to the position of incident and if so when do you expect to arrive?	I am proceeding to the position of incident and expect to arrive at... hours (on... *date*).

Abbre-viation	Question	Answer or Advice
	Search and Rescue (cont.)	
QTZ*	Are you continuing the search?	I am continuing the search for... (aircraft, ship, survival craft, survivors or wreckage).
QUN	1. *When directed to all stations:* Will vessels in my immediate vicinity... *or* (in the vicinity of... latitude... longitude) *or* (in the vicinity of...) please indicate their position, TRUE course and speed? 2. *When directed to a single station:* Please indicate your position, TRUE course and speed?	My position, TRUE course and speed are...
QUO*	Shall I search for... 1. aircraft 2. ship 3. survival craft in the vicinity of... latitude... longitude *(or according to any other indication)*?	Please search for... 1. aircraft 2. ship 3. survival craft in the vicinity of... latitude... longitude *(or according to any other indication)*.
QUP*	Will you indicate your position by... 1. searchlight 2. black smoke trail 3. pyrotechnic lights?	My position is indicated by... 1. searchlight 2. black smoke trail 3. pyrotechnic lights.
QUR*	Have survivors... 1. received survival equipment 2. been picked up by rescue vessel 3. been reached by ground rescue party?	Survivors... 1. are in possession of survival equipment dropped by... 2. have been picked up by rescue vessel 3. have been reached by ground rescue party.

Abbre-viation	Question	Answer or Advice
	Search and Rescue (cont.)	
QUS*	Have you sighted survivors or wreckage? If so, in what position?	Have sighted... 1. survivors in water 2. survivors on rafts 3. wreckage in position... latitude... longitude *(or according to any other indication)*.
QUT*	Is position of incident marked?	Position of incident is marked by... 1. flame or smoke float 2. sea marker 3. sea marker dye 4. ... *(specify other marking)*.
QUU*	Shall I home ship or aircraft to my position?	Home ship or aircraft... *(name and/or call sign)*... 1. to your position by sending your call sign and long dashes on... kHz (*or* MHz) 2. by sending on... kHz (*or* MHz) TRUE track to reach you.
QUW*	Are you in the search area designated as... *(designator or latitude and longitude)*?	I am in the... *(designation)* search area.
QUY*	Is position of survival craft marked?	Position of survival craft was marked at... hours by... 1. flame or smoke float 2. sea marker 3. sea marker dye 4. ... *(specify other marking)*.
QUZ	May I resume restricted working?	Distress phase still in force, restricted working may be resumed.
	Identification	
QTT		The identification signal which follows is superimposed on another transmission.

SECTION II. MISCELLANEOUS ABBREVIATIONS AND SIGNALS

Abbreviation or Signal	Definition
AA	All after... *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition).*
AB	All before... *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition).*
ADS	Address *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition).*
$\overline{\text{AR}}$	End of transmission.
$\overline{\text{AS}}$	Waiting period.
BK	Signal used to interrupt a transmission in progress.
BN	All between... and... *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition).*
BQ	A reply to an RQ.
$\overline{\text{BT}}$	Signal to mark the separation between different parts of the same transmission.
C	Yes *or* "The significance of the previous group should be read in the affirmative".
CFM	Confirm (*or* I confirm).
CL	I am closing my station.
COL	Collate (*or* I collate).
CORREC-TION	Cancel my last word *or* group. The correct word *or* group follows *(used in radiotelephony, spoken as KOR-REK-SHUN).*

Note When used in radiotelegraphy a bar over the letters composing a signal denotes that the letters are to be sent as one signal.

Abbreviation or Signal	Definition
CP	General call to two or more specified stations *(see Article 31)*.
CQ	General call to all stations.
CS	Call sign *(used to request a call sign)*.
DE	"from..." *(used to precede the name or other identification of the calling station)*.
DF	Your bearing at... hours was... degrees, in the doubtful sector of this station, with a possible error of... degrees.
DO	Bearing doubtful. Ask for another bearing later (*or* at... hours).
E	East (Cardinal point) *(see No.* **1400***)*.
ETA	Estimated time of arrival.
INTERCO	International Code of Signals groups follow *(used in radiotelephony, spoken as IN-TER-CO)*.
K	Invitation to transmit.
$\overline{\text{KA}}$	Starting signal.
KTS	Nautical miles per hour *(Knots)*.
MIN	Minute (*or* Minutes).
MSG	Prefix indicating a message to or from the master of a ship concerning its operation or navigation.
N	North (Cardinal point) *(see No.* **1400***)*.
NIL	I have nothing to send to you.
NO	No *(Negative)*.
NW	Now.
NX	Notice to Mariners (*or* Notice to Mariners follows).
OK	We agree (*or* It is correct).
OL	Ocean Letter.
P	Prefix indicating a private radiotelegram.
PBL	Preamble *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition)*.
PSE	Please.
R	Received.
REF	Reference to... (*or* Refer to...).
RPT	Repeat (*or* I repeat) (*or* Repeat...)

Abbreviation or Signal	Definition
RQ	Indication of a request.
S	South (Cardinal point) *(see No.* **1400***)*.
SIG	Signature *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition)*.
SLT	Radiomaritime Letter.
SVC	Prefix indicating a service telegram.
SYS	Refer to your service telegram.
TFC	Traffic.
TR	Used by a land station to request the position and next port of call of a mobile station *(see Nos.* **1083** *and* **1314***)*; used also as a prefix to the reply.
TU	Thank you.
TXT	Text *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition)*.
$\overline{\text{VA}}$	End of work.
W	West (Cardinal point) *(see No.* **1400***)*.
WA	Word after. . *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition)*.
WB	Word before... *(used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition)*.
WD	Word(s) *or* Group(s).
WX	Weather report (*or* Weather report follows).
XQ	Prefix used to indicate the transmission of a service note.
YZ	The words which follow are in plain language.

APPENDIX 14

SINPO and SINPFEMO Codes

(See C.C.I.R. Recommendation No. 251)

SINPO signal reporting code

Rating scale	S	I	N	P	O
	Signal strength	Degrading effect of			Overall rating
		Interference	Noise	Propagation disturbance	
5	Excellent	Nil	Nil	Nil	Excellent
4	Good	Slight	Slight	Slight	Good
3	Fair	Moderate	Moderate	Moderate	Fair
2	Poor	Severe	Severe	Severe	Poor
1	Barely audible	Extreme	Extreme	Extreme	Unusable

SINPFEMO signal reporting code

Rating scale	S	I	N	P	F	E	M	O
	Signal strength	Degrading effect of			Frequency of fading	Modulation		Overall rating
		Interference	Noise	Propagation disturbance		Quality	Depth	
5	Excellent	Nil	Nil	Nil	Nil	Excellent	Maximum	Excellent
4	Good	Slight	Slight	Slight	Slow	Good	Good	Good
3	Fair	Moderate	Moderate	Moderate	Moderate	Fair	Fair	Fair
2	Poor	Severe	Severe	Severe	Fast	Poor	Poor or Nil	Poor
1	Barely audible	Extreme	Extreme	Extreme	Very fast	Very poor	Continuously overmodulated	Unusable

Special remarks :

a) A signal report shall consist of the code word SINPO or SINPFEMO followed by a group of five or eight numerals, rating, respectively, the five or eight characteristics of the particular signal code.

b) The letter X shall be used instead of a numeral for characteristics not rated.

c) Although the code word SINPFEMO is intended for radiotelephony, it may be used for radiotelegraphy.

d) The overall rating for radiotelegraphy shall be as indicated in Tables I and II, below.

TABLE I

Overall rating	Mechanized Operations
5. Excellent	4-channel time-division multiplex
4. Good	2-channel time-division multiplex
3. Fair	Marginal single start-stop printer
2. Poor	BK's, XQ's and call signs readable
1. Unusable	Unreadable

TABLE II

Overall rating	Morse Operation
5. Excellent	High speed
4. Good	100 wpm
3. Fair	50 wpm
2. Poor	BK's, XQ's and call signs readable
1. Unusable	Unreadable

e) The overall rating for telephony shall be as indicated in Table III.

TABLE III

Overall rating	Operating condition	Quality
5. Excellent	Signal quality unaffected	Commercial
4. Good	Signal quality slightly affected	
3. Fair	Signal quality seriously affected. Channel usable by operators or by experienced subscribers	Marginally commercial
2. Poor	Channel just usable by operators	Not commercial
1. Unusable	Channel unusable by operators	

APPENDIX 15*)

Mar

Table of Frequencies to be used by Ship Radiotelegraph Stations in the Bands Between 4 and 27·5 MHz Allocated Exclusively to the Maritime Mobile Service

(See Article 32)

In the Table:

a) the assignable frequencies in a given band for each usage are:

— indicated by the lowest and highest frequency, in heavy type, assigned in that band;

— regularly spaced, the number of assignable frequencies and the spacing in kHz, being indicated in italics;

b) the vertical arrows indicate the harmonic relationship between the frequencies assigned in the different bands.

---

*) *Note by the General Secretariat:* The provisions of this Appendix will continue to apply until the provisions of Appendix 15 Mar2 concerning radiotelegraphy begin gradually to come into force, i.e., until 16 July 1977 at the latest (see Resolution No. Mar2 – 2).

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

Frequencies Assignable to Ship Radiotelegraph Stations Using the Maritime Mobile Service Bands between 4 and 27·5 MHz

(kHz)

Bands MHz	Limits	Assignable frequencies for wide-band telegraphy, facsimile and special transmission systems	Limits	Oceanographic data transmission *a)*	Limits	Assignable frequencies for narrow-band direct-printing telegraph and data transmission systems	Limits	Assignable working frequencies for high traffic ships *b)*	Limits	Calling frequencies *d)*	Limits	Assignable working frequencies for low traffic ships		Limits
												GROUP A	GROUP B	
4	**4 142·5**	**4 144·5- - - 4 160·5** *5 frequencies spaced 4*	**4 162·5**	**4 162·9- - - 4 165·6** *10 frequencies spaced 0·3*	**4 166**	**4 166·5- - - 4 172** *12 frequencies spaced 0·5*	**4 172·25**	**4 172·5 - - 4 177·5** *11 frequencies spaced 0·5*	**4 178**	**4 178·5- - - 4 186·5** *17 frequencies spaced 0·5*	**4 187**	**4 187·5 - - 4 208** *84 frequencies spaced 0·5*	**4 208·5- - 4 229**	**4 231**
6	**6 216·5**	**6 218·5- - - 6 242·5** *7 frequencies spaced 4*	**6 244·5**	**6 244·9- - - 6 247·6** *10 frequencies spaced 0·3*	**6 248**	**6 248·5- - - 6 258** *20 frequencies spaced 0·5*	**6 258·25**	**6 258·75- - 6 266·25** *11 frequencies spaced 0·75*	**6 267**	**6 267·75- -6 279·75** *17 frequencies spaced 0·75*	**6 280·5**	**6 281·25- - 6 312** *84 frequencies spaced 0·75*	**6 312·75- - 6 343·5**	**6 345·5**
8	**8 288**	**8 290 - - - 8 326** *10 frequencies spaced 4*	**8 328**	**8 328·4- - - 8 331·1** *10 frequencies spaced 0·3*	**8 331·5**	**8 332 - - - 8 341·5** *20 frequencies spaced 0·5*	**8 341·75**	**8 342- - 8 345 - - 8 355** *14 frequencies spaced 1*	**8 356**	**8 357- -** *c)* **- - 8 373** *17 frequencies spaced 1*	**8 374**	**8 375 - - 8 416** *84 frequencies spaced 1*	**8 417 - - 8 458**	**8 459·5**
12	**12 431·5**	**12 433·5- - -12 477·5** *12 frequencies spaced 4*	**12 479·5**	**12 479·9- - -12 482·6** *10 frequencies spaced 0·3*	**12 483**	**12 484- - -12 503** *20 frequencies spaced 1*	**12 503·25**	**12 504- -12 513- -12 517·5 - -12 532·5** *20 frequencies spaced 1·5*	**12 534**	**12 535·5 - - -12 559·5** *17 frequencies spaced 1·5*	**12 561**	**12 562·5 - -12 624** *84 frequencies spaced 1·5*	**12 625·5 - -12 687**	**12 689**
16	**16 576**	**16 578 - - -16 634** *15 frequencies spaced 4*	**16 636·5**	**16 636·9- - -16 639·6** *10 frequencies spaced 0·3*	**16 640**	**16 641 - - -16 660** *20 frequencies spaced 1*	**16 660·5**	**16 662- -16 672- -16 684- -16 690 - -16 710** *25 frequencies spaced 2*	**16 712**	**16 714 - - -16 746** *17 frequencies spaced 2*	**16 748**	**16 750 - -16 832** *84 frequencies spaced 2*	**16 834 - -16 916**	**16 917·5**
22	**22 112**	**22 114 - - -22 158** *12 frequencies spaced 4*	**22 160·5**	**22 160·9- - -22 163·6** *10 frequencies spaced 0·3*	**22 164**	**22 165 - - -22 184** *20 frequencies spaced 1*	**22 184·5**	**22 187- -22 221** *18 frequencies spaced 2*	**22 222·5**	**22 225 - - -22 265** *17 frequencies spaced 2·5*	**22 267·5**	**22 270 - -22 320** *41 frequencies spaced 2·5*	**22 322·5 - -22 370**	**22 374**

Assignable Frequencies to Ships of all Categories

	Limit	Calling frequencies	Limit	Working frequencies	Limit
25	**25 070**	**25 073·5 - 25 081** *6 frequencies spaced 1·5*	**25 082·5**	**25 084 - 25 106·5** *16 frequencies spaced 1·5*	**25 110**

---

a) The frequency bands may also be used by buoy stations for oceanographic data transmission and by stations interrogating these buoys, in accordance with the conditions set forth in Resolution No. Mar 20.

b) Manual or automatic A1 Morse telegraphy at speeds not exceeding 40 bauds.

c) For the conditions of use of 8 364 kHz, see No. **1179.**

d) The frequencies 4 186·5, 6 279·75, 8 373, 12 559·5, 16 746 and 22 262·5 kHz may also be assigned as special calling frequencies. Administrations should, if possible, abstain from assigning these frequencies as normal calling frequencies (See Nos. **1013E** and **1013E.1**).

APPENDIX 15 Mar2*)

Mar Mar2

Table of Frequencies to be used in the Bands between 4 and 27·5 MHz allocated exclusively to the Maritime Mobile Service

(see Articles 32 and 35)

In the table, where appropriate, the assignable frequencies in a given band for each usage are:

- indicated by the lowest and highest frequency, in heavy type, assigned in that band;
- regularly spaced, the number of assignable frequencies and the spacing in kHz being indicated in italics.

---

*) *Note by the General Secretariat:* The provisions of this Appendix will be implemented according to the time schedule given in Annexes 1 and 2 to Resolution No. Mar2 – 2, the last stage of which is fixed for 1 January 1978.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

Table of Frequencies to be used in the Bands between 4 and 23 MHz allocated exclusively to the Maritime Mobile Service

(kHz)

Bands (MHz)	Limits	Frequencies assignable to ship stations for telephony, duplex operation	Limits	Frequencies assignable to ship and coast stations for telephony, simplex operation	Limits	Frequencies (non-paired) assignable to ship stations for narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds	Limits	Frequencies assignable to ship stations for wide-band telegraphy, facsimile and special transmission systems	Limits	Frequencies assignable to ship stations for oceanographic data transmission	Limits	Frequencies assignable to ship stations for wide-band telegraphy, facsimile and special transmission systems	Limits	Frequencies (paired) assignable to ship stations for narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds	Limits	Frequencies (non-paired) assignable to ship stations for narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds	Limits
		*a)**		*a)*		*b)*				*c)*				*d)*		*b)*	
4	4 063	**4 064·4 - - - 4 141·9** *26 frequencies spaced 3·1*	4 143·6	**4 145** *1 frequency*	4 146·6		4 146·6	**4 148·6 - - - 4 160·6** *4 frequencies spaced 4*	4 162·5	**4 162·9 - - - 4 165·6** *10 frequencies spaced 0·3*	4 166	**4 168** *1 frequency*	4 170	**4 170·5 - - - 4 177** *14 frequencies spaced 0·5*	4 177·25	**4 177·5 - - - 4 179·5** *5 frequencies spaced 0·5*	4 179·75
6	6 200	**6 201·4 - - - 6 216·9** *6 frequencies spaced 3·1*	6 218·6	**6 220** and **6 223** *2 frequencies spaced 3*	6 224·6		6 224·6	**6 226·6 - - - 6 242·6** *5 frequencies spaced 4*	6 244·5	**6 244·9 - - - 6 247·6** *10 frequencies spaced 0·3*	6 248	**6 250 and 6 254** *2 frequencies spaced 4*	6 256	**6 256·5 - - - 6 267·5** *23 frequencies spaced 0·5*	6 267·75	**6 268 - - - 6 269·5** *4 frequencies spaced 0·5*	6 269·75
8	8 195	**8 196·4 - - - 8 289·4** *31 frequencies spaced 3·1*	8 291·1	**8 292·5** and **8 295·6** *2 frequencies spaced 3.1*	8 297·3	**8 297·6 - - - 8 299·6** *5 frequencies spaced 0·5*	8 300	**8 302 - - - 8 326** *7 frequencies spaced 4*	8 328	**8 328·4 - - - 8 331·1** *10 frequencies spaced 0·3*	8 331·5	**8 333·5 - - - 8 341·5** *3 frequencies spaced 4*	8 343·5	**8 344 - - - 8 357** *27 frequencies spaced 0·5*	8 357·25	**8 357·5** *1 frequency*	8 357·75
12	12 330	**12 331·4 - - - 12 427·5** *32 frequencies spaced 3·1*	12 429·2	**12 430·6 - - - 12 436·8** *3 frequencies spaced 3·1*	12 439·5		12 439·5	**12 441·5 - - - 12 477·5** *10 frequencies spaced 4*	12 479·5	**12 479·9 - - - 12 482·6** *10 frequencies spaced 0·3*	12 483	**12 485** and **12 489** *2 frequencies spaced 4*	12 491	**12 491·5 - - - 12 519·5** *57 frequencies spaced 0·5*	12 519·75	**12 520 - - - 12 526·5** *14 frequencies spaced 0·5*	12 526·75
16	16 460	**16 461·4 - - - 16 585·4** *41 frequencies spaced 3·1*	16 587·1	**16 588·5 - - - 16 594·7** *3 frequencies spaced 3·1*	16 596·4		16 596·4	**16 598·4 - - - 16 634·4** *10 frequencies spaced 4*	16 636·5	**16 636·9 - - - 16 639·6** *10 frequencies spaced 0·3*	16 640	**16 642 - - - 16 658** *5 frequencies spaced 4*	16 660	**16 660·5 - - - 16 694·5** *69 frequencies spaced 0·5*	16 694·75	**16 695 - - - 16 705·5** *22 frequencies spaced 0·5*	16 705·8
22	22 000	**22 001·4 - - - 22 122·3** *40 frequencies spaced 3·1*	22 124	**22 125·4 - - - 22 137·8** *5 frequencies spaced 3·1*	22 139·5		22 139·5	**22 142 - - - 22 158** *5 frequencies spaced 4*	22 160·5	**22 160·9 - - - 22 163·6** *10 frequencies spaced 0·3*	22 164	**22 166 - - - 22 190** *7 frequencies spaced 4*	22 192	**22 192·5 - - - 22 225·5** *67 frequencies spaced 0·5*	22 225·75	**22 226** and **22 226·5** *2 frequencies spaced 0·5*	22 227

* For notes *a)* to *h)*, see page AP15Mar2-7.

(continued)

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

Table of Frequencies to be used in the Bands between 4 and 23 MHz allocated exclusively to the Maritime Mobile Service

(kHz)
(concluded)

Bands (MHz)	Limits	Working frequencies assignable to ship stations for A1 Morse telegraphy	Limits	Calling frequencies assignable to ship stations for A1 Morse telegraphy	Limits	Frequencies assignable to ship stations for digital selective calling	Limits	Working frequencies assignable to ship stations for A1 Morse telegraphy	Limits	Frequencies assignable to coast stations for wide-band and A1 Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems	Limits	Frequencies (paired) assignable to coast stations, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds	Limits	Frequencies assignable to coast stations for digital selective calling	Limits	Frequencies assignable to coast stations for telephony, duplex operation	Limits
		e) *		*g) h)*				*e) f)*				*d)*				*a)*	
4	4 179·75		4 179·75		4 187·2	**4 187·6** *1 frequency*	4 188	**4 188·5 - - - 4 219** *62 frequencies spaced 0·5*	4 219·4		4 349·4	**4 350 - - - 4 356·5** *14 frequencies spaced 0·5*	4 356·75	**4 357** *1 frequency*	4 357·4	**4 358·8 - - - 4 436·3** *26 frequencies spaced 3·1*	4 438
6	6 269·75		6 269·75		6 280·8	**6 281·4** *1 frequency*	6 282	**6 282·75 - - - 6 324·75** *57 frequencies spaced 0·75*	6 325·4		6 493·9	**6 494·5 - - - 6 505·5** *23 frequencies spaced 0·5*	6 505·75	**6 506** *1 frequency*	6 506·4	**6 507·8 - - - 6 523·3** *6 frequencies spaced 3·1*	6 525
8	8 357·75	**8 358·5 - - - 8 359·5** *3 frequencies spaced 0·5*	8 359·75		8 374·4	**8 375·2** *1 frequency*	8 376	**8 377 - - - 8 435** *117 frequencies spaced 0·5*	8 435·4		8 704·4	**8 705 - - - 8 718** *27 frequencies spaced 0·5*	8 718·25	**8 718·5** *1 frequency*	8 718·9	**8 720·3 - - - 8 813·3** *31 frequencies spaced 3·1*	8 815
12	12 526·75	**12 528 - - - 12 538·5** *22 frequencies spaced 0·5*	12 539·6		12 561·6	**12 562·3** and **12 562·8** *2 frequencies spaced 0·5*	12 564	**12 565·5 - - - 12 651** *172 frequencies spaced 0·5*	12 652·3		13 070·8	**13 071·5 - - - 13 099·5** *57 frequencies spaced 0·5*	13 099·75	**13 100** and **13 100·5** *2 frequencies spaced 0·5*	13 100·8	**13 102·2 - - - 13 198·3** *32 frequencies spaced 3·1*	13 200
16	16 705·8	**16 707 - - - 16 719** *25 frequencies spaced 0·5*	16 719·8		16 748·8	**16 749·9** and **16 750·4** *2 frequencies spaced 0·5*	16 752	**16 754 - - - 16 858** *209 frequencies spaced 0·5*	16 859·4		17 196·9	**17 197·5 - - - 17 231·5** *69 frequencies spaced 0·5*	17 231·75	**17 232** and **17 232·5** *2 frequencies spaced 0·5*	17 232·9	**17 234·3 - - - 17 358·3** *41 frequencies spaced 3·1*	17 360
22	22 227		22 227		22 247	**22 248** and **22 248·5** *2 frequencies spaced 0·5*	22 250	**22 250·5 - - - 22 309** *118 frequencies spaced 0·5*	22 310·5		22 561	**22 561·5 - - - 22 594·5** *67 frequencies spaced 0·5*	22 594·75	**22 595** and **22 595·5** *2 frequencies spaced 0·5*	22 596	**22 597·4 - - - 22 718·3** *40 frequencies spaced 3·1*	22 720

* For notes *a)* to *h)*, see page AP15Mar2-7.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

Table of Frequencies assignable to Ship Stations in the 25 MHz Band

(kHz)

Limit	Calling frequencies assignable to ship stations for A1 Morse telegraphy	Limit	Frequencies (non-paired) assignable to ship stations for narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds	Limit	Working frequencies assignable to ship stations for A1 Morse telegraphy	Limit
	g)		*b)*		*e)*	
25 070		25 076	**25 076·3- - -25 089·8** *28 frequencies spaced 0·5*	25 090·1	**25 091·5- - -25 108·5** *35 frequencies spaced 0·5*	25 110

a) See Appendix 17 Rev.
b) See Appendix 15B.
c) The frequency bands may also be used by buoy stations for oceanographic data transmission and by stations interrogating these buoys, in accordance with the conditions set forth in Resolution No. Mar 20.
d) See Appendix 15A.
e) In the frequency bands to be used by ship stations for A1 Morse telegraphy working, at speeds not exceeding 40 bauds, administrations may assign additional frequencies interleaved between the extreme assignable frequencies. Any frequencies so assigned shall be multiples of 100 Hz. Administrations shall ensure a uniform distribution of such assignments within the bands and avoid, as far as possible, assigning the two frequencies at ±100 Hz from each of the harmonically related frequencies indicated in the first line of each series in Appendix 15D.
f) See Appendix 15D.
g) See Appendix 15C.
h) For the conditions of use of 8 364 kHz, see No. **1179**.

APPENDIX 15A*)

Mar2

Channelling of the Maritime Mobile Bands between 4 000 and 23 000 kHz used for Narrow-Band Direct-Printing Telegraphy and Data Systems (Frequencies Paired)

(see Article 32 and Resolution No. Mar2 – 7)

Each coast station which uses paired frequencies is assigned one or more frequency pairs from the following series; each pair consists of a transmitting and a receiving frequency.

*) *Note by the General Secretariat:* The provisions of this Appendix will apply only as from 1 June 1977 (see Resolution No. Mar2 – 2).

Table of Frequencies for Two-Frequency Operation by Coast Stations
(kHz)

Series No.	4 MHz Band		6 MHz Band		8 MHz Band	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
1	4 350	4 170·5	6 494·5	6 256·5	8 705	8 344
2	4 350·5	4 171	6 495	6 257	8 705·5	8 344·5
3	4 351	4 171·5	6 495·5	6 257·5	8 706	8 345
4	4 351·5	4 172	6 496	6 258	8 706·5	8 345·5
5	4 352	4 172·5	6 496·5	6 258·5	8 707	8 346
6	4 352·5	4 173	6 497	6 259	8 707·5	8 346·5
7	4 353	4 173·5	6 497·5	6 259·5	8 708	8 347
8	4 353·5	4 174	6 498	6 260	8 708·5	8 347·5
9	4 354	4 174·5	6 498·5	6 260·5	8 709	8 348
10	4 354·5	4 175	6 499	6 261	8 709·5	8 348·5
11	4 355	4 175·5	6 499·5	6 261·5	8 710	8 349
12	4 355·5	4 176	6 500	6 262	8 710·5	8 349·5
13	4 356	4 176·5	6 500·5	6 262·5	8 711	8 350
14	4 356·5	4 177	6 501	6 263	8 711·5	8 350·5
15			6 501·5	6 263·5	8 712	8 351
16			6 502	6 264	8 712·5	8 351·5
17			6 502·5	6 264·5	8 713	8 352
18			6 503	6 265	8 713·5	8 352·5
19			6 503·5	6 265·5	8 714	8 353
20			6 504	6 266	8 714·5	8 353·5
21			6 504·5	6 266·5	8 715	8 354
22			6 505	6 267	8 715·5	8 354·5
23			6 505·5	6 267·5	8 716	8 355
24					8 716·5	8 355·5
25					8 717	8 356
26					8 717·5	8 356·5
27					8 718	8 357

Table of Frequencies for Two-Frequency Operation by Coast Stations
(kHz)

Series No.	12 MHz Band		16 MHz Band		22 MHz Band	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
1	13 071·5	12 491·5	17 197·5	16 660·5	22 561·5	22 192·5
2	13 072	12 492	17 198	16 661	22 562	22 193
3	13 072·5	12 492·5	17 198·5	16 661·5	22 562·5	22 193·5
4	13 073	12 493	17 199	16 662	22 563	22 194
5	13 073·5	12 493·5	17 199·5	16 662·5	22 563·5	22 194·5
6	13 074	12 494	17 200	16 663	22 564	22 195
7	13 074·5	12 494·5	17 200·5	16 663·5	22 564·5	22 195·5
8	13 075	12 495	17 201	16 664	22 565	22 196
9	13 075·5	12 495·5	17 201·5	16 664.5	22 565·5	22 196·5
10	13 076	12 496	17 202	16 665	22 566	22 197
11	13 076·5	12 496·5	17 202·5	16 665·5	22 566·5	22 197·5
12	13 077	12 497	17 203	16 666	22 567	22 198
13	13 077·5	12 497·5	17 203·5	16 666·5	22 567·5	22 198·5
14	13 078	12 498	17 204	16 667	22 568	22 199
15	13 078·5	12 498·5	17 204·5	16 667·5	22 568·5	22 199·5
16	13 079	12 499	17 205	16 668	22 569	22 200
17	13 079·5	12 499·5	17 205·5	16 668·5	22 569·5	22 200·5
18	13 080	12 500	17 206	16 669	22 570	22 201
19	13 080·5	12 500·5	17 206·5	16 669·5	22 570·5	22 201·5
20	13 081	12 501	17 207	16 670	22 571	22 202
21	13 081·5	12 501·5	17 207·5	16 670·5	22 571·5	22 202·5
22	13 082	12 502	17 208	16 671	22 572	22 203
23	13 082·5	12 502·5	17 208·5	16 671·5	22 572·5	22 203·5
24	13 083	12 503	17 209	16 672	22 573	22 204
25	13 083·5	12 503·5	17 209·5	16 672·5	22 573·5	22 204·5
26	13 084	12 504	17 210	16 673	22 574	22 205
27	13 084·5	12 504·5	17 210·5	16 673·5	22 574·5	22 205·5

(continued)

Table of Frequencies for Two-Frequency Operation by Coast Stations

(kHz)

(continued)

Series No.	12 MHz Band		16 MHz Band		22 MHz Band	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
28	13 085	12 505	17 211	16 674	22 575	22 206
29	13 085·5	12 505·5	17 211·5	16 674·5	22 575·5	22 206·5
30	13 086	12 506	17 212	16 675	22 576	22 207
31	13 086·5	12 506·5	17 212·5	16 675·5	22 576·5	22 207·5
32	13 087	12 507	17 213	16 676	22 577	22 208
33	13 087·5	12 507·5	17 213·5	16 676·5	22 577·5	22 208·5
34	13 088	12 508	17 214	16 677	22 578	22 209
35	13 088·5	12 508·5	17 214·5	16 677·5	22 578·5	22 209·5
36	13 089	12 509	17 215	16 678	22 579	22 210
37	13 089·5	12 509·5	17 215·5	16 678·5	22 579·5	22 210·5
38	13 090	12 510	17 216	16 679	22 580	22 211
39	13 090·5	12 510·5	17 216·5	16 679·5	22 580·5	22 211·5
40	13 091	12 511	17 217	16 680	22 581	22 212
41	13 091·5	12 511·5	17 217·5	16 680·5	22 581·5	22 212·5
42	13 092	12 512	17 218	16 681	22 582	22 213
43	13 092·5	12 512·5	17 218·5	16 681·5	22 582·5	22 213·5
44	13 093	12 513	17 219	16 682	22 583	22 214
45	13 093·5	12 513·5	17 219·5	16 682·5	22 583·5	22 214·5
46	13 094	12 514	17 220	16 683	22 584	22 215
47	13 094·5	12 514·5	17 220·5	16 683·5	22 584·5	22 215·5
48	13 095	12 515	17 221	16 684	22 585	22 216
49	13 095·5	12 515·5	17 221·5	16 684·5	22 585·5	22 216·5
50	13 096	12 516	17 222	16 685	22 586	22 217
51	13 096·5	12 516·5	17 222·5	16 685·5	22 586·5	22 217·5
52	13 097	12 517	17 223	16 686	22 587	22 218
53	13 097·5	12 517·5	17 223·5	16 686·5	22 587·5	22 218·5
54	13 098	12 518	17 224	16 687	22 588	22 219
55	13 098·5	12 518·5	17 224·5	16 687·5	22 588·5	22 219·5

Table of Frequencies for Two-Frequency Operation by Coast Stations

(kHz)

(concluded)

Series No.	12 MHz Band		16 MHz Band		22 MHz Band	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
56	13 099	12 519	17 225	16 688	22 589	22 220
57	13 099·5	12 519·5	17 225·5	16 688·5	22 589·5	22 220·5
58			17 226	16 689	22 590	22 221
59			17 226·5	16 689·5	22 590·5	22 221·5
60			17 227	16 690	22 591	22 222
61			17 227·5	16 690·5	22 591·5	22 222·5
62			17 228	16 691	22 592	22 223
63			17 228·5	16 691·5	22 592·5	22 223·5
64			17 229	16 692	22 593	22 224
65			17 229·5	16 692·5	22 593·5	22 224·5
66			17 230	16 693	22 594	22 225
67			17 230·5	16 693·5	22 594·5	22 225·5
68			17 231	16 694		
69			17 231·5	16 694·5		

APPENDIX 15B*)

Mar2

Channelling of the Maritime Mobile Bands between 4 000 and 27 500 kHz used for Narrow-Band Direct-Printing Telegraphy and Data Transmission (Non-Paired)

(see Article 32 and Resolution No. Mar2 – 8)

One or more frequencies are assigned
to each ship station as transmitting frequencies.

*) *Note by the General Secretariat:* The provisions of this Appendix will apply from 1 June 1977, except for those relating to the 8 MHz band, which may be applied only as from 16 July 1977, and those relating to the 25 MHz band, which may be applied as from 2 June 1976 (see Resolution No. Mar2 – 2).

Table of Ship Station Transmitting Frequencies

(kHz)

	Frequency Bands						
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	22 MHz	25 MHz
1	4 177·5	6 268	8 297·6	12 520	16 695	22 226	25 076·3
2	4 178	6 268·5	8 298·1	12 520·5	16 695·5	22 226·5	25 076·8
3	4 178·5	6 269	8 298·6	12 521	16 696		25 077·3
4	4 179	6 269·5	8 299·1	12 521·5	16 696·5		25 077·8
5	4 179·5		8 299·6	12 522	16 697		25 078·3
6			8 357·5	12 522·5	16 697·5		25 078·8
7				12 523	16 698		25 079·3
8				12 523·5	16 698·5		25 079·8
9				12 524	16 699		25 080·3
10				12 524·5	16 699·5		25 080·8
11				12 525	16 700		25 081·3
12				12 525·5	16 700·5		25 081·8
13				12 526	16 701		25 082·3
14				12 526·5	16 701·5		25 082·8
15					16 702		25 083·3
16					16 702·5		25 083·8
17					16 703		25 084·3
18					16 703·5		25 084·8
19					16 704		25 085·3
20					16 704·5		25 085·8
21					16 705		25 086·3
22					16 705·5		25 086·8
23							25 087·3
24							25 087·8
25							25 088·3
26							25 088·8
27							25 089·3
28							25 089·8

APPENDIX 15C*)

Mar2

Table of Calling Frequencies assignable to Ship Stations for A1 Morse Telegraphy at Speeds not exceeding 40 Bauds

(see Article 32 and Resolution No. Mar2 – 5)

(kHz)

Group	Channel series	4 MHz Band (Ch. width 0·4) *a)*	6 MHz Band (Ch. width 0·6) *a)*	8 MHz Band (Ch. width 0·8) *a)*	12 MHz Band (Ch width 1·2) *a)*	16 MHz Band (Ch. width 1·6) *a)*	Channel series (22 MHz)	22 MHz Band (Ch. width 2·0) *b)*	25 MHz Band (Ch. width 2·0) *b)*
I	1	4 180 - 4 180·4	6 270 - 6 270·6	8 360 - 8 360·8	12 540 - 12 541·2	16 720 - 16 721·6			Channel A
	2	4 180·4 - 4 180·8	6 270·6 - 6 271·2	8 360·8 - 8 361·6	12 541·2 - 12 542·4	16 721·6 - 16 723·2	1	22 227 - 22 229	
	3	4 180·8 - 4 181·2	6 271·2 - 6 271·8	8 361·6 - 8 362·4	12 542·4 - 12 543·6	16 723·2 - 16 724·8	2	22 229 - 22 231	25 070 - 25 072
	4	4 181·2 - 4 181·6	6 271·8 - 6 272·4	8 362·4 - 8 363·2	12 543·6 - 12 544·8	16 724·8 - 16 726·4			Groups I and II
Common Ch.	5	4 181·6 - 4 182	6 272·4 - 6 273	8 363·2 - 8 364	12 544·8 - 12 546	16 726·4 - 16 728	3	22 231 - 22 233	Common Channel C
Common Ch.	6	4 182 - 4 182·4	6 273 - 6 273·6	8 364 - 8 364·8	12 546 - 12 547·2	16 728 - 16 729·6	4	22 233 - 22 235	25 072 - 25 074
II	7	4 182·4 - 4 182·8	6 273·6 - 6 274·2	8 364·8 - 8 365·6	12 547·2 - 12 548·4	16 729·6 - 16 731·2			Channel A
	8	4 182·8 - 4 183·2	6 274·2 - 6 274·8	8 365·6 - 8 366·4	12 548·4 - 12 549·6	16 731·2 - 16 732·8	5	22 235 - 22 237	
	9	4 183·2 - 4 183·6	6 274·8 - 6 275·4	8 366·4 - 8 367·2	12 549·6 - 12 550·8	16 732·8 - 16 734·4	6	22 237 - 22 239	25 070 - 25 072
	10	4 183·6 - 4 184	6 275·4 - 6 276	8 367·2 - 8 368	12 550·8 - 12 552	16 734·4 - 16 736			Groups I and II
III	11	4 184 - 4 184·4	6 276 - 6 276·6	8 368 - 8 368·8	12 552 - 12 553·2	16 736 - 16 737·6			
	12	4 184·4 - 4 184·8	6 276·6 - 6 277·2	8 368·8 - 8 369·6	12 553·2 - 12 554·4	16 737·6 - 16 739·2	7	22 239 - 22 241	
	13	4 184·8 - 4 185·2	6 277·2 - 6 277·8	8 369·6 - 8 370·4	12 554·4 - 12 555·6	16 739·2 - 16 740·8	8	22 241 - 22 243	Channel B
	14	4 185·2 - 4 185·6	6 277·8 - 6 278·4	8 370·4 - 8 371·2	12 555·6 - 12 556·8	16 740·8 - 16 742·4			
IV	15	4 185·6 - 4 186	6 278·4 - 6 279	8 371·2 - 8 372	12 556·8 - 12 558	16 742·4 - 16 744			25 074 - 25 076
	16	4 186 - 4 186·4	6 279 - 6 279·6	8 372 - 8 372·8	12 558 - 12 559·2	16 744 - 16 745·6	9	22 243 - 22 245	Groups III and IV
	17	4 186·4 - 4 186·8	6 279·6 - 6 280·2	8 372·8 - 8 373·6	12 559·2 - 12 560·4	16 745·6 - 16 747·2	10	22 245 - 22 247	
	18	4 186·8 - 4 187·2	6 280·2 - 6 280·8	8 373·6 - 8 374·4	12 560·4 - 12 561·6	16 747·2 - 16 748·8			

*) *Note by the General Secretariat:* The provisions of this Appendix may begin to be applied as from 2 June 1976. They are to be fully applied as from 1 June 1977 in accordance with Resolution No. Mar2 – 2.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

a) Administrations should assign the centre frequency within each channel of the appropriate group and/or common channel to ship stations equipped only with crystal-controlled oscillators and using harmonic relationships for A1 Morse telegraphy calling. However, administrations may subdivide each appropriate group channel and common channels into specific calling frequencies commencing 100 Hz from the lower end of the channel and ending 100 Hz from the upper end (see examples below) and assign these discrete frequencies to ships with synthesized transmitters. Administrations shall avoid, as far as possible, assigning the two frequencies at ± 100 Hz from each of the harmonically related centre frequencies in this Appendix.

Examples of subdivision of channels (centre frequencies in italics)

4/1/a	4 180·1	6/1/a	6 270·1	8/1/a	8 360·1	12/1/a	12 540·1	16/1/a	16 720·1
4/1/b	*4 180·2*	6/1/b	6 270·2	8/1/b	8 360·2	12/1/b	12 540·2	16/1/b	16 720·2
4/1/c	4 180·3	6/1/c	*6 270·3*	8/1/c	8 360·3	12/1/c	12 540·3	16/1/c	16 720·3
		6/1/d	6 270·4	8/1/d	*8 360·4*	12/1/d	12 540·4	16/1/d	16 720·4
		6/1/e	6 270·5	8/1/e	8 360·5	12/1/e	12 540·5	16/1/e	16 720·5
				8/1/f	8 360·6	12/1/f	*12 540·6*	16/1/f	16 720·6
				8/1/g	8 360·7	12/1/g	12 540·7	16/1/g	16 720·7
						12/1/h	12 540·8	16/1/h	*16 720·8*
						12/1/i	12 540·9	16/1/i	16 720·9
						12/1/j	12 541·0	16/1/j	16 721·0
						12/1/k	12 541·1	16/1/k	16 721·1
								16/1/l	16 721·2
								16/1/m	16 721·3
								16/1/n	16 721·4
								16/1/o	16 721·5

b) In 22 MHz and 25 MHz bands the channels are not harmonically related to those in the 4 to 16 MHz bands. However, the principle of subdivision of channels into specific calling frequencies commencing 100 Hz from the lower end of the channel and ending 100 Hz from the upper end applies.

APPENDIX 15D*)

Mar2

Table of Working Frequencies, in kHz, assignable to Ship Stations for A1 Morse Telegraphy at Speeds not exceeding 40 Bauds

(see also Note *e)* to Appendix 15Mar2)

Note: The first line in each series up to and including series No. 53 indicates the harmonically related assignable frequencies in the 4, 6, 8, 12 and 16 MHz bands. The other frequencies are not necessarily harmonically related.

---

*) *Note by the General Secretariat:* The provisions of this Appendix will become fully applicable as from 1 June 1976 (see Resolution No. Mar2 – 2).

(kHz)

Series No.	Bands				
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz
1.	4 188·5	6 282·75	8 377	12 565·5	16 754
a)				12 566	16 754·5
b)			8 377·5		16 755
c)				12 566·5	16 755·5
2.	4 189	6 283·5	8 378	12 567	16 756
a)				12 567·5	16 756·5
b)			8 378·5		16 757
c)				12 568	16 757·5
3.	4 189·5	6 284·25	8 379	12 568·5	16 758
a)				12 569	16 758·5
b)			8 379·5		16 759
c)				12 569·5	16 759·5
4.	4 190	6 285	8 380	12 570	16 760
a)				12 570·5	16 760·5
b)			8 380·5		16 761
c)				12 571	16 761·5
5.	4 190·5	6 285·75	8 381	12 571·5	16 762
a)				12 572	16 762·5
b)			8 381·5		16 763
c)				12 572·5	16 763·5
6.	4 191	6 286·5	8 382	12 573	16 764
a)				12 573·5	16 764·5
b)			8 382·5		16 765
c)				12 574	16 765·5
7.	4 191·5	6 287·25	8 383	12 574·5	16 766
a)				12 575	16 766·5
b)			8 383·5		16 767
c)				12 575·5	16 767·5
8.	4 192	6 288	8 384	12 576	16 768
a)				12 576·5	16 768·5
b)			8 384·5		16 769
c)				12 577	16 769·5
9.	4 192·5	6 288·75	8 385	12 577·5	16 770
a)				12 578	16 770·5
b)			8 385·5		16 771
c)				12 578·5	16 771·5
10.	4 193	6 289·5	8 386	12 579	16 772
a)				12 579·5	16 772·5
b)			8 386·5		16 773
c)				12 580	16 773·5

(kHz)

Series No.	Bands				
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz
11.	4 193·5	6 290·25	8 387	12 580·5	16 774
a)				12 581	16 774·5
b)			8 387·5		16 775
c)				12 581·5	16 775·5
12.	4 194	6 291	8 388	12 582	16 776
a)				12 582·5	16 776·5
b)			8 388·5		16 777
c)				12 583	16 777·5
13.	4 194·5	6 291·75	8 389	12 583·5	16 778
a)				12 584	16 778·5
b)			8 389·5		16 779
c)				12 584·5	16 779·5
14.	4 195	6 292·5	8 390	12 585	16 780
a)				12 585·5	16 780·5
b)			8 390·5		16 781
c)				12 586	16 781·5
15.	4 195·5	6 293·25	8 391	12 586·5	16 782
a)				12 587	16 782·5
b)			8 391·5		16 783
c)				12 587·5	16 783·5
16.	4 196	6 294	8 392	12 588	16 784
a)				12 588·5	16 784·5
b)			8 392·5		16 785
c)				12 589	16 785·5
17.	4 196·5	6 294·75	8 393	12 589·5	16 786
a)				12 590	16 786·5
b)			8 393·5		16 787
c)				12 590·5	16 787·5
18.	4 197	6 295·5	8 394	12 591	16 788
a)				12 591·5	16 788·5
b)			8 394·5		16 789
c)				12 592	16 789·5
19.	4 197·5	6 296·25	8 395	12 592·5	16 790
a)				12 593	16 790·5
b)			8 395·5		16 791
c)				12 593·5	16 791·5
20.	4 198	6 297	8 396	12 594	16 792
a)				12 594·5	16 792·5
b)			8 396·5		16 793
c)				12 595	16 793·5

(continued)

(kHz)

(continued)

Series No.	Bands				
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz
21.	4 198·5	6 297·75	8 397	12 595·5	16 794
a)				12 596	16 794·5
b)			8 397·5		16 795
c)				12 596·5	16 795·5
22.	4 199	6 298·5	8 398	12 597	16 796
a)				12 597·5	16 796·5
b)			8 398·5		16 797
c)				12 598	16 797·5
23.	4 199·5	6 299·25	8 399	12 598·5	16 798
a)				12 599	16 798·5
b)			8 399·5		16 799
c)				12 599·5	16 799·5
24.	4 200	6 300	8 400	12 600	16 800
a)				12 600·5	16 800·5
b)			8 400·5		16 801
c)				12 601	16 801·5
25.	4 200·5	6 300·75	8 401	12 601·5	16 802
a)				12 602	16 802·5
b)			8 401·5		16 803
c)				12 602·5	16 803·5
26.	4 201	6 301·5	8 402	12 603	16 804
a)				12 603·5	16 804·5
b)			8 402·5		16 805
c)				12 604	16 805·5
27.	4 201·5	6 302·25	8 403	12 604·5	16 806
a)				12 605	16 806·5
b)			8 403·5		16 807
c)				12 605·5	16 807·5
28.	4 202	6 303	8 404	12 606	16 808
a)				12 606·5	16 808·5
b)			8 404·5		16 809
c)				12 607	16 809·5
29.	4 202·5	6 303·75	8 405	12 607·5	16 810
a)				12 608	16 810·5
b)			8 405·5		16 811
c)				12 608·5	16 811·5
30.	4 203	6 304·5	8 406	12 609	16 812
a)				12 609·5	16 812·5
b)			8 406·5		16 813
c)				12 610	16 813·5

(kHz)

Series No.	Bands				
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz
31.	4 203·5	6 305·25	8 407	12 610·5	16 814
a)				12 611	16 814·5
b)			8 407·5		16 815
c)				12 611·5	16 815·5
32.	4 204	6 306	8 408	12 612	16 816
a)				12 612·5	16 816·5
b)			8 408·5		16 817
c)				12 613	16 817·5
33.	4 204·5	6 306·75	8 409	12 613·5	16 818
a)				12 614	16 818·5
b)			8 409·5		16 819
c)				12 614·5	16 819·5
34.	4 205	6 307·5	8 410	12 615	16 820
a)				12 615·5	16 820·5
b)			8 410·5		16 821
c)				12 616	16 821·5
35.	4 205·5	6 308·25	8 411	12 616·5	16 822
a)				12 617	16 822·5
b)			8 411·5		16 823
c)				12 617·5	16 823·5
36.	4 206	6 309	8 412	12 618	16 824
a)				12 618·5	16 824·5
b)			8 412·5		16 825
c)				12 619	16 825·5
37.	4 206·5	6 309·75	8 413	12 619·5	16 826
a)				12 620	16 826·5
b)			8 413·5		16 827
c)				12 620·5	16 827·5
38.	4 207	6 310·5	8 414	12 621	16 828
a)				12 621·5	16 828·5
b)			8 414·5		16 829
c)				12 622	16 829·5
39.	4 207·5	6 311·25	8 415	12 622·5	16 830
a)				12 623	16 830·5
b)			8 415·5		16 831
c)				12 623·5	16 831·5
40.	4 208	6 312	8 416	12 624	16 832
a)				12 624·5	16 832·5
b)			8 416·5		16 833
c)				12 625	16 833·5

(continued)

(kHz)

(continued)

Series No.	Bands				
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz
41.	4 208·5	6 312·75	8 417	12 625·5	16 834
a)				12 626	16 834·5
b)			8 417·5		16 835
c)				12 626·5	16 835·5
42.	4 209	6 313·5	8 418	12 627	16 836
a)				12 627·5	16 836·5
b)			8 418·5		16 837
c)				12 628	16 837·5
43.	4 209·5	6 314·25	8 419	12 628·5	16 838
a)				12 629	16 838·5
b)			8 419·5		16 839
c)				12 629·5	16 839·5
44.	4 210	6 315	8 420	12 630	16 840
a)				12 630·5	16 840·5
b)			8 420·5		16 841
c)				12 631	16 841·5
45.	4 210·5	6 315·75	8 421	12 631·5	16 842
a)				12 632	16 842·5
b)			8 421·5		16 843
c)				12 632·5	16 843·5
46.	4 211	6 316·5	8 422	12 633	16 844
a)				12 633·5	16 844·5
b)			8 422·5		16 845
c)				12 634	16 845·5
47.	4 211·5	6 317·25	8 423	12 634·5	16 846
a)				12 635	16 846·5
b)			8 423·5		16 847
c)				12 635·5	16 847·5
48.	4 212	6 318	8 424	12 636	16 848
a)				12 636·5	16 848·5
b)			8 424·5		16 849
c)				12 637	16 849·5
49.	4 212·5	6 318·75	8 425	12 637·5	16 850
a)				12 638	16 850·5
b)			8 425·5		16 851
c)				12 638·5	16 851·5
50.	4 213	6 319·5	8 426	12 639	16 852
a)				12 639·5	16 852·5
b)			8 426·5		16 853
c)				12 640	16 853·5

(kHz)

(concluded)

Series No.	Bands				
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz
51.	4 213·5	6 320·25	8 427	12 640·5	16 854
a)				12 641	16 854·5
b)			8 427·5		16 855
c)				12 641·5	16 855·5
52.	4 214	6 321	8 428	12 642	16 856
a)				12 642·5	16 856·5
b)			8 428·5		16 857
c)				12 643	16 857·5
53.	4 214·5	6 321·75	8 429	12 643·5	*16 858* *
a)				12 644	
b)			8 429·5		
c)				12 644·5	
54.	4 215	6 322·5	8 430	12 645	
a)				12 645·5	
b)			8 430·5		
c)				12 646	
55.	4 215·5	6 323·25	8 431	12 646·5	
a)				12 647	
b)			8 431·5		
c)				12 647·5	
56.	4 216	6 324	8 432	12 648	
a)				12 648·5	
b)			8 432·5		
c)				12 649	
57.	4 216·5	*6 324·75**	8 433	12 649·5	
a)				12 650	
b)			8 433·5		
c)				12 650·5	
58.	4 217		8 434	*12 651* *	
a)					
b)			8 434·5		
59.	4 217·5		*8 435* *		
60.	4 218				
61.	4 218·5				
62.	*4 219* *				

* This is the highest assignable frequency within the band.

APPENDIX 16

Mar

Phonetic Alphabet and Figure Code

(See Articles 33 and 36)

1. When it is necessary to spell out call signs, service abbreviations and words, the following letter spelling table shall be used:

Letter to be transmitted	Word to be used	Spoken as *
A	Alfa	AL FAH
B	Bravo	BRAH VOH
C	Charlie	CHAR LEE or SHAR LEE
D	Delta	DELL TAH
E	Echo	ECK OH
F	Foxtrot	FOKS TROT
G	Golf	GOLF
H	Hotel	HOH TELL
I	India	IN DEE AH
J	Juliett	JEW LEE ETT
K	Kilo	KEY LOH
L	Lima	LEE MAH

* The syllables to be emphasized are underlined.

Letter to be transmitted	Word to be used	Spoken as *
M	Mike	MIKE
N	November	NO VEM BER
O	Oscar	OSS CAH
P	Papa	PAH PAH
Q	Quebec	KEH BECK
R	Romeo	ROW ME OH
S	Sierra	SEE AIR RAH
T	Tango	TANG GO
U	Uniform	YOU NEE FORM or OO NEE FORM
V	Victor	VIK TAH
W	Whiskey	WISS KEY
X	X–ray	ECKS RAY
Y	Yankee	YANG KEY
Z	Zulu	ZOO LOO

2. When it is necessary to spell out figures or marks, the following table shall be used:

Figure or mark to be transmitted	Code word to be used	Spoken as **
0	NADAZERO	NAH-DAH-ZAY-ROH
1	UNAONE	OO-NAH-WUN
2	BISSOTWO	BEES-SOH-TOO
3	TERRATHREE	TAY-RAH-TREE
4	KARTEFOUR	KAR-TAY-FOWER
5	PANTAFIVE	PAN-TAH-FIVE
6	SOXISIX	SOK-SEE-SIX

* The syllables to be emphasized are underlined.

** Each syllable should be equally emphasized.

Figure or mark to be transmitted	Code word to be used	Spoken as **
7	SETTESEVEN	SAY-TAY-SEVEN
8	OKTOEIGHT	OK-TOH-AIT
9	NOVENINE	NO-VAY-NINER
Decimal point	DECIMAL	DAY-SEE-MAL
Full stop	STOP	STOP

3. However, stations of the same country, when communicating between themselves, may use any other table recognized by their administration.

** Each syllable should be equally emphasized.

APPENDIX 17

Mar Mar2

Channelling of the Maritime Mobile Radiotelephone Bands between 4 000 and 23 000 kHz

(see Article 35)

This Appendix will apply until 1 January 1978; however, as from 16 July 1977, the frequencies in Section B of Appendix 17 Rev. will be in use simultaneously with those in Section C of this Appendix. (See Resolutions Nos. Mar2 – 2 and Mar2 – 12.)

*
* *

1. Radiotelephone channelling arrangements for the frequencies to be used by coast and ship stations in the bands allocated to the maritime mobile service are indicated in three sections as follows:

Section A – Table of double sideband transmitting frequencies for duplex (two-frequency) operation (in kHz). (Double sideband emissions cease no later than 1 January 1978.)

Section B – Table of single sideband transmitting frequencies for duplex (two-frequency) operation (in kHz).

Section C – Table of single sideband transmitting frequencies for simplex (single-frequency) operation and for intership cross-band (two-frequency) operation (in kHz).

2. The technical characteristics for single sideband transmitters are specified in Appendix 17A.

3. One or more series of frequencies from Sections A or B (with the exception of those frequencies of Section B mentioned in paragraph 5 below) are assigned to each coast station, which uses these frequencies associated in pairs (see No. **1355**); each pair consists of a transmitting and a receiving frequency. The series shall be selected with due regard to the areas served and so as to avoid, as far as possible, harmful interference between the services of different coast stations.

4. The frequencies in Section C are provided for world-wide common use by ships of all categories, according to traffic requirements, for ship transmissions to coast stations and for intership communication. They are also authorized for world-wide common use for transmissions by coast stations (simplex operation) provided the peak envelope power does not exceed 1 kW (see Recommendation No. Mar2 – 6).

5. *a)* The following series of frequencies in Section B are allocated for calling purposes:

- Series No. 24 in the 4 and 8 MHz bands;
- Series No. 2 in the 6 MHz band;
- Series No. 22 in the 12, 16 and 22 MHz bands.

The remaining frequencies in Sections A, B and C are working frequencies.

b) Use of the double sideband calling frequencies 8 269, 12 403·5, 16 533·5 and 22 074 kHz should cease as soon as possible, in order to permit the use of the new single sideband channels. In any event, the use of these frequencies for double sideband calling shall cease not later than 1 January 1978.

6. Stations utilizing double sideband emissions shall operate only on the frequencies in Section A subject to No. **1351A** and on the frequencies mentioned in paragraph 5 *b)* above.

7. *a)* Stations using single sideband emissions shall operate only on the carrier frequencies shown in Sections B and C in conformity with the technical characteristics specified in Appendix 17A. The upper sideband mode shall always be employed.

b) Stations employing the single sideband mode shall use only class A3A and A3J emissions. However, administrations should endeavour, as far as possible, to restrict to class A3J emissions, the use of the Series No. 1 frequencies from Section B. Until 1 January 1978 class A3H emissions (in accordance with No. **1351A**) are permitted only on those carrier frequencies shown in Section B which are coincident with, or within 100 Hz of, the frequencies shown in Section A. However, on the calling frequencies for coast stations class A3H emissions may be used until 1 January 1978.

8. During the transition period (see Resolution No. Mar2 – 13) assignments to stations using independent sideband emissions shall be considered to be in accordance with the Table in Section A if the necessary bandwidth does not extend beyond the upper or lower limits of the bandwidth provided for double sideband emissions.

9. If an administration authorizes the use of frequencies other than those indicated in Sections A, B and C, its radiotelephone service shall not cause harmful interference to radiotelephone stations of the maritime mobile service which use frequencies in accordance with the following Tables.

SECTION A

Table of Double Sideband Transmitting Frequencies for Duplex (Two-Frequency) Operation (in kHz)

	4 MHz Band		8 MHz Band		12 MHz Band		16 MHz Band		22 MHz Band	
Series No.	Coast station frequency	Ship station frequency	Coast station frequency	Ship station frequency	Coast station frequency	Ship station frequency	Coast station frequency	Ship station frequency	Coast station frequency	Ship station frequency
1	4 364·7	4 066·1	8 732·1	8 198·1	13 112·5	12 333·5	17 258·5	16 463·5	22 629	22 003·5
2	4 371	4 072·4	8 738·4	8 204·4	13 119·5	12 340·5	17 265·5	16 470·5	22 636	22 010·5
3	4 377·4	4 078·8	8 744·8	8 210·8	13 126·5	12 347·5	17 272·5	16 477·5	22 643	22 017·5
4	4 383·8	4 085·2	8 751·2	8 217·2	13 133·5	12 354·5	17 279·5	16 484·5	22 650	22 024·5
5	4 390·2	4 091·6	8 757·6	8 223·6	13 140·5	12 361·5	17 286·5	16 491·5	22 657	22 031·5
6	4 396·6	4 098	8 764	8 230	13 147·5	12 368·5	17 293·5	16 498·5	22 664	22 038·5
7	4 403	4 104·4	8 770·4	8 236·4	13 154·5	12 375·5	17 300·5	16 505·5	22 671	22 045·5
8	4 409·4	4 110·8	8 776·8	8 242·8	13 161·5	12 382·5	17 307·5	16 512·5	22 678	22 052·5
9	4 415·8	4 117·2	8 783·2	8 249·2	13 168·5	12 389·5	17 314·5	16 519·5	22 685	22 059·5
10	4 422·2	4 123·6	8 789·6	8 255·6	13 175·5	12 396·5	17 321·5	16 526·5	22 692	22 066·5
11	4 428·6	4 129·9	8 796	8 261·9						

Table of Single Sideband Transmitting Frequencies for Duplex (Two-Frequency) Operation (in kHz)

Series No.	4 MHz Band				6 MHz Band				8 MHz Band				12 MHz Band				16 MHz Band				22 MHz Band				Series No.
	Coast stations		Ship stations		Coast stations		Ship stations		Coast stations		Ship stations		Coast stations		Ship stations		Coast stations		Ship stations		Coast stations		Ship stations		
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	
1	4 361·6	4 363	4 063	4 064·4	6 515·4	6 516·8	6 200·8	6 202·2	8 729	8 730·4	8 195	8 196·4	13 109	13 110·4	12 330	12 331·4	17 255	17 256·4	16 460	16 461·4	22 625·5	22 626·9	22 000	22 001·4	1
2	4 364·7	4 366·1	4 066·1	4 067·5	6 518·6*	6 520 *	6 204 *[1]	6 205·4*	8 732·1	8 733·5	8 198·1	8 199·5	13 112·5	13 113·9	12 333·5	12 334·9	17 258·5	17 259·9	16 463·5	16 464·9	22 629	22 630·4	22 003·5	22 004·9	2
3	4 367·8	4 369·2	4 069·2	4 070·6	6 521·8	6 523·2	6 207·2	6 208·6	8 735·2	8 736·6	8 201·2	8 202·6	13 116	13 117·4	12 337	12 338·4	17 262	17 263·4	16 467	16 468·4	22 632·5	22 633·9	22 007	22 008·4	3
4	4 371	4 372·4	4 072·4	4 073·8					8 738·4	8 739·8	8 204·4	8 205·8	13 119·5	13 120·9	12 340·5	12 341·9	17 265·5	17 266·9	16 470·5	16 471·9	22 636	22 637·4	22 010·5	22 011·9	4
5	4 374·2	4 375·6	4 075·6	4 077					8 741·6	8 743	8 207·6	8 209	13 123	13 124·4	12 344	12 345·4	17 269	17 270·4	16 474	16 475·4	22 639·5	22 640·9	22 014	22 015·4	5
6	4 377·4	4 378·8	4 078·8	4 080·2					8 744·8	8 746·2	8 210·8	8 212·2	13 126·5	13 127·9	12 347·5	12 348·9	17 272·5	17 273·9	16 477·5	16 478·9	22 643	22 644·4	22 017·5	22 018·9	6
7	4 380·6	4 382	4 082	4 083·4					8 748	8 749·4	8 214	8 215·4	13 130	13 131·4	12 351	12 352·4	17 276	17 277·4	16 481	16 482·4	22 646·5	22 647·9	22 021	22 022·4	7
8	4 383·8	4 385·2	4 085·2	4 086·6					8 751·2	8 752·6	8 217·2	8 218·6	13 133·5	13 134·9	12 354·5	12 355·9	17 279·5	17 280·9	16 484·5	16 485·9	22 650	22 651·4	22 024·5	22 025·9	8
9	4 387	4 388·4	4 088·4	4 089·8					8 754·4	8 755·8	8 220·4	8 221·8	13 137	13 138·4	12 358	12 359·4	17 283	17 284·4	16 488	16 489·4	22 653·5	22 654·9	22 028	22 029·4	9
10	4 390·2	4 391·6	4 091·6	4 093					8 757·6	8 759	8 223·6	8 225	13 140·5	13 141·9	12 361·5	12 362·9	17 286·5	17 287·9	16 491·5	16 492·9	22 657	22 658·4	22 031·5	22 032·9	10
11	4 393·4	4 394·8	4 094·8	4 096·2					8 760·8	8 762·2	8 226·8	8 228·2	13 144	13 145·4	12 365	12 366·4	17 290	17 291·4	16 495	16 496·4	22 660·5	22 661·9	22 035	22 036·4	11
12	4 396·6	4 398	4 098	4 099·4					8 764	8 765·4	8 230	8 231·4	13 147·5	13 148·9	12 368·5	12 369·9	17 293·5	17 294·9	16 498·5	16 499·9	22 664	22 665·4	22 038·5	22 039·9	12
13	4 399·8	4 401·2	4 101·2	4 102·6					8 767·2	8 768·6	8 233·2	8 234·6	13 151	13 152·4	12 372	12 373·4	17 297	17 298·4	16 502	16 503·4	22 667·5	22 668·9	22 042	22 043·4	13
14	4 403	4 404·4	4 104·4	4 105·8					8 770·4	8 771·8	8 236·4	8 237·8	13 154·5	13 155·9	12 375·5	12 376·9	17 300·5	17 301·9	16 505·5	16 506·9	22 671	22 672·4	22 045·5	22 046·9	14
15	4 406·2	4 407·6	4 107·6	4 109					8 773·6	8 775	8 239·6	8 241	13 158	13 159·4	12 379	12 380·4	17 304	17 305·4	16 509	16 510·4	22 674·5	22 675·9	22 049	22 050·4	15
16	4 409·4	4 410·8	4 110·8	4 112·2					8 776·8	8 778·2	8 242·8	8 244·2	13 161·5	13 162·9	12 382·5	12 383·9	17 307·5	17 308·9	16 512·5	16 513·9	22 678	22 679·4	22 052·5	22 053·9	16
17	4 412·6	4 414	4 114	4 115·4					8 780	8 781·4	8 246	8 247·4	13 165	13 166·4	12 386	12 387·4	17 311	17 312·4	16 516	16 517·4	22 681·5	22 682·9	22 056	22 057·4	17
18	4 415·8	4 417·2	4 117·2	4 118·6					8 783·2	8 784·6	8 249·2	8 250·6	13 168·5	13 169·9	12 389·5	12 390·9	17 314·5	17 315·9	16 519·5	16 520·9	22 685	22 686·4	22 059·5	22 060·9	18
19	4 419	4 420·4	4 120·4	4 121·8					8 786·4	8 787·8	8 252·4	8 253·8	13 172	13 173·4	12 393	12 394·4	17 318	17 319·4	16 523	16 524·4	22 688·5	22 689·9	22 063	22 064·4	19
20	4 422·2	4 423·6	4 123·6	4 125					8 789·6	8 791	8 255·6	8 257	13 175·5	13 176·9	12 396·5	12 397·9	17 321·5	17 322·9	16 526·5	16 527·9	22 692	22 693·4	22 066·5	22 067·9	20
21	4 425·4	4 426·8	4 126·8	4 128·2					8 792·8	8 794·2	8 258·8	8 260·2	13 179	13 180·4	12 400	12 401·4	17 325	17 326·4	16 530	16 531·4	22 695·5	22 696·9	22 070	22 071·4	21
22	4 428·6	4 430	4 130	4 131·4					8 796	8 797·4	8 262	8 263·4	13 182·5*	13 183·9*	12 403·5*	12 404·9*	17 328·5*	17 329·9*	16 533·5*	16 534·9*	22 699 *	22 700·4*	22 073·5*	22 074·9*	22
23	4 431·8	4 433·2	4 133·2	4 134·6					8 799·2	8 800·6	8 265·2	8 266·6	13 186	13 187·4	12 407	12 408·4	17 332	17 333·4	16 537	16 538·4	22 702·5	22 703·9	22 077	22 078·4	23
24	4 434·9*	4 436·3*	4 136·3*[1]	4 137·7*					8 802·4*	8 803·8*	8 268·4*	8 269·8*	13 189·5	13 190·9	12 410·5	12 411·9	17 335·5	17 336·9	16 540·5	16 541·9	22 706	22 707·4	22 080·5	22 081·9	24
25									8 805·6	8 807	8 271·6	8 273	13 193	13 194·4	12 414	12 415·4	17 339	17 340·4	16 544	16 545·4	22 709·5	22 710·9	22 084	22 085·4	25
26									8 808·8	8 810·2	8 274·8	8 276·2	13 196·5	13 197·9	12 417·5	12 418·9	17 342·5	17 343·9	16 547·5	16 548·9	22 713	22 714·4	22 087·5	22 088·9	26
27									8 812	8 813·4	8 278	8 279·4					17 346	17 347·4	16 551	16 552·4	22 716·5	22 717·9	22 091	22 092·4	27
28																	17 349·5	17 350·9	16 554·5	16 555·9					28
29																	17 353	17 354·4	16 558	16 559·4					29
30																	17 356·5	17 357·9	16 561·5	16 562·9					30

* The frequencies followed by an asterisk are calling frequencies (see Nos. **1352** and **1352A**).

[1] For the conditions of use of carrier frequencies 4 136·3 and 6 204 kHz, see Nos. **1351E** to **1351I**.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

SECTION C

Table of Single Sideband Transmitting Frequencies for Simplex (Single-Frequency) Operation and for Intership Cross-Band (Two-Frequency) Operation (in kHz)

(see paragraph 4 of this Appendix)

4 MHz Band		6 MHz Band		8 MHz Band		12 MHz Band		16 MHz Band		22 MHz Band	
Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
4 139·5	4 140·9	6 210·4 6 213·5	6 211·8 6 214·9	8 281·2 8 284·4	8 282·6 8 285·8	12 421 12 424·5 12 428	12 422·4 12 425·9 12 429·4	16 565 16 568·5 16 572	16 566·4 16 569·9 16 573·4	22 094·5 22 098 22 101·5 22 105 22 108·5	22 095·9 22 099·4 22 102·9 22 106·4 22 109·9

APPENDIX 17 Rev.

Mar2

Channelling of the Maritime Mobile Radiotelephone Bands between 4 000 and 23 000 kHz

(see Article 35)

Section A of this Appendix applies as from 1 January 1978. Section B of this Appendix applies as from 16 July 1977; however until 1 January 1978, these frequencies will be in use simultaneously with those of Appendix 17, Section C. (See Resolutions Nos. Mar2 – 2 and Mar2 – 12.)

*
* *

1. Radiotelephone channelling arrangements for the frequencies to be used by coast and ship stations in the bands allocated to the maritime mobile service are indicated in two sections as follows:

Section A – Table of single sideband transmitting frequencies for duplex (two-frequency) operation (in kHz);

Section B – Table of single sideband transmitting frequencies for simplex (single-frequency) operation and for intership cross-band (two-frequency) operation (in kHz).

2. The technical characteristics for single sideband transmitters are specified in Appendix 17A.

3. One or more series of frequencies from Section A (with the exception of those frequencies mentioned in paragraph 5 below) may be assigned to each coast station, which uses these frequencies associated in pairs (see No. **1355**); each pair consists of a transmitting and a receiving frequency. The series shall be selected with due regard to the areas served and so as to avoid, as far as possible, harmful interference between the services of different coast stations.

4. The frequencies in Section B are provided for world-wide common use by ships of all categories, according to traffic requirements, for ship transmissions to coast stations and for intership communication. They are also authorized for world-wide common use for transmissions by coast stations (simplex operation) provided the peak envelope power does not exceed 1 kW. (See Recommendation No. Mar2 – 6.)

5. The following frequencies in Section A are allocated for calling purposes:

- Channel No. 421 in the 4 MHz band;
- Channel No. 606 in the 6 MHz band;
- Channel No. 821 in the 8 MHz band;
- Channel No. 1221 in the 12 MHz band;
- Channel No. 1621 in the 16 MHz band;
- Channel No. 2221 in the 22 MHz band.

The remaining frequencies in Sections A and B are working frequencies.

6. *a)* Stations using single sideband emissions shall operate only on the carrier frequencies shown in Sections A and B in conformity with the technical characteristics specified in Appendix 17A. The upper sideband mode shall always be employed.

b) Stations employing the single sideband mode shall use only class A3A and A3J emissions. However, administrations should endeavour, as far as possible, to restrict to class A3J emissions the use of the Channels Nos. 401, 601, 801, 1201, 1601 and 2201.

7. If an administration authorizes the use of frequencies other than those indicated in Sections A and B, its radiotelephone service shall not cause harmful interference to radiotelephone stations of the maritime mobile service which use frequencies in accordance with the following Tables.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

Table of Single Sideband Transmitting Frequencies for Duplex (Two-Frequency) Operation (in kHz)

Channel No.	4 MHz Band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
401	4 357·4	4 358·8	4 063	4 064·4
402	4 360·5	4 361·9	4 066·1	4 067·5
403	4 363·6	4 365	4 069·2	4 070·6
404	4 366·7	4 368·1	4 072·3	4 073·7
405	4 369·8	4 371·2	4 075·4	4 076·8
406	4 372·9	4 374·3	4 078·5	4 079·9
407	4 376	4 377·4	4 081·6	4 083
408	4 379·1	4 380·5	4 084·7	4 086·1
409	4 382·2	4 383·6	4 087·8	4 089·2
410	4 385·3	4 386·7	4 090·9	4 092·3
411	4 388·4	4 389·8	4 094	4 095·4
412	4 391·5	4 392·9	4 097·1	4 098·5
413	4 394·6	4 396	4 100·2	4 101·6
414	4 397·7	4 399·1	4 103·3	4 104·7
415	4 400·8	4 402·2	4 106·4	4 107·8
416	4 403·9	4 405·3	4 109·5	4 110·9
417	4 407	4 408·4	4 112·6	4 114
418	4 410·1	4 411·5	4 115·7	4 117·1
419	4 413·2	4 414·6	4 118·8	4 120·2
420	4 416·3	4 417·7	4 121·9	4 123·3
421	4 419·4*	4 420·8*	4 125 *[1]	4 126·4*
422	4 422·5	4 423·9	4 128·1	4 129·5
423	4 425·6	4 427	4 131·2	4 132·6
424	4 428·7	4 430·1	4 134·3	4 135·7
425	4 431·8	4 433·2	4 137·4	4 138·8
426	4 434·9	4 436·3	4 140·5	4 141·9

Channel No.	6 MHz Band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
601	6 506·4	6 507·8	6 200	6 201·4
602	6 509·5	6 510·9	6 203·1	6 204·5
603	6 512·6	6 514	6 206·2	6 207·6
604	6 515·7	6 517·1	6 209·3	6 210·7
605	6 518·8	6 520·2	6 212·4	6 213·8
606	6 521·9*	6 523·3*	6 215·5*[2]	6 216·9*

Channel No.	8 MHz Band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
801	8 718·9	8 720·3	8 195	8 196·4
802	8 722	8 723·4	8 198·1	8 199·5
803	8 725·1	8 726·5	8 201·2	8 202·6
804	8 728·2	8 729·6	8 204·3	8 205·7
805	8 731·3	8 732·7	8 207·4	8 208·8
806	8 734·4	8 735·8	8 210·5	8 211·9
807	8 737·5	8 738·9	8 213·6	8 215
808	8 740·6	8 742	8 216·7	8 218·1
809	8 743·7	8 745·1	8 219·8	8 221·2
810	8 746·8	8 748·2	8 222·9	8 224·3
811	8 749·9	8 751·3	8 226	8 227·4
812	8 753	8 754·4	8 229·1	8 230·5
813	8 756·1	8 757·5	8 232·2	8 233·6
814	8 759·2	8 760·6	8 235·3	8 236·7
815	8 762·3	8 763·7	8 238·4	8 239·8
816	8 765·4	8 766·8	8 241·5	8 242·9
817	8 768·5	8 769·9	4 244·6	8 246
818	8 771·6	8 773	8 247·7	8 249·1
819	8 774·7	8 776·1	8 250·8	8 252·2
820	8 777·8	8 779·2	8 253·9	8 255·3
821	8 780·9*	8 782·3*	8 257 *	8 258·4*
822	8 784	8 785·4	8 260·1	8 261·5
823	8 787·1	8 788·5	8 263·2	8 264·6
824	8 790·2	8 791·6	8 266·3	8 267·7
825	8 793·3	8 794·7	8 269·4	8 270·8
826	8 796·4	8 797·8	8 272·5	8 273·9
827	8 799·5	8 800·9	8 275·6	8 277
828	8 802·6	8 804	8 278·7	8 280·1
829	8 805·7	8 807·1	8 281·8	8 283·2
830	8 808·8	8 810·2	8 284·9	8 286·3
831	8 811·9	8 813·3	8 288	8 289·4

Channel No.	12 MHz Band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
1201	13 100·8	13 102·2	12 330	12 331·4
1202	13 103·9	13 105·3	12 333·1	12 334·5
1203	13 107	13 108·4	12 336·2	12 337·6
1204	13 110·1	13 111·5	12 339·3	12 340·7
1205	13 113·2	13 114·6	12 342·4	12 343·8
1206	13 116·3	13 117·7	12 345·5	12 346·9
1207	13 119·4	13 120·8	12 348·6	12 350
1208	13 122·5	13 123·9	12 351·7	12 353·1
1209	13 125·6	13 127	12 354·8	12 356·2
1210	13 128·7	13 130·1	12 357·9	12 359·3
1211	13 131·8	13 133·2	12 361	12 362·4
1212	13 134·9	13 136·3	12 364·1	12 365·5
1213	13 138	13 139·4	12 367·2	12 368·6
1214	13 141·1	13 142·5	12 370·3	12 371·7
1215	13 144·2	13 145·6	12 373·4	12 374·8
1216	13 147·3	13 148·7	12 376·5	12 377·9
1217	13 150·4	13 151·8	12 379·6	12 381
1218	13 153·5	13 154·9	12 382·7	12 384·1
1219	13 156·6	13 158	12 385·8	12 387·2
1220	13 159·7	13 161·1	12 388·9	12 390·3
1221	12 162·8*	13 164·2*	12 392 *	12 393·4*
1222	13 165·9	13 167·3	12 395·1	12 396·5
1223	13 169	13 170·4	12 398·2	12 399·6
1224	13 172·1	13 173·5	12 401·3	12 402·7
1225	13 175·2	13 176·6	12 404·4	12 405·8
1226	13 178·3	13 179·7	12 407·5	12 408·9
1227	13 181·4	13 182·8	12 410·6	12 412
1228	13 184·5	13 185·9	12 413·7	12 415·1
1229	13 187·6	13 189	12 416·8	12 418·2
1230	13 190·7	13 192·1	12 419·9	12 421·3
1231	13 193·8	13 195·2	12 423	12 424·4
1232	13 196·9	13 198·3	12 426·1	12 427·5

Channel No.	16 MHz Band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
1601	17 232·9	17 234·3	16 460	16 461·4
1602	17 236	17 237·4	16 463·1	16 464·5
1603	17 239·1	17 240·5	16 466·2	16 467·6
1604	17 242·2	17 243·6	16 469·3	16 470·7
1605	17 245·3	17 246·7	16 472·4	16 473·8
1606	17 248·4	17 249·8	16 475·5	16 476·9
1607	17 251·5	17 252·9	16 478·6	16 480
1608	17 254·6	17 256	16 481·7	16 483·1
1609	17 257·7	17 259·1	16 484·8	16 486·2
1610	17 260·8	17 262·2	16 487·9	16 489·3
1611	17 263·9	17 265·3	16 491	16 492·4
1612	17 267	17 268·4	16 494·1	16 495·5
1613	17 270·1	17 271·5	16 497·2	16 498·6
1614	17 273·2	17 274·6	16 500·3	16 501·7
1615	17 276·3	17 277·7	16 503·4	16 504·8
1616	17 279·4	17 280·8	16 506·5	16 507·9
1617	17 282·5	17 283·9	16 509·6	16 511
1618	17 285·6	17 287	16 512·7	16 514·1
1619	17 288·7	17 290·1	16 515·8	16 517·2
1620	17 291·8	17 293·2	16 518·9	16 520·3
1621	17 294·9*	17 296·3*	16 522 *	16 523·4*
1622	17 298	17 299·4	16 525·1	16 526·5
1623	17 301·1	17 302·5	16 528·2	16 529·6
1624	17 304·2	17 305·6	16 531·3	16 532·7
1625	17 307·3	17 308·7	16 534·4	16 535·8
1626	17 310·4	17 311·8	16 537·5	16 538·9
1627	17 313·5	17 314·9	16 540·6	16 542
1628	17 316·6	17 318	16 543·7	16 545·1
1629	17 319·7	17 321·1	16 546·8	16 548·2
1630	17 322·8	17 324·2	16 549·9	16 551·3
1631	17 325·9	17 327·3	16 553	16 554·4
1632	17 329	17 330·4	16 556·1	16 557·5
1633	17 332·1	17 333·5	16 559·2	16 560·6
1634	17 335·2	17 336·6	16 562·3	16 563·7
1635	17 338·3	17 339·7	16 565·4	16 566·8
1636	17 341·4	17 342·8	16 568·5	16 569·9
1637	17 344·5	17 345·9	16 571·6	16 573
1638	17 347·6	17 349	16 574·7	16 576·1
1639	17 350·7	17 352·1	16 577·8	16 579·2
1640	17 353·8	17 355·2	16 580·9	16 582·3
1641	17 356·9	17 358·3	16 584	16 585·4

Channel No.	22 MHz Band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
2201	22 596	22 597·4	22 000	22 001·4
2202	22 599·1	22 600·5	22 003·1	22 004·5
2203	22 602·2	22 603·6	22 006·2	22 007·6
2204	22 605·3	22 606·7	22 009·3	22 010·7
2205	22 608·4	22 609·8	22 012·4	22 013·8
2206	22 611·5	22 612·9	22 015·5	22 016·9
2207	22 614·6	22 616	22 018·6	22 020
2208	22 617·7	22 619·1	22 021·7	22 023·1
2209	22 620·8	22 622·2	22 024·8	22 026·2
2210	22 623·9	22 625·3	22 027·9	22 029·3
2211	22 627	22 628·4	22 031	22 032·4
2212	22 630·1	22 631·5	22 034·1	22 035·5
2213	22 633·2	22 634·6	22 037·2	22 038·6
2214	22 636·3	22 637·7	22 040·3	22 041·7
2215	22 639·4	22 640·8	22 043·4	22 044·8
2216	22 642·5	22 643·9	22 046·5	22 047·9
2217	22 645·6	22 647	22 049·6	22 051
2218	22 648·7	22 650·1	22 052·7	22 054·1
2219	22 651·8	22 653·2	22 055·8	22 057·2
2220	22 654·9	22 656·3	22 058·9	22 060·3
2221	22 658 *	22 659·4*	22 062 *	22 063·4*
2222	22 661·1	22 662·5	22 065·1	22 066·5
2223	22 664·2	22 665·6	22 068·2	22 069·6
2224	22 667·3	22 668·7	22 071·3	22 072·7
2225	22 670·4	22 671·8	22 074·4	22 075·8
2226	22 673·5	22 674·9	22 077·5	22 078·9
2227	22 676·6	22 678	22 080·6	22 082
2228	22 679·7	22 681·1	22 083·7	22 085·1
2229	22 682·8	22 684·2	22 086·8	22 088·2
2230	22 685·9	22 687·3	22 089·9	22 091·3
2231	22 689	22 690·4	22 093	22 094·4
2232	22 692·1	22 693·5	22 096·1	22 097·5
2233	22 695·2	22 696·6	22 099·2	22 100·6
2234	22 698·3	22 699·7	22 102·3	22 103·7
2235	22 701·4	22 702·8	22 105·4	22 106·8
2236	22 704·5	22 705·9	22 108·5	22 109·9
2237	22 707·6	22 709	22 111·6	22 113
2238	22 710·7	22 712·1	22 114·7	22 116·1
2239	22 713·8	22 715·2	22 117·8	22 119·2
2240	22 716·9	22 718·3	22 120·9	22 122·3

* The frequencies followed by an asterisk are calling frequencies (see Nos. **1352** and **1352A**).

[1] For the conditions of use of the carrier frequency 4 125 kHz, see Nos. **1351E, 1351G, 1351H** and **1351I**.

[2] For the conditions of use of the carrier frequency 6 215·5 kHz, see Nos. **1351F** to **1351I**.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

SECTION B

Table of Single Sideband Transmitting Frequencies for Simplex (Single-Frequency) Operation and for Intership Cross-Band (Two-Frequency) Operation (in kHz)

(see paragraph 4 of this Appendix)

4 MHz Band		6 MHz Band		8 MHz Band		12 MHz Band		16 MHz Band		22 MHz Band	
Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
4 143·6	4 145	6 218·6	6 220	8 291·1	8 292·5	12 429·2	12 430·6	16 587·1	16 588·5	22 124	22 125·4
		6 221·6	6 223	8 294·2	8 295·6	12 432·3	12 433·7	16 590·2	16 591·6	22 127·1	22 128·5
						12 435·4	12 436·8	16 593·3	16 594·7	22 130·2	22 131·6
										22 133·3	22 134·7
										22 136·4	22 137·8

APPENDIX 17A

Mar Mar2

Technical Characteristics of Single Sideband Transmitters used in the Maritime Mobile Service for Radiotelephony in the Bands between 1 605 and 4 000 kHz and between 4 000 and 23 000 kHz

1. Power of the carrier:

a) for class A3A emissions the power of the carrier shall be:

Bands between 1 605 and 4 000 kHz

– for coast station transmitters until 1 January 1982 and for ship station transmitters in use or to be installed before 1 January 1982: 16 ± 2 dB below the peak envelope power;

– for coast station transmitters after 1 January 1982 and for ship station transmitters installed after 1 January 1982: 18 ± 2 dB below the peak envelope power;

Bands between 4 000 and 23 000 kHz

– for coast station transmitters until 1 January 1978 and for ship station transmitters in use or to be installed before 1 January 1978: 16 ± 2 dB below the peak envelope power;

– for coast station transmitters after 1 January 1978 and for ship station transmitters installed after 1 January 1978: 18 ± 2 dB below the peak envelope power;

b) for class A3J emissions the power of the carrier shall be at least 40 dB below the peak envelope power.

2. Coast and ship stations shall use only the upper sideband.

3. The transmitter audio-frequency band shall be 350 to 2 700 Hz with a permitted amplitude variation of 6 dB.

4. The carrier frequencies shall be maintained within the following tolerances:

a) coast stations: ±20 Hz;

b) ship stations:

Bands between 1 605 and 4 000 kHz

– tolerance applicable to transmitters in use or to be installed before 1 January 1982: ± 100 Hz; the short-term limits (of the order of 15 minutes) shall be ± 40 Hz;

– tolerance applicable to transmitters installed after 1 January 1982: ± 50 Hz;

Bands between 4 000 and 23 000 kHz

– tolerance applicable to transmitters in use or to be installed before 1 January 1978: ± 100 Hz; the short-term limits (of the order of 15 minutes) shall be ± 40 Hz;

– tolerance applicable to transmitters installed after 1 January 1978: ± 50 Hz.

5. The unwanted frequency modulation of the carrier shall be sufficiently low to prevent harmful distortion.

6. When class A3H, A3A or A3J emissions are used, the power of any unwanted emission supplied to the antenna transmission line on any discrete frequency shall, when the transmitter is driven to full peak envelope power, be in accordance with the following table:

a) Transmitters in use or installed before 1 January 1982:[1]

Separation Δ in kHz between the frequency of the unwanted emission[2] and the assigned frequency[3]	Minimum attenuation below peak envelope power
$1{\cdot}6 < \Delta \leqslant 4{\cdot}8$	28 dB
$4{\cdot}8 < \Delta \leqslant 8$	38 dB
$8 < \Delta$	43 dB without exceeding the power of 50 mW

Transmitters using reduced carrier or suppressed carrier emission may, as far as out-of-band emissions[4] and those spurious emissions which are a result of the modulation process but do not fall in the out-of-band spectrum[5] are concerned, be tested for compliance with this regulation by means of a two-tone-audio input signal with a frequency separation between the tones such that all intermodulation products occur at frequencies at least 1·6 kHz removed from the assigned frequency.

b) Transmitters installed after 1 January 1982:[1]

Separation Δ in kHz between the frequency of the unwanted emission[2] and the assigned frequency[3]	Minimum attenuation below peak envelope power
$1{\cdot}5 < \Delta \leqslant 4{\cdot}5$	31 dB
$4{\cdot}5 < \Delta \leqslant 7{\cdot}5$	38 dB
$7{\cdot}5 < \Delta$	43 dB without exceeding the power of 50 mW

For Notes, see following page.

Transmitters using reduced carrier or suppressed carrier emission may, as far as out-of-band emissions[4] and those spurious emissions which are a result of the modulation process but do not fall in the out-of-band spectrum[5] are concerned, be tested for compliance with this regulation by means of a two-tone-audio input signal with a frequency separation between the tones such that all intermodulation products occur at frequencies at least 1·5 kHz removed from the assigned frequency.

---

[1] All administrations recognize the need to reduce the level of unwanted emissions and will therefore endeavour to ensure that the new requirements will be met by all newly designed transmitters under their jurisdiction as soon as practicable before 1 January 1982.

[2] *Unwanted emission**: Expression covering spurious radiations[6] and out-of-band emissions.[4]

[3] The assigned frequency is 1 400 Hz higher than the carrier frequency (see No. **445A**).

[4] *Out-of-band emission**: Emission on a frequency or frequencies of the out-of-band spectrum.[5]

[5] *Out-of-band spectrum* (of an emission)*: The part of the power density spectrum (or the power spectrum when the spectrum consists of discrete components) of an emission which is outside the necessary bandwidth, with the exception of spurious radiations.[6]

[6] *Spurious radiation* (of a radio emission)*: Radiation at a frequency, or frequencies, outside the necessary band, the level of which may be reduced without affecting the corresponding transmission of information; spurious radiation includes harmonic radiation, parasitic radiation and unwanted intermodulation products which are remote from the necessary band.

---

* These definitions have been adopted for the purpose of Appendix 17A only.

APPENDIX 18

Mar Mar2

Table of Transmitting Frequencies in the Band 156 – 174 MHz for Stations in the Maritime Mobile Service

(see No. **287** and Articles 27 and 35)

Note 1: For assistance in understanding the Table, see notes *a)* to *q)* below.

Note 2: Channels 01 to 28, except 15 and 17, correspond to the channels of Appendix 18 to the Radio Regulations, Geneva, 1959, and channels 15, 17, and 60 to 88 correspond to those additional channels made available for assignment in accordance with the provisions of Appendix 18 Mar to the Radio Regulations, Geneva, 1967 (see Resolution No. Mar2 – 14).

Note 3: Channel designators 60 to 88 were chosen for the additional channels in order to separate them clearly from the original channels.

Channel designators	Notes	Transmitting frequencies (MHz)		Inter-ship	Port operations		Ship movement		Public correspondence
		Ship stations	Coast stations		Single frequency	Two frequency	Single frequency	Two frequency	
60	*j)*	156·025	160·625			17		9	25
01	*i)*	156·050	160·650			10		15	8
61		156·075	160·675			23		3	19
02		156·100	160·700			8		17	10
62		156·125	160·725			20		6	22
03	*i)*	156·150	160·750			9		16	9
63	*i)*	156·175	160·775			18		8	24
04		156·200	160·800			11		14	7
64		156·225	160·825			22		4	20
05		156·250	160·850			6		19	12
65		156·275	160·875			21		5	21
06	*h)*	156·300		1					
66		156·325	160·925			19		7	23
07		156·350	160·950			7		18	11
67	*n)*	156·375	156·375	10	10		9		
08		156·400		2					
68	*p)*	156·425	156·425		6		2		
09	*o)*	156·450	156·450	5	5		12		
69	*p)*	156·475	156·475	9	11		4		
10	*n)*	156·500	156·500	3	9		10		
70	*o)*	156·525		6					
11	*p)*	156·550	156·550		3		1		
71	*p)*	156·575	156·575		7		6		
12	*p)*	156·600	156·600		1		3		
72	*o)*	156·625		7					
13	*p)*	156·650	156·650	4	4		5		
73	*n)*	156·675	156·675	8	12		11		
14	*p)*	156·700	156·700		2		7		
74	*p)*	156·725	156·725		8		8		
15	*g) l)*	156·750	156·750	12	14				
75	*m)*		Guard-band 156·7625 – 156·7875 MHz						

Channel designators	Notes	Transmitting frequencies (MHz)		Inter-ship	Port operations		Ship movement		Public correspondence
		Ship stations	Coast stations		Single frequency	Two frequency	Single frequency	Two frequency	
16		156·800	156·800 DISTRESS SAFETY AND CALLING						
76	*m)*		Guard band 156·8125 156·8375 MHz						
17	*g) l)*	156·850	156·850	13	13				
77		156·875		11					
18	*f)*	156·900	161·500			3		22	
78		156·925	161·525			12		13	27
19	*f)*	156·950	161·550			4		21	
79	*f) p)*	156·975	161·575			14		1	
20	*f)*	157·000	161·600			1		23	
80	*f) p)*	157·025	161·625			16		2	
21	*f) i)*	157·050	156·050 or 161·650			5		20	
81		157·075	161·675			15		10	28
22	*f)*	157·100	161·700			2		24	
82		157·125	161·725			13		11	26
23	*i)*	157·150	156·150 or 161·750						5
83	*i)*	157·175	156·175 or 161·775						16
24		157·200	161·800						4
84		157·225	161·825			24		12	13
25		157·250	161·850						3
85		157·275	161·875						17
26		157·300	161·900						1
86	*q)*	157·325	161·925						15
27		157·350	161·950						2
87		157·375	161·975						14
28		157·400	162·000						6
88	*j)*	157·425	162·025						18

NOTES REFERRING TO THE TABLE

a) The figures in the column headed "Intership" indicate the normal sequence in which channels should be taken into use by mobile stations.

b) The figures in the columns headed "Port operations", "Ship movement" and "Public correspondence" indicate the normal sequence in which channels should be taken into use by each coast station. However, in some cases, it may be necessary to omit channels in order to avoid harmful interference between the services of neighbouring coast stations.

c) Administrations may designate frequencies in the intership, port operations and ship movement services for use by light aircraft and helicopters to communicate with ships or participating coast stations in predominantly maritime support operations under the conditions specified in Nos. **952**, **952A**, **952B**, **952C**, **952D** and **952E**. However, the use of the channels which are shared with public correspondence shall be subject to prior agreement between interested and affected administrations.

d) The channels of the present Appendix, with the exception of 06, 15, 16, 17, 75 and 76, may also be used for high-speed data and facsimile transmissions, subject to special arrangement between interested and affected administrations.

e) Except in the United States of America, the channels of Appendix 18, preferably two adjacent channels from the series 87, 28, 88, with the exception of 06, 15, 16, 17, 75 and 76, may be used for narrow-band direct-printing telegraphy and data transmission, subject to special arrangement between interested and affected administrations.

f) The two-frequency channels for port operations (18, 19, 20, 21, 22, 79 and 80) may be used for public correspondence, subject to special arrangement between interested and affected administrations.

g) Until 1 January 1983, the effective radiated power of ship stations on channels 15 and 17 shall not exceed 1 W.

h) The frequency 156·300 MHz (channel 06) (see No. **953**) may also be used for communication between ship stations and aircraft stations engaged in coordinated search and rescue operations. Ship stations shall avoid harmful interference to such communications on channel 06 as well as to communications between aircraft stations, ice-breakers and assisted ships during ice seasons.

i) In France and in Belgium, the frequencies 156·050, 156·150 and 156·175 MHz are used as ship station frequencies in channels 01, 03 and 63 respectively and as coast station frequencies in channels 21, 23 and 83 respectively when the latter are used in the special semi-duplex public correspondence systems employed with 1 MHz separation between transmit and receive frequencies. These special provisions will cease to be used not later than 1 January 1983.

j) Channels 60 and 88 can be used subject to special arrangements between interested and affected administrations.

k) The frequencies in this Table may also be used for radiocommunications on inland waterways in accordance with the conditions specified in No. **287**.

l) Channels 15 and 17 may also be used for on-board communications provided the effective radiated power does not exceed 1 W, and subject to the national regulations of the administration concerned when these channels are used in its territorial waters. (However, see Recommendation No. Mar2 – 11).

m) This guard-band will apply after 1 January 1983 (see Nos. **1363** and **1363.1**).

n) Within the European Maritime area and in Canada these frequencies (channels 10, 67, 73) may also be used, if so required, by the individual administrations concerned, for communication between ship stations, aircraft stations and participating land stations engaged in coordinated search and rescue and anti-pollution operations in local areas, under the conditions specified in Nos. **952**, **952A**, **952B**, **952C**, **952D**, and **952E**.

o) The preferred first three frequencies for the purpose indicated in Note *c)* are 156·450 MHz (channel 09), 156·525 MHz (channel 70) and 156·625 MHz (channel 72).

p) These channels (68, 69, 11, 71, 12, 13, 14, 74, 79, 80) are the preferred channels for the ship movement service. They may, however, be assigned to the port operations service until required for the ship movement service if this should prove to be necessary in any specific area.

q) This channel (86) may be used as a calling channel if such a channel is required in an automatic radiotelephone system when such a system is recommended by the C.C.I.R.

APPENDIX 19

Mar Mar2

Technical Characteristics for Transmitters and Receivers used in the Maritime Mobile Service in the Band 156 – 174 MHz

(see Articles 28 and 35, Appendix 18 and Resolution No. Mar2 – 14)

1. Only frequency modulation with a pre-emphasis of 6 dB/octave (phase modulation) shall be used.

2. The frequency deviation corresponding to 100% modulation shall approach ±5 kHz as nearly as practicable. In no event shall the frequency deviation exceed ±5 kHz.

3. The frequency tolerance for coast and ship stations shall be 10 parts in 10^6 (see note *n)* to Appendix 3).

4. When transmitting on any of the frequencies designated in the Table in Appendix 18, the emission of each station shall be vertically polarized at the source.

5. The audio-frequency band shall be limited to 3 000 Hz.

6. It shall be possible to reduce, readily, the mean power of a ship station transmitter to 1 watt or less.

APPENDIX 19A

Mar2

Characteristics of Equipment used for On-Board Communication in the 450 – 470 MHz Bands

(see Nos. **318B** and **318C**)

1. The equipment should be fitted with sufficient channels for satisfactory operation in the area of intended use.

2. The effective radiated power shall be limited to the minimum required for satisfactory operation, but shall in no case exceed 2 W. Wherever practicable the equipment should be fitted with a suitable device to reduce readily the output power by at least 10 dB.

3. In the case of equipment installed at a fixed point on the ship, the height of its antenna shall not be more than 3·5 metres above the level of the bridge.

4. Only frequency modulation with a pre-emphasis of 6 dB/octave (phase modulation) shall be used.

5. The frequency deviation shall not exceed ± 5 kHz.

6. The frequency tolerance shall be 5 parts in 10^6.

7. The audio-frequency band shall be limited to 3 000 Hz.

8. Control, telemetry and other non-voice signals shall be coded in such a manner as to minimize the possibility of false response to interfering signals.

9. If the use of a repeater station is required on board a ship, the following frequency pairs shall be used (see also No. **318C**):

457·525 MHz and 467·525 MHz

457·550 MHz and 467·550 MHz

457·575 MHz and 467·575 MHz

APPENDIX 20

Mar

Automatic Receiving Equipment for Radiotelegraph and Radiotelephone Alarm Signals

(See Section VIII of Article 36)

1. The automatic devices intended for the reception of the radiotelegraph alarm signal shall fulfil the following conditions:

a) The equipment shall respond to the alarm signal transmitted by the telegraphic emissions of at least class A2 and A2H (see No. **1094A**).

b) The equipment shall respond to the alarm signal through interference (provided it is not continuous) caused by atmospherics and powerful signals other than the alarm signal, preferably without any manual adjustment being required during any period of watch maintained by the apparatus.

c) The equipment shall not be actuated by atmospherics or by strong signals other than the alarm signal.

d) The equipment shall possess a minimum sensitivity such that with negligible atmospheric interference, it is capable of being operated by the alarm signal transmitted by the emergency transmitter of a ship station at any distance from this station up to the normal range fixed for this transmitter by the International Convention for the Safety of Life at Sea, and preferably at greater distances.

e) The equipment shall give warning of any fault which would prevent the apparatus from performing its normal functions during watch hours.

2. The automatic devices intended for the reception of the radiotelephone alarm signal shall fulfil the following conditions :

a) The equipment shall respond to the alarm signal through intermittent interference caused by atmospherics and powerful signals other than the alarm signal, preferably without any manual adjustment being required during any period of watch maintained by the equipment.

b) The equipment shall not be actuated by atmospherics or by strong signals other than the alarm signal.

c) The equipment shall be effective beyond the range at which speech transmission is satisfactory and it should, as far as practicable, give warning of faults that would prevent the apparatus from performing its normal function during watch hours.

APPENDIX 20A

Mar

Technical Characteristics of Emergency Position-indicating Radiobeacons Operating on the Carrier Frequency 2 182 kHz

(See Section VIIIA of Article 36)

Emergency position-indicating radiobeacons shall fulfil the following conditions:

a) The power radiated by low-power radiobeacons (Type L) shall be of a value necessary to produce at a distance of 30 nautical miles at sea level a field strength equal to or less than 10 microvolts per metre, with an initial field strength of at least 2·5 microvolts per metre.

b) The power radiated by high-power radiobeacons (Type H) shall be of a value necessary to produce at a distance of 30 nautical miles at sea level a field strength greater than 10 microvolts per metre.

c) After a period of 48 hours' continuous operation the radiated power shall not be less than 20 per cent of the initial power.

d) The radiobeacons shall be capable of class A2 or A2H emissions, with a depth of modulation between 30 and 90 per cent.

e) The audio-frequency tolerance of emissions used for emergency position-indicating radiobeacons (Nos. **1476B** and **1476C**) are:

± 20 Hz for the frequency of 1 300 Hz
± 35 Hz for the frequency of 2 200 Hz

f) Equipment shall be designed to comply with relevant C.C.I.R. recommendations.

APPENDIX 20B

Mar Mar2

Narrow-Band Direct-Printing Telegraph Equipment

(see Articles 28, 28B, 29, 29A and 32)

The equipment for narrow-band direct-printing telegraph systems in the maritime mobile service shall fulfil the following conditions:

a) The equipment shall accept signals conforming to International Telegraph Alphabet Code No. 2 at a modulation rate of 50 bauds and shall provide similar signals at its output suitable for extension to the public telegraph network.

b) The modulation rate over the radio path shall not exceed 100 bauds.

c) Class F1 emissions shall be used, with a frequency shift of 170 Hz (Note 1).

Note 1: When frequency-shift keying is effected by applying audio signals to the input of a single-sideband transmitter particular care should be taken to suppress adequately the residual carrier of the single-sideband modulation process. In addition a suitable choice of the centre audio frequency will minimize the possibility of the residual carrier causing interference to nearby channels. For this reason some administrations have chosen 1 700 Hz as the centre frequency.

d) The frequency tolerance of the transmitted signal shall be ±40 Hz for ship stations, and shall be ± 15 Hz for coast stations (Note 1) (Note 2) (Note 3).

e) The higher of the emitted frequencies shall correspond to "space" (start), and the lower of the emitted frequencies shall correspond to "mark" (stop) in accordance with the relevant C.C.I.R. Recommendation.

f) Where an error control system is employed the apparatus should be provided with a simple device to by-pass the error control system to permit transmission and reception over the radio path of uncorrected signals conforming with *a)* above.

g) When an error-detecting and correcting system is used for direct-printing telegraphy in the maritime mobile service, a 7-unit ARQ system or a 7-unit forward acting error-correcting and indicating time diversity system, using the same code, shall be employed. Remaining technical characteristics of the error-detecting and correcting equipment should be in accordance with the relevant C.C.I.R. Recommendations.

Note 1: For operational purposes the associated receiving equipment should conform to the frequency stability of the transmitters.

Note 2: These tolerances shall apply to equipment installed after 1 January 1976 and to all equipment after 1 January 1985. For equipment installed before 2 January 1976 the tolerance is 100 Hz for ship station transmitters (with a maximum deviation of 40 Hz for short periods of the order of 15 minutes) and for coast station transmitters the tolerance is 40 Hz.

Note 3: Stricter tolerances may be desirable, depending on the method of operation of the service and the equipment employed.

h) If a station is equipped with a selective calling system in accordance with the provisions of Appendix 20C and with a direct-printing system in accordance with the provisions of the present Appendix and uses a two block call signal, that station shall be assigned the same identification or selective call number in accordance with Nos. **749A** and **783H** for both systems.

i) A station, equipped with a direct-printing system in accordance with the provisions of the present Appendix and using a two block call signal, which has not already been assigned a number in accordance with Nos. **749A** and **783H**, should be assigned such a number for the direct-printing system.

j) Conversion from the numerical identification to the 28-bit (4-character) pattern shall be performed according to the relevant C.C.I.R. Recommendations.

APPENDIX 20C

Mar **Mar2**

Selective Calling System for Use in the International Maritime Mobile Service

(See Articles 19, 28A, 29 and 33 and Appendix 9)

1. Where there is a need to fulfil immediate requirements for selective calling, the system to be used shall have the following characteristics:

1.1 the selective call signal shall consist of five figures representing the code number assigned to a ship for selective calling;

1.2 the audio-frequency signal applied to the input of the coast station transmitter shall consist of consecutive audio-frequency pulses conforming to the following:

1.2.1 the audio frequencies used to identify the figures of the code number assigned to a ship shall conform to the following series:

Figure	1	2	3	4	5	6	7	8	9	0	Figure repetition
Audio frequency (Hz)	1124	1197	1275	1358	1446	1540	1640	1747	1860	1981	2110

For example, the series of audio-frequency pulses corresponding to the selective call 12133 would be 1124-1197-1124-1275-2110 Hz, and the series corresponding to the code number 22222 would be 1197-2110-1197-2110-1197 Hz;

1.2.2 if the series of numbers represented by the use of only two frequencies, chosen from those in paragraph 1.2.1, are reserved for calling predetermined groups of ships, then 100 different groups of numbers are available for allocation, according to the needs of administrations;

1.2.3 the waveforms of the audio-frequency generators shall be substantially sinusoidal, not exceeding 2% total harmonic distortion;

1.2.4 the audio-frequency pulses shall be transmitted sequentially;

1.2.5 the difference between the maximum amplitude of any audio-frequency pulses shall not exceed 1 dB;

1.2.6 the duration of each audio-frequency pulse, measured between the half-amplitude points, shall be 100 ms ± 10 ms;

1.2.7 the time interval between consecutive pulses, measured between the half-amplitude points, shall be 3 ms ± 2 ms;

1.2.8 the rise and the decay time of each audio-frequency pulse, measured between the 10% and 90% amplitude points, shall be 1·5 ms ± 1 ms;

1.2.9 the frequency tolerance of the audio frequencies given in paragraph 1.2.1 shall be ± 4 Hz;

1.2.10 the selective call signal (the selective call number assigned to the ship station) shall be transmitted twice with an interval of 900 ms ± 100 ms between the end of the first signal and the beginning of the second signal (Figure 1);

1.2.11 the interval between calls from a coast station to different ships shall be at least 1 second (Figure 1).

2. The additional information following the selective call signal shall be transmitted as follows:

2.1 to identify the calling coast station, four figures shall be transmitted;

2.2 to identify the VHF channel on which a reply is required, two "zeros" followed by two "figures" should be transmitted (see Appendix 18);

2.3 the characteristics of the signals shall conform to paragraphs 1.2.1 and 1.2.3 to 1.2.9 inclusive;

2.4 the composition of the signal shall be as shown in the diagram (Figure 2), the tolerance on the 350 ms interval being ± 30 ms.

3. A special "all ships call" signal to actuate the receiving selectors on all ships, regardless of their individual code number, shall consist of a continuous sequential transmission of the eleven audio-frequencies given in paragraph 1.2.1. The parameters of the audio-frequency pulses shall be in accordance with paragraphs 1.2.3, 1.2.4, 1.2.5 and 1.2.9. The duration of each audio-frequency pulse, measured between the half-amplitude points, shall be 17 ms ±1 ms and the interval between consecutive pulses, measured between half-amplitude points, shall not exceed 1 ms. The total duration of this "all ships call" signal should be at least five seconds.

4. Receiving selectors on ships should operate reliably in any radio conditions acceptable for satisfactory communication.

5. The receiving selector shall be designed to accept the signals as defined in paragraph 1. However, bearing in mind that coast stations may transmit additional signals (e.g. coast station identification), it is important that the reset time of the decoder should be 250 ms ± 40 ms.

6. The receiving selector should be so designed, constructed and maintained that it is resistant to atmospherics and other unwanted signals including selective calling signals other than that for which the decoder has been set up.

7. The receiving selector shall include an audible or visual means of indicating the receipt of a call and, if required, an additional facility allowing the determination of the identity of the calling station or the VHF channel on which to reply according to the needs of administrations.

8. The indicating means shall be actuated on correct reception of the calling signal, no matter whether the correct registration has occurred on the first, or the second, or both parts of the calling signal transmitted by the coast stations.

9. The indicating means shall remain actuated until reset manually.

10. The receiving selector equipment should be as simple as is practicable, be capable of reliable operation over long periods with a minimum of maintenance, and could, with advantage, include facilities for self-testing.

FIGURE 1

Composition of Selective Call Signals without Additional Information

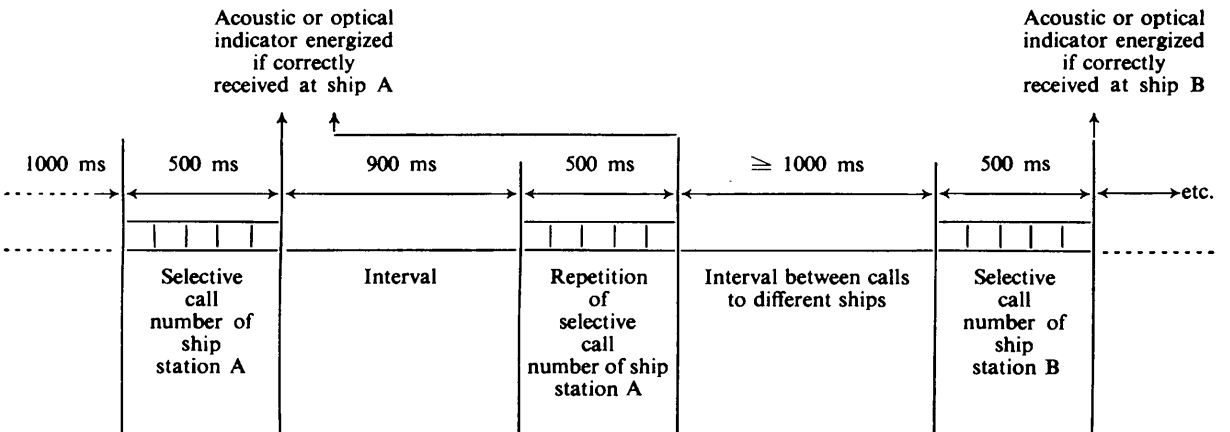
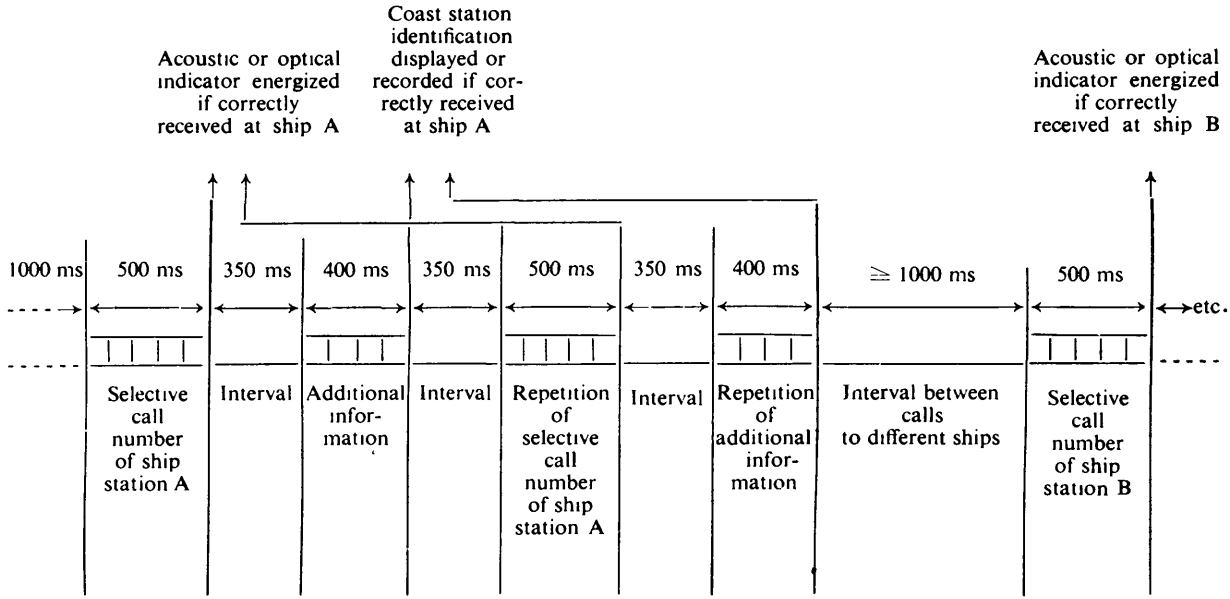


FIGURE 2

Composition of Selective Call Signals with Additional Information



APPENDIX 20D

Mar2

Linked Compressor and Expander Systems

(see Section I of Article 35 and Appendix 17A)

When linked compressor and expander systems are used in the international maritime mobile radiotelephone service:

a) the characteristics of the linked compressor and expander equipment shall be in accordance with relevant C.C.I.R. Recommendations;

b) for optimum performance the characteristics of SSB radio equipment used in conjunction with compressor and expander systems shall be in accordance with Appendix 17A and should, in addition, meet the following requirements:

1. The short-term frequency stability (of the order of 15 minutes) of coast station transmitters should be within ±2 Hz;

2. The short-term frequency stability (of the order of 15 minutes) of ship station transmitters should be within ±5 Hz;

3. To ensure sufficient overall gain stability of the system, for the duration of a call, facilities should be provided in coast station receivers to keep the end-to-end frequency error within ±2 Hz; similarly, facilities should be provided in ship station receivers to keep the end-to-end frequency error within ±5 Hz;

4. The maximum permissible amplitude variation in the transmitter over the 350 – 2 700 Hz audio frequency band should be 6 dB and the differential delay should not exceed 3 ms. The receiver should have at least the same standards of performance in these respects;

5. If the pilot carrier of a class A3A emission is not used to provide a continuous signal for controlling the frequency and gain of the receiver, for example where class A3J emission is used, the initial tuning procedure will require the provision, for a brief period, of a suitable reference tone (e.g. 1 000 Hz ±1 Hz) at a level of the order of −10 dBm0 ±0·5 dB;

6. Where it is desired to use speech inverters or other types of privacy equipment, it should be borne in mind that the upper audio frequency of the speech channel is 2 380 Hz.

APPENDIX 21

Mar2

Specimen Form of Statement of Account for Radiotelegrams and Radiotelephone Calls except in the Maritime Mobile Service

(see Article 40)

Account between country A and country B

in respect of { *radiotelegrams* / *radiotelephone calls*

exchanged between a country A and a country B by the intermediary of land stations of country A during the month of . . .

Date	Origin	Land station	Destination	Number of		Credit or debit of country A in gold francs		Remarks
				Words	Minutes	Credit	Debit	
					Totals			

Balance due to country * . . . . . gold francs

* A or B as appropriate.

APPENDIX 21A

Mar2

Specimen Form of Statement of account for Radiotelegrams, Radiotelephone Calls and Radiotelex Calls in the Maritime Mobile Service

(see Article 40A)

Account between country A and country B

in respect of { *radiotelegrams* / *radiotelephone calls* / *radiotelex calls* }

sent through the coast stations of country A during the month of . . . .

Date	Coast station	Origin	Call sign	Destination	Number of		Category	Credit or debit of country A in gold francs		Remarks
					Words	Minutes		Credit	Debit	
							Totals			

Balance due to country * . . . . . gold francs

* A or B as appropriate.

APPENDIX 22*)

Payment of Balance of Accounts

(See Article 40)

§ 1. The currencies used for payment, as well as the rules for conversion of the balances expressed in gold francs into the currency of payment, referred to in Nos. **1547** and **1550** of the Radio Regulations, shall be the following:

A. Currencies of Payment

§ 2. (1) The currencies used for the payment of the gold franc balances of international radiotelegraph and radiotelephone accounts shall be in accordance with the following:

(2) If the country to which the creditor administration or recognized private operating agency belongs has made a special monetary agreement with the country to which the debtor administration or recognized private operating agency belongs, the currency shall be as designated by that agreement.

(3) If no special monetary agreement exists between these countries, the creditor country may request that this payment be made:

a) in the money of a country where the central bank of issue or other official institution freely buys and sells gold or gold currency for the national money at fixed rates determined by law or by virtue of an agreement with the government (money referred to hereinafter as " gold currency ");

b) or in the money of a country with a free rate of exchange (money referred to hereinafter as " free currency "), the gold parity of which is fixed by the International Monetary Fund;

c) or in the money of a country with a free rate of exchange (free currency), the gold parity of which is determined by domestic law or by an arrangement between the government and an official issuing house of that country;

---

*) *Note by the General Secretariat*: This Appendix no longer applies to the Maritime Mobile Service.

d) or in its own money, which may not necessarily fulfil the conditions laid down in *a)*, *b)* or *c)* of sub-paragraph (3), above ; in this case, the administrations or recognized private operating agencies concerned must be in agreement.

(4) If the currencies of several countries fulfil the conditions in *a)*, *b)* or *c)* of sub-paragraph (3), above, the creditor administration or recognized private operating agency shall indicate the currency of payment which is convenient to it.

B. Rules for Conversion

§ 3. (1) Conversion into the currency of payment of the balances in gold francs shall be effected according to the following rules :

(2) If the administrations or recognized private operating agencies belong to countries between which special monetary agreements exist, conversion shall be made :

a) at the choice of the debtor administration or recognized private operating agency either directly into the currency of the creditor country at the gold parity fixed for such currency by the International Monetary Fund ; or through the currency of the debtor country on the basis of the gold parity approved for this currency by the International Monetary Fund ; the result obtained in the currency of the creditor country or of the debtor country shall, if necessary, be converted into the currency of payment in conformity with special monetary agreements between the two countries ;

b) in the absence of a gold parity approved by the International Monetary Fund for both the currency of the creditor country and the currency of the debtor country, at the gold par rate of a currency fulfilling the conditions prescribed in sub-paragraphs (3) *a)*, (3) *b)* or (3) *c)* of § 2, above ; the result obtained shall then be converted into the currency of the debtor country at the current official rate of exchange for such currency in that country, and thence, if necessary, into

the currency of payment, in conformity with the special monetary agreements;

c) at the choice of the debtor administration or recognized private operating agency either directly into the currency of the creditor country and at the gold parity fixed for that currency by a law of the country, or by an arrangement between the government and an official issuing house, or through the currency of the debtor country and at the gold parity determined for that currency by a law of the country or by an arrangement between the government and an official issuing house; the result obtained in the currency of the creditor country or in the currency of the debtor country shall, if necessary, be converted into the currency of payment in conformity with the special monetary agreements between the two countries.

(3) If the administrations or recognized private operating agencies belong to countries which have not made any special monetary agreement, conversion shall be made as follows:

a) if the currency in which payment is made is a gold currency, at the gold par rate of such currency;

b) if the currency in which payment is made is a free currency for which a gold parity has been fixed by the International Monetary Fund, at the gold parity approved by the Fund, or at the gold par rate determined by domestic law, or by an arrangement between the government and an official issuing house;

c) if the currency in which payment is made is a free currency for which the International Monetary Fund has not fixed any gold parity, either at the gold par rate determined by domestic law or by an arrangement between the government and an official issuing house, or through another free currency with a gold parity fixed by the Fund; the result obtained shall be converted into the currency in which payment is made at the official rate in force in the debtor country the day or the day before the transfer is effected or the cheque or draft is purchased.

(4) If, by agreement between the two administrations or recognized private operating agencies concerned, the currency in which payment is made is that specified in sub-paragraph (3) *d)* of § 2., above, the balance in gold francs shall be converted into any gold currency or free currency ; the result obtained shall be converted into the currency of the debtor country, and thence into the currency of the creditor country at the official rate of exchange in force in the debtor country on the day or the day before the transfer is effected or the cheque or draft is purchased.

APPENDIX 23

Procedure for Obtaining Radio Direction-Finding Bearings and Positions

(See Article 43)

Section I. General Instructions

§ 1. Stations of the aeronautical mobile service shall use such special procedures as may be in force as a result of agreements concluded between administrations. However, if they have need to participate in direction-finding operations with stations of the maritime mobile service, the provisions of this Appendix shall be applicable.

§ 2. Before calling one or more radio direction-finding stations for the purpose of asking for a bearing or position, a mobile station shall ascertain from the List of Radiodetermination and Special Service Stations :

a) the call signs of the stations to be called to obtain the desired bearings or position ;

b) the frequency on which the radio direction-finding stations keep watch, and the frequency or frequencies on which they take bearings ;

c) the radio direction-finding stations which, being linked by special circuits, can be grouped operationally with the radio direction-finding station to be called.

§ 3. The procedure to be followed by the mobile station depends on varying circumstances. Generally, the following shall be taken into account :

a) If the radio direction-finding stations do not keep watch on the same frequency (whether it be the frequency on which bearings are taken or another frequency), a separate request for the bearings shall be made to each station or group of stations using a given frequency.

b) If all the radio direction-finding stations concerned keep watch on the same frequency, and if they are able to take bearings on a common frequency (which may be different from the listening frequency), the mobile station shall call all of them at the same time, in order that all these stations may take simultaneous bearings on the same transmission.

c) If several radio direction-finding stations are grouped by means of special circuits, only one of them, the radio direction-finding control station, shall be called even if all are furnished with transmitting apparatus. In that case, however, the mobile station shall, if appropriate, specify in the call, by means of call signs, the radio direction-finding stations from which it wishes to obtain bearings.

§ 4. The List of Radiodetermination and Special Service Stations contains information relating to :

a) the type of signal and class of emission to be used for obtaining the bearings ;

b) the duration of the transmission to be made by the mobile station ;

c) the time used by the radio direction-finding station in question, if different from Greenwich Mean Time (G.M.T.).

Section II. Rules of Procedure

§ 5. The following rules of procedure applicable to radiotelegraphy and radiotelephony are based on the use of radiotelegraphy. When used for radiotelephony, appropriate phrases may replace the service abbreviations.

To obtain a bearing

§ 6. (1) The mobile station shall call the radio direction-finding station or the radio direction-finding control station on the listening frequency indicated in the List of Radiodetermination and Special Service Stations. Depending on the type of information desired, the calling station shall transmit the appropriate service abbreviation followed, if the radio direction-finding station is a mobile station, by the service abbreviation QTH? It shall indicate, if necessary, the frequency on which it is going to transmit to enable its bearing to be taken, and then await instructions.

(2) The radio direction-finding station called shall request the calling station, by means of the appropriate service abbreviation, to transmit for the bearing. If necessary, it shall indicate the frequency to be used for this purpose and the number of times the transmission is to be repeated.

(3) After having changed, if necessary, to its new transmitting frequency, the calling station shall transmit two dashes of approximately ten seconds each, followed by its call sign. It shall repeat this signal as often as the radio direction-finding station requires.

(4) The radio direction-finding station shall determine the direction and, if possible, the sense of the bearing, and its classification (see paragraph 7).

(5) If the radio direction-finding station is not satisfied with the operation, it shall request the calling station to repeat the transmission described in (3).

(6) The radio direction-finding station shall transmit the information to the calling station in the following order:

a) the appropriate service abbreviation;

b) three digits indicating the true bearing in degrees from the radio direction-finding station;

c) class of bearing;

d) time of observation;

e) if the radio direction-finding station is mobile, its own position in latitude and longitude, preceded by the service abbreviation QTH.

(7) As soon as the calling station has received the result of the observation, it shall repeat the message, if this is considered necessary to obtain confirmation. The radio direction-finding station then shall confirm that the repetition is correct or, if necessary, correct it by repeating the message. When the radio direction-finding station is sure that the calling station has received the message correctly, it shall transmit the signal " end of work ". The calling station shall repeat this signal to indicate that the operation is finished.

(8) In the absence of information to the contrary, the calling station may assume that the sense of the bearing was determined. If the radio direction-finding station has not determined the sense, it shall indicate this in the information transmitted, or report the bearing and its reciprocal.

Classification of bearings

§ 7. To estimate the accuracy and determine the corresponding class of a bearing :

a) An operator should generally, and particularly in the maritime mobile radio direction-finding service on frequencies below 3 000 kHz, use the observational characteristics of bearings shown in the following Table.

b) The operators at a radio direction-finding station, when facilities and time permit, may take into account the probability of error in the bearing. A bearing is considered as belonging to a particular class if there is a probability of less than one in twenty that the bearing error would exceed the numerical values specified for that class in the Table shown on the following page. This probability should be determined from an analysis of the five components that make up the total variance of the bearing (instrumental, site, propagation, random-sampling and observational components).

To obtain a position determined by two or more radio direction-finding stations organized as a group

§ 8. (1) If the calling station wishes to be informed of its position by a group of radio direction-finding stations, it shall call the control station as is indicated in § 6. (1) above, and request its position by means of the appropriate service abbreviation.

(2) The control station shall reply to the call and, when the radio direction-finding stations are ready, request, by means of the appropriate service abbreviation, that the calling station transmit. When the position has been determined, the control station shall transmit to the calling station :

a) the appropriate service abbreviation ;

b) the position, in latitude and longitude or, if appropriate, in relation to a known geographical position ;

c) the class of position as defined in the following sub-paragraph ;

d) the time of observation.

(3) According to its estimate of the accuracy of the observations, the control station shall classify the position in one of the four following classes :

Class A : positions which the operator may reasonably expect to be accurate to within 5 nautical miles ;

Class B : positions which the operator may reasonably expect to be accurate to within 20 nautical miles ;

Class C: positions which the operator may reasonably expect to be accurate to within 50 nautical miles;

Class D: positions which the operator may not expect to be accurate to within 50 nautical miles.

(4) However, for frequencies above 3 000 kHz, where the distance limits specified in the preceding sub-paragraph may not be appropriate, the control station may classify the position in accordance with current C.C.I.R. Recommendations.

To obtain simultaneous bearings from two or more radio direction-finding stations organized as a group

§ 9. On a request for bearings, the control station of a group of radio direction-finding stations shall proceed as indicated in § 8 above. It then shall transmit the bearings observed by each station of the group, each bearing being preceded by the call sign of the station which observed it.

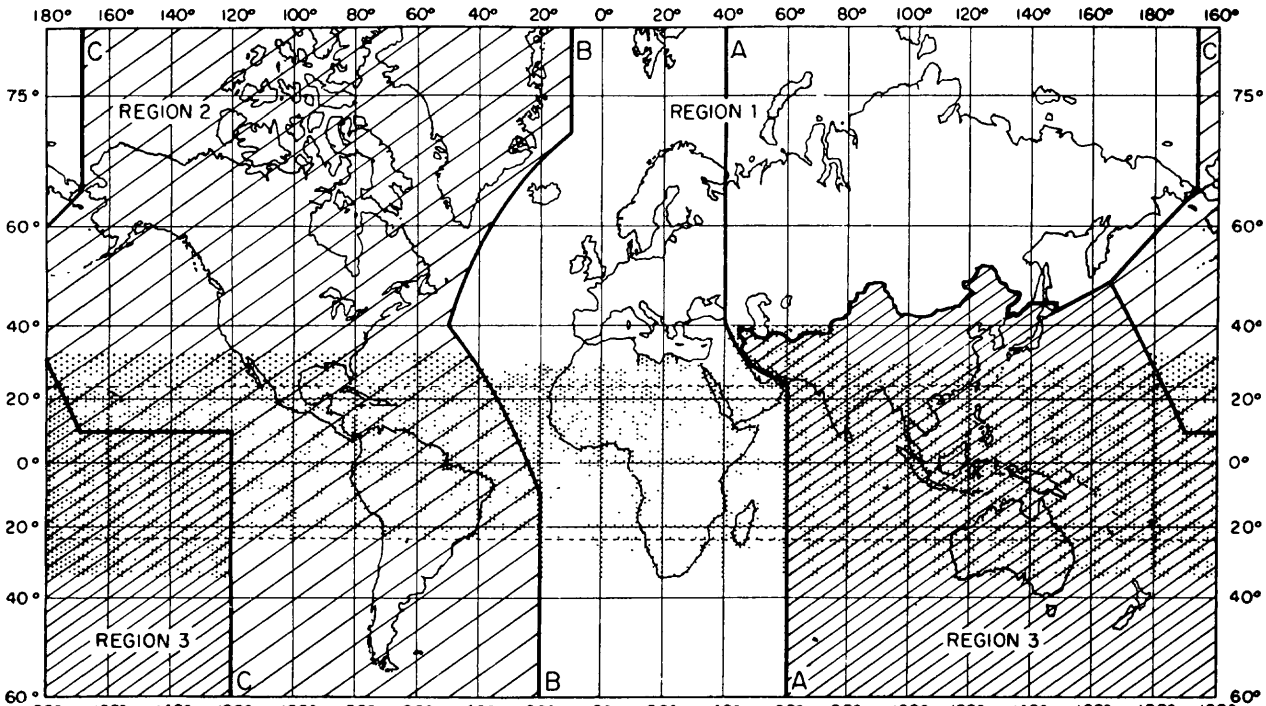
TABLE

Classification of Bearings

Class	Bearing Error (Degrees)	Observational Characteristics					
		Signal Strength	Bearing Indication	Fading	Interference	Bearing Swing (Degrees)	Duration of Observation
A	± 2	very good or good	definite (sharp null)	negligible	negligible	less than 3	adequate
B	± 5	fairly good	blurred	slight	slight	more than 3 less than 5	short
C	± 10	weak	severely blurred	severe	strong	more than 5 less than 10	very short
D	more than ± 10	scarcely perceptible	ill-defined	very severe	very strong	more than 10	inadequate

Chart of Regions as Defined in Table of Frequency Allocations

(See Nos. **125** to **132** and **135**)



The shaded part represents the Tropical Zone as defined in Nos. **135** and **136**

APPENDIX 25 Mar2

Frequency Allotment Plan for Coast Radiotelephone Stations operating in the Exclusive Maritime Mobile Bands between 4 000 and 23 000 kHz

(See Nos. **448** and **457** of the Radio Regulations and Appendix 17 Rev.)

Note *a)*: The frequencies in column 1 are assigned frequencies (see No. **85**) as listed in Appendix 17 Rev. to the Radio Regulations. Each frequency is followed, in parentheses, by the carrier frequency and the channel number (see Section A of Appendix 17 Rev. to the Radio Regulations).

Note *b)*: The coast radiotelephone stations operating in the exclusive maritime mobile bands between 4 000 and 23 000 kHz must use the minimum power required to cover their service area. They may in no case use a peak envelope power above 10 kW per channel (see No. **1351C** of the Radio Regulations).

Note *c)*: The Plan contained in this Appendix is updated in accordance with the procedure defined in Article 9B of the Radio Regulations, which is reproduced in annex.

Column 1	Column 2	Column 3
Assigned frequency (carrier frequency) (channel number)	Country or area	Observations

Note by the General Secretariat: Appendix 25 Mar2 will be published as a separate booklet before the date of its coming into force. It will also contain the text of Article 9B of the Radio Regulations to which reference is made in Note *c)* of the preceding page.

APPENDIX 25 MOD
Mar

Frequency Allotment Plan for Coast Radiotelephone Stations Operating in the Exclusive Maritime Mobile Bands between 4 000 and 23 000 kHz

This Appendix to the Radio Regulations (Geneva, 1959) is published as a separate booklet.

In accordance with the provisions of Resolution No. Mar2 – 12, it will be replaced, from the 1st January 1978, by Appendix 25 Mar2 which follows:

APPENDIX 26

Aer

Frequency Allotment Plan for the Aeronautical Mobile Service and Related Information

This Appendix to the Radio Regulations (Geneva, 1959) was published as a separate booklet. As far as the Aeronautical Mobile (R) Service is concerned, a revised Plan was adopted in 1966 by the Aeronautical Conference : it is contained in Appendix 27. However, the Plan adopted in 1959 for the Aeronautical Mobile (OR) Service remains in force, so that for this service reference should be made to Appendix 26. Copies of Appendix 26 (1959 edition) are obtainable from the General Secretariat of the I.T.U.

APPENDIX 27

Aer

Frequency Allotment Plan for the Aeronautical Mobile (R) Service and Related Information

This Appendix is published as a separate booklet. It contains provisions relating exclusively to the Aeronautical Mobile (R) Service, which have replaced the provisions relating to this service that are contained in Appendix 26. Reference should therefore be made exclusively to Appendix 27 as far as the Aeronautical Mobile (R) Service is concerned.

APPENDIX 28

Spa2

Procedure for Determination of the Co-ordination Area around an Earth Station in Frequency Bands between 1 and 40 GHz shared between Space and Terrestrial Radiocommunication Services

1. *Objectives*

The co-ordination area (see No. **103D**) is determined by calculating, in all directions of azimuth from the earth station, the co-ordination distances (see No. **103B**), and drawing to scale on an appropriate map the co-ordination contour (see No. **103C**).

It must be emphasized that the presence or installation of a terrestrial station within the co-ordination area of an earth station would not necessarily preclude the successful operation of either the earth station or that terrestrial station, since the procedure is based on the most unfavourable case asumptions as regards interference.

For the determination of the co-ordination area two cases may have to be considered:

1) for the earth station when it is receiving (and hence capable of being interfered with by terrestrial stations);

2) for the earth station when it is transmitting (and hence capable of interfering with terrestrial stations).

Where an earth station is intended to operate with a variety of classes of emissions, the earth station parameters to be used in the determination of the co-ordination contour shall be those which lead to the greatest co-ordination distances, for each earth station antenna beam and in each allocated frequency band which the earth station proposes to share with the terrestrial services.

The procedure given in this Appendix for the determination of the co-ordination area is fairly complex. For this reason, it is considered useful

to present in Annex A a simplified version of this procedure which will assist a user in following the necessary steps to produce co-ordination contours. The simplified presentation is given for certain allocated frequency bands.

It is suggested to draw, together with the co-ordination contour, auxiliary contours based on less unfavourable assumptions than those chosen for determination of the co-ordination contour. These auxiliary contours may be used during subsequent negotiations between the administrations concerned with a view to eliminating from the discussions (without the need for more precise calculations) the case of certain existing or planned stations located within the co-ordination area. The determination and use of these auxiliary contours is explained in Annex B to this Appendix.

2. *Permissible values of interference*

The permissible interference power (in dBW) in the reference bandwidth to be exceeded for no more than p percent of the time at the receiver input of a station suffering interference, from each source of interference, is given by the general formula below:

$$P_r(p) = 10 \log_{10} (kT_rB) + J + M(p) - W \qquad (1)$$

where

with

$$M(p) \equiv M(p_o/n) = M_o(p_o) \qquad (1a)$$

k = Boltzmann's constant ($1{\cdot}38 \times 10^{-23}$ joule per K);

T_r = thermal noise temperature of the receiving system (K);

B = reference bandwidth (in Hz) (bandwidth, of concern to the interfered with system, over which the interference power can be averaged);

J = ratio (in dB) of the permissible long term (20% of the time) interfering power to the thermal noise power in the receiving system ([1]);

([1]) see note ([1]) on following page.

p_o = percentage of the time during which the interference from all sources may exceed the permissible value;

n = number of expected entries of interference, assumed to be uncorrelated;

p = percentage of the time during which the interference from one source may exceed the permissible value; since the entries are not likely to occur simultaneously $p = p_o/n$;

$M_o(p_o)$ = ratio (in dB) between the permissible interference powers during p_o% and 20% of the time respectively, for all entries of interference (2);

$M(p)$ = ratio (in dB) between the permissible interference powers during p% of the time for one entry of interference, and during 20% of the time for all entries of interference, respectively;

Notes

(1) The factor J (in dB) is defined as the ratio of total permissible long-term (20% of the time) interference power in the system, to the long-term thermal noise power in a single receiver. For example, in a 50-hop terrestrial line-of-sight radio relay hypothetical reference circuit, the total allowable additive interference power is 1 000 pW0p (C.C.I.R. Recommendation 357-1) and the mean thermal noise power in a single hop may be assumed to be 25 pW0p.Therefore, since in a FDM/FM system the ratio of the interference noise power to the thermal noise power in a 4 kHz band is the same before and after demodulation, J = 16 dB. In a satellite link in the fixed-satellite service, the total allowable interference power is also 1 000 pW0p (C.C.I.R. Recommendation 356-2), but the thermal noise contribution of the down path is not likely to exceed 7 000 pW0p, hence $J \geqslant -8{\cdot}5$ dB. In digital systems it may be necessary to protect each communication path individually, and in that case, long term interference power may be of the same order of magnitude as long-term thermal noise, hence J = 0 dB.

(2) $M_o(p_o)$ (in dB) is the "interference margin" between the long-term (20%) and the short-term (p_o%) allowable interference powers. For analogue radio-relay and fixed-satellite systems in bands between 1 and 15 GHz, this is the ratio (in dB) between 50 000 and 1 000 pW0p (17 dB). In the case of digital systems, $M_o(p_o)$ may tentatively be set equal to the fading margin which depends, inter alia, on the local rain climate.

W = equivalence factor (in dB) relating the effect of interference to that of thermal noise of equal power in the reference bandwidth ([1]).

Tables I and II list values for the above parameters.

3. *Determination of co-ordination distance for near great circle propagation mechanisms*

When determining the co-ordination distance for an earth station, a number of mechanisms of radio-wave propagation need to be considered. This section deals with the determination of co-ordination distance in conditions associated with super-refraction, ducting, scattering and reflection due to irregularities in the refractive index of the lower atmosphere in the absence of precipitation. The determination of the co-ordination distance associated with propagation due to scattering from hydrometeors is discussed in Section 4.

([1]) The factor W (in dB) is the ratio of thermal noise power to interference power, in the reference bandwidth, producing the same interference effect after demodulation (e.g. in a FDM/FM system it would be expressed for equal voice channel performance; in a digital system it would be expressed for equal bit error probabilities). For FM signals, it is defined as follows:

$$W = 10 \log_{10} \left\{ \frac{\text{Interfering power in the receiving system after demodulation}}{\text{Thermal noise power in the receiving system after demodulation}} \times \frac{\text{Thermal noise power at the receiver input in the reference bandwidth}}{\text{Interfering power at the radio frequency in the reference bandwidth}} \right\}$$

Also, when the wanted signal uses FM modulation with r.m.s. modulation indices which are greater than unity, W is approximately 4 dB, regardless of the characteristics of the interfering signal. For low-index FDM/FM systems a very small reference bandwidth (4 kHz) has been used in order to avoid the necessity of dealing with a large range of characteristics of both wanted and unwanted signals upon which, for greater reference bandwidths, the value of W would depend.

When the wanted signal is digital, W is usually equal to or less than 0 dB, regardless of the characteristics of the interfering signal.

3.1 *Normalized basic transmission loss $L_0(0{\cdot}01)$*

To facilitate the graphical determination of the co-ordination distance, it is convenient to normalize the percentage of time to 0·01% and the frequency to 4 GHz.

The first step in the determination of the co-ordination distance is the calculation of a normalized basic transmission loss L_0 (0·01) given by:

$$L_0(0{\cdot}01) = P_{t'} + G_{t'} + G_r - P_r(p) - F(p) - 20 \log_{10} (f/4) \qquad (2)$$

where

$P_{t'}$ = maximum available transmitting power (in dBW) in reference bandwidth B at the input to the antenna of an interfering station *;

$G_{t'}$ = gain (in dB relative to isotropic) of the transmitting antenna of the interfering station. If the interfering station is an earth station, this is the isotropic gain in the pertinent direction. If it is a terrestrial station, $P_{t'}$ and $G_{t'}$ are combined in the main beam equivalent isotropically radiated power E, for which the values given in Table II shall be used. When $G_{t'}$ is the gain in the main direction of radiation it is denoted $G_{t'}max.$;

G_r = gain (in dB relative to isotropic) of the receiving antenna of the station suffering interference. If that station is an earth station, this is the isotropic gain in the pertinent direction; in the case of a terrestrial station, the maximum antenna gain is to be used. When G_r is the main beam gain, it is denoted $G_r max.$ (In the case of terrestrial stations, see Table I);

$F(p)$ = correction factor in dB to relate the effective percentage of the time p to 0·01% (see Figure 1);

f = operating frequency in GHz.

The "pertinent direction" referred to in the definitions of $G_{t'}$ and G_r is usually the direction toward the physical horizon on the azimuth

* Primes refer to the parameters associated with the interfering station.

considered (see Section 3.2) except when an earth station points its main beam at elevation angles below 12°. In the latter case, the path of minimum transmission loss may not be the horizon path but rather the main beam path (see Section 3.6).

When considering moving satellites, $G_{t'}$ or G_r (whichever pertains to the earth station antenna) is variable with time. In such cases, it is suggested that an equivalent time-invariant earth station antenna gain * should be used. This equivalent gain is either 10 dB less than the maximum horizon antenna gain or is that value of horizon antenna gain exceeded for no more than 10% of the time, whichever is the greater.

3.2 *Antenna gain at the earth station horizon for geostationary satellites*

The gain component of the earth station antenna in the direction of the physical horizon around an earth station is a function of the angular separation φ between the antenna main beam direction and the horizon direction under consideration. Therefore, knowledge of the angle φ is required for each azimuth.

The elevation ε and azimuth α of geostationary satellites as seen from an earth station at a latitude λ are uniquely related. Figure 2 shows the "permissible" location arcs of geostationary satellites in a rectangular *elevation/azimuth* plot, each arc corresponding to an earth station latitude.

Specific relative satellite longitudes may not be known beforehand, but even when they are, the possibility of the addition of a new satellite, or the repositioning of an existing one suggests that all or a portion of the applicable arc be considered to hold satellites.

---

* This equivalent antenna gain should not be used when the earth station antenna points in the same direction for appreciable periods of time (e.g., when working to deep space probes or to satellites which are almost geostationary).

With the correct arc or segment of arc chosen and suitably marked, the horizon profile $\theta(\alpha)$ is superimposed on the plot of Figure 3, which shows an example for an earth station located at 45°N latitude for a satellite expected to be located somewhere between relative longitudes of 10°E and 45°W, with the site horizon profile drawn as shown.

For each point on the local horizon $\theta(\alpha)$, the smallest distance to the arc is determined and measured on the elevation scale. The example of Figure 3 shows the determination of the off-beam angle φ at an azimuth $\alpha_0 = 210°$ with a horizon elevation $\theta = 4°$.

If this is done for all azimuths (in suitable increments, e.g. 5°), a relationship $\varphi(\alpha)$ results. The relationship $\varphi(\alpha)$ may be used to derive a function for the horizon antenna gain, $G(\alpha)$, by using the actual earth station antenna pattern, or a formula giving a good approximation; for example, in cases where the ratio between the antenna diameter and the wavelength exceeds 100, the following equation should be used:

$$G(\varphi) = 32 - 25 \log_{10} \varphi \text{ (dB)} \qquad (1° \leqslant \varphi < 48°)$$
$$= -10 \text{ dB} \qquad (48° \leqslant \varphi \leqslant 180°)$$

The application of this gain equation to the $\varphi(\alpha)$ plot yields the desired horizon antenna gain as a function of azimuth.

The parameters used above are defined as follows:

α = azimuthal angle under consideration, east of True North;

φ = the smaller angle in degrees between the main beam direction of the earth station antenna and the straight line connecting the earth station to the physical horizon on azimuth α;

ε = earth station main beam elevation angle above horizontal plane;

λ = latitude of earth station;

θ = elevation angle of the physical horizon above the horizontal plane on azimuth α.

3.3 *Radio-climatic Zones*

The world has been divided into three basic radio-climatic regions termed Zones A, B and C, respectively.

These zones are defined as follows:

— Zone A: land, with the exception of a coastal strip the width of which is either 100 km or that distance from the actual coast at which the terrain begins to exceed an altitude of 1000 m, whichever is the lesser distance;

— Zone B: sea, at latitudes greater than 23·5° (North or South), excluding the Mediterranean and Black Seas, but including the coastal strip defined above wherever land borders on sea at latitudes greater than 23·5°;

— Zone C: sea, at latitudes smaller than 23·5° (North or South), including the Mediterranean and Black Seas, and the coastal strip defined above wherever land borders on sea at latitudes smaller than 23·5°.

3.4 *Procedure for the determination of the co-ordination distance for propagation mode (a)*

To obtain the co-ordination distance for Zone A, it is necessary to subtract from $L_0(0{\cdot}01)$ a correction ΔL which accounts for the difference in basic transmission loss over paths that have different horizon elevation angles at the earth station. ΔL is computed in two steps. First a correction ΔL_0 for unit elevation angle (i.e., for a 1° elevation angle) is obtained from Figure 4 as a function of the normalized basic transmission loss and the frequency. Linear interpolation should be used between the curves of Figure 4 for frequencies not shown.

For any other horizon elevation angle θ, the horizon angle correction ΔL (in dB) is obtained from Figure 5 using the value of ΔL_0 previously obtained from Figure 4. If values are required at elevation angles

other than those indicated, linear interpolation should again be used. In cases where the elevation angle is less than 0·2°, ΔL is always 0 dB.

The horizon angle correction ΔL so obtained should be subtracted from the normalized basic transmission loss to result in a "co-ordination loss" L_c :

$$L_c = L_0(0{\cdot}01) - \Delta L \qquad (3)$$

This co-ordination loss, used with the appropriate frequency in Figure 6, yields the co-ordination distance.

In a similar manner, the Zone B and Zone C co-ordination distance can be determined using Figures 7, 8 and 9 for Zone B and Figures 10, 11 and 12 for Zone C.

Distances so obtained are, for reference purposes, to be labelled d_{aA}, d_{aB} and d_{aC} for Zones A, B and C, respectively.

3.5 *Co-ordination distance for mixed paths*

3.5.1 *Two Zones*

The procedure to be followed in the case of a mixed path involving two zones is illustrated by the example shown in Figure 13b. The earth station is situated in Zone A at a distance of 75 km from Zone B. The graphical presentation described below is particularly useful where more than one boundary between zones may be involved, as in this example.

It is assumed that, at a frequency of 4 GHz, the normalized basic transmission loss $L_0(0{\cdot}01)$ is 200 dB, and that the horizon elevation angle is zero degrees. This results in identical values of 200 dB for L_c in any zone (which would, of course, not be the case if the horizon elevation angle were greater than 0·2°). The procedure is as follows:

i) determine the distance entirely in Zone A that would give the co-ordination loss. Mark this distance (in this case it is 350 km) from the origin along the abscissa axis of linear graph paper as indicated by the point A (Figure 13a);

ii) determine the distance entirely in Zone B that would give the same co-ordination loss. Mark this distance (in this case it is 530 km) from the origin along the ordinate axis of the chart as indicated by the point B;

iii) draw a straight line between points A and B representing these distances from the origin;

iv) starting from the origin, the distance of 75 km from the earth station to Zone B is set off along the abscissa axis of the chart as indicated by the point A_1;

v) starting from point A_1 the Zone B path length of 375 km is then set off parallel to the ordinate axis of the chart as indicated by the point B_1;

vi) the further distance in the next Zone A region is then measured parallel to the abscissa axis from the point B_1 to the point of intersection of the mixed path curve as indicated by X. On Figure 13a, this distance is 30 km;

vii) the co-ordination distance is the sum of the distances OA_1, A_1B_1 and B_1X and is equal to

$$75 + 375 + 30 = 480 \text{ km}$$

The distance B_1X can also, more precisely, be found numerically from the total distance of the two parts in Zone A, $OA_1 + B_1X$ given by

$$OA_1 + B_1X = OA\left(1 - \frac{A_1B_1}{OB}\right)$$

whence:

$$B_1X = OA\left(1 - \frac{A_1B_1}{OB}\right) - OA_1$$

hence,

$$B_1X = 350\left(1 - \frac{375}{530}\right) - 75 = 27 \text{ km}$$

3.5.2 *Three Zones*

In some special cases, the mixed path involves all three radio-climatic Zones A, B and C. A solution to this problem can be found in adding a third dimension to the procedure to be followed for mixed paths involving only two zones. Theoretically, it means that the third coordinate has to be determined for a point having coordinates corresponding to the known distances in the first two zones and lying in a plane defined by three points on the axes X, Y and Z, corresponding to distances in Zones A, B and C, respectively, that would give the required basic transmission loss.

In practice, the procedure can be reduced to a simple graphical method shown in Figure 14, assuming for example a co-ordination loss (L_c) of 200 dB at a frequency of 4 GHz. It is required to find the co-ordination distance from the earth station in the direction given in Figure 14a. Here an earth station is situated in Zone A at a distance of 75 km in a given azimuthal direction from Zone B. In the same azimuthal direction Zone B is 375 km long and followed by an unknown portion in Zone C (Figure 14a).

In this case, the procedure to be applied should be as follows (Figure 14b):

i) repeat the same procedure as for mixed paths involving only two zones, given in steps (i) to (v) above, and continue as follows:

ii) from the point B_1 draw a line parallel to the line AB to intersect the abscissa axis as indicated by the point D;

iii) determine the distance entirely in Zone C that would give the co-ordination loss. Mark this distance (in this case it is 930 km) from the origin along the ordinate axis of the chart as indicated by the point C. Draw a straight line between the points C and A;

iv) at the point D, draw a line parallel to the ordinate axis to intersect the line CA as indicated by X;

v) the distance between the points D and X, which is the unknown distance in Zone C, is found to be 75 km;

vi) the co-ordination distance is then the sum of the distances $OA_1 + A_1B_1 + DX$ and in this example is equal to

$$75 + 375 + 75 = 525 \text{ km}$$

The distance DX can also, more precisely, be found numerically from the formula:

$$DX = OC\left(1 - \frac{OA_1}{OA} - \frac{A_1B_1}{OB}\right)$$

hence,

$$DX = 930\left(1 - \frac{75}{350} - \frac{375}{530}\right) = 73 \text{ km}$$

The distance obtained from either the single zone case (Section 3.4), or the multi-zone case (Section 3.5), whichever is applicable, is to be labelled d_a.

3.6 *Determination of the co-ordination distance for propagation mode (b)*

If the main beam of the earth station antenna is elevated less than 12° for long periods of time, as may be the case in operation with geostationary satellites, the co-ordination distance in the azimuthal direction of the main beam is determined in the same manner as above but the antenna elevation angle ε is used instead of the horizon elevation angle θ, and the antenna main beam gain is used instead of the gain towards the horizon. *In all such cases, the Zone A curves should be used irrespective of the actual zone involved.*

This procedure yields a distance for propagation mode (*b*), to be labelled d_b.

When considering non-geostationary satellites, interference via the main beam path should only be considered when the earth station antenna points in the same direction for appreciable periods of time (e.g., when working to deep space probes or to satellites which are almost geostationary).

3.7 *Evaluation of results from propagation modes (a) and (b)*

If propagation mode (*b*) is applicable, then the distance obtained for propagation mode (*b*) is compared with that of propagation mode (*a*) and where the co-ordination distance resulting from the main beam calculation exceeds that from the horizon path calculation, the procedure illustrated in Figure 15 should be used as follows to obtain the co-ordination contour for great circle propagation mechanisms:

i) draw two straight lines from the earth station at azimuthal angles of $\pm 5°$ relative to the azimuth of the main beam till they intersect the co-ordination contour obtained according to propagation mode (*a*);

ii) from the point corresponding to the co-ordination distance derived according to propagation mode (*b*) in the azimuthal direction of the main beam, draw two straight lines to join these two intersections;

iii) these two lines so drawn constitute the part of the co-ordination contour to be used in the sector $\pm 5°$ relative to the azimuthal direction of the main beam;

iv) outside the preceding sector $\pm 5°$ the co-ordination contour for the great circle propagation mechanisms is the one obtained for propagation mode (*a*).

For reference purposes, the distances obtained after application of procedures set forth in Sections 3.4 to 3.7 are to be labelled d_{ab}.

4. *Determination of co-ordination distance for propagation mode (c) (scattering from hydrometeors)*

The determination of co-ordination distance for scattering from hydrometeors (rain scatter) is predicated on a path geometry which is substantially different from that of the great circle propagation mechanisms.

4.1 *Normalized transmission loss $L_1(0{\cdot}01)$*

To determine the co-ordination distance associated with rain scatter, it is necessary to calculate a "normalized transmission loss", given by:

$$L_1(0{\cdot}01) = P_{t'} + \Delta G - P_r(p) - F_1(p,f) \qquad (4)$$

where:

ΔG = difference (in dB) between the maximum gain of terrestrial station antennae in the frequency band under investigation and the value of 42 dB. When the earth station is a transmitting station, the values shown in Table I should be used; when it is a receiving station, the values shown in Table II should be used.

$F_1(p,f)$ = correction factor (in dB) to relate the effective percentage of the time p to 0·01%, in the frequency band under consideration (see Figure 16).

All other parameters have been defined in Section 2. For terrestrial stations, values of $P_{t'}$ are listed in Table II.

4.2 *Rain-climatic Zones*

The world has been divided into five basic rain-climatic zones numbered 1 to 5 as shown in Figure 17.

4.3 *Procedure for the determination of rain scatter co-ordination distance*

To obtain the rain scatter co-ordination distance for rain-climatic Zone 1, the normalized transmission loss (obtained by solving equation (4)), is used together with the appropriate frequency in Figure 18 to yield the rain scatter distance d_{cr}.

Figures 19 to 21 show corresponding curves for rain-climatic Zones 2 to 5. In all cases that rain climate is to be chosen which corresponds to the location of the earth station. Due to the peculiar geometry associated with rain scatter propagation, the centre of the rain scatter co-ordination contour does not coincide with the location of the earth station by a distance Δd.

The rain scatter distance d_{cr}, together with the elevation angle ε of the main beam of the earth station antenna are used in Figure 22 to obtain the distance denoted Δd. The distance Δd is measured from the earth station location along the azimuth of the main beam of the earth station antenna; a circle of radius d_{cr} is drawn around the point so reached. The circle is the rain scatter contour.

The rain scatter co-ordination distance, to be labelled d_c, is the distance from the earth station site to the rain scatter co-ordination contour on the azimuth under consideration.

5. *Minimum value of co-ordination distance*

In the process of determining the co-ordination distance for propagation mode (*a*) or (*b*), if values result which would require the co-ordination distance curves to be extended to distances of less than 100 km, the co-ordination distance (d_a or d_b) for the propagation mode under consideration shall be 100 km.

In the process of determining the co-ordination distance for propagation mode (*c*), if values result which would require the rain scatter distance curves to be extended to distances of less than 100 km, the rain scatter distance (d_{cr}) shall be 100 km, used with the appropriate value of Δd.

6. *The co-ordination distance*

On any azimuth, the greatest of the co-ordination distances d_a, d_b or d_c, for any of the three propagation modes, represents the co-ordination

distance and is to be used for the co-ordination procedure.

An example of a co-ordination contour is shown in Figure 23.

7. *Parameters for calculation*

The values of parameters necessary for the determination of the co-ordination contour are given in Table I in the case of a transmitting earth station, and in Table II in the case of a receiving earth station.

In certain cases, an administration may have reason to believe that, for its specific earth station, a departure from the values associated with the earth station, as listed in Table II, may be justified. Attention is drawn to the fact that for specific systems the bandwidths B or, as for instance in the case of demand assignment systems, the percentages of the time p and p_0 may have to be changed from the values given in Table II.

To aid in subsequent negotiations between administrations (as discussed in Annex B), it has been found useful to isolate from equation (2) two composite parameters associated only with terrestrial stations, an interference sensitivity factor $S = G_r - P_r(p)$ for the case of transmitting earth stations, and the e.i.r.p. $E = P_{t'} + G_{t'}$ for the case of receiving earth stations. The values to be used for S and E are given in Tables I and II, respectively.

If it becomes necessary to calculate the co-ordination distance in a band not shown in Table I or II, the values associated with the nearest allocated frequency band for the same service should be used.

TABLE I

Parameters required for the Determination of Co-ordination Distance for a Transmitting Earth Station

Space radiocommunication service designation		Space Operation (Telecommand)	Fixed-Satellite	Fixed-Satellite	Fixed-Satellite	Fixed-Satellite	Fixed-Satellite	Fixed-Satellite	Fixed-Satellite	Fixed-Satellite
Frequency bands (GHz)		1·427–1·429	2·655–2·690	4·400–4·700	5·850–6·425	7·900–7·975 8·025–8·400	10·95–11·20	12·50–12·75	14·4 – 14·5	27·5 – 29·5
Modulation of terrestrial station (1)		A	A	A	A	A	A	A	A	N
Interference parameters and criteria	p_o (%)	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·003
	n	2	1	1	2	2	2	2	2	1
	p (%)	0·005	0·01	0·01	0·005	0·005	0·005	0·005	0·005	0·003
	J (dB)	16	9	9	16	16	16	16	16	0
	$M_o(p_o)$ (dB)	17	17	17	17	17	17	17	17	30
	W (dB)	0	0	0	0	0	0	0	0	0
Terrestrial station parameters	B (Hz)	4×10^3	4×10^3	4×10^3	4×10^3	4×10^3	4×10^3	4×10^3	4×10^3	1×10^6
	G_r (dB) (2)	35	52 (3)	52 (3)	45	47	50	50	50	50
	ΔG (dB)	−7	10 (3)	10 (3)	3	5	8	8	8	8
	T_r (K)	750	500 (3)	500 (3)	750	750	1500	1500	1500	3200
Auxiliary parameters	S (dBW)	166	192	192	176	178	178	178	178	154
	$P_r(p)$ (dBW) in B	−131	−140	−140	−131	−131	−128	−128	−128	−104

(1) A = analogue modulation; N = digital modulation.

(2) Feeder losses are not included in the values for G_r.

(3) In these bands the parameters for the terrestrial station associated with transhorizon systems have been used.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

TABLE II

Parameters required for the Determination of Co-ordination Distance for a Receiving Earth Station

Space Radiocommunication Service designation		Space Operation (Telemetering) (1)	Meteorological-Satellite (1)	Space Research: Near Earth	Space Research: Deep Space; Manned	Fixed-Satellite		Fixed-Satellite		Fixed-Satellite		Earth Exploration-Satellite (1)	Space Research: Near Earth	Space Research: Deep Space	Fixed-Satellite		Fixed-Satellite		Fixed-Satellite	Earth Exploration-Satellite (1)
Frequency band (GHz)		1·525–1·535	1·670–1·690	1·700–1·710 2·290–2·300		2·500–2·535		3·400–4·200		7·300–7·750		8·025–8·400	8·400–8·500		10·95–11·20 11·45–11·70		11·70–12·20 12·50–12·75		17·7–19·7	21·2–22·0
Modulation at earth station (2)				—	—	A	N	A	N	A	N		—	—	A	N	A	N	N	
Interference parameters and criteria	p_o (%)			0·1	0·001	0·03		0·03	0·003	0·03	0·003		0·1	0·001	0·03	0·003	0·03	0·003	0·003	
	n			2	1	3		3	3	3	3		2	1	2	1	2	1	1	
	p (%)			0·05	0·001	0·01		0·01	0·001	0·01	0·001		0·05	0·001	0·015	0·003	0·015	0·003	0·003	
	J (dB)			—	—	−8		−8	0	−8	0		—	—	−8	0	−8	0	0	
	$M_o(p_o)$ (dB)			—	—	17		17	5 (3)	17	5 (3)		—	—	17	5 (3)	17	5 (3)	5 (3)	
	W (dB)			—	—	4		4	0	4	0		—	—	4	0	4	0	0	
Terrestrial station parameters	E (dBW) in B	55	55	62(4)(6)	62(4)(6)	92 (6)		55	55	55	55		25(4)	25(4)	55	55	55	55	35(5)	
	P_t' (dBW) in B	13	13	10(4)(6)	10(4)(6)	40 (6)		13	13	13	13		−17(4)	−17(4)	5	5	5	5	−15(5)	
	ΔG (dB)	0	0	10 (6)	10 (6)	10 (6)		0	0	0	0		0	0	0	0	0	0	0	
Reference bandwidth	B (Hz)			1	1	10^6		10^6	10^6	10^6	10^6		1	1	10^6	10^6	10^6	10^6	10^6	
Permissible interference power	$P_r(p)$ (dBW) in B			−220	−220	—		—	—	—	—		−220	−220	—	—	—	—	—	

(1) Parameters associated with these services may vary over a rather wide range. Further study is required before representative values become available.
(2) A = analogue modulation; N = digital modulation.
(3) See note (2) in Section 2. $M_o(p_o)$ may assume values between 5 and 40 dB, depending on frequency, rain-climatic zone and system design.
(4) These values are estimated for 1 Hz bandwidth and are 30 dB below the total power assumed for emission.
(5) These values assume an r.f. bandwidth of no less than 100 MHz, and are 20 dB below total power assumed per emission.
(6) In these bands, the parameters for the terrestrial stations associated with transhorizon systems have been used.

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

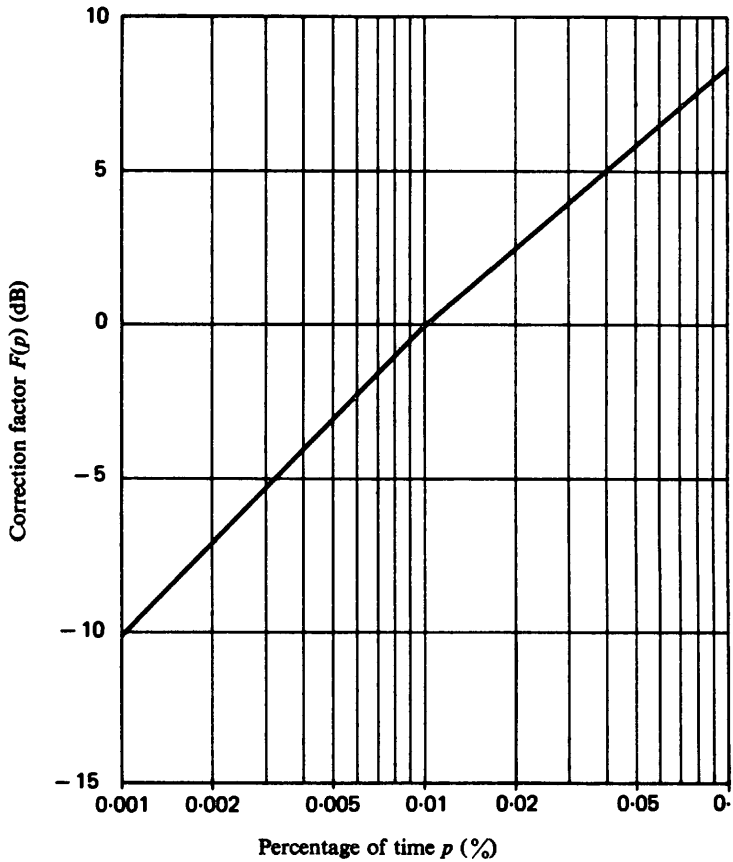


FIGURE 1

Correction factor F(p) for percentages of the time p other than 0·01%

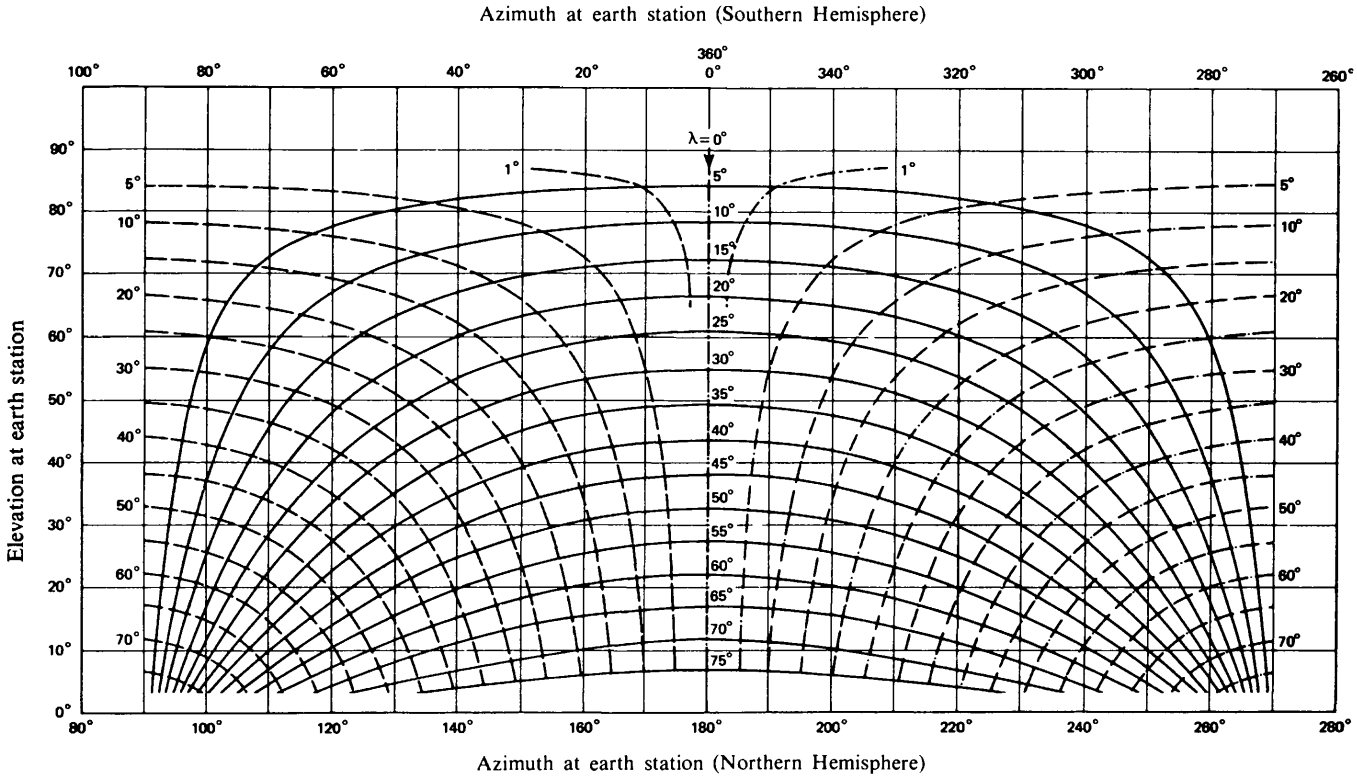


FIGURE 2 - ***Position arcs of geostationary satellites***

Arc of geostationary satellite orbit visible from earth station at terrestrial latitude λ

Difference in longitude between earth station and the sub-satellite point:

Satellite longitude E of earth station longitude

Satellite longitude W of earth station longitude

Satellite longitude equal to the earth station longitude

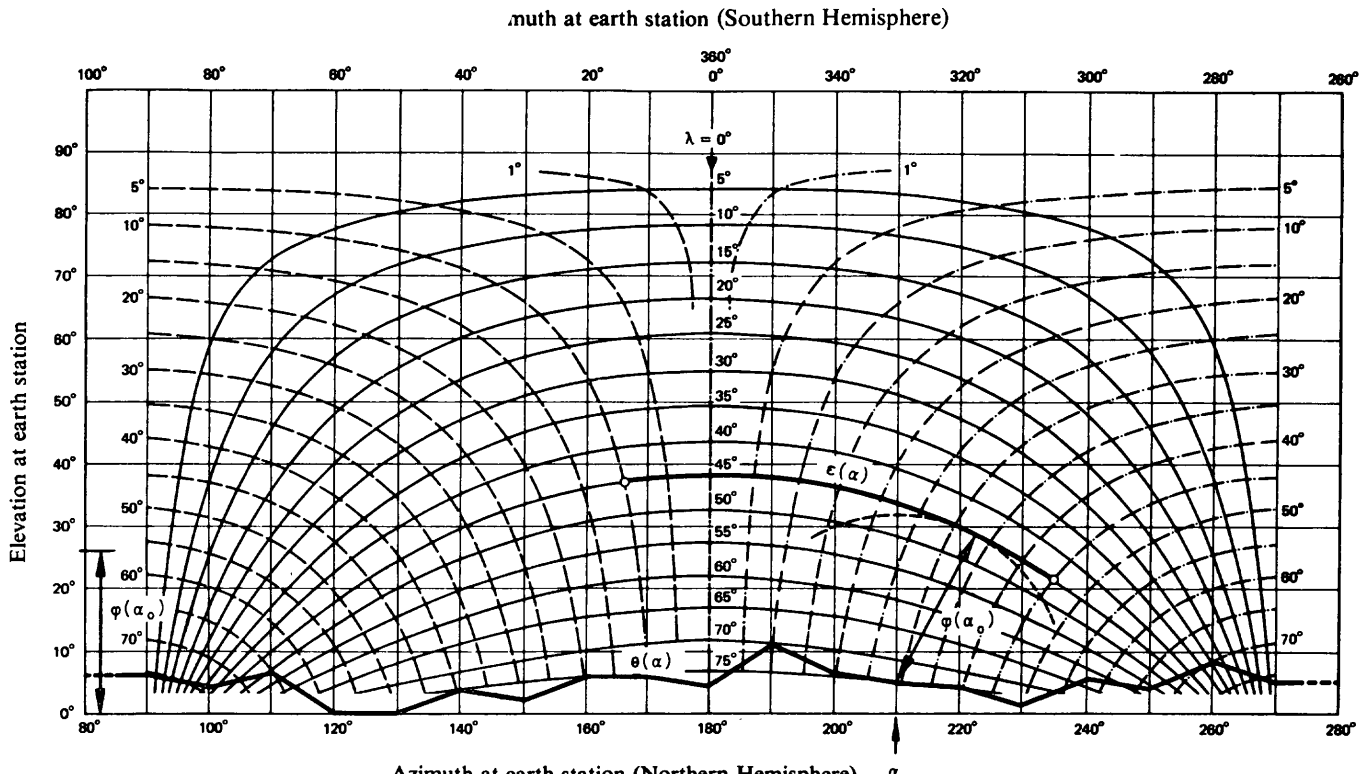


FIGURE 3 - *Example of derivation of* φ

Arc of geostationary satellite orbit visible from earth station at terrestrial latitude λ

Horizon profile θ(α)

Difference in longitude between earth station and the sub-satellite point:

Satellite longitude E of earth station longitude

Satellite longitude W of earth station longitude

Satellite longitude equal to the earth station longitude

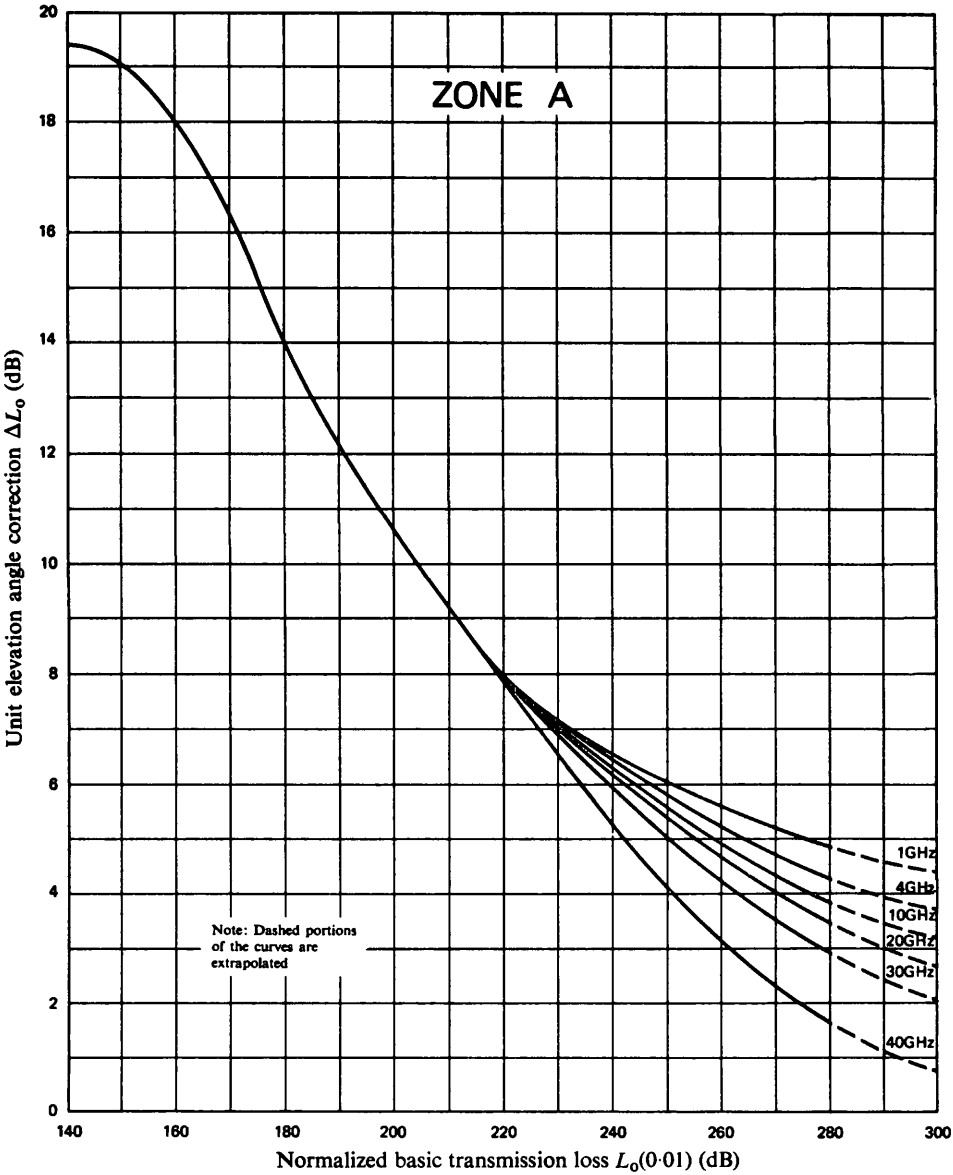


FIGURE 4

Unit elevation angle correction as a function of normalized basic transmission loss and frequency — Zone A

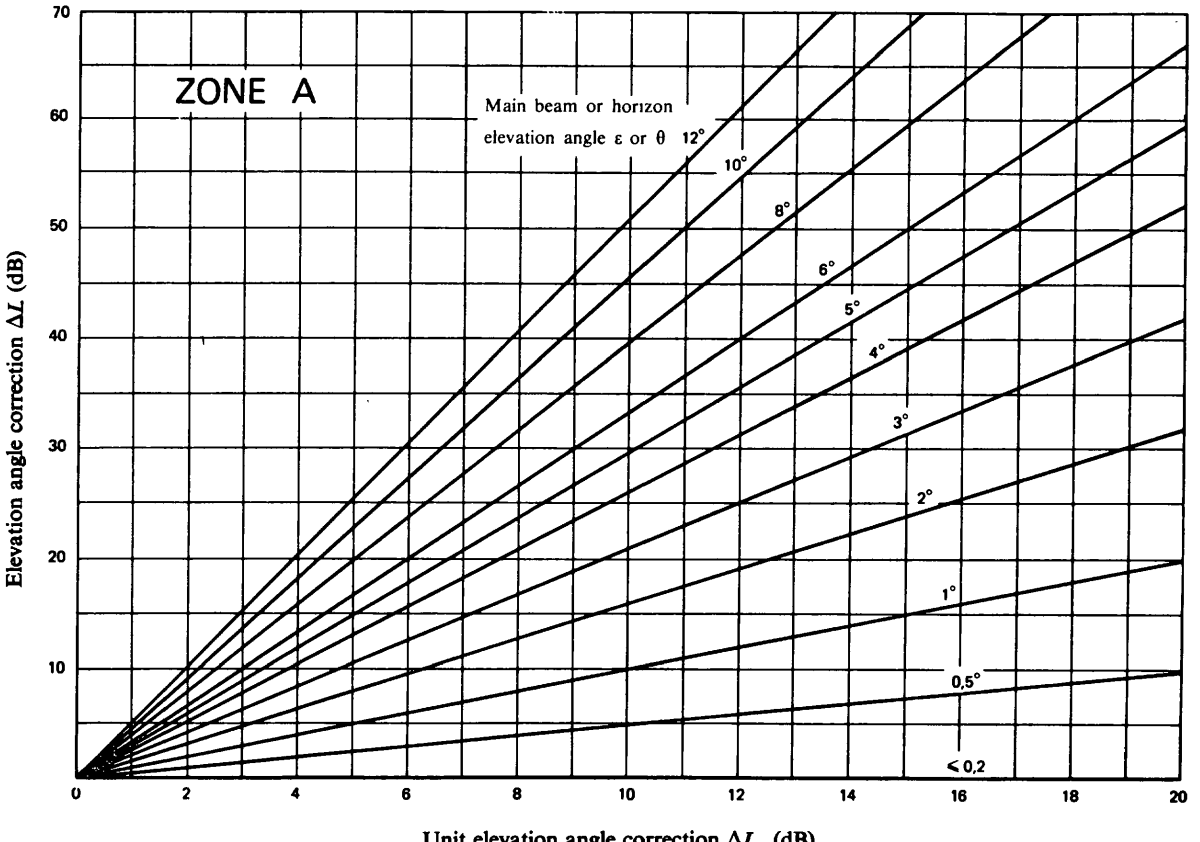


FIGURE 5

Elevation angle correction — Zone A

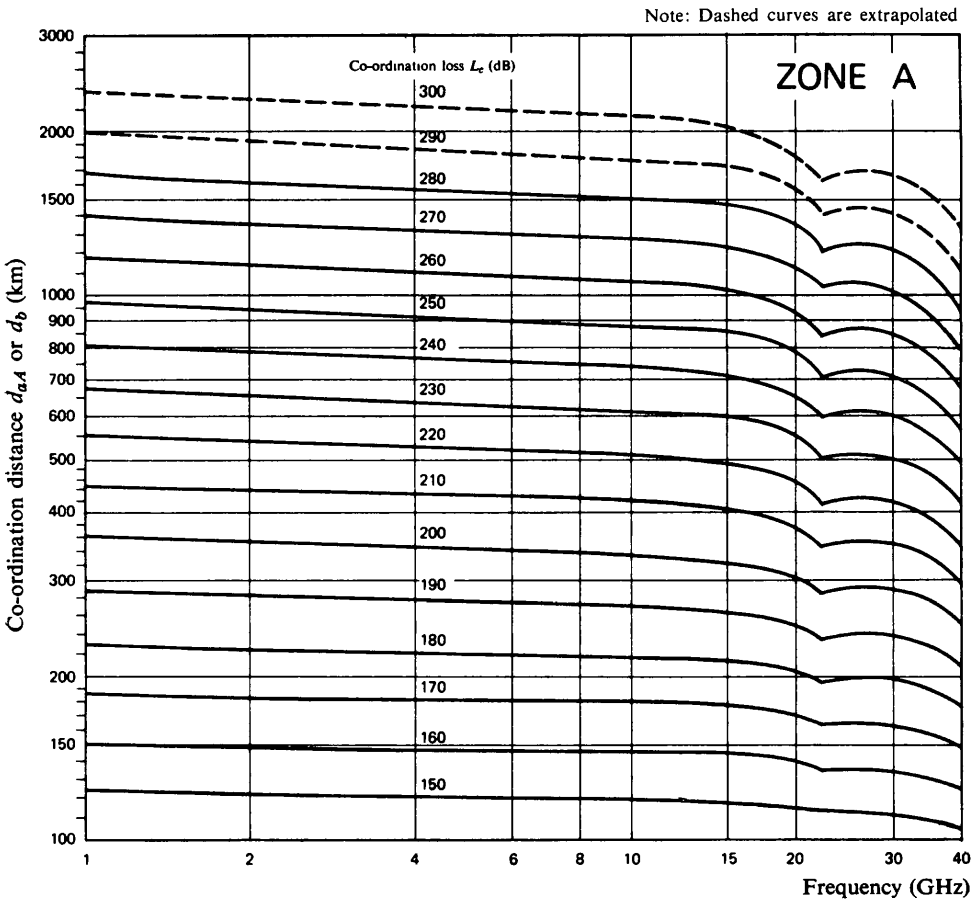


FIGURE 6

Co-ordination distance d_{aA} or d_b as a function of frequency and co-ordination loss — Zone A

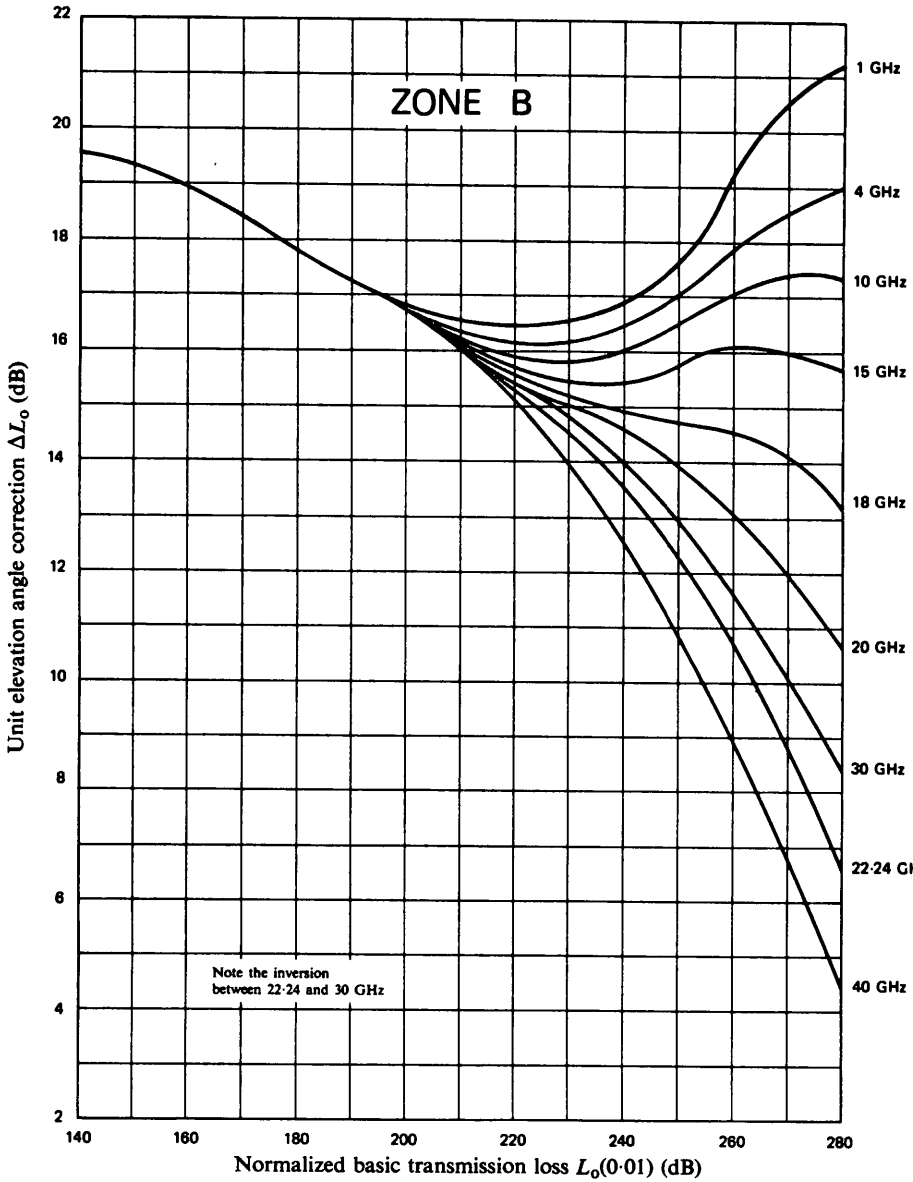


FIGURE 7

Unit elevation angle correction as a function of normalized basic transmission loss and frequency — Zone B

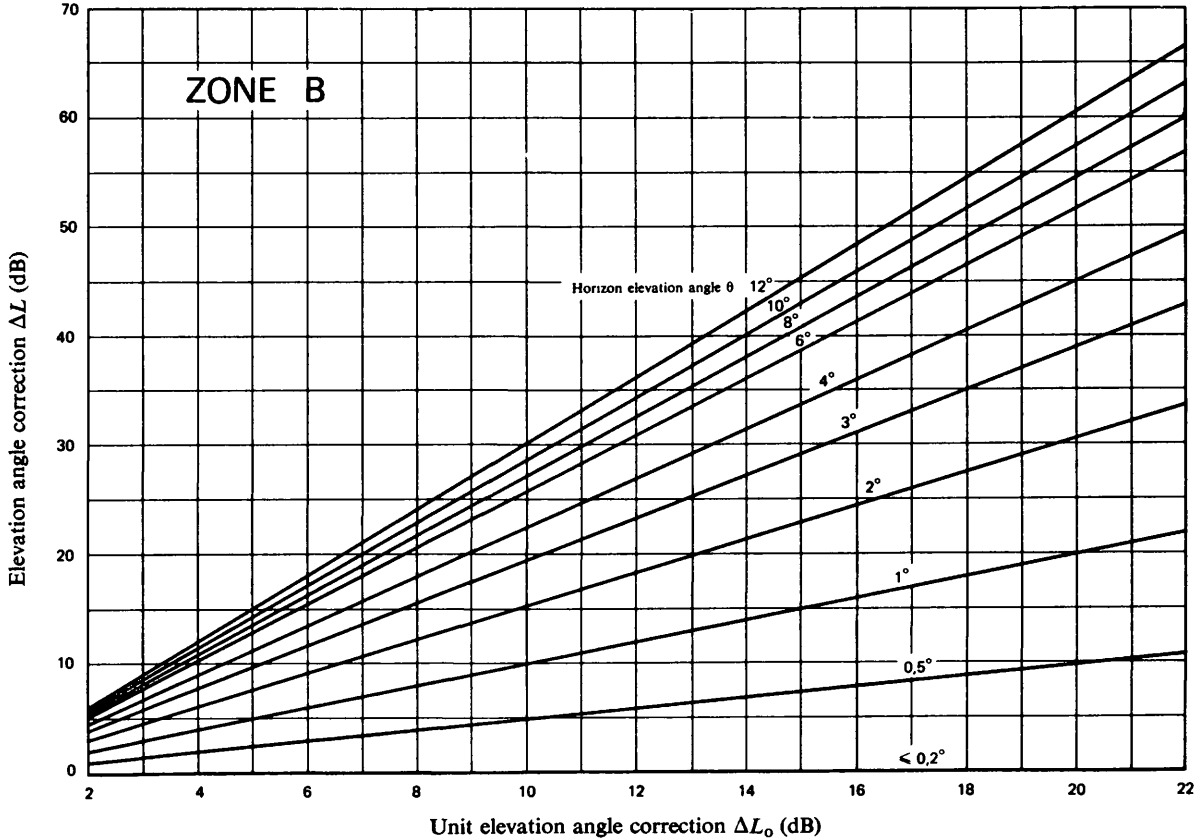


FIGURE 8

Elevation angle correction — Zone B

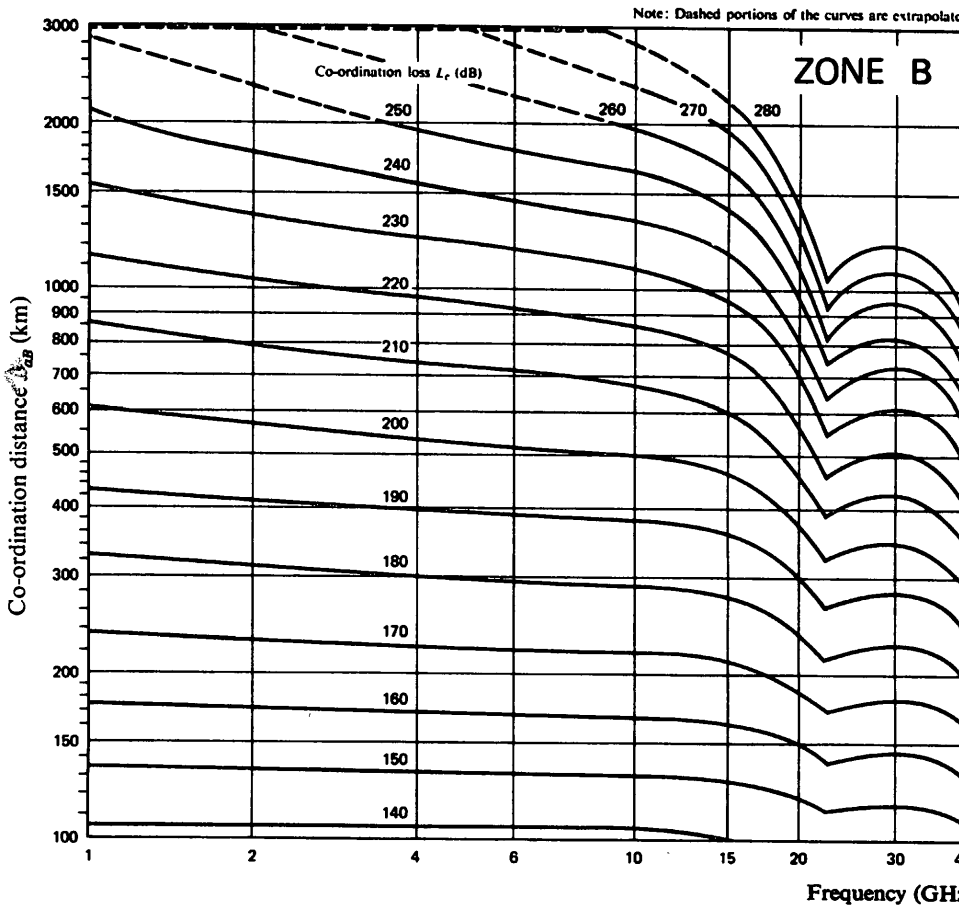


FIGURE 9

Co-ordination distance d_{aB} as a function of frequency and co-ordination loss — Zone B

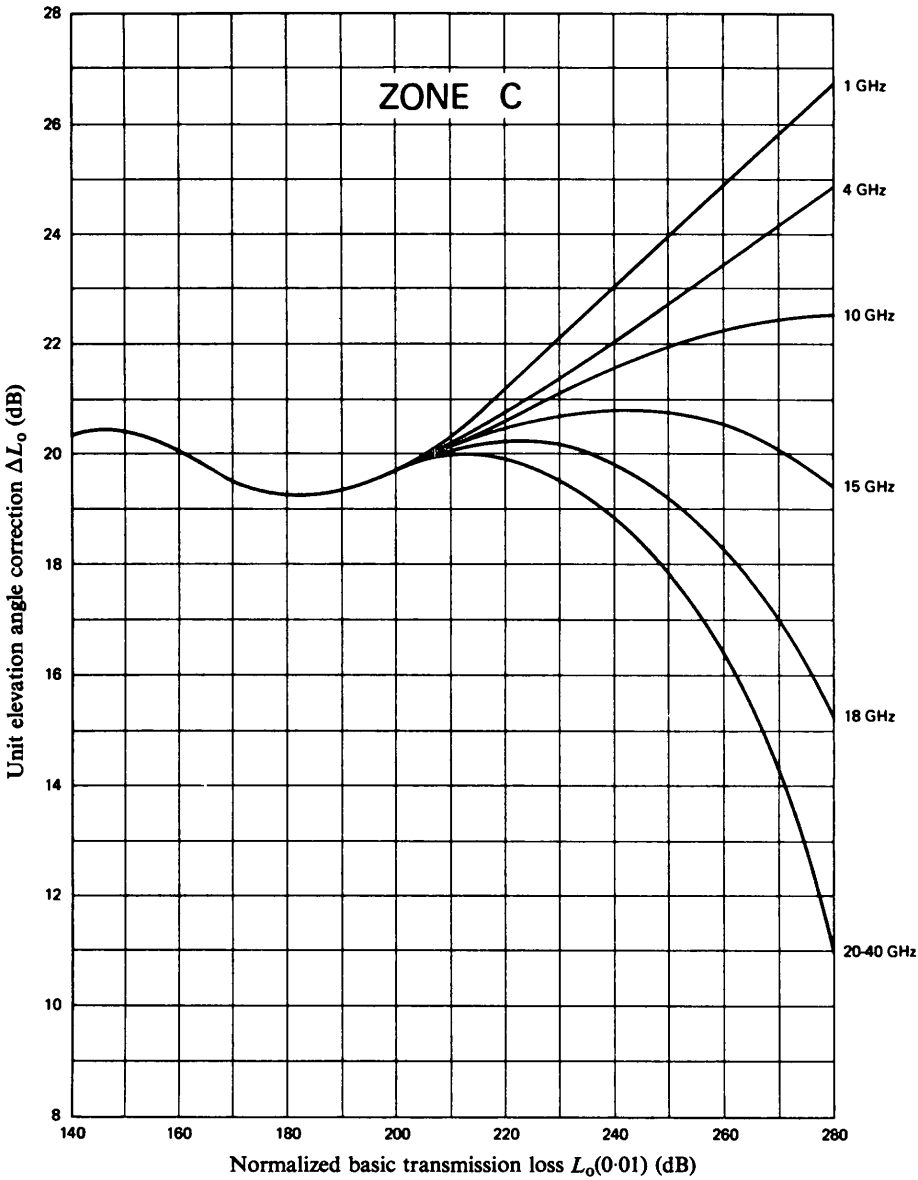


FIGURE 10

Unit elevation angle correction as a function of normalized basic transmission loss and frequency — Zone C

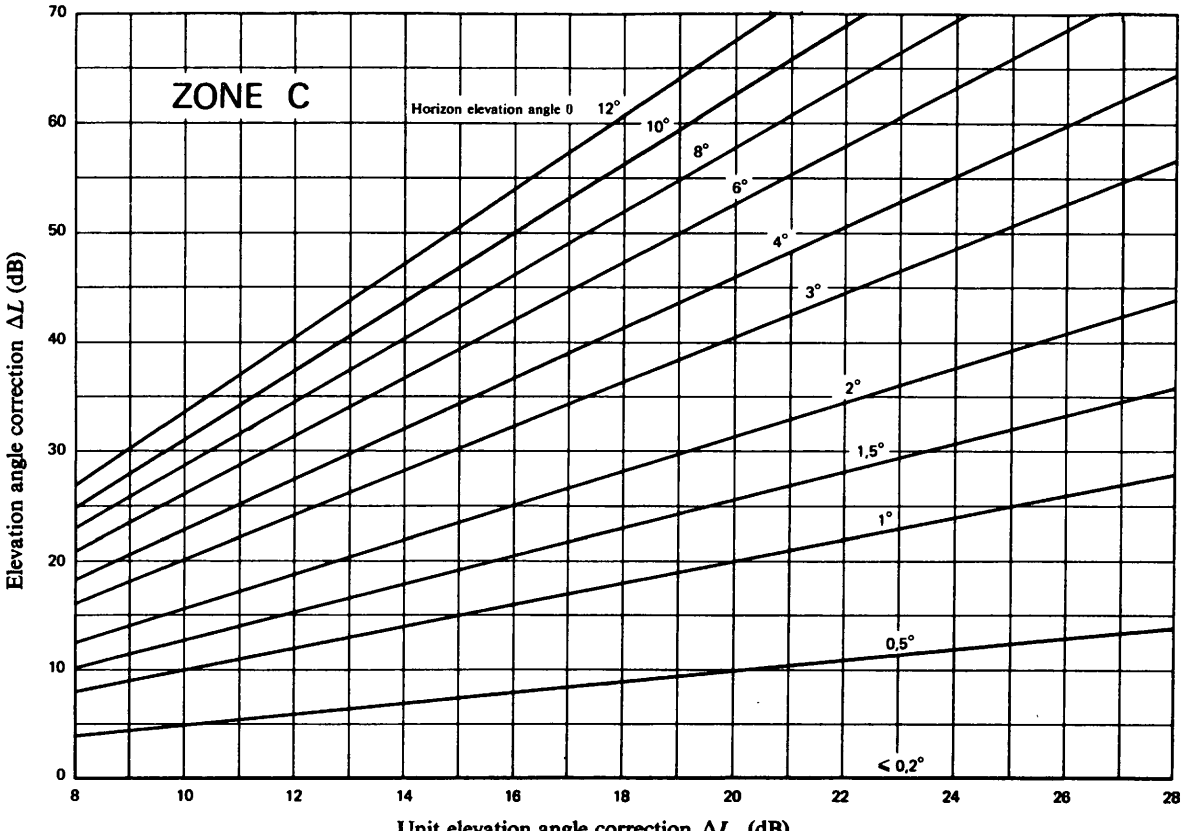


FIGURE 11

Elevation angle correction — Zone C

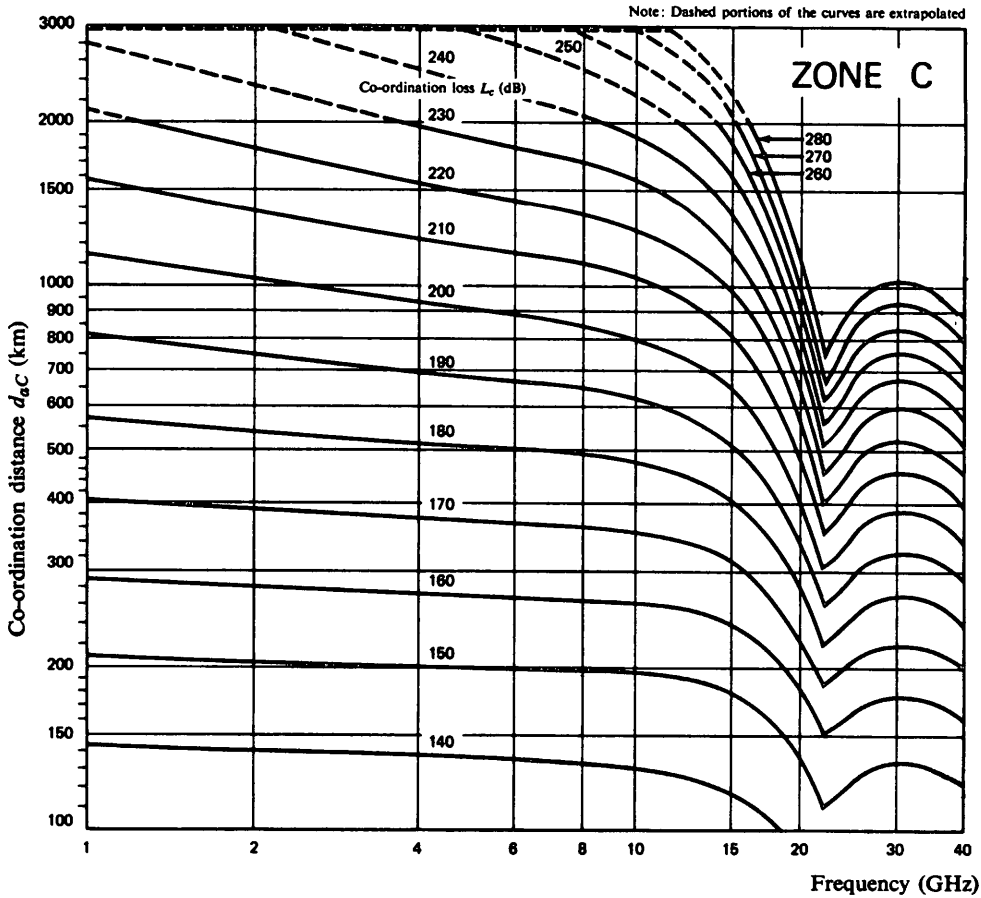


FIGURE 12

Co-ordination distance d_{aC} as a function of frequency and co-ordination loss — Zone C

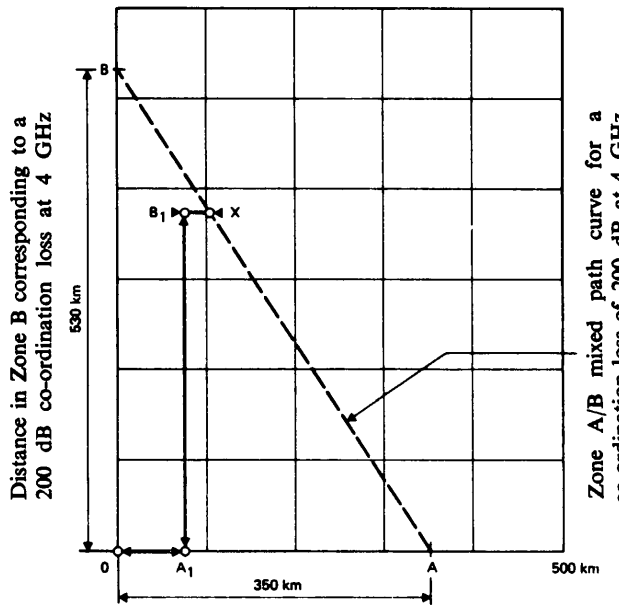


FIGURE 13a

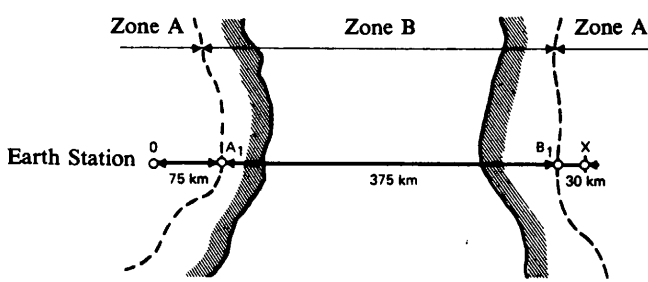


FIGURE 13b

FIGURE 13

Example of the determination of co-ordination distance for a mixed path involving two zones

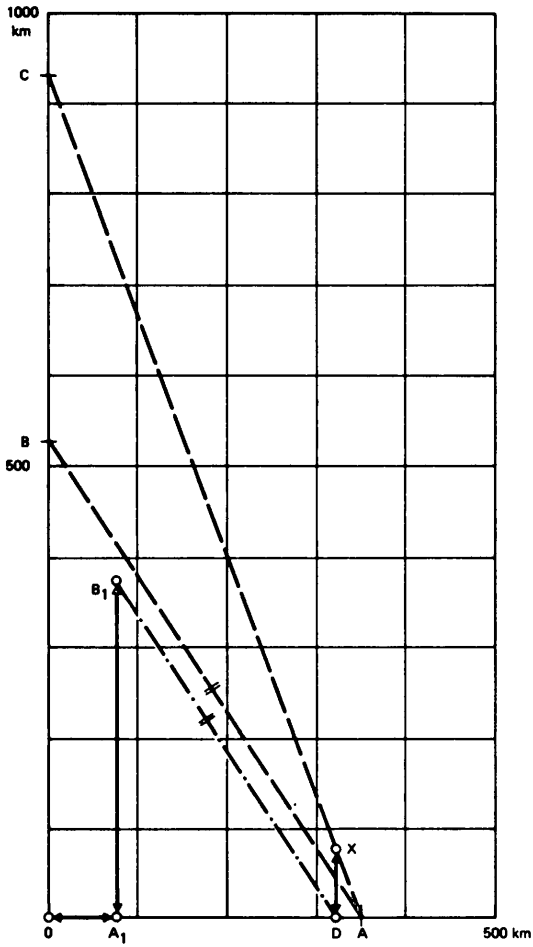


FIGURE 14b

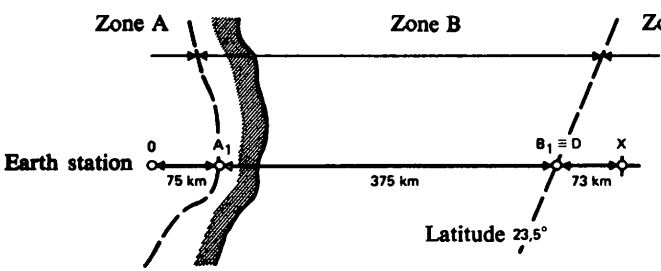


FIGURE 14a

FIGURE 14

Example of the determination of co-ordination distance for a mixed path involving the three zones

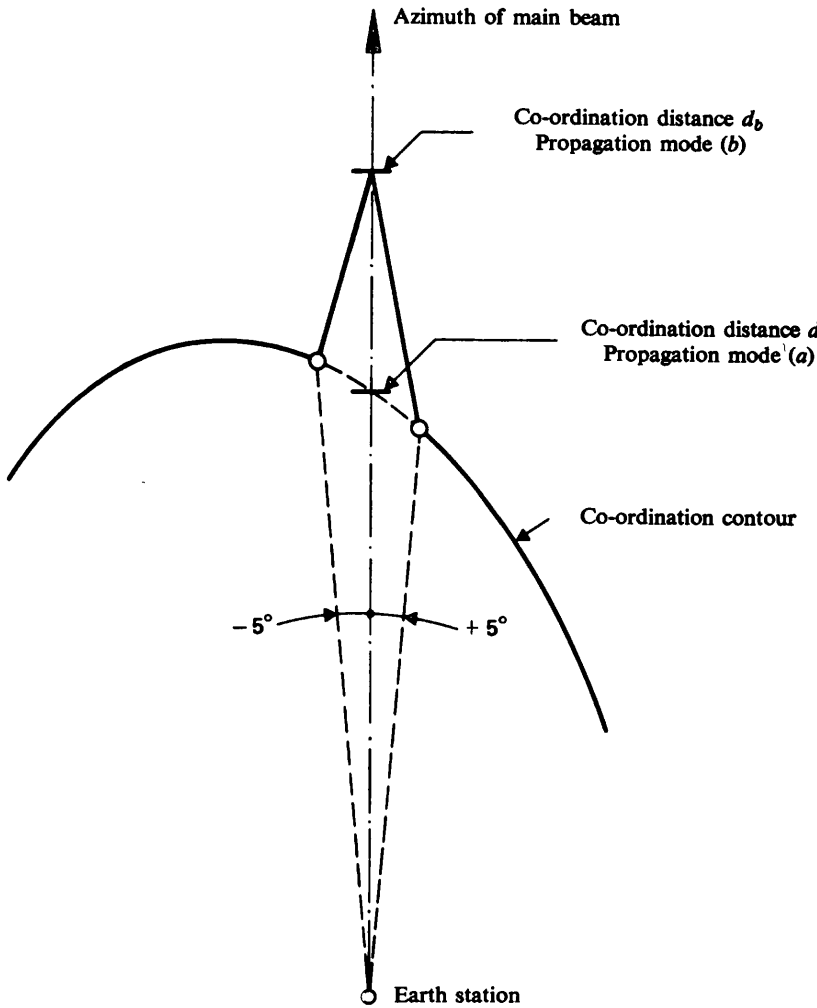
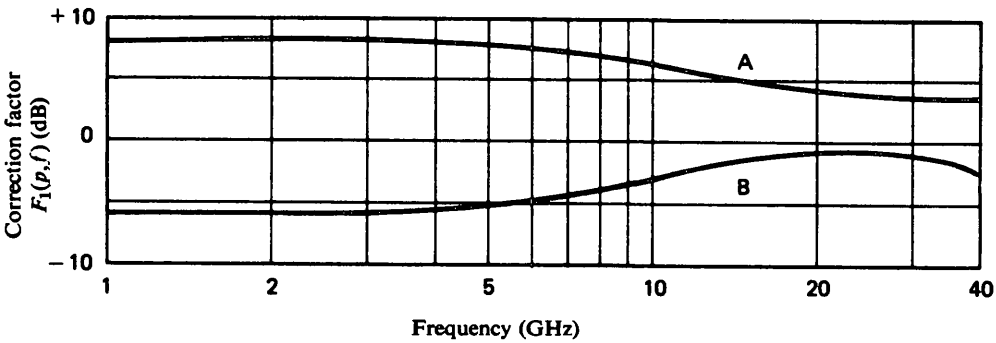


FIGURE 15

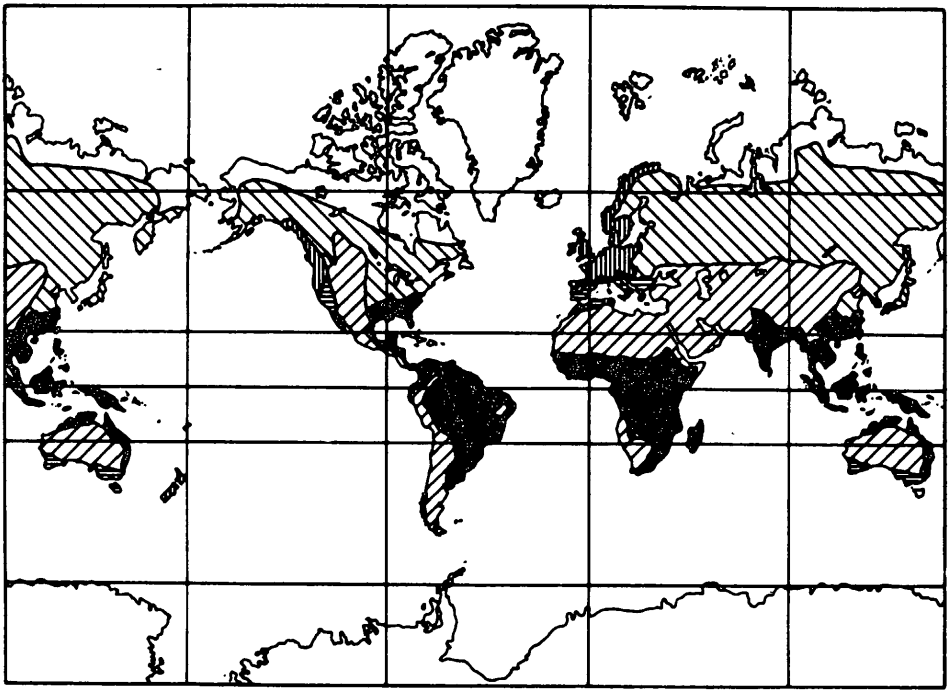
Example of the determination of the co-ordination distance in the case where the elevation of the earth station main beam is less than 12°



A: Correction for 0·1% of the time } for all rain climatic zones
B: Correction for 0·001% of the time

FIGURE 16

Correction factor $F_1(p, f)$ to relate the effective percentage of time to 0·01%, as a function of frequency for propagation mode (c)



Zone 1
Zone 2
Zone 3
Zone 4
Zone 5

FIGURE 17

Rain-climatic zones of the world

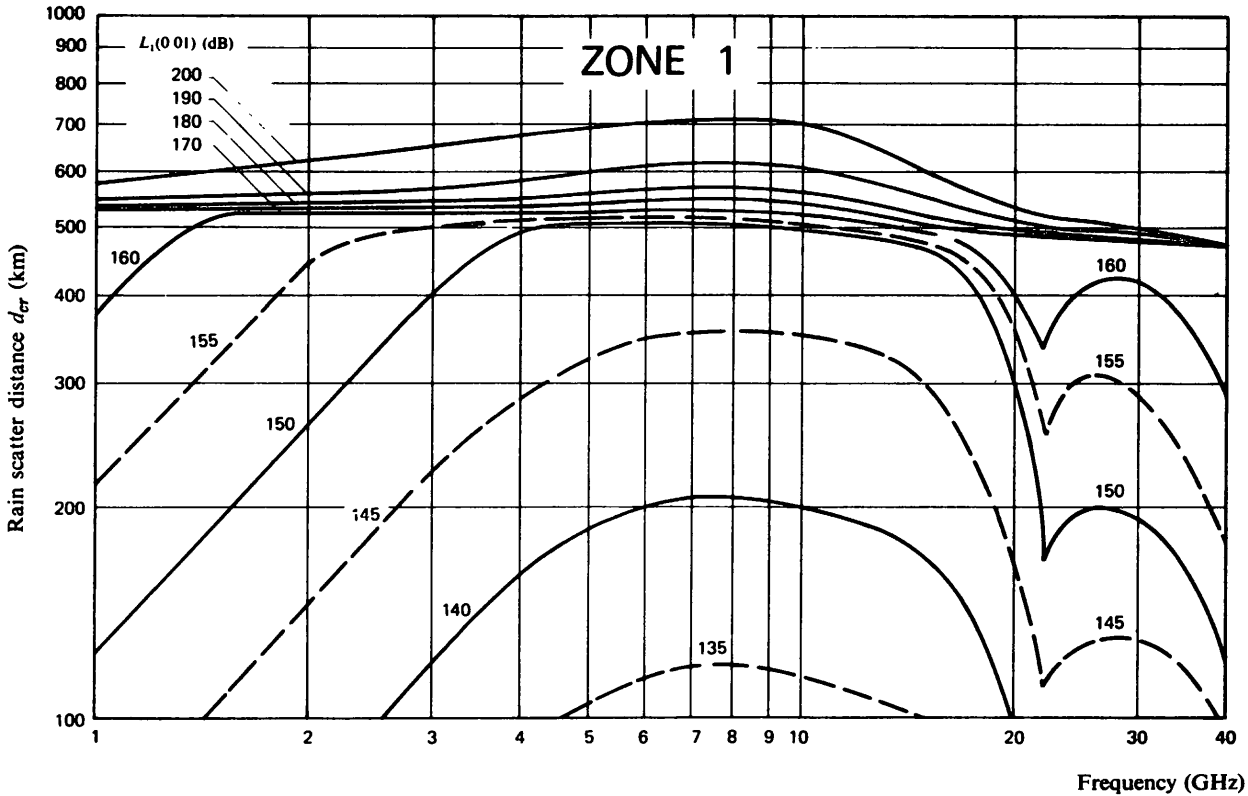


FIGURE 18

Rain scatter distance as a function of frequency and normalized transmission loss — Rain climatic Zone 1 (see figure 17)

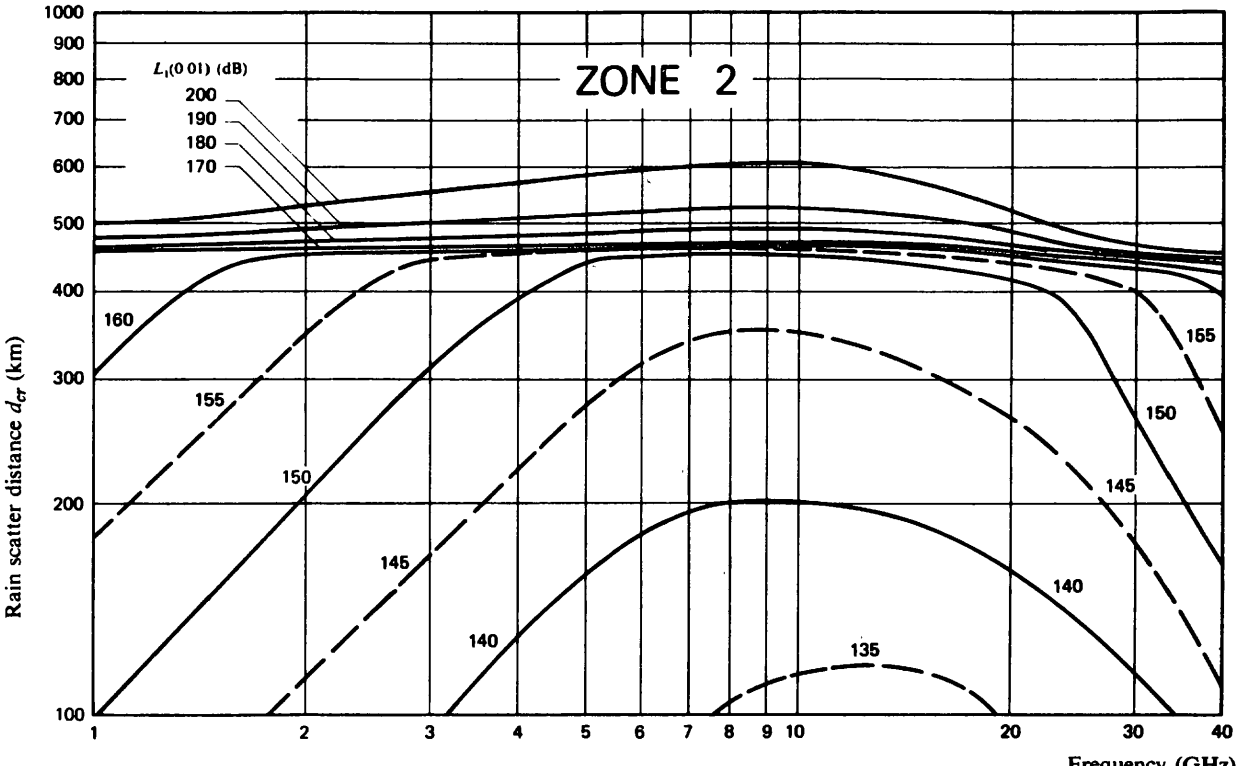


FIGURE 19

Rain scatter distance as a function of frequency and normalized transmission loss — Rain climatic Zone 2 (see figure 17)

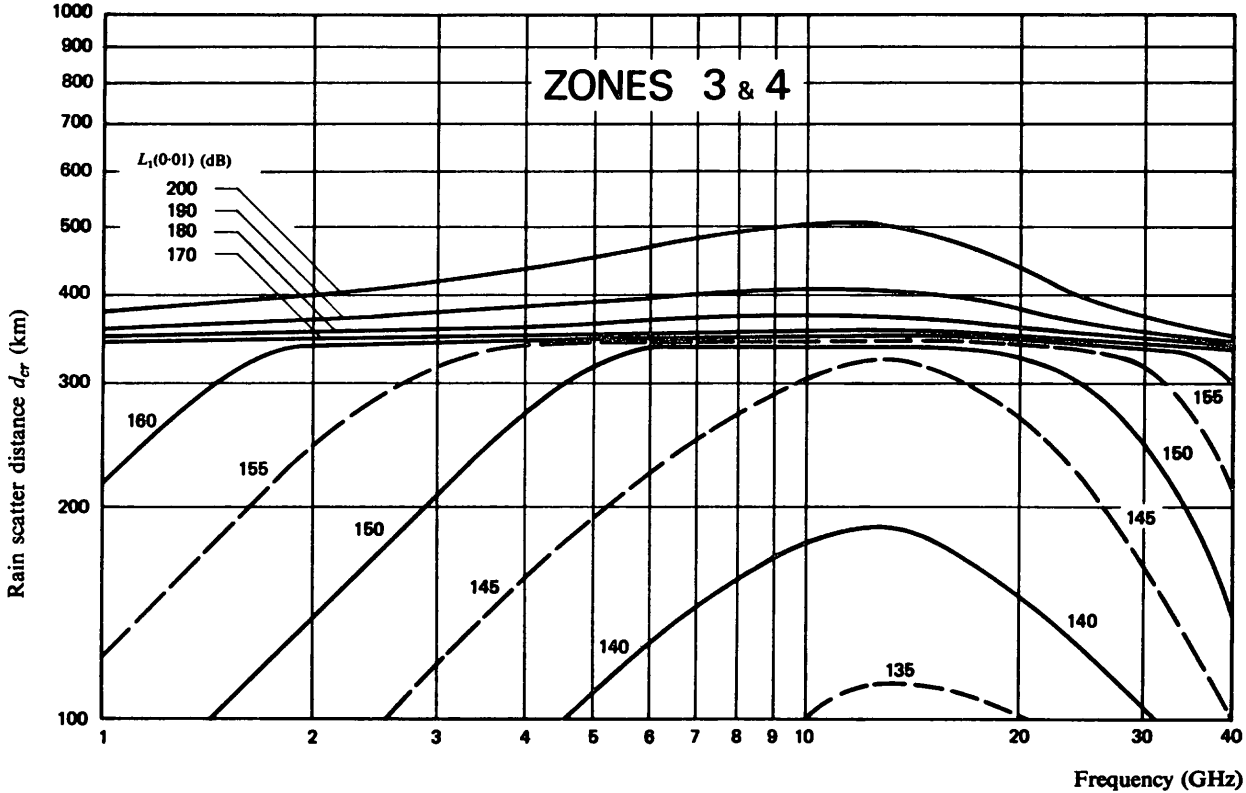


FIGURE 20

Rain scatter distance as a function of frequency and normalized transmission loss — Rain climatic Zones 3 and 4 (see figure 17)

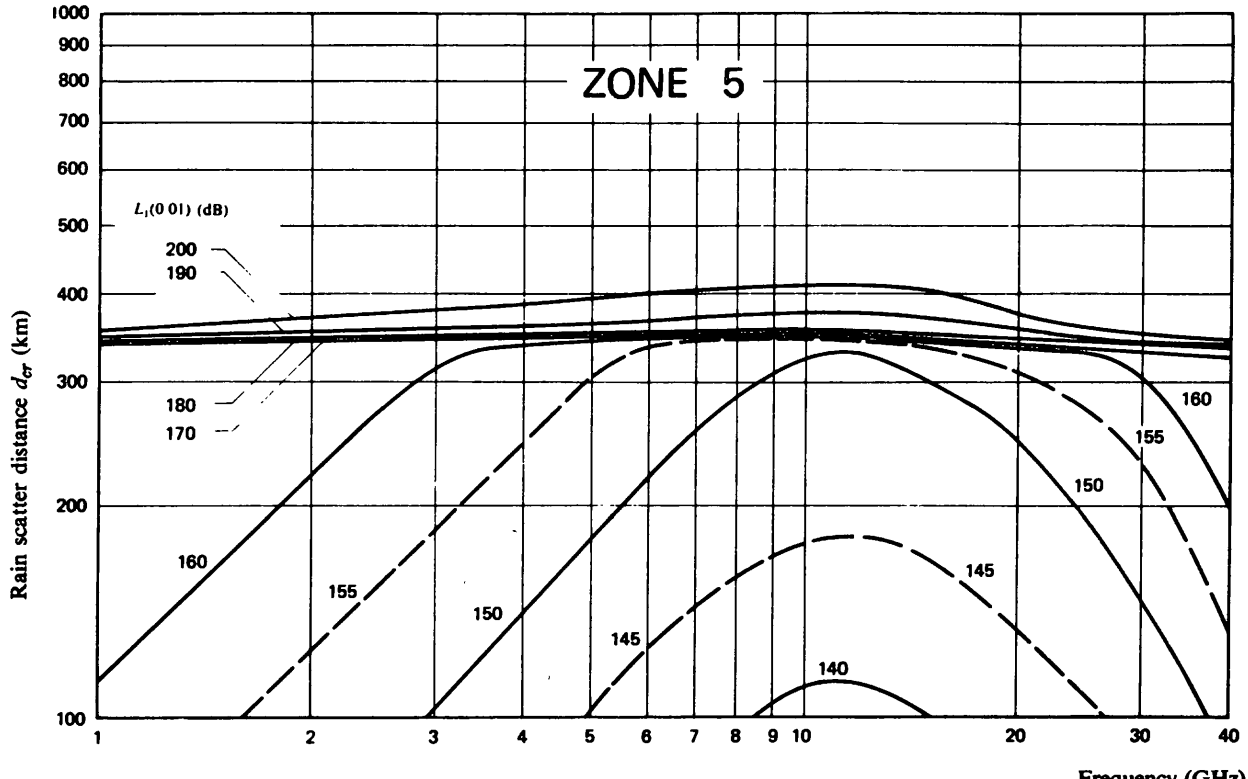


FIGURE 21

Rain scatter distance as a function of frequency and normalized transmission loss — Rain climatic Zone 5 (see figure 17)

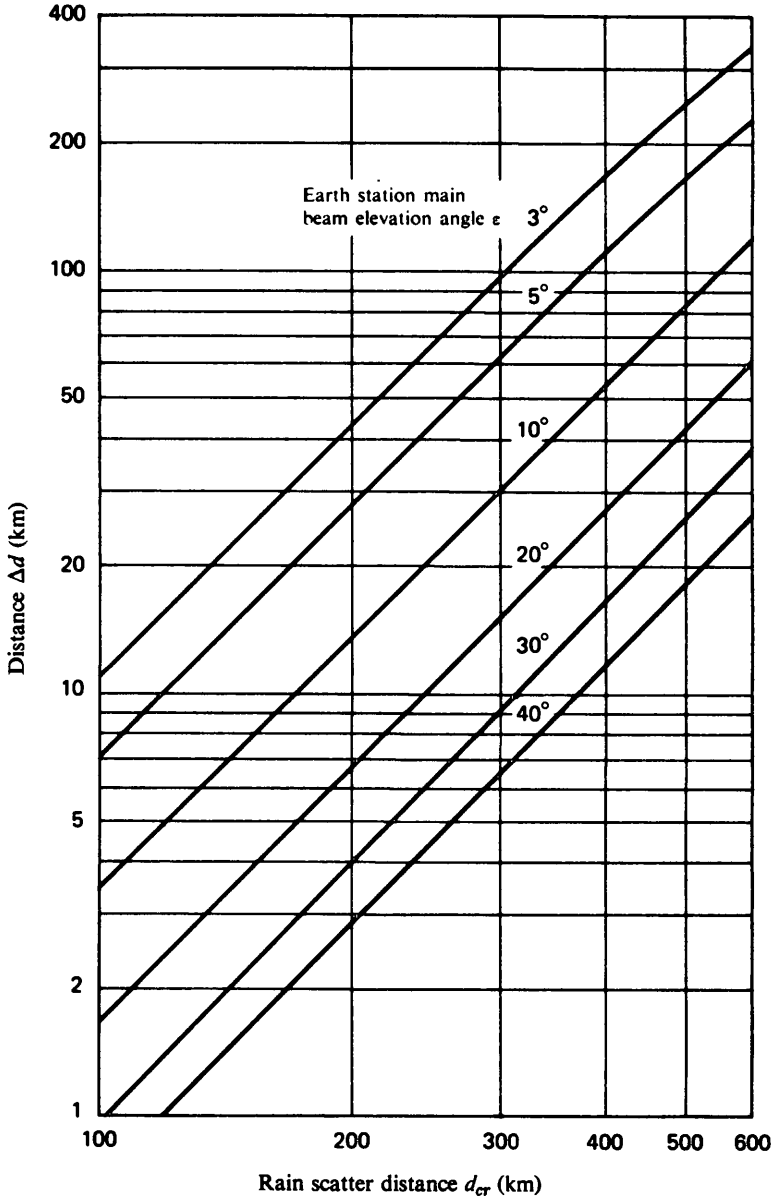
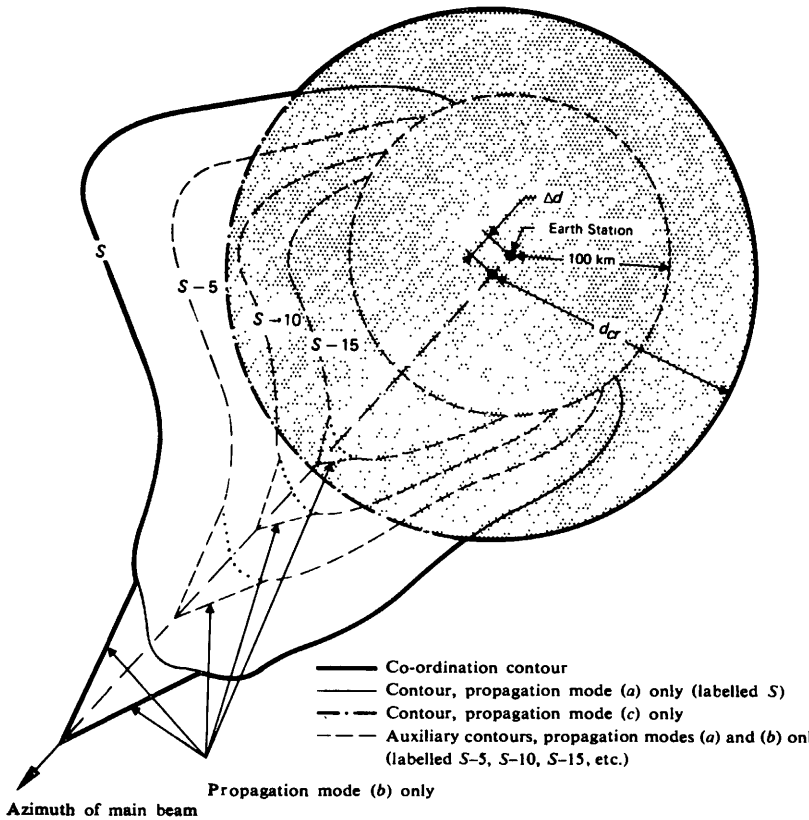


FIGURE 22

Distance Δd as a function of rain scatter distance d_{cr} and earth station main beam elevation angle ε



If by using the auxiliary contours it is seen that a terrestrial station can be eliminated with respect to the great circle propagation mechanism then:

i) if that terrestrial station is outside of the shaded area (rain-scatter mode), it may be eliminated from any further consideration;

ii) if that terrestrial station is within the shaded area (rain-scatter mode), it must still be considered, but simply for the rain-scatter propagation mode only.

FIGURE 23

Example of contours for a transmitting earth station

PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

ANNEX A TO APPENDIX 28

Determination of Co-ordination Distance in allocated Frequency Bands

1. Article 9A of the Radio Regulations requires co-ordination distances to be determined only in the particular frequency bands given in Article 5 of these Regulations and listed in Tables III and IV of this Annex. For each of these frequency bands it is convenient to combine those parameters which depend only upon the frequency and types of system using the band. The resulting value of the combined parameters is then a given constant for a particular allocated frequency band and type of earth station.

Earth station transmission

2. In the bands allocated for earth station transmission (Table III), use is made of constants C_1 and C_2 derived in the following manner:

For propagation by modes (*a*) and (*b*):

$$C_1 = G_r - P_r(p) - 20 \log_{10}(f/4) - F(p)$$
$$= S - 20 \log_{10}(f/4) - F(p)$$

For propagation by mode (*c*):

$$C_2 = -P_r(p) - F_1(p,f) + \Delta G$$

The normalized basic transmission loss $L_0(0{\cdot}01)$ and the normalized transmission loss $L_1(0{\cdot}01)$ are given by:

$$L_0(0{\cdot}01) = P_{t'} + G_{t'} + C_1$$
$$L_1(0{\cdot}01) = P_{t'} + C_2$$

The values of C_1 and C_2 for bands allocated for earth station transmission are given in Table III, together with the reference bandwidth (*B*) which is used in calculating $P_{t'}$.

Earth station reception

3. In the bands allocated for earth station reception (see Table IV) use is made of constants C_3 and C_4 which are derived in the following manner:

For propagation by modes (*a*) and (*b*):

$$C_3 = E - (10 \log_{10} kB + J - W) - F(p) - 20 \log_{10} (f/4)$$

For propagation by mode (*c*):

$$C_4 = P_{t'} - (10 \log_{10} kB + J - W) - F_1(p,f) + \Delta G$$

The normalized basic transmission loss $L_0(0{\cdot}01)$ and the normalized transmission loss $L_1(0{\cdot}01)$ are given by:

$$L_0(0{\cdot}01) = G_r + C_3 - 10 \log_{10} T_r - M(p)$$
$$L_1(0{\cdot}01) = C_4 - 10 \log_{10} T_r - M(p)$$

The values of C_3 and C_4 for bands allocated for earth station reception are given in Table IV.

Flow Diagrams

4. The procedure for determining co-ordination distance is illustrated by Flow Diagrams 1 and 2 in this Annex. The steps required to determine co-ordination distances for a transmitting earth station are shown in Flow Diagram 1, and those for a receiving earth station are shown in Flow Diagram 2. The symbols used in these diagrams are defined in the main text of Appendix 28.

TABLE III

Earth Station Transmission (See Flow Diagram 1)

Allocated Frequency Bands (GHz)	C_1 (dBW)	C_2 (dBW)	Reference Bandwidth B (Hz)
1·427 - 1·429	178	127	4×10^3
2·655 - 2·690	196	150	4×10^3
4·400 - 4·700	191	150	4×10^3
5·850 - 6·425	175	136	4×10^3
7·900 - 7·975 8·025 - 8·400	175	138	4×10^3
10·95 - 11·20	172	137	4×10^3
12·50 - 12·75	171	137	4×10^3
14·40 - 14·50	170	137	4×10^3
27·5 - 29·5	142	112	1×10^6

TABLE IV

Earth Station Reception (see Flow Diagram 2)

Allocated frequency bands (GHz)	Designation of space radiocommunication service		Type of modulating signal (1)	C_3 (dBW)	C_4 (dBW)
1·525 - 1·535	Space operation (Telemetering)				
1·670 - 1·690	Meteorological-satellite				
1·700 - 1·710 2·290 - 2·300	Space research	Near Earth			
		Deep space, manned			
2·500 - 2·535	Fixed-satellite		A	277	231
3·400 - 4·200	Fixed-satellite		A	236	194
			N	234	188
7·300 - 7·750	Fixed-satellite		A	230	194
			N	228	186
8·025 - 8·400	Earth exploration-satellite				
8·400 - 8·500	Space research	Near Earth			
		Deep space			
10·95 - 11·20 11·45 - 11·70	Fixed-satellite		A	225	184
			N	220	176
11·70 - 12·20 12·50 - 12·75	Fixed-satellite		A	224	184
			N	219	176
17·7 - 19·7	Fixed-satellite		N	196	154
21·2 - 22·0	Earth exploration-satellite				

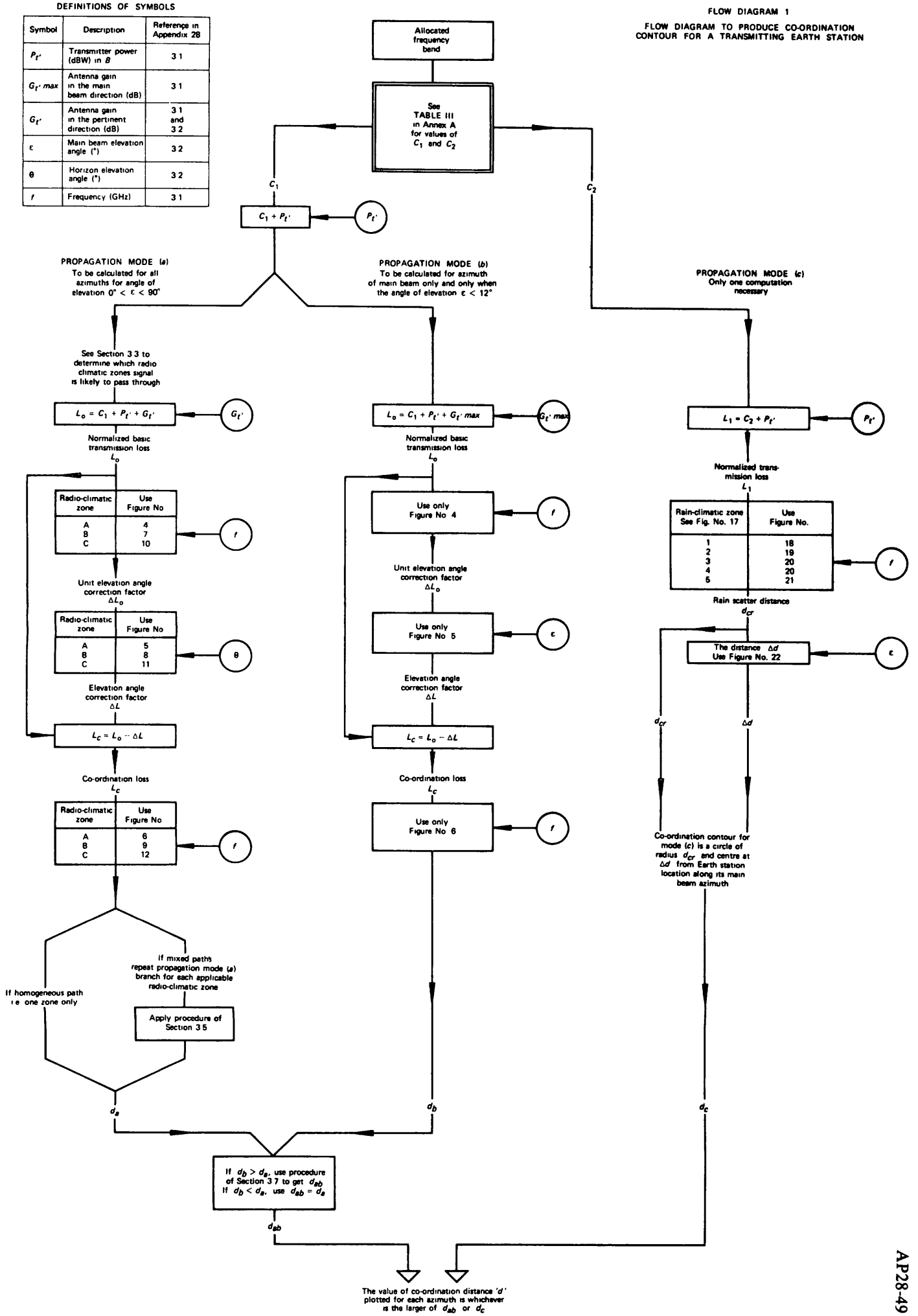
(1) A = Analogue Modulation; N = Digital Modulation.

DEFINITIONS OF SYMBOLS

Symbol	Description	Reference in Appendix 28
P_t'	Transmitter power (dBW) in B	3 1
$G_t' max$	Antenna gain in the main beam direction (dB)	3 1
G_t'	Antenna gain in the pertinent direction (dB)	3 1 and 3 2
ε	Main beam elevation angle (°)	3 2
θ	Horizon elevation angle (°)	3 2
f	Frequency (GHz)	3 1

FLOW DIAGRAM 1

FLOW DIAGRAM TO PRODUCE CO-ORDINATION CONTOUR FOR A TRANSMITTING EARTH STATION



PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

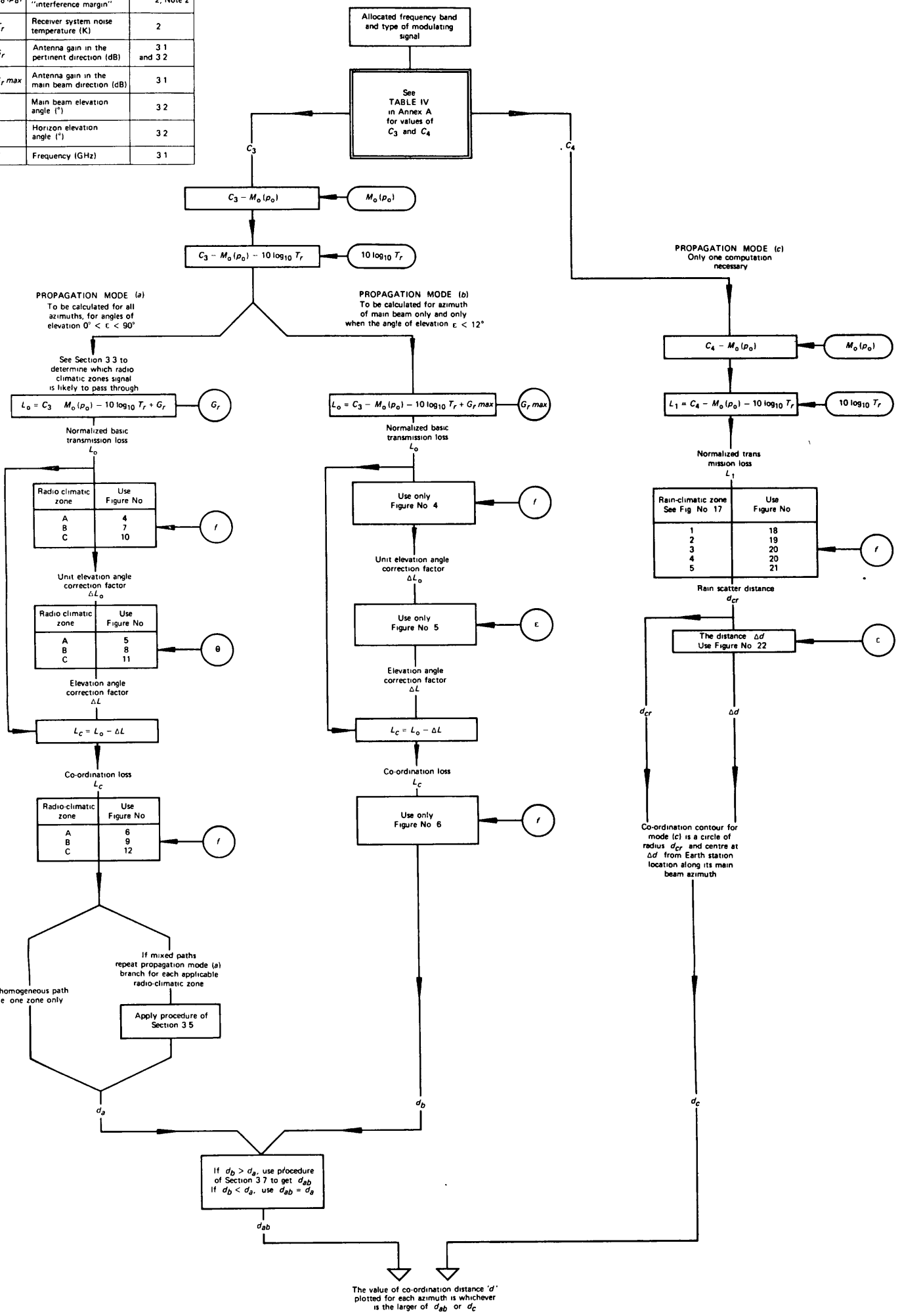
PAGE INTENTIONALLY LEFT BLANK

DEFIN. .ONS OF SYMBOLS

Symbol	Description	Reference in Appendix 2B
$M_o(p_o)$	Long term/short term "interference margin"	2, Note 2
T_r	Receiver system noise temperature (K)	2
G_r	Antenna gain in the pertinent direction (dB)	3 1 and 3 2
$G_r max$	Antenna gain in the main beam direction (dB)	3 1
ε	Main beam elevation angle (°)	3 2
θ	Horizon elevation angle (°)	3 2
f	Frequency (GHz)	3 1

FLOW DIAGRAM 2

FLOW DIAGRAM TO PRODUCE CO-ORDINATION CONTOUR FOR A RECEIVING EARTH STATION



PAGE LAISSEE EN BLANC INTENTIONNELLEMENT

PAGE INTENTIONALLY LEFT BLANK

ANNEX B TO APPENDIX 28

Determination and Use of auxiliary Contours

1. *Introduction*

For great circle propagation mechanisms, modes (*a*) and (*b*), auxiliary contours are of great value in eliminating certain existing or planned terrestrial stations falling within the co-ordination area without recourse to precise and arduous calculations. The work of both the earth station administration and the affected administrations is therefore eased during subsequent negotiations if these auxiliary contours are supplied.

2. *Determination of the auxiliary contours*

Two types of contours can be determined, depending on whether the earth station is used for transmission or reception.

2.1 *Transmitting earth station*

The contours are determined in the same way as the corresponding co-ordination contour for propagation modes (*a*) and (*b*), but using terrestrial station interference sensitivity factor S values (in dBW) which are 5, 10, 15, 20 dB, etc. lower than the value (given in Table I of Appendix 28) corresponding to the co-ordination contour.

2.2 *Receiving earth station*

The contours are determined in the same way as the corresponding co-ordination contour, for propagation modes (*a*) and (*b*), but using terrestrial station e.i.r.p. values E (in dBW) which are 5, 10, 15, 20 dB, etc. lower than the value (given in Table II of Appendix 28) corresponding to the co-ordination contour.

3. *Use of auxiliary contours*

The auxiliary contours, the co-ordination contour for great circle propagation (modes (*a*) and (*b*)) and the co-ordination contour for

rain scatter (mode (*c*)) are all plotted on the same diagram for a given shared band. An illustrated example is given in Figure 23 of Appendix 28 for a transmitting earth station.

For each terrestrial station situated within the co-ordination area, a two-stage procedure may be applied, one for the great circle propagation mechanism and the other for rain scatter.

3.1 *Great circle propagation mechanism (modes (a) and (b))*

If a transmitting terrestrial station is outside the co-ordination area corresponding to modes (*a*) and (*b*), it need not be considered further with respect to modes (*a*) and (*b*).

For each transmitting terrestrial station situated within the co-ordination area corresponding to modes (*a*) and (*b*), the e.i.r.p. value in the direction of the earth station is determined. If this value is less than the value associated with the nearest contour defining an area outside of which the station is situated, the station may be considered not to cause more than a permissible level of interference and therefore may be eliminated from further considerations with respect to modes (*a*) and (*b*).

For each receiving terrestrial station, the analogous procedure may be applied, using the interference sensitivity factor instead of the e.i.r.p. value.

3.2 *Elimination of a terrestrial station and rain scatter mechanism (mode (c))*

Terrestrial stations eliminated by the above procedure from further consideration with regard to propagation modes (*a*) and (*b*) need, nevertheless, be further considered with regard to propagation mode (*c*) when they lie within the rain scatter co-ordination area.

APPENDIX 29

Spa2

Method of Calculation to evaluate the Degree of Interference between geostationary Satellite Networks Sharing the same Frequency Bands

1. *Introduction*

The method of calculating interference is based on the concept that the noise temperature of the system receiving interference increases as the level of the interference increases. It can, therefore, be applied irrespective of the modulation characteristics of these satellite networks, and of the precise frequencies used.

In this method, the apparent increase in the equivalent satellite link noise temperature (1) resulting from interference caused by a given system is calculated and this value is compared with a predetermined increase in the noise temperature (see section 3 below).

2. *Calculation of the increase in noise temperature of the satellite link receiving interference*

Let A and A′ be the satellite links (2) of the two satellite networks considered. Primes indicate the parameters of satellite link A′; the notation without primes is used for the parameters of satellite link A.

The parameters are defined as follows (for satellite link A):

ΔT_s = increase in the receiver noise temperature of the satellite S caused by interference in the receiver of this satellite (K);

ΔT_e = increase in the receiver noise temperature of the earth station e_R caused by interference in the receiver of this station (K);

---

(1) See No. **103A.**

(2) See No. **84AFC.**

p_s = maximum power density per Hz delivered to the antenna of satellite S (averaged over the worst 4 kHz band for a carrier frequency below 15 GHz or over the worst 1 MHz band above 15 GHz) (W/Hz);

$g_3(\eta_{e'})$ = transmitting antenna gain of satellite S in the direction of the receiving earth station e'_R of satellite link A′ (numerical power ratio);

Note: the product $p_s\, g_3(\eta_{e'})$ is the maximum equivalent isotropically radiated power per Hz of satellite S in the direction of the receiving earth station e'_R of satellite link A′;

p_e = maximum power density per Hz delivered to the antenna of the transmitting earth station e_T (averaged over the worst 4 kHz band for a carrier frequency below 15 GHz or over the worst 1 MHz band above 15 GHz) (W/Hz);

$g_2(\delta_{e'})$ = receiving antenna gain of satellite S in the direction of the transmitting earth station e'_T (numerical power ratio);

$g_1(\theta)$ = transmitting antenna gain of the earth station e_T in the direction of satellite S′ (numerical power ratio);

$g_4(\theta)$ = receiving antenna gain of the earth station e_R in the direction of satellite S′ (numerical power ratio);

k = Boltzmann's constant (J/K);

l_d = free-space transmission loss on the down-path (numerical power ratio) (*);

l_u = free-space transmission loss on the up-path (numerical power ratio) (*);

(*) To simplify the calculation it was assumed that:

— basic transmission loss on the down-path is the same regardless of the satellite and earth station considered;

— basic transmission loss on the up-path is the same regardless of the earth station and satellite considered.

γ = transmission gain of the satellite link evaluated from the output of the receiving antenna of the space station S to the output of the receiving antenna of the earth station e_R (numerical power ratio, usually less than 1);

θ = geocentric angular separation between two satellites (degrees) (*).

The parameters ΔT_s and ΔT_e are given by the following equations:

$$\Delta T_s = \frac{p'_e\, g'_1(\theta)\, g_2(\delta_{e'})}{kl_u} \tag{1}$$

$$\Delta T_e = \frac{p'_s\, g'_3(\eta_e)\, g_4(\theta)}{kl_d} \tag{2}$$

The symbol ΔT will be used to denote the apparent increase in the equivalent noise temperature for the entire satellite link at the receiver input of the receiving station e_R due to interference from link A′.

This increase is the result of interference entering at both the satellite and earth station receiver of link A and can accordingly be expressed as:

$$\Delta T = \gamma \Delta T_s + \Delta T_e \tag{3}$$

Hence,

$$\Delta T = \gamma \frac{p'_e\, g'_1(\theta)\, g_2(\delta_{e'})}{kl_u} + \frac{p'_s\, g'_3(\eta_e)\, g_4(\theta)}{kl_d} \tag{4}$$

Equation (4) combines both the up-path and the down-path interference. If there is a change of modulation in the satellite or if the translation frequencies of the wanted and interfering satellites are different then it may be necessary to treat up and down paths separately using equations (1) and (2).

(*) To simplify the calculation it was assumed that the topocentric angular separation between the two satellites as seen from any earth station is identical to the geocentric angular separation between the two satellites.

In the foregoing equations, the gains $g_1'(\theta)$ and $g_4(\theta)$ are those of the earth stations concerned. Unless more precise actual data are available, an appropriate reference radiation pattern may be used to express the gain $g_1'(\theta)$ and $g_4(\theta)$ in a direction forming an angle θ with the direction of maximum radiation. In the event that precise numerical data are not available, the reference radiation pattern $32 - 25 \log_{10}\theta$ shall be used for earth station antennae for which the ratio *diameter/wavelength* exceeds 100.

In the same way, the increase $\Delta T'$ in the equivalent noise temperature for the entire satellite link at the receiver input of the receiving earth station e_R' under the effect of the interference caused by satellite link A is given by the following equations:

$$\Delta T'_{s'} = \frac{p_e\, g_1(\theta)\, g_2'(\delta_e)}{k l_u} \tag{5}$$

$$\Delta T'_{e'} = \frac{p_s\, g_3(\eta_{e'})\, g_4'(\theta)}{k l_d} \tag{6}$$

$$\Delta T' = \gamma' \frac{p_e\, g_1(\theta)\, g_2'(\delta_e)}{k l_u} + \frac{p_s\, g_3(\eta_{e'})\, g_4'(\theta)}{k l_d} \tag{7}$$

For two multiple-access satellites this calculation must be made for each of the satellite links established via one satellite in relation to each of the satellite links established via the other satellite.

3. *Comparison between calculated and predetermined percentage increase in equivalent satellite link noise temperature*

The calculated values of ΔT and $\Delta T'$ shall be compared with the corresponding predetermined values. These predetermined values are taken as 2% of the appropriate equivalent satellite link noise temperatures:

— if the calculated value of ΔT is less than the predetermined one, the interference level from satellite link A′ to satellite link A is permissible irrespective of the modulation characteristics of the two satellite links and of the precise frequencies used;

— if the calculated value of ΔT is more than the predetermined one, a detailed calculation shall be carried out following the methods and techniques set out in the relevant C.C.I.R. Reports and Recommendations.

The comparison of $\Delta T'$ with the predetermined value shall be carried out in a similar manner.

As an example, it can be seen that in the case of a satellite link operating in accordance with current C.C.I.R. Recommendations, using FM telephony and having a total noise in a telephone channel of 10 000 pW0p including 1 000 pW0p interference noise from terrestrial radio-relay systems and 1 000 pW0p interference noise from other satellite links, a 2% increase in equivalent noise temperature would correspond to 160 pW0p of interference noise.

The list of basic characteristics to be furnished for each network is given in Appendix 1B to the Radio Regulations. A detailed illustration of the interference calculation in the case of two geostationary satellite links is given in the Annex to this Appendix.

4. *Determination of the satellite links to be considered in calculating the increase in equivalent satellite link noise temperature from the data furnished for the advance publication of a satellite network*

The greatest increase in equivalent satellite link noise temperature caused to any link of another satellite network, existing or planned, by interference produced by the proposed satellite network must be determined.

The most unfavourably sited transmitting earth station of the interfering satellite network should be determined for each satellite receiving antenna of the network suffering interference by superimposing the "Earth-to-space" service areas of the interfering network on the space station receiving antenna gain contours plotted on a map of the Earth's surface. The most unfavourably sited transmitting earth station is the one in the direction of which the satellite receiving antenna gain of the network interfered with is the greatest.

The most unfavourably sited receiving earth station of the network suffering interference should be determined in an analogous manner for each "space-to-Earth" service area of that network. The most unfavourably sited receiving earth station is the one in the direction of which the satellite transmitting antenna gain of the interfering network is the greatest.

When the satellite of the network suffering interference is equipped with simple frequency-translating transponders the above determinations are made in pairs, one for the receiving antenna of a particular transponder and one for the "space-to-Earth" service area associated with the transmitting antenna of that transponder.

The calculation procedure described above may be used to determine the greatest increase in equivalent noise temperature caused to any satellite link in a proposed satellite network by interference produced by any other satellite network.

ANNEX TO APPENDIX 29

Example of an Interference Calculation between two geostationary Satellite Links Sharing the same Frequency Band

A. General

In this example, for simplicity, two identical satellite networks are assumed with $\theta = 6°$ geocentric angular spacing between the satellites. For this angular separation the reference radiation pattern of the earth station antenna ($32 - 25 \log_{10}\theta$) gives a gain of 12·5 dB in the direction of the satellite of the other network.

The calculations have been performed in dB, which means that numerical multiplications thus become dB additions and numerical divisions become dB subtractions. In each step, the contributing factors have been introduced in a sequence corresponding to the propagation direction. The first three steps define the system parameters for each link. Steps 4, 5 and 6 perform the actual interference calculations.

To determine the equivalent link noise temperature it is necessary to know the ratio between the total internal link noise and the thermal noise of the down-path. The noise budget for this example is assumed as follows:

Noise budget

Internal noise 8 000 pW0p	Thermal noise (down-path)	5 000 pW0p
	Thermal noise (up-path)	1 000 pW0p
	Intermodulation noise	2 000 pW0p
External noise 2 000 pW0p	Interference noise from links using other satellites	1 000 pW0p
	Interference noise from terrestrial systems	1 000 pW0p
	Total noise	10 000 pW0p

It may be noted that since both satellites use global beams, essentially no antenna discrimination between wanted and unwanted signals is obtained at the satellite and that this constitutes a worst case.

B. System parameters

	Symbol	Link A or A′	Unit
Step 1) *Up-path at 6 175 MHz*			
Maximum power density per Hz delivered to the antenna of the transmitting earth station in the worst 4 kHz band	p_e	−37	dBW/Hz
Earth station antenna gain	g_1	62·5	dB
Free space loss 38 500 km at 6 175 MHz	l_u	200	dB
Satellite antenna gain (using global beam)	g_2	15·5	dB
Receiver input at satellite $p_e + g_1 - l_u + g_2$		−159	dBW/Hz
Step 2) *Down-path at 3 950 MHz*			
Maximum power density per Hz delivered to the satellite antenna in the worst 4 kHz band	p_s	−57	dBW/Hz
Satellite transmitting antenna gain	g_3	15·5	dB
Free space loss for 38 500 km at 3 950 MHz	l_d	196	dB
Earth station receiv. antenna gain	g_4	58·5	dB
Receiver input at earth station $p_s + g_3 - l_d + g_4$		−179	dBW/Hz
Step 3) *Link calculations*			
Transmission gain from satellite receiver input to earth station receiver input 159 dB − 179 dB	γ	−20	dB

	Symbol	Link A or A′	Unit
Earth station noise temperature (giving G/T = 40·7 dB)		60	K
Thermal noise down-path (see noise budget)		5 000	pW0p
Total internal link noise (see noise budget)		8 000	pW0p
Equivalent link noise temperature $\frac{8\,000}{5\,000} \times 60$	T	96	K

C. *Interference calculation*

Step 4) *Up-path interference*			
Interfering earth station power density (as in Step 1)	p_e'	−37	dBW/Hz
Interfering earth station antenna gain towards interfered satellite (6° off beam)	$g_1'(\theta)$	12·5	dB
Free space loss for 38 500 km at 6 175 MHz (see Step 1)	l_u	200	dB
Satellite antenna gain in the direction of the interfering earth station	$g_2(\delta_e')$	15·5	dB
Boltzmann's constant $1{\cdot}38 \times 10^{-23}$ J/K	k	−228·6	dBW/K
Increase in receiver noise temperature of the satellite $p_e' + g_1'(\theta) - l_u + g_2(\delta_e') - k$ (in logarithmic units)		19·6	
Increase in receiver noise temperature of the satellite	ΔT_s	91	K
Step 5) *Down-path interference*			
Interfering satellite transmitter power density (as in Step 2)	p_s	−57	dBW/Hz

	Symbol	Link A or A′	Unit
Interfering satellite antenna gain towards interfered earth station	$g_3'(\eta_e)$	15·5	dB
Free space loss for 38 500 km at 3 950 MHz (see Step 2)	l_d	196	dB
Earth station antenna gain in the direction of the interfering satellite (6° off beam)	$g_4(\theta)$	12·5	dB
Boltzmann's constant $1{\cdot}38 \times 10^{-23}$ J/K	k	−228·6	dBW/K
Increase in receiver noise temperature of the earth station $p_e' + g_3'(\eta_e) - l_d + g_4(\theta) - k$ (in logarithmic units)		3·6	
Increase in receiver noise temperature of the earth station	ΔT_e	2·29	K
Step 6) *Total link interference*			
Increase in satellite noise temperature (from Step 4)	ΔT_s	91	K
Numerical value for γ (from Step 3)	γ	0·01	numerical
Increase in receiver noise temperature of the earth station (from Step 5)	ΔT_e	2·29	K
Increase in equivalent link noise temperature $\gamma\Delta T_s + \Delta T_e = 0{\cdot}01 \times 91 + 2{\cdot}29$	ΔT	3·2	K
Percentage increase $\frac{3{\cdot}2}{96} \times 100\%$	$(\Delta T/T) \times 100\%$	3·33	%
Increase in link noise due to interference (3·33/100) × 8 000 pW0p		266	pW0p

D. *Conclusions*

In the example shown, the increase in equivalent satellite link noise temperature is 3.33%. Since it exceeds the predetermined value of 2%,

the amount of noise introduced can no longer be considered permissible and therefore co-ordination between the two networks is required. More precise calculations should now be made using, in particular, the actual antenna patterns of the earth stations, the topocentric angular separation of the satellites, and the precise basic transmission losses. There may be additional factors such as polarization discrimination, frequency interleaving, spectral distribution of the interference which all reduce the calculated interference.

It can be shown that for this example a larger satellite spacing of 7·4° would have caused only 2% increase in equivalent link noise temperature and thus obviated the need for any co-ordination.

APPENDIX A

Studies and Prediction of Radio Propagation and Radio Noise

Recognizing the vital dependence of maximum utilization of radio frequencies and efficient planning of radiocommunication services upon the fullest use of radio propagation and radio noise data, the Members and Associate Members of the Union shall continue to promote the establishment and operation of world-wide systems of observation stations to obtain data on radio noise and on ionospheric, tropospheric and other phenomena affecting radio propagation. Each Member or Associate Member shall provide, by the best means possible, for the study, co-ordination and rapid dissemination of such data and of their predictions. In formulating and carrying out their programme of work in this field, Members and Associate Members shall take note of the relevant C.C.I.R. 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.

RESOLUTIONS

Note by the General Secretariat:

The Resolutions are arranged in the chronological order of the Conferences at which they were adopted, i.e.:

- Administrative Radio Conference (Geneva, 1959) (RES 1, etc.)
- Space Conference (Geneva, 1963) (RES Spa 1, etc.)
- Aeronautical Conference (Geneva, 1966) (RES Aer 1, etc.)
- Maritime Conference (Geneva, 1967) (RES Mar 1, etc.)
- Space Conference (Geneva, 1971) (RES Spa2–1, etc.)
- Maritime Conference (Geneva, 1974) (RES Mar2–1, etc.)

RESOLUTION No. 1

Relating to the Establishment of the Master International Frequency Register

The Administrative Radio Conference, Geneva, 1959,

decides

1. *General*

1.1 The Master International Frequency Register shall be compiled and maintained by the International Frequency Registration Board, preferably by means of a mechanical system.

1.2 The effective date of the Master International Frequency Register shall be the first of May, 1961.

2. *Initial entries*

2.1 The Master International Frequency Register shall include:

a) the information contained in the Master Radio Frequency Record [1] as on the thirtieth of April, 1961, subject to the provisions of paragraph 3 below;

b) the frequencies (e.g. 500 kHz or 2 182 kHz) prescribed in the Radio Regulations, Geneva, 1959, for common use by certain services, including the frequencies specified in Appendices 15, 17 and 18 to these Regulations;

c) the allotments in the Plans included in Appendices 25 and 26 to the Regulations, Geneva, 1959.

---

[1] Master Radio Frequency Record: The interim master register of frequency assignments established and maintained pursuant to the provisions of the Agreement adopted by the Extraordinary Administrative Radio Conference, Geneva, 1951 (E.A.R.C. Agreement).

2.2 An indication of the purpose of the frequencies and allotments under paragraphs 2.1 *b)* and 2.1 *c)* shall be included in the entries concerned, which shall not bear any date in Column 2 of the Master International Frequency Register.

3. *Methods of transfer*

3.1 Those entries in the Master Radio Frequency Record which will not be complete according to Nos. 269 or 270 of the E.A.R.C. Agreement, Geneva, 1951, or according to Annex 6 to this Resolution, as appropriate, on the date specified above shall not be transferred to the Master International Frequency Register. However, except for the bands above 28 000 kHz, the Board shall send before the thirtieth of September, 1960, to each administration concerned, a list of incomplete frequency assignments in order that the missing data may be notified as soon as possible, and by the thirtieth of April, 1961, at the latest.

3.2 In those cases provided for in Annex 1 where an entry shall be transferred after an examination or re-examination, and where the finding of the Board is favourable, the Board shall amend the entry in order that this entry will appear in the Master International Frequency Register in the same way as if the Board had made a favourable finding at the time of notification. If, on the contrary, the finding is unfavourable, the assignment shall be entered in the Master International Frequency Register as if the Board had in the first place made an unfavourable finding at the time of notification.

3.3 Frequency assignments not in conformity with No. **501** of the Radio Regulations, Geneva, 1959, shall be indicated, where appropriate, by an appropriate symbol in the Remarks Column. Moreover, any Remark in the Master Radio Frequency Record which is consistent with the provisions of Article 9 of the Radio Regulations, Geneva, 1959, shall be entered in the Master International Frequency Register.

4. *Additional basic characteristics*

4.1 Inasmuch as the Radio Regulations, Geneva, 1959, stipulate certain basic characteristics heretofore not required, administrations should furnish to the Board these additional characteristics in respect of their initial entries in the Master International Frequency Register as and when possible.

4.2 However, these additional characteristics shall be supplied when an initial entry is involved in any review conducted by the Board under Article 9 of the Radio Regulations, Geneva, 1959.

ANNEX 1 — Method of Transfer from the Master Radio Frequency Record
(see paragraph 3 of this resolution)

Frequency band kHz	Regions or Services	Dates recorded in Master Radio Frequency Record ø — Column 2a	2b	2c	Transfer to new Register	Method of transfer: examination	Nature of examination (if any)	Dates recorded in new Master International Frequency Register ø — Column 2a	2b	2c	2d	Remarks
14-2 850	Regions 1 and 3	Δ		Δ	Yes	No		Δ		Δ		
			Δ	Δ	Yes	Yes	Art. 9	(1)	(1)	Δ		(2)
		03			No							
			04		No							
				Δ**	Yes	No				Δ**		
14-2 000	Region 2	Δ		Δ	Yes	No		Δ		Δ		
			Δ	Δ	Yes	Yes	Art. 9	(1)	(1)	Δ		(2)
		03			No							
			04		No							
				Δ**	Yes	No				Δ**		
				Δ***	Yes	No				Δ***		

ø The symbol " 03 " means 3.12.51 and the symbol " 04 " means 4.12.51.
** Ship-to-ship frequencies.
*** For the band 535-1 605 kHz in Region 2, see No. 576 of the Radio Regulations, Geneva 1959.

Frequency band kHz	Regions or Services	Dates recorded in Master Radio Frequency Record ø			Transfer to new Register	Method of transfer: examination	Nature of examination (if any)	Dates recorded in new Master International Frequency Register ø				Remarks
		Column						Column				
		2a	2b	2c				2a	2b	2c	2d	
3 155- 3 400 3 500- 3 900	Region 1		03	Δ	Yes	No		03		Δ		
			03		No							
			Δ	Δ	Yes	Yes	Art. 9	(1)	(1)	Δ		(2)
2 000- 2 850 3 155- 3 400 3 500- 4 000	Region 2	03		Δ	Yes	No		03		Δ		
			Δ	Δ	Yes	Yes	Art. 9	(1)	(1)	Δ		(2)
		03			No							
			04		No							
3 155- 3 400 3 500- 3 950	Region 3	03		Δ	Yes	No		03		Δ		
			Δ	Δ	Yes	Yes	Art. 9	(1)	(1)	Δ		(2)
		03			No							
			04		No							

ø The symbol " 03 " means 3.12.51 and the symbol " 04 " means 4.12.51.

Frequency band kHz	Regions or Services	Dates recorded in Master Radio Frequency Record ø			Transfer to new Register	Method of transfer: examination	Nature of examination (if any)	Dates recorded in new Master International Frequency Register ø				Remarks
		Column						Column				
		2a	2b	2c				2a	2b	2c	2d	
2 850-3 155 3 400-3 500 3 900-3 950 (Region 1)	Aeronautical mobile (R) and (OR)											
		03		Δ	Yes	No		03		Δ		
4 650-4 750 5 450-5 480 (Region 2)			03	Δ	Yes	No			03	Δ		
5 480-5 730 6 525-6 765 8 815-9 040 10 005-10 100 11 175-11 400 13 200-13 360 15 010-15 100 17 900-18 030			Δ	Δ	Yes	Yes	(3)		Δ(3)	Δ(4)		
4 238-4 368 6 357-6 525 8 476-8 745 12 714-13 130 16 952-17 290 22 400-22 650	Maritime mobile (Radio-telegraph coast stations)	03		Δ	Yes	No		03		Δ		
			Δ	Δ	Yes	Yes	E.A.R.C. Art. 33 234-235 (ii)	(1)	(1)	Δ (4)		(2)
		03			No							
			04		No							

ø The symbol " 03 " means 3.12.51 and the symbol " 04 " means 4.12.51.

Frequency band kHz	Regions or Services	Dates recorded in Master Radio Frequency Record ø			Transfer to new Register	Method of transfer examination	Nature of examination (if any)	Dates recorded in new Master International Frequency Register ø				Remarks
		Column						Column				
		2a	2b	2c				2a	2b	2c	2d	
4 368- 4 438 8 745- 8 815 13 130-13 200 17 290-17 360 22 650-22 720	Maritime mobile (Radio-telephone coast stations)	03		Δ	Yes	No		03		Δ		
			04	Δ	Yes	No			04	Δ		
			Δ	Δ	Yes	Yes	(5)		Δ	Δ (4)		(2)
4 063- 4 133 8 195- 8 265 12 330-12 400 16 460-16 530 22 000-22 070	Maritime mobile (Radio-telephone ship stations)											
			Δ	Δ	Yes	Yes	(6)	(1)	(1)	Δ		
5 950- 6 200 7 100- 7 300 (Regions 1 & 3) 9 500- 9 775 11 700-11 975 15 100-15 450 17 700-17 900 21 450-21 750 25 600-26 100	Broadcasting											
				Δ	Yes	No				Δ (7)	Δ (7)	

ø The symbol " 03 " means 3.12.51 and the symbol " 04 " means 4.12.51.

Frequency band kHz	Regions or Services	Dates recorded in Master Radio Frequency Record			Transfer to new Register	Method of transfer: examination	Nature of examination (if any)	Dates recorded in new Master International Frequency Register				Remarks
		Column						Column				
		2a	2b	2c				2a	2b	2c	2d	
3 950 (4 000 Region 2) - 27 500	Various, excluding the bands allocated exclusively to aeronautical mobile, maritime mobile, broadcasting and amateur			Δ	Yes	No				Δ (7)	Δ (7)	
27 500-28 000	Various			Δ	Yes	Yes	Art. 9			Δ	Δ (8)	
Above 28 000	Various			Δ	Yes (8)	No (8)				Δ	Δ (8)	

FOOTNOTES TO ANNEX 1

(1) According to the result of the examination

(2) Application of Section V of Article 9 of the Radio Regulations, Geneva, 1959, from 1st May, 1961

(3) See Annex 2 to this Resolution

(4) In case of assignments which bear symbols ZZ or ZZZ, see paragraph 2.2.2 of Annex 5 to this Resolution

(5) See Annex 3 to this Resolution

(6) See Annex 4 to this Resolution

(7) See Annex 5 to this Resolution

(8) See Annex 6 to this Resolution

ANNEX 2

Bands allocated exclusively to the Aeronautical Mobile Service between 2 850 and 18 030 kHz

Frequency assignments entered in the Master Radio Frequency Record with a date in Column 2b which is after 3rd December, 1951, shall be examined by the Board following the relevant parts of the procedure described in Nos. **552** to **567** inclusive of the Radio Regulations, Geneva, 1959; they shall be recorded in the Master International Frequency Register following the procedure described in Nos. **589** to **599** inclusive of those Radio Regulations.

ANNEX 3

Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz for Radiotelephone Coast Stations

1. All assignments not in conformity with the Plan adopted by the E.A.R.C. (Annex 5 to the E.A.R.C. Agreement, Geneva, 1951), notified to the Board between 3rd December, 1951, and the 1st May, 1961, shall be submitted to a complete technical examination by the Board in accordance with Nos. 233, 234, 235(ii) and 236 of Section III of Article 33 of the E.A.R.C. Agreement, Geneva, 1951, with respect to the allotments appearing in Sections I and II of the Plan in Annex 5 to that Agreement (that is to say, with respect to the frequency assignments brought into use or liable to be brought into use in the future in accordance with the allotments in the Plan), as well as with respect to frequency assignments in conformity with Nos. 327 and 328 of the Radio Regulations, Atlantic City, 1947, which were previously recorded in the Master Radio Frequency Record on frequencies specified in Annex 7 to the E.A.R.C. Agreement, Geneva, 1951, either as a consequence of a favourable finding or after an unfavourable finding, the assignment having not, in this latter case, caused harmful interference. The same shall be done for the changes of basic characteristics of assignments in conformity with the Plan.

2. Upon the entry into force of the Radio Regulations, Geneva, 1959, assignments in conformity with the Allotment Plan adopted by the E.A.R.C. shall be considered as transferred to the channel frequencies of the Plan in Appendix 25 to the Radio Regulations, Geneva, 1959. All assignments not in conformity with the Plan adopted by the E.A.R.C., Geneva, 1951, which were notified to the Board between 3rd December, 1951, and 1st May, 1961, shall be considered as transferred to the channel frequencies of the Plan in Appendix 25 to the Radio Regulations, Geneva, 1959, if they had been notified on the central channel frequencies of the Plan adopted by the E.A.R.C., Geneva, 1951. If they have not been so notified, the administrations concerned shall notify to the Board as soon as possible before 1st May, 1961, the adjustments considered necessary in order that these assignments retain the same relative positions in relation to the channels in the Plan in Appendix 25 as they had in relation to the channels in the Plan adopted by the E.A.R.C., Geneva, 1951.

3. Frequency assignments transferred on 1st May, 1961, according to paragraph 2 above shall retain in Columns 2a or 2b the dates which appear in these columns on 30th April, 1961.

ANNEX 4

Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz for Radiotelephone Ship Stations

1. Assignments of frequencies for reception by radiotelephone coast stations, notified to the Board between 3rd December, 1951, and 1st May, 1961, shall be examined by the Board following the procedure described in Nos. **547** to **551** inclusive of the Radio Regulations, Geneva, 1959 ; they shall be entered in the Master International Frequency Register following the procedure described in Nos. **582** to **586** of those Regulations.

2. Upon the entry into force of the Radio Regulations, Geneva, 1959, assignments shall be considered as transferred to the frequencies in Appendix 17 to the Radio Regulations, Geneva, 1959, if they had been notified on frequencies specified in Annex 7 to the E.A.R.C. Agreement,

Geneva, 1951. If they have not been so notified, the administrations concerned shall notify to the Board as soon as possible before 1st May, 1961, the adjustments considered necessary in order that these assignments retain the same relative positions in relation to the channels in Appendix 17 to the Radio Regulations, Geneva, 1959, as they had in relation to the channel in Annex 7 to the Final Acts of the E.A.R.C. Agreement, Geneva, 1951.

3. Frequency assignments transferred on 1st May, 1961, according to paragraph 2 above shall retain in Columns 2a or 2b the dates which appear in those columns on 30th April, 1961.

ANNEX 5

Bands between 3 950 kHz (4 000 kHz in Region 2) and 27 500 kHz other than those allocated exclusively to the Aeronautical Mobile Service, Maritime Mobile Service or Amateur Service

1. *Transfer of frequency assignments notified pursuant to the provisions of No. 272 of the E.A.R.C. Agreement, Geneva, 1951*

1.1 A symbol shall be inserted in Column 2d.

1.2 The date entered in Column 2c of the Master Radio Frequency Record shall be transferred to Column 2c of the Master International Frequency Register.

2. *Transfer of frequency assignments notified from 1st April, 1952, other than those referred to in paragraph 1*

2.1 In the case where the finding reached by the Board under Article 33 of the E.A.R.C. Agreement, Geneva, 1951, was favourable :

2.1.1 the date of receipt by the Board of the first notice shall be entered in Column 2d ;

2.1.2 the date entered in Column 2c of the Master Radio Frequency Record shall be transferred to Column 2c of the Master International Frequency Register ;

2.1.3 if appropriate, the date following symbol XX in Column 13 shall be inserted in the Remarks Column of the Master International Frequency Register, as well as any other relevant date entered in Column 13 of the Master Radio Frequency Record.

2.2 In the case where the finding reached by the Board under Article 33 of the E.A.R.C. Agreement, Geneva, 1951, was unfavourable, i.e. in the case where the assignment concerned bears symbol ZZ or ZZZ in Column 13 of the Master Radio Frequency Record :

2.2.1 the date of receipt by the Board of the first notice (i.e. the date which follows immediately symbol ZZ or ZZZ) shall be entered in Column 2d ;

2.2.2 the date to be entered in Column 2c of the Master International Frequency Register shall be either the date of putting into use notified by the administration concerned, or the date of the tenth day prior to the date following symbol ZZ or ZZZ, whichever is the later ;

2.2.3 the date of receipt by the Board of the resubmitted notice (i.e. in general the date of the tenth day following the date entered in Column 2c of the Master Radio Frequency Record) shall be entered in the Remarks Column of the Master International Frequency Register.

ANNEX 6

Frequency Bands above 27 500 kHz

1. Bands between 27 500 and 28 000 kHz.

1.1 *Transfer of frequency assignments, the notification of which was received by the Board before 1st April, 1952*

1.1.1 A symbol shall be inserted in Column 2d of the Master International Frequency Register.

1.1.2 The date entered in Column 2c of the Master Radio Frequency Record shall be transferred to Column 2c of the Master International Frequency Register.

1.1.3 With a view to the application of the provisions of paragraph 1.2 below, administrations, if so requested in specific cases, should supply the Board with those basic characteristics listed in Appendix 1 to the Radio Regulations, Geneva, 1959, which might be missing in the assignments concerned.

1.2 *Transfer of frequency assignments, the notification of which was received by the Board between 1st April, 1952, and the date of entry into force of the Radio Regulations, Geneva, 1959.*

1.2.1 These assignments shall be examined by the Board following the procedure described in Article 9 of the Radio Regulations, Geneva, 1959. Administrations, if so requested, in specific cases, should supply the Board with those basic characteristics listed in Appendix 1 to the Radio Regulations, Geneva, 1959, which might be missing in the assignments concerned.

1.2.2 The date of receipt of the first notice by the Board shall be entered in Column 2d of the Master International Frequency Register.

1.2.3 The date entered in Column 2c of the Master Radio Frequency Record shall be transferred to Column 2c of the Master International Frequency Register.

2. *Transfer of frequency assignments in the bands above 28 000 kHz.*

2.1 From the end of this Conference, administrations shall review the frequency assignments entered on their behalf in the Master Radio Frequency Record above 28 000 kHz, with a view to reducing substantially the number of such assignments to be transferred to the Master International Frequency Register as initial entries. For this purpose, administrations should be guided

by the principles contained in No. **490** of the Radio Regulations, Geneva, 1959, and in Appendix 1 to those Regulations (Section E, Column 5a, paragraph 2d). Only those entries should be retained where they relate to stations which fulfil one or more of the conditions listed in No. **486** of the Radio Regulations, Geneva, 1959.

2.2 As a result of such review, administrations shall notify to the Board prior to 1st October, 1960, in the form described in Appendix 1 to the Radio Regulations, Geneva, 1959, all entries in the Master Radio Frequency Record which they desire to be transferred to the Master International Frequency Register. Assignments so notified shall not be included in the weekly circulars of the Board referred to in Nos. **497** and **498** of the Radio Regulations, Geneva, 1959.

2.3 When notifying, after the end of this Conference, new frequency assignments, i.e. assignments which will not be subject to review under paragraph 2.1 above, administrations shall prepare their notices in the form described in Appendix 1 to the Radio Regulations, Geneva, 1959, and shall apply, in appropriate cases, the principles contained in No. **490** of the Radio Regulations, Geneva, 1959, and in Appendix 1 (Section E, Column 5a, paragraph 2d) to those Regulations.

2.4 Notices submitted under either paragraphs 2.2 or 2.3 above should bear a suitable reference to the appropriate paragraph.

2.5 From 1st October, 1960, the Board shall transfer to the Master International Frequency Register, as initial entries, complete assignments in the Master Radio Frequency Record, as notified by administrations in conformity with paragraphs 2.2 or 2.3 above.

2.6 Frequency assignments, the notification of which was received by the Board before 1st April, 1952, shall bear a symbol in Column 2d of the Master International Frequency Register.

2.7 Assignments, the notification of which was received by the Board between 1st April, 1952, and the date of entry into force of the Radio Regulations, Geneva, 1959, shall bear in Column 2d of the Master International Frequency Register the date of receipt of the notice by the Board.

2.8 All transferred assignments shall bear in Column 2c of the Master International Frequency Register the date entered in Column 2c of the Master Radio Frequency Record. Where, under the principles in No. 490 of the Radio Regulations, Geneva, 1959, and in Appendix 1 (Section E, Column 5a, paragraph 2d) to those Regulations, a single assignment is notified under paragraph 2.2 above in replacement of several assignments entered in the Master Radio Frequency Record, the date to be entered in Column 2c of the Master International Frequency Register shall be the earliest date entered in Column 2c of the Master Radio Frequency Record for the assignments concerned.

RESOLUTION No. 2

Relating to the Application, from 1st March, 1960, to 30th April, 1961, of the Procedure specified in Article 10 of the Radio Regulations, Geneva, 1959, for the Bands allocated exclusively to the Broadcasting Service between 5 950 and 26 100 kHz

The Administrative Radio Conference, Geneva, 1959,

resolves

1. that the procedure specified in Article 10 of the Radio Regulations, Geneva, 1959, shall be applied from 1st March, 1960;

2. that for this purpose, the first schedules, to become effective on 4th September, 1960, for the September/October period 1960, should be received from administrations by the International Frequency Registration Board by 1st March, 1960. The closure dates for the receipt of the subsequent schedules will be set by the Board under No. **641** of Article 10;

3. that the schedules referred to in paragraph 2 shall be prepared and submitted to the Board in conformity with the provisions of Section I of Article 10;

4. that the procedure for notifying and recording frequency assignments, provided for in Articles 32 and 33 of the Agreement of the Extraordinary Administrative Radio Conference, Geneva, 1951, shall cease to be applied from 1st March, 1960, to frequency assignments to broadcasting stations in the bands allocated exclusively to the broadcasting service between 5 950 and 26 100 kHz;

5. that from 1st March 1960, the procedure specified in Nos. **568** to **570** of the Radio Regulations, Geneva, 1959, shall be applied. Frequency assignments recorded in the Master Radio Frequency Record according to these provisions shall bear in Column 2c a date determined according to the relevant provisions of No. **606** of the Radio Regulations, Geneva, 1959. No date shall be entered in Column 2a or Column 2b;

6. that in applying the provisions of Article 10 in accordance with the terms of this Resolution, " Nos. 327 and 328 of the Radio Regulations, Atlantic City, 1947 ", should be read instead of " No. **501** of these Regulations ", and " Master Radio Frequency Record " should be read instead of " Master International Frequency Register ";

7. that the first edition of the High Frequency Broadcasting Frequency List referred to in No. **655** of Article 10 shall be published as of September, 1961.

RESOLUTION No. 3

Relating to a Study by a Panel of Experts of Measures to Reduce Congestion in the Bands between 4 and 27·5 MHz

(See Recommendation No. 37)

The Administrative Radio Conference, Geneva, 1959,

considering

the trend towards congestion and saturation in the bands between 4 and 27·5 MHz;

realising

a) that if this trend continues, this portion of the radio frequency spectrum will become progressively less useful to administrations for purposes for which it is indispensable;

b) that there are uses of the bands between 4 and 27·5 MHz that could, from a technical and operational point of view, be satisfied by other means;

c) that before administrations will be willing to undertake a programme to relieve congestion in the bands between 4 and 27·5 MHz they will need a clear statement of the issues involved and of the measures that need to be taken;

d) that the ability of administrations to undertake such a programme is intimately linked to the financial implications involved;

resolves

1. that a Panel of Experts should be convened for the purpose of devising ways and means of relieving the pressure on the bands between 4 and 27·5 MHz;

2. that the preparatory work as set out in Annex 1 of the present Resolution should be undertaken by the International Frequency

Registration Board in collaboration with the other permanent organs of the Union before this Panel of Experts is convened ;

invites

the Administrative Council

1. 1.1 in the light of the progress made in the above preparatory work, to convene the Panel of Experts to undertake the tasks covered in the terms of reference set out in Annex 2. The Panel would include the Heads of the permanent organs, or their representatives, and should not be more than eleven in number ;

1.2 to request administrations to nominate highly qualified technical experts to serve on the Panel and, when nominating, to submit a biographical sketch of the qualifications and professional experience of each nominee ;

1.3 to select, from those nominated, a maximum of seven experts, taking into consideration the need to obtain very highly qualified individuals drawn from the various parts of the world. The experts, as a group, should have a broad overall knowledge covering the following :

— the world-wide aspects of telecommunication planning
— the economic factors involved in the development of telecommunications
— high frequency communications
— land and submarine cables
— broadcasting techniques
— radio relay systems
— scatter propagation
— space communications ;

1.4 to set the date on which the Panel should meet ;

1.5 to request the Chairman of the International Frequency Registration Board to convene the meeting in Geneva ;

2. to decide, after considering the final report and recommendations of the Panel of Experts, and after consulting administrations, whether any further action should be taken and whether or not an Administrative Conference should be called for the purpose of taking the necessary decisions.

ANNEX 1

Preliminary Study to be made before convening the Panel of Experts

1. The International Frequency Registration Board shall group the existing uses of the bands between 4 and 27·5 MHz into appropriate categories.

2. The Board shall study and analyse each such category of use with a view to determining those categories which might be satisfied by means other than the use of these bands. However, it shall not consider possible amendments to the Table of Frequency Allocations.

3. The Board shall invite administrations, at the appropriate time, to submit any general proposals they may have for relieving the pressure on the bands in question.

4. The Board shall also, through the Secretary General, obtain all pertinent facts relating to the provision of economic assistance to countries which would need such assistance to carry out a programme for relieving the pressure on the bands between 4 and 27·5 MHz.

5. The Board shall submit a report, to be prepared in collaboration with the Secretary General and the Directors of the C.C.I.R. and the C.C.I.T.T., to the Administrative Council at its 1961 Session on the results of their study. The report shall include the information and proposals called for in paragraphs 3 and 4 above, together with suitable recommendations to the Administrative Council, so that the meeting of the Panel of Experts can be convened to undertake its tasks. Copies of this report shall also be sent to all administrations.

ANNEX 2

Terms of Reference for a Panel of Experts to study Measures to reduce Congestion in the Bands between 4 and 27·5 MHz

1. The Panel at each session shall elect its own chairman. The Chairman of the International Frequency Registration Board shall convene the first meeting of each session and act as co-ordinator between sessions.

2. The Panel shall first consider the report on the preparatory study forwarded to it by the Administrative Council and shall make any further investigations and studies deemed appropriate.

3. The Panel shall determine those categories of use of the bands between 4 and 27·5 MHz that could be satisfied by other means, and analyse the implications of utilizing such other means from the technical, practical and, in particular, economic aspects, in consultation with administrations when necessary. Due consideration shall be given to estimated traffic growth.

4. The Panel shall take account of the different degrees of technical development of countries as well as their differing needs in relation to the various telecommunication services concerned.

5. The Panel shall, through the Secretary General, obtain any necessary additional information about the facilities available for affording economic assistance to those countries that might need such aid in proceeding with any programme envisaged by the Panel, as well as any other specific information required from administrations or other sources.

6. The Panel shall study the best method of informing the administrations of the problems that exist.

7. The Panel shall then prepare a report to the Administrative Council together with recommendations as to the steps that should be taken for the purpose of relieving the pressure on the bands in question.

8. The recommendations of the Panel shall include a detailed and specific agenda which, when approved by the Administrative Council, would be the agenda of whatever body, Administrative Conference or otherwise, is to consider the policy decisions necessary to relieve the pressure on the bands concerned.

RESOLUTION No. 4

Relating to Certain Entries in the Master Radio Frequency Record[1] in the Bands below 27 500 kHz

The Administrative Radio Conference, Geneva, 1959,

considering that

a) in various parts of the Table of Frequency Allocations, Atlantic City, 1947, certain services had priority and will be primary services according to the Table of Frequency Allocations, Geneva, 1959 ;

b) the concepts of primary and secondary services have only now been introduced (see Article 5 of the Radio Regulations, Geneva, 1959) ;

c) the Extraordinary Administrative Radio Conference, Geneva, 1951, adopted an International Frequency List which included entries not in conformity with the Table of Frequency Allocations, Atlantic City, 1947 ;

d) provisions have to be made in connection with these entries on the establishment of the Master International Frequency Register ;

and taking into account

the Report by the International Frequency Registration Board to this Conference;

---

[1] Master Radio Frequency Record: The interim master register of frequency assignments established and maintained pursuant to the provisions of the Agreement adopted by the Extraordinary Administrative Radio Conference, Geneva, 1951 (E.A.R.C. Agreement).

resolves

that those entries in the Master Radio Frequency Record referred to in the Annexes to this Resolution which will be transferred to the Master International Frequency Register shall receive the consideration and treatment specified in these Annexes ;

and decides

1. to urge administrations to take the required action ; and

2. to invite the next Administrative Radio Conference to reconsider the situation.

ANNEX 1

Bands below 3 950 kHz (4 000 kHz Region 2) except the Bands allocated exclusively to the Aeronautical Mobile Service above 2 850 kHz

Frequency bands	Entry in the Master Radio Frequency Record	Description of entry	Date in Column 2a or 2b	To be considered as a permitted service, as defined in Article 5 of the Radio Regulations, Geneva, 1959, until: (6)	Treatment thereafter: (6)
14 - 2 850 kHz (2 000 kHz in Region 2)	Initial and Subsequent (until 31 December, 1959)	Non-priority, Atlantic City, 1947	2a	Next Administrative Radio Conference (1)	According to the decisions of the next Administrative Radio Conference (1)
	Initial	Non-conformity with Table of Frequency Allocations, Atlantic City, 1947	2a	31 December, 1961 (2)	As not conforming with Table of Frequency Allocations, Geneva, 1959 (3)
	Initial	Classes of emission not in conformity with Table of Frequency Allocations, Atlantic City, 1947	2a	31 December, 1961 (2)	As not conforming with Table of Frequency Allocations, Geneva, 1959 (3)
	Initial and Subsequent	Conformity with Table of Frequency Allocations, Atlantic City 1947, but Non-conformity with Table of Frequency Allocations, Geneva, 1959	2a	Next Administrative Radio Conference (4)	According to the decisions of the next Administrative Radio Conference (4)

Frequency bands	Entry in the Master Radio Frequency Record	Description of entry	Date in Column 2a or 2b	To be considered as a permitted service, as defined in Article 5 of the Radio Regulations, Geneva, 1959, until: (6)	Treatment thereafter : (6)
2 850 kHz (2 000 kHz Region 2) - 3 950 kHz (4 000 kHz Region 2), except for the bands allocated exclusively to the aeronautical mobile service	Initial and Subsequent	Non-priority; Atlantic City, 1947 (5)	2a (Regions 2 and 3) 2b (Region 1)	Next Administrative Radio Conference (1)	According to the decisions of the next Administrative Radio Conference (1)
	Initial	Non-conformity with Table of Frequency Allocations, Atlantic City, 1947	2a (Regions 2 and 3) 2b (Region 1)	31 December, 1961 (2)	As not conforming with Table of Frequency Allocations, Geneva, 1959 (3)
	Initial	Class of emission not in conformity with Table of Frequency Allocations, Atlantic City, 1947	2a (Regions 2 and 3) 2b (Region 1)	31 December, 1961 (2)	As not conforming with Table of Frequency Allocations, Geneva, 1959 (3)
	Initial and Subsequent	Conformity with Table of Frequency Allocations, Atlantic City, 1947, but Non-conformity with Table of Frequency Allocations, Geneva, 1959	2a (Regions 2 and 3) 2b (Region 1)	Next Administrative Radio Conference (4)	According to the decisions of the next Administrative Radio Conference (4)

Footnotes to Annex 1

(1) *a)* Until the situation has been reconsidered by the next Administrative Radio Conference, the class of service of these assignments shall be considered as being a permitted service, as defined in Article 5 of the Radio Regulations, Geneva, 1959, and existing or future assignments for the primary or priority service in the same frequency band according to the Table of Frequency Allocations and other relevant provisions of the Radio Regulations of either Atlantic City, 1947, or Geneva, 1959, shall be considered, as far as their relationship with the former assignments is concerned, as being for a primary service as referred to in Article 5 of the Radio Regulations, Geneva, 1959.

b) In respect of the relationship with each other of the assignments referred to in *a)* above, these provisions replace the relevant provisions of the Radio Regulations of Atlantic City, 1947, and of Geneva, 1959, whereby certain services in the particular bands are primary or priority services and other services are secondary or non-priority services in the same bands.

(2) These assignments should be brought into conformity with the provisions of the Radio Regulations, Geneva, 1959, as soon as possible, either by their transfer to appropriate bands or by discontinuance of the operations of the services concerned. Until the date this has been done or until 31st December, 1961, whichever date is the earlier, the assignments or classes of emission concerned shall be considered as being for a permitted service as defined in Article 5 of the Radio Regulations, Geneva, 1959, in derogation of the relevant provisions of the Radio Regulations of Atlantic City, 1947, and of Geneva, 1959. The International Frequency Registration Board should draw the attention of the administrations concerned to these entries as soon as possible.

(3) On 1st January, 1962, provided that the entries are not in conformity with the Table of Frequency Allocations, Geneva, 1959, the dates appearing in Column 2a of the Master International Frequency Register shall be transferred to Column 2b and a symbol shall be entered in Column 13 to indicate non-conformity with that Table.

(4) These assignments should be brought into conformity with the provisions of the Radio Regulations, Geneva, 1959, as soon as possible after the entry into force of these Regulations, either by their transfer to appropriate bands or by discontinuance of the operations of the services concerned. Until this has been done, these assignments shall be considered as being for a permitted service as defined in Article 5 of the Radio Regulations, Geneva, 1959, in derogation of the relevant provisions of these Regulations until the next Administrative Radio Conference has reconsidered the situation. The International Frequency Registration Board should draw the attention of the administrations concerned to these entries as soon as possible.

(5) The subsequent entries for Region 1 are those which are in conformity with Nos. 327 and 328 of the Radio Regulations, Atlantic City, 1947.

(6) The foregoing provisions shall be taken into account by the International Frequency Registration Board when conducting the examinations prescribed in the Resolution relating to the establishment of the Master International Frequency Register and in Article 9 of the Radio Regulations, Geneva, 1959.

ANNEX 2

Shared Bands between 3 950 kHz (4 000 kHz Region 2) and 27 500 kHz

Entry in the Master Radio Frequency Record	Description of Entry	To be considered as a permitted service, as defined in Article 5 of the Radio Regulations, Geneva, 1959, until:	Treatment thereafter:
Initial and Subsequent	Non-priority Atlantic City, 1947, but in conformity with the Table of Frequency Allocations, Atlantic City, 1947	Next Administrative Radio Conference (1)	According to the decisions of the next Administrative Radio Conference (1)

Footnote to Annex 2

(1) *a)* Until the situation has been reconsidered by the next Administrative Radio Conference, the class of service of these assignments shall be considered as being a permitted service as defined in Article 5 of the Radio Regulations, Geneva, 1959, and existing or future assignments for the primary or priority service in the same frequency band according to the Table of Frequency Allocations and other relevant provisions of the Radio Regulations of either Atlantic City, 1947, or Geneva, 1959, shall be considered, as far as their relationship with the former assignments is concerned, as being for a primary service as referred to in Article 5 of the Radio Regulations, Geneva, 1959.

b) In respect of the relationship with each other of the assignments referred to in *a)* above, these provisions replace the relevant provisions of the Radio Regulations of Atlantic City, 1947, and of Geneva, 1959, whereby certain services in the particular bands are primary or priority services and other services are secondary or non-priority services in the same bands.

c) The foregoing provisions shall be taken into account by the International Frequency Registration Board when conducting the examinations prescribed in Article 9 of the Radio Regulations, Geneva, 1959.

RESOLUTION No. 5

Relating to Notification of Frequency Assignments

The Administrative Radio Conference, Geneva, 1959,

referring to

— the Preamble of the Convention,

— Article 43 *) of the Convention (Special Agreements),

— Article 4 of the Radio Regulations (Special Agreements),

— Article 9 of the Radio Regulations (Notification and Recording of Frequencies in the Master International Frequency Register).

resolves

that, unless specifically stipulated otherwise by special arrangements communicated to the Union by the 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.

---

*) *Note by the General Secretariat:* Article 31 of the Malaga-Torremolinos Convention (1973).

RESOLUTION No. 6

Relating to Frequency Terminology

The Administrative Radio Conference, Geneva, 1959,

considering

a) that it is necessary that, in the documents of the Union, frequency terminology be used accurately ;

b) that in the past, some of these terms have been used ambiguously;

decides

that wherever used in the documents of the Union the terms listed below shall be expressed in the appropriate working language of the Union as indicated in the following table :

Frequency distribution to:	French	English	Spanish
Services	Attribution (attribuer)	Allocation (to allocate)	Atribución (atribuir)
Areas or countries	Allotissement (allotir)	Allotment (to allot)	Adjudicación (adjudicar)
Stations	Assignation (assigner)	Assignment (to assign)	Asignación (asignar)

RESOLUTION No. 7

Relating to Radio Emissions from Artificial Satellites and other Space Vehicles

The Administrative Radio Conference, Geneva, 1959,

considering

a) that it is desirable to study the question of identification for radio emissions from satellites and other space vehicles ;

b) that it is desirable to study the question of providing for the cessation, at appropriate times, of radio emissions from satellites and other space vehicles ;

invites

1. the C.C.I.R. to study the above-mentioned questions ;

2. Members and Associate Members of the Union launching satellites and other space vehicles to give consideration to the above-mentioned problems and to present the results of their study to the C.C.I.R.

RESOLUTION No. 8

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

The Administrative Radio Conference, Geneva, 1959,

considering

a) the Recommendation of the International Radio Conference, Atlantic City, 1947, relating to a new method of generating call signs ;

b) the fact that no new proposal has been placed before the Administrative Radio Conference, Geneva, 1959 ;

c) Document No. 456 submitted by the Republic of the Philippines;

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

e) 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

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

b) that, however, the current system of forming call signs may not be adequate to meet all the requirements submitted between the present time and the next Administrative Radio Conference ;

resolves

1. that, should the existing call sign series formed of three letters, or a figure and two letters, be exhausted, a new series should be introduced formed of a letter, a figure and a letter ; but in no case may the figure be 0 or 1 ;

2. that the method advocated in 1 above shall not be applicable to series beginning with one of the following letters : B F G I K M N Q R U W ;

3. that the Secretary General shall, as soon as possible, issue a circular letter urging administrations :

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

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

4. 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 ;

5. that if, nevertheless, before the next Administrative Radio Conference, it appears that all the possibilities of the present system of forming call signs as amended by 1 and 2 above will be exhausted, the Secretary General shall issue a circular letter :

5.1 explaining the position ;

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

6. that, from the information thus submitted, the Secretary General shall prepare a report, together with his comments and suggestions, for submission to the next Administrative Radio Conference.

RESOLUTION No. 9

Relating to the Publication of Service Documents

The Administrative Radio Conference, Geneva, 1959,

considering

that the early implementation of the provisions of Article 20 of the Radio Regulations and Appendix 9 would be of general advantage;

resolves

that the Secretary General may, at his discretion, implement these provisions in part or in whole, in advance of the effective date of the Radio Regulations.

RESOLUTION No. 10

Relating to the Use of the Bands 7 000 to 7 100 kHz and 7 100 to 7 300 kHz by the Amateur Service and the Broadcasting Service

The Administrative Radio Conference, Geneva, 1959,

considering

a) that the sharing of frequency bands by amateur, fixed 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 to 7 100 kHz is allocated on a world-wide basis exclusively to the amateur service ;

d) that the band 7 100 to 7 300 kHz is allocated in Regions 1 and 3 to the broadcasting service and in Region 2 to the amateur service ;

resolves

that the broadcasting service should be prohibited from the band 7 000 to 7 100 kHz and that broadcasting stations operating on frequencies in this band should cease such operation ;

and noting

the provisions of No. **117** of the Radio Regulations ;

further resolves

that inter-Regional amateur contacts should be only in the band 7 000 to 7 100 kHz and that the administrations should make every effort to ensure that the broadcasting service in the band 7 100 to 7 300 kHz in Regions 1 and 3, does not cause interference to the amateur service in Region 2 ; such being consistent with the provisions of No. **117** of the Radio Regulations.

RESOLUTION No. 11

Relative to the Convening of a Special Regional Conference

The Administrative Radio Conference, Geneva, 1959,

considering

a) that, according to No. **250** of the Radio Regulations, a special regional conference is to be held not later than 1st May, 1960, to draw up agreements and associated plans for the bands 68-73 MHz and 76-87·5 MHz;

b) the desirability to hold this conference at Geneva with regard to the availability of relevant data of the International Frequency Registration Board and C.C.I.R., and the experienced staff of the Secretariat of the Union ;

c) that this conference should be convened by the Secretary General under the provisions of the General Regulations annexed to the Convention ;

requests the Secretary General

to take the necessary steps for convening at Geneva the special regional conference referred to in No. **250** of the Radio Regulations, Geneva, 1959.

RESOLUTION No. 12

Relating to the Establishment of a Manual for Use by the Mobile Services

The Administrative Radio Conference, Geneva, 1959,

considering

a) that the provisions of the Radio Regulations Atlantic City, 1947, applicable to the mobile services include, in particular :

— provisions directly related to the operation of the mobile services,

— other provisions not directly related to these services ;

b) that certain administrations have submitted to the Administrative Radio Conference, Geneva, 1959, proposals to revise and reclassify those provisions directly related to the operation of the mobile services ;

c) that those administrations have found a new layout for the provisions necessary to facilitate the understanding of the technical stipulations and service procedure regulations concerning radiotelegraphy and radiotelephony, as well as the rules regarding radiotelegrams, radiotelephone calls, and distress traffic ;

d) that this new layout would be of great value to the mobile services and would enable administrations to issue, if they wish to do so, national regulations based upon internationally self-contained sets of rules for the different services ;

e) that a complete rearrangement of certain parts of the Radio Regulations and the Additional Radio Regulations cannot, for practical reasons, be achieved during the Conference ;

f) that those provisions directly related to the mobile services will not be presented in the new Radio Regulations in the form recommended and that in consequence the final reclassification of those provisions should be carried out after the close of the Conference;

g) that it would, however, be very useful to rearrange and to publish in a manual those provisions relating directly to the operation of the mobile services;

h) that the Secretary General should be requested to undertake these tasks;

i) that, in the future, those provisions not related directly to the mobile services should be reclassified by the next Administrative Radio Conference if this is considered useful;

j) that this reclassification would require a preliminary study which should be undertaken by the Secretary General and the results communicated to administrations;

k) that, finally, the Secretary General in carrying out these tasks mentioned in *h)* above should consult a small group of administrations;

resolves

1. that the provisions of the Radio Regulations and its Appendices, together with those of the Additional Radio Regulations, Geneva, 1959, which deal with the operation of the mobile services, shall be assembled in the order indicated in Document No. 775 of the Conference and published in a manual, drawn up in accordance with Article 17, paragraphs 2 and 4, of the Convention;

2. that the Secretary General shall, as soon as possible after the publication of the Radio Regulations, Geneva, 1959, proceed to the rearrangement and the issue of the Manual as mentioned in paragraph 1 above, after approval by the administrations named in paragraph 4, below;

3. that the Secretary General shall also undertake a study with a view to the insertion, in the appropriate places, in the next Radio Regulations, of those regulations contained in the Manual and also those other regulations mentioned in paragraph *i)* above. The results of this study shall be communicated to administrations well in advance of the next Administrative Radio Conference ;

4. that the Secretary General may consult the following administrations on questions relating to the tasks entrusted to him, in accordance with paragraph 2 above :

— United States of America,
— France,
— Italy,
— Netherlands,
— the United Kingdom of Great Britain and Northern Ireland,
— Sweden ;

5. that these administrations approve the Manual before publication ;

6. that the Manual should be available to administrations before 1st August 1960.

RESOLUTION No. 13

Relating to the Preparation of revised Allotment Plans for the Aeronautical Mobile Service

The Administrative Radio Conference, Geneva, 1959,

considering

a) that the Frequency Allotment Plans for the Aeronautical Mobile Service produced by the International Administrative Aeronautical Radio Conference (I.A.A.R.C.), Geneva, 1949, and adopted by the Extraordinary Administrative Radio Conference, Geneva, 1951, have been substantially adopted by the present Conference and included in the Radio Regulations;

b) that since the time of the I.A.A.R.C. there have been changes in the route patterns flown by international civil airlines;

c) that the rates of increase of international civil air traffic have differed amongst the various Major World Air Route Areas (MWARA's);

d) that there are now new requirements for frequency allotments to serve the needs of international civil aviation outside the existing MWARA's; for example, in the area of the North Pole and in the territories of the U.S.S.R. adjacent to the existing MWARA's;

e) that because of the higher speeds of aircraft there are now new requirements for frequencies to meet the needs of international civil aviation for particular purposes, for example, frequencies allotted in the Plans for the purpose of providing meteorological information to aircraft in flight;

f) that, on the other hand, certain provisions of the I.A.A.R.C. Plans are no longer required, for example, the provision for extending the MWARA frequency families, NSA-1 and NSA-2, into the whole of the European area:

g) that a limited number of new provisions to meet urgent requirements have been incorporated into the Plans at this Conference ;

h) that the Plans contain a measure of flexibility which will permit some but not all new requirements to be satisfied ;

i) that there are new aeronautical communication techniques under study and development which have a direct bearing on channel widths and on the number of channels required to meet essential communication needs of national and international aircraft operations. These include :

1. extensions of the useful communication range and increased application of very high frequencies,
2. new high frequency techniques to increase the speed and quantity of communications,
3. new methods for more expeditious dissemination of meteorological information,
4. improved selective calling systems ;

j) that the new frequency allotment plans should adequately reflect the communication techniques above, together with anticipated improvements in aeronautical radionavigation techniques, having a direct influence upon the nature and quantity of communications handled and having an impact on spectrum space required ;

k) that whereas the present Plans were produced on the basis of a large amount of material relating to the operational requirements, usages and procedures of the aeronautical mobile service, it has been impracticable for this Conference to obtain and study the corresponding material essential at this time to effect a complete review of the Aeronautical Mobile Service Plans ;

l) that many countries did not have available at this Conference the information necessary to determine the extent to which the Fre-

quency Allotment Plans meet current requirements for national and regional air operations ;

m) that the International Telecommunication Convention, Geneva, 1959, in Article 7*), paragraphs 4 and 5, provides that an Extraordinary Administrative Radio Conference may revise the provisions of the Radio Regulations;

is of the opinion

that the Aeronautical Mobile Service Plans contained in Appendix 26 of the Radio Regulations will have to be reviewed and administrations should urgently study the communications requirements of their national and international air operations in order to establish when, in the best interests of aviation, such a review shall be undertaken ;

resolves

that, when the Administrative Council deems it appropriate and timely, an Extraordinary Administrative Radio Conference be convened under the provisions of Article 7*) of the International Telecommunication Convention to review Appendix 26 and the provisions of the Radio Regulations associated therewith and to complete its work before the next Ordinary Administrative Radio Conference.

---

*) *Note by the General Secretariat:* This Article was revised by the Plenipotentiary Conference (Malaga-Torremolinos, 1973) and replaced by Article 54.

RESOLUTION No. 14

Relating to the Use of Frequencies of the Aeronautical Mobile (R) Service

The Administrative Radio Conference, Geneva, 1959,

considering

a) that the Plan developed for the use of high frequency channels for the Aeronautical Mobile (R) Service (Appendix 26 to the Radio Regulations, Geneva, 1959) has been substantially implemented ;

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 co-ordinated utilization of those high frequency (R) band allotments as prescribed in the Plan ;

e) that the families of high frequencies allotted to the Major World Air Route Areas (MWARA), Regional and Domestic Air Route Areas (RDARA) and Sub-Areas have been chosen considering propagation conditions which allow for the selection of the most suitable frequencies for the distance involved ;

f) that it is essential to distribute the communication traffic load as uniformly as possible over frequencies of the same order ;

g) that specific steps should be taken to ensure that the correct order of frequency is used ;

resolves

that administrations, individually or in collaboration, take the necessary steps :

1. to make as great a use as possible of very high frequencies in order to lessen the load on the high frequency (R) bands ;

2. to make as great a use as possible of antennae of appropriate directivity and efficiency in order to minimise possibilities of mutual interference within an area or between areas ;

3. to co-ordinate the use of families of frequencies necessary for a given route segment in accordance with the technical principles in Appendix 26 and, in the light of the propagation data available, in order that the most appropriate frequencies be 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 high frequency communications ;

5. to collect precise data on the operation of their high frequency communication systems, particularly that having a bearing on technical and operating standards, so as to facilitate re-examination of this Plan;

6. to establish, through regional agreements, the best method to provide the required communications 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 Aeronautical Mobile (R) Frequency Plan.

RESOLUTION No. 15

Relating to Inter-ship Frequencies in the Bands between 1 605 and 3 600 kHz in Region 1

The Administrative Radio Conference, Geneva, 1959,

considering

a) that the Master International Frequency Register will contain among the initial entries the frequency assignments adopted by the Extraordinary Administrative Radio Conference, Geneva, 1951, made to specific countries for inter-ship communications in the bands between 1 605 and 3 600 kHz in Region 1 ;

b) that provisions should be made for the notification and recording of the use of these frequencies for inter-ship communications by administrations of other countries in Region 1 ;

resolves

1. that the use of the frequencies referred to in *a)* above by other administrations should be co-ordinated with the administrations concerned, and subsequently notified to the International Frequency Registration Board ;

2. that upon such notification the Board shall record these new assignments in the Master International Frequency Register, without any date in Columns 2a or 2b, but with an appropriate note in the Remarks Column followed by the date of receipt of the notice by the Board ;

invites administrations

to review the recorded areas of operation of the frequency assignments concerned, with a view to improving sharing possibilities ; and

requests the International Frequency Registration Board

to make, where necessary, such suggestions to the administrations concerned as it may be able to offer with a view to achieving the purpose referred to in the immediately preceding paragraph.

RESOLUTION No. Spa 1

Relating to the Provision and Use of Information Regarding International Satellite Systems

(Abrogated by Resolution No. Spa2 – 8)

RESOLUTION No. Spa 2

Relating to Space Vehicles in Distress and Emergency

(Abrogated by Resolution No. Spa2 – 8)

RESOLUTION No. Spa 3

Relating to the Category of the Fixed and Mobile Services in the Band 1 525-1 540 MHz

(Abrogated by Resolution No. Spa2 – 8)

RESOLUTION No. Spa 4

Relating to International Co-operation and Technical Assistance in the Field of Space Radiocommunications

The Extraordinary Administrative Radio Conference, Geneva, 1963,

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 will be subject to the Convention and Regulations and that they will 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;

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 No. 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. Aer 1

relating to the use of frequencies 3023·5 and 5680 kHz common to the aeronautical mobile (R) and (OR) services

The Extraordinary Administrative Radio Conference, Geneva, 1966,

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 3023·5 and 5680 kHz, as contained in Article 2 of the Frequency Allotment Plan, Column 3, clauses 2 *a)* and 2 *b)* and having taken steps to remove these anomalies ;

considering

1. that the coordination of search and rescue operations at the scene of a disaster would be improved if the use of the frequencies 3023·5 and 5680 kHz, in such operations, was extended to include communication between mobile stations and participating land stations ;

2. that it would be in the general interests of the aeronautical mobile service if the same provisions relating to the use of the frequencies 3023·5 and 5680 kHz were applied to operations both in the aeronautical mobile (R) service and the aeronautical mobile (OR) service ;

resolves

to invite administrations to apply in the aeronautical mobile (OR) service, as from the date of coming into force of the Final Acts of the Conference, the provisions governing the use of the frequencies 3023·5 and 5680 kHz specified in Appendix 27 (Nos. **27/196** and **27/201**).

RESOLUTION No. Aer 2

relating to the use of frequencies in the HF bands allocated exclusively to the aeronautical mobile (R) service

The Extraordinary Administrative Radio Conference, Geneva, 1966,

considering

a) that monitoring observations on the use of frequencies in the bands allocated exclusively to the aeronautical mobile (R) service between 2850 and 17 970 kHz show that a number of frequencies in these bands are being used by stations of services other than the aeronautical mobile (R) service, thus causing harmful interference to aeronautical mobile (R) service communications on some international air routes ; and that a considerable number of emissions, the sources of which could not be positively identified, were observed in these bands ;

b) that the aeronautical mobile (R) service is a safety service, to which frequency bands are exclusively allocated in order to ensure the safety and regularity of flight along national or international civil air routes as defined in No. **429** of the Radio Regulations, Geneva, 1959 ;

c) that in order to protect the safety of life and property in the air, and to operate aeronautical transport services in a regular and effective manner, it is essential that the aeronautical mobile communication channels be kept free from harmful interference ;

recognizing

that the aeronautical mobile (R) service is a safety service ;

urges

administrations to abstain from the use of frequencies in the bands exclusively allocated to this service by stations of services other than the aeronautical mobile (R) service, except under

the express conditions prescribed in No. **115** or No. **415** of the Radio Regulations, Geneva, 1959 ;

invites

the I.F.R.B. to continue to organize monitoring observations in the bands exclusively allocated to the aeronautical mobile (R) service with a view to eliminating the emissions of out-of-band stations which cause, or are likely to cause, harmful interference to the aeronautical mobile (R) service ; and to seek the collaboration of administrations in identifying the source of such emission by all available means including the use of automatic recording equipment, direction finding and field strength measurements, and in securing the suppression of these emissions.

RESOLUTION No. Aer 3

relating to the introduction of single sideband techniques in the HF bands allocated to the aeronautical mobile (R) service

The Extraordinary Administrative Radio Conference, Geneva, 1966,

considering

a) that congestion should be avoided in the HF bands allocated to the aeronautical mobile (R) service ;

b) that the great majority of stations now operating in the HF bands allocated to the aeronautical mobile (R) service are capable of operating only in the double sideband radiotelephony mode ;

c) that, because of the preponderance of double sideband equipment in use, the Allotment Plan adopted by the Conference is one based on the assumption that all existing stations are capable of operating only in the double sideband radiotelephony mode, and

d) that recent advances in technology may make it possible to avoid congestion in the HF bands allocated to the aeronautical mobile (R) service through the use of VHF techniques and of space radiocommunication techniques ;

recognizing

a) that, despite the recent advances in technology permitting the accommodation of the aeronautical mobile (R) service in bands other than HF bands, there are many areas of the world where the need for HF communication will continue into the foreseeable future, and in some areas this may be an increasing need ;

b) that single sideband radiotelephony has demonstrated advantages over double sideband radiotelephony in many radio services in terms of radio spectrum economy and in reliability

of communication, particularly under adverse atmospheric and propagation conditions ;

c) that economic, technical and operational considerations make it impracticable to specify, at this time, any definitive date by which the use of double sideband radiotelephony must be discontinued in favour of single sideband radiotelephony ;

d) that single sideband equipment of appropriate design can operate compatibly with double sideband systems, and would permit the introduction of SSB on an evolutionary basis ;

e) that significant spectrum economy will be realized only when the ratio of SSB-to-DSB users is sufficiently large to make channel splitting practicable ; and

f) the desirability of introducing single sideband equipment in the interest of improving the standard of communication and effecting spectrum economy ;

resolves

1. that, taking into account economic, technical and operational considerations, administrations shall effect, as soon as possible, a progressive conversion of their HF radiotelephone services in the aeronautical mobile (R) service from double sideband to single sideband operation using, where necessary, single sideband equipment capable of working compatibly with double sideband systems ;

2. that, notwithstanding the foregoing, administrations may continue to instal and operate equipment having characteristics similar to those of equipment in current use ;

3. that the International Civil Aviation Organization be invited, as a matter of urgency and within the framework of the decisions taken by this Conference, to establish technical characteristics for system standards relative to single sideband equipment, in respect of application to international operations in the aeronautical mobile (R) service, and to advise the C.C.I.R. of any technical or operational problems on which they would like the assistance of the C.C.I.R.

RESOLUTION No. Aer 4

relating to the use of VHF for communication in the aeronautical mobile (R) service

The Extraordinary Administrative Radio Conference, Geneva, 1966,

considering

a) that from an aeronautical viewpoint, VHF can provide a more reliable and more noise-free communication system than HF ;

b) that from a technical and operational viewpoint, the use of VHF by aviation has progressed appreciably ;

c) that the use of VHF in its several modes could appreciably reduce the use of HF in the aeronautical mobile (R) service ;

d) that, owing to development in the general telecommunication networks in many areas of the world, the possibilities of providing VHF coverage are rapidly increasing ;

resolves

that administrations, to the maximum extent practicable, should employ VHF to meet their requirements in the aeronautical mobile (R) service.

RESOLUTION No. Aer 5

relating to the use of VHF for meteorological broadcasts in the aeronautical mobile (R) service

The Extraordinary Administrative Radio Conference, Geneva, 1966,

considering

a) that the number of channels available for the aeronautical mobile (R) service in the frequency bands between 2850 and 17 970 kHz is limited ;

b) that the need for frequencies for aeronautical mobile (R) service communications and for meteorological broadcasts to aircraft is increasing ;

c) that the propagation characteristics of high frequencies make them essential for aviation communication requirements over long distances ;

d) that in Recommendation No. 13 of the International Administrative Aeronautical Radio Conference, Geneva, 1949, and Resolution No. 14 of the Ordinary Administrative Radio Conference, Geneva, 1959, administrations were urged "to make as great a use as possible of very high frequencies in order to lessen the load on the high frequency (R) bands" ;

e) that substantial technical progress has been made by aviation since 1949 in extending the operational range of VHF used for communications within the aeronautical mobile (R) service;

f) that this extension of the operational range of VHF could partially meet the increasing need for meteorological broadcasts to aircraft ;

resolves

that administrations, to the maximum extent practicable, should employ VHF for meteorological broadcasts to aircraft.

RESOLUTION No. Aer 6

relating to the treatment of notices concerning frequency assignments to aeronautical stations in the aeronautical mobile (R) service in the bands allocated exclusively to that service between 2850 and 17 970 kHz

The Extraordinary Administrative Radio Conference, Geneva, 1966,

considering

a) that the Final Acts of this Conference will enter into force on 1st July, 1967, but

b) that the revised Frequency Allotment Plan contained in Appendix 27 will enter into force at 0001 hours G.M.T. on 10th April, 1970 ;

c) that some administrations may wish to implement certain provisions of the revised Frequency Allotment Plan in advance of the latter date where this may be done without causing harmful interference to stations working in accordance with the present Frequency Allotment Plan, Geneva, 1959 ;

d) that it will therefore be necessary to provide an interim procedure to facilitate transition from the present Frequency Allotment Plan to the revised Frequency Allotment Plan ;

resolves

1. that during the period between the date of entry into force of the Final Acts and the date of entry into force of the revised Frequency Allotment Plan :

1.1 the provisions of Nos. **553** to **559** of the Radio Regulations, Geneva, 1959, shall continue to be applied in the examination of notices concerning frequency assignments to aeronautical stations in the aeronautical mobile (R) service in the bands allocated exclusively to that service between 2850 and 17 970 kHz ;

1.2 all such assignments shall be recorded in the Master International Frequency Register according to the findings reached by the I.F.R.B. ;

1.3 the date to be entered in Column 2a or 2b of the Master International Frequency Register shall be as follows :

a) if the finding is favourable with respect to Nos. **554** to **557**, the date of 3rd December 1951 shall be entered in Column 2a ;

b) if the finding is favourable with respect to No. **558**, the date of 3rd December 1951 shall be entered in Column 2b ;

c) for all other such assignments (including those which may be in conformity with the revised Frequency Allotment Plan but not in conformity with the present Frequency Allotment Plan) the date of receipt of the notice by the I.F.R.B. shall be entered in Column 2b ;

1.4 any assignment which is in accordance with the revised Frequency Allotment Plan shall be so indicated by the insertion by the I.F.R.B. of an appropriate symbol in the Remarks Column of the Master International Frequency Register ;

2. that on the date of coming into force of the revised Frequency Allotment Plan, the I.F.R.B. shall examine those frequency assignments to aeronautical stations in the aeronautical mobile (R) service in the bands allocated exclusively to that service between 2850 and 17 970 kHz, which are contained in the Master International Frequency Register from the point of view of their conformity with the revised Frequency Allotment Plan following the relevant parts of the procedure described in Nos. **553** to **559** of the Radio Regulations, Geneva, 1959, as modified by the Extraordinary Administrative Radio Conference, Geneva, 1966, and shall record against them in the Master International Frequency Register a date in Column 2a or 2b as follows :

2.1 assignments found favourable with respect to Nos. **554** to **557** shall have the date of 29th April 1966 entered in Column 2a ;

2.2 assignments found favourable with respect to No. **558** shall have the date of 29th April 1966 entered in Column 2b ;

2.3 all other assignments shall have the date of 30th April, 1966 entered in Column 2b ;

3. that, on the date of entry into force of the revised Frequency Allotment Plan, the allotments therein shall replace in the Master International Frequency Register those allotments in the present Frequency Allotment Plan ;

invites

administrations to notify to the I.F.R.B. as soon as possible the cancellation of frequency assignments released as a consequence of bringing into use the allotments in the revised Frequency Allotment Plan.

RESOLUTION No. Mar 1

Relating to the Abrogation of Obsolete Recommendations of the Administrative Radio Conference, Geneva, 1959

The World Administrative Radio Conference, Geneva, 1967,

considering

a) that all necessary action has been taken on the following Recommendations of the Administrative Radio Conference, Geneva, 1959:

Recommendation No. 22 to the Intergovernmental Maritime Consultative Organization, the International Civil Aviation Organization and to Administrations relating to an International Radiotelephone Code for the Maritime Mobile Service;

Recommendation No. 23 to the Safety of Life at Sea Conference relating to the Use of the Term "Emergency (Reserve)";

Recommendation No. 24 to the Governments Signatory to the International Convention for the Safety of Life at Sea relating to the Adoption of a Radiotelephone Alarm Signal;

Recommendation No. 25 to the International Conference on Safety of Life at Sea relating to Distress, Urgency and Safety Communications;

b) that the undermentioned Recommendations of the Administrative Radio Conference, Geneva, 1959, are obsolete:

Recommendation No. 26 relating to a Reclassification of International Public Correspondence Categories of Ship Stations;

Recommendation No. 27 relating to Hours of Service for Ship Stations;

Recommendation No. 28 relating to the Use of Single Sideband Systems by the Maritime Mobile Service;

Recommendation No. 30 relating to the Phonetic Figure Table;

resolves

that the said Recommendations are abrogated.

RESOLUTION No. Mar 2

Relating to the Establishment of a Manual for Use by the Maritime Mobile Service

The World Administrative Radio Conference, Geneva, 1967,

considering

that provision has been made in Appendix 11 to the Radio Regulations for the carriage by ship stations of a manual for use by the maritime mobile service ;

resolves

1. that those provisions of

   a) the Radio Regulations (including Appendices thereto) and the Additional Radio Regulations, as revised by the World Administrative Radio Conference, Geneva, 1967,

   b) the Telegraph Regulations and the Telephone Regulations, and

   c) the International Telecommunication Convention,

which are applicable or useful to stations in the maritime mobile service shall be assembled by the Secretary-General in a manual entitled "Manual for Use by the Maritime Mobile Service";

2. that the Secretary-General shall publish such a manual, using as a basis the "Manual for Use by the Mobile Services" published in 1961 with the exception of such provisions as do not relate to the maritime mobile service, and shall make it available by 1 October 1968 at the latest;

3. that the Secretary-General may consult the following Administrations on questions relating to the tasks entrusted to him in accordance with paragraphs 1 and 2 above:

United States of America
France
Italy
Kingdom of the Netherlands
United Kingdom of Great Britain and Northern Ireland
Sweden;

4. that the Secretary-General shall examine the possibility of issuing this manual in loose-leaf form to facilitate its being brought up to date following any revision by future conferences of the provisions referred to in 1. *a)*, *b)* and *c)* above;

5. that, as from 1 April 1969, the "Manual for Use by the Maritime Mobile Service" shall replace, so far as the maritime mobile service is concerned, the "Manual for Use by the Mobile Services" published in accordance with the provisions of Resolution No. 12 of the Administrative Radio Conference, Geneva, 1959.

RESOLUTION No. Mar 3

Relating to the Classes of Emissions to be used for Remote-Controlled Coast Stations in the Maritime Mobile Radiotelephone Service

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 4

Relating to the Conversion to Single Sideband Technique of Stations of the Radiotelephone Maritime Mobile Service Operating in the Bands between 1 605 and 4 000 kHz

The World Administrative Radio Conference, Geneva, 1967,

considering

a) that radiotelephone stations in the maritime mobile service operating with double sideband emissions in the bands between 1 605 and 4 000 kHz use a bandwidth of the order of 6 kHz;

b) that these stations will have to use single sideband operation in future;

c) that, during the period of conversion to single sideband operation, every precaution must be taken to avoid harmful interference between stations operating with double sideband emissions and those operating with single sideband emissions;

resolves

1. that the transition to single sideband operation in the stations referred to in considerandum *a)* above shall be made in accordance with the following provisions:

1.1 the carrier frequency of the single sideband channel in the upper part of the previous double sideband channel shall be the same as the carrier frequency of that channel;

1.2 the carrier frequency of the single sideband channel in the lower part of the previous double sideband channel shall be 3 kHz lower than the carrier frequency of the previous double sideband channel when the latter has a carrier frequency at least 6 kHz

above that of the lower adjacent double sideband radiotelephone channel;

1.3 in Region 1, the carrier frequency of the single sideband channel in the lower part of the previous double sideband channel for intership communication shall be 2·5 kHz below the carrier frequency of the previous double sideband channel when the latter has a carrier frequency 5 kHz above that of the lower adjacent double sideband radiotelephone channel;

2. that class A3H emissions shall not be used on single sideband channels in the lower part of previous double sideband channels.

RESOLUTION No. Mar 5

Relating to the Use of Single Sideband Technique in the Radiotelephone Maritime Mobile Service Bands between 1 605 and 4 000 kHz

The World Administrative Radio Conference, Geneva, 1967,

considering

a) Recommendation No. 28 of the Administrative Radio Conference, Geneva, 1959;

b) that the present Conference has decided to require the use of single sideband techniques, except in certain circumstances;

c) the desirability of replacing double sideband emissions by single sideband emissions as early as possible in the maritime mobile service bands between 1 605 and 4 000 kHz;

resolves

that, unless otherwise specified in the Final Acts of this Conference, radiotelephone stations in the maritime mobile service operating in the bands between 1 605 and 4 000 kHz shall comply with the following conditions:

1. as from 1 January 1973, any new installations of double sideband equipment in ship stations shall not be permitted, except in the cases covered by Nos. **984**, **987** and **1323** of the Radio Regulations; however, administrations shall endeavour to discontinue the installation of double sideband equipment at the earliest possible date after 1 April 1969;

2. coast stations shall be capable of single sideband operation at the earliest possible date; furthermore, they shall discontinue double sideband emissions as early as possible, and, in any case, not later than 1 January 1975;

3. until 1 January 1982, coast and ship stations equipped for single sideband operation shall also be equipped to transmit class A3H emissions compatible with reception by double sideband equipment. On the carrier frequency 2 182 kHz this requirement with respect to class A3H emissions will continue beyond 1 January 1982;

4. with the following exceptions, as from 1 January 1982, the use of class A3A and A3J emissions only shall be authorized:

— class A3 and A3H emissions for ship, survival craft and aircraft stations transmitting with a carrier frequency of 2 182 kHz;

— class A3H emissions for coast stations transmitting with a carrier frequency of 2 182 kHz;

— in Regions 1, 3 and in Greenland, in exceptional circumstances, class A3H emissions for coast stations sending safety messages on the carrier frequency 2 170·5 kHz;

— classes of emission A2H, A2A and A2J for coast stations for selective calling on the carrier frequency 2 170·5 kHz;

— the class of emission specified in Appendix 20A to the Radio Regulations for emergency position-indicating radiobeacons (see also No. **1476G** of the Radio Regulations);

5. as from 1 January 1982, ship and aircraft stations required to employ single sideband operation on the working frequencies of the maritime mobile service shall use only class A3H emissions on the carrier frequency 2 182 kHz.

RESOLUTION No. Mar 6

Relating to the Use of Single Sideband Technique in the Radiotelephone Maritime Mobile Service Bands between 4 000 and 23 000 kHz

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No Mar 7

Relating to the Recommendations and Standards for Emergency Position-Indicating Radiobeacons Operating on the Frequencies 121·5 MHz and 243 MHz

The World Administrative Radio Conference, Geneva, 1967,

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 has established recommended signal characteristics and technical specifications for aircraft equipment operating on 121·5 MHz and/or 243 MHz;

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 recommendations and standards of the International Civil Aviation Organization and the International Radio Consultative Committee.

RESOLUTION No. Mar 8

Relating to the Notification of Ship Station Frequencies used for Narrow-Band Direct-Printing Telegraph and Data Transmission Systems

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 9

Relating to the Unauthorized Use of Frequencies in the Bands Allocated to the Maritime Mobile Service

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 10

Relating to the Transfer of certain Frequency Assignments for Coast Radiotelegraph Stations in the Frequency Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 11

Relating to the Transfer of Frequency Assignments to Coast Radiotelephone Stations in the Frequency Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz

The World Administrative Radio Conference, Geneva, 1967,

considering

a) that the frequency allotment plan appearing in Appendix 25 to the Radio Regulations, Geneva, 1959, is to be retained until a new plan is established by the Conference mentioned in Recommendation No. Mar 6;

b) that, as a result of the extension of the bands allocated exclusively to the maritime mobile service for radiotelephony, new duplex radiotelephone channels will be available to the maritime mobile service and will be contained in Section III of Appendix 25 MOD (see Resolution No. Mar 15);

c) that the separation between the transmitting frequencies of coast and ship stations should remain constant within each band;

d) that on the whole it is easier and cheaper to change transmitting frequencies for coast stations than for ship stations, taking into account the large number of ship stations;

e) that the additions to the bands allocated exclusively to the maritime mobile service for radiotelephony will become available on 1 March 1970 (see Resolution No. Mar 12);

f) that the new channels should be brought into use as soon as possible;

resolves

1. that, on 1 March 1970, the frequencies appearing in Appendix 25 to the Radio Regulations, Geneva, 1959, shall be replaced by the frequencies appearing in Annex 1 to this Resolution. This Appendix, as modified, shall also contain the new Section III (see Annex 3) referred to in Resolution No. Mar 15 and shall then be known as Appendix 25 MOD;

2. that, on 1 March 1970, the I.F.R.B. shall bring the appropriate initial entries, listed in the Master International Frequency Register in accordance with the provisions of paragraph 2.1 *c)* of Resolution No. 1 of the Administrative Radio Conference, Geneva, 1959, into conformity with the allotments included in Appendix 25 MOD referred to above;

3. that the frequency assignments to high frequency coast radiotelephone stations recorded in the Master Register on 1 March 1970 on the channels defined in Appendix 17 to the Radio Regulations, Geneva, 1959, shall be transferred in accordance with the Tables appearing in Annex 1 (double sideband or independent sideband emissions) or Annex 2 (single sideband emissions), as the case may be;

4. that the frequency assignments to coast radiotelephone stations in the high frequency bands allocated exclusively for that purpose, recorded in the Master Register on 1 March 1970, but not in accordance with Appendix 17 to the Radio Regulations, Geneva, 1959, shall be transferred in such a way as to retain, with respect to the frequencies specified in Section A of Appendix 17, the same relative positions they occupied in relation to the frequencies listed in Appendix 17 to the Radio Regulations, Geneva, 1959;

5. that, on 1 March 1970 at 0001 G.M.T., administrations shall modify, as indicated in paragraphs 3 and 4 above, the transmitting frequencies of their coast radiotelephone stations. They shall notify these modifications to the I.F.R.B. in accordance with the provisions of Section I of Article 9 of the Radio Regulations;

6. that, provided the notice received by the I.F.R.B. in accordance with paragraph 5 above does not contain any change in the basic characteristics of the originally recorded assignment, other than the assigned frequency, the I.F.R.B. shall record the change in the Master Register; the dates to be entered in the appropriate parts of Column 2 shall be those of the original assignment. Should any other change be notified in the basic characteristics of the original assignment, it shall be dealt with in accordance with the provisions of Article 9 of the Radio Regulations;

7. that, on 1 March 1970, the I.F.R.B. shall also include in the Master Register, in respect of each original assignment the transfer of which has not at that time been notified to the I.F.R.B., a provisional entry determined in accordance with the provisions of paragraphs 3 or 4 above. For such provisional entries, the dates in Column 2 recorded for the original assignment shall be retained. The original entries shall be retained in the Master Register, but with a special remark in the Remarks Column, and any dates in Column 2a shall be transferred to Column 2b;

8. that, thirty days after that date, the I.F.R.B. shall send to those administrations which have not yet notified the transfer of frequency assignment to their coast radiotelephone stations in accordance with paragraphs 3 or 4 and 5 above, an extract from the Master Register showing the relevant entries contained therein on their behalf, and shall remind them of the provisions of this Resolution;

9. that if, sixty days after the despatch of these extracts, an administration has still not notified to the I.F.R.B. the transfer of an existing assignment in accordance with paragraphs 3 or 4 and 5 above, the corresponding provisional new entry shall be deleted from the Master Register and the original entry shall be retained with its date in Column 2b and a special remark in the Remarks Column. If, however, the administration concerned notifies the transfer during the sixty days period, the provisions of paragraph 6 above shall apply.

ANNEX 1

Table of Transmitting Frequencies of Coast Radiotelephone Stations (in kHz) (Double sideband or independent sideband [1] emissions)

4 MHz band		8 MHz band		12 MHz band		16 MHz band		22 MHz band	
Old frequencies	New frequencies	Old frequencies	New frequencies	Old frequencies	New frequencies	Old frequencies	New frequencies	Old frequencies	New frequencies
4 371·1	4 364·7	8 748·1	8 732·1	13 133·5	13 112·5	17 293·5	17 258·5	22 653·5	22 629·0
4 377·4	4 371·0	8 754·4	8 738·4	13 140·5	13 119·5	17 300·5	17 265·5	22 660·5	22 636·0
4 383·8	4 377·4	8 760·8	8 744·8	13 147·5	13 126·5	17 307·5	17 272·5	22 667·5	22 643·0
4 390·2	4 383·8	8 767·2	8 751·2	13 154·5	13 133·5	17 314·5	17 279·5	22 674·5	22 650·0
4 396·6	4 390·2	8 773·6	8 757·6	13 161·5	13 140·5	17 321·5	17 286·5	22 681·5	22 657·0
4 403·0	4 396·6	8 780·0	8 764·0	13 168·5	13 147·5	17 328·5	17 293·5	22 688·5	22 664·0
4 409·4	4 403·0	8 786·4	8 770·4	13 175·5	13 154·5	17 335·5	17 300·5	22 695·5	22 671·0
4 415·8	4 409·4	8 792·8	8 776·8	13 182·5	13 161·5	17 342·5	17 307·5	22 702·5	22 678·0
4 422·2	4 415·8	8 799·2	8 783·2	13 189·5	13 168·5	17 349·5	17 314·5	22 709·5	22 685·0
4 428·6	4 422·2	8 805·6	8 789·6	13 196·5	13 175·5	17 356·5	17 321·5	22 716·5	22 692·0
4 434·9	4 428·6	8 811·9	8 796·0						

[1] See Resolution No. Mar 13

ANNEX 2

Table of Single Sideband Transmitting Frequencies of Coast Radiotelephone Stations (in kHz)

4 MHz band				8 MHz band			
Old frequencies		New frequencies		Old frequencies		New frequencies	
Carrier frequencies	Assigned frequencies	Carrier frequencies	Assigned frequencies	Carrier frequencies	Assigned frequencies	Carrier frequencies	Assigned frequencies
4 368·0	4 369·4	4 361·6	4 363·0	8 745·0	8 746·4	8 729·0	8 730·4
4 371·1	4 372·5	4 364·7	4 366·1	8 748·1	8 749·5	8 732·1	8 733·5
4 374·3	4 375·7	4 367·8	4 369·2	8 751·3	8 752·7	8 735·2	8 736·6
4 377·4	4 378·8	4 371·0	4 372·4	8 754·4	8 755·8	8 738·4	8 739·8
4 380·7	4 382·1	4 374·2	4 375·6	8 757·7	8 759·1	8 741·6	8 743·0
4 383·8	4 385·2	4 377·4	4 378·8	8 760·8	8 762·2	8 744·8	8 746·2
4 387·1	4 388·5	4 380·6	4 382·0	8 764·1	8 765·5	8 748·0	8 749·4
4 390·2	4 391·6	4 383·8	4 385·2	8 767·2	8 768·6	8 751·2	8 752·6
4 393·5	4 394·9	4 387·0	4 388·4	8 770·5	8 771·9	8 754·4	8 755·8
4 396·6	4 398·0	4 390·2	4 391·6	8 773·6	8 775·0	8 757·6	8 759·0
4 399·9	4 401·3	4 393·4	4 394·8	8 776·9	8 778·3	8 760·8	8 762·2
4 403·0	4 404·4	4 396·6	4 398·0	8 780·0	8 781·4	8 764·0	8 765·4
4 406·3	4 407·7	4 399·8	4 401·2	8 783·3	8 784·7	8 767·2	8 768·6
4 409·4	4 410·8	4 403·0	4 404·4	8 786·4	8 787·8	8 770·4	8 771·8
4 412·7	4 414·1	4 406·2	4 407·6	8 789·7	8 791·1	8 773·6	8 775·0
4 415·8	4 417·2	4 409·4	4 410·8	8 792·8	8 794·2	8 776·8	8 778·2
4 419·1	4 420·5	4 412·6	4 414·0	8 796·1	8 797·5	8 780·0	8 781·4
4 422·2	4 423·6	4 415·8	4 417·2	8 799·2	8 800·6	8 783·2	8 784·6
4 425·5	4 426·9	4 419·0	4 420·4	8 802·5	8 803·9	8 786·4	8 787·8
4 428·6	4 430·0	4 422·2	4 423·6	8 805·6	8 807·0	8 789·6	8 791·0
4 431·8	4 433·2	4 425·4	4 426·8	8 808·8	8 810·2	8 792·8	8 794·2
4 434·9	4 436·3	4 428·6	4 430·0	8 811·9	8 813·3	8 796·0	8 797·4

ANNEX 2 *(continued)*

Table of Single Sideband Transmitting Frequencies of Coast Radiotelephone Stations (in kHz)

12 MHz band				16 MHz band			
Old frequencies		New frequencies		Old frequencies		New frequencies	
Carrier frequencies	Assigned frequencies	Carrier frequencies	Assigned frequencies	Carrier frequencies	Assigned frequencies	Carrier frequencies	Assigned frequencies
13 130·2	13 131·6	13 109·0	13 110·4	17 290·2	17 291·6	17 255·0	17 256·4
13 133·5	13 134·9	13 112·5	13 113·9	17 293·5	17 294·9	17 258·5	17 259·9
13 137·2	13 138·6	13 116·0	13 117·4	17 297·2	17 298·6	17 262·0	17 263·4
13 140·5	13 141·9	13 119·5	13 120·9	17 300·5	17 301·9	17 265·5	17 266·9
13 144·2	13 145·6	13 123·0	13 124·4	17 304·2	17 305·6	17 269·0	17 270·4
13 147·5	13 148·9	13 126·5	13 127·9	17 307·5	17 308·9	17 272·5	17 273·9
13 151·2	13 152·6	13 130·0	13 131·4	17 311·2	17 312·6	17 276·0	17 277·4
13 154·5	13 155·9	13 133·5	13 134·9	17 314·5	17 315·9	17 279·5	17 280·9
13 158·2	13 159·6	13 137·0	13 138·4	17 318·2	17 319·6	17 283·0	17 284·4
13 161·5	13 162·9	13 140·5	13 141·9	17 321·5	17 322·9	17 286·5	17 287·9
13 165·2	13 166·6	13 144·0	13 145·4	17 325·2	17 326·6	17 290·0	17 291·4
13 168·5	13 169·9	13 147·5	13 148·9	17 328·5	17 329·9	17 293·5	17 294·9
13 172·2	13 173·6	13 151·0	13 152·4	17 332·2	17 333·6	17 297·0	17 298·4
13 175·5	13 176·9	13 154·5	13 155·9	17 335·5	17 336·9	17 300·5	17 301·9
13 179·2	13 180·6	13 158·0	13 159·4	17 339·2	17 340·6	17 304·0	17 305·4
13 182·5	13 183·9	13 161·5	13 162·9	17 342·5	17 343·9	17 307·5	17 308·9
13 186·2	13 187·6	13 165·0	13 166·4	17 346·2	17 347·6	17 311·0	17 312·4
13 189·5	13 190·9	13 168·5	13 169·9	17 349·5	17 350·9	17 314·5	17 315·9
13 193·2	13 194·6	13 172·0	13 173·4	17 353·2	17 354·6	17 318·0	17 319·4
13 196·5	13 197·9	13 175·5	13 176·9	17 356·5	17 357·9	17 321·5	17 322·9

ANNEX 2 *(end)*

Table of Single Sideband Transmitting Frequencies of Coast Radiotelephone Stations (in kHz)

22 MHz band			
Old frequencies		New frequencies	
Carrier frequencies	Assigned frequencies	Carrier frequencies	Assigned frequencies
22 650·2	22 651·6	22 625·5	22 626·9
22 653·5	22 654·9	22 629·0	22 630·4
22 657·2	22 658·6	22 632·5	22 633·9
22 660·5	22 661·9	22 636·0	22 637·4
22 664·2	22 665·6	22 639·5	22 640·9
22 667·5	22 668·9	22 643·0	22 644·4
22 671·2	22 672·6	22 646·5	22 647·9
22 674·5	22 675·9	22 650·0	22 651·4
22 678·2	22 679·6	22 653·5	22 654·9
22 681·5	22 682·9	22 657·0	22 658·4
22 685·2	22 686·6	22 660·5	22 661·9
22 688·5	22 689·9	22 664·0	22 665·4
22 692·2	22 693·6	22 667·5	22 668·9
22 695·5	22 696·9	22 671·0	22 672·4
22 699·2	22 700·6	22 674·5	22 675·9
22 702·5	22 703·9	22 678·0	22 679·4
22 706·2	22 707·6	22 681·5	22 682·9
22 709·5	22 710·9	22 685·0	22 686·4
22 713·2	22 714·6	22 688·5	22 689·9
22 716·5	22 717·9	22 692·0	22 693·4

ANNEX 3

Channels in Section III of Appendix 25 MOD (in kHz)

The frequencies printed in italics are calling frequencies (see No. **1352A***)*

4 MHz Band		6 MHz Band		8 MHz Band		12 MHz Band		16 MHz Band		22 MHz Band	
Carrier frequecny	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
4 431·8	4 433·2	6 515·4	6 516·8	8 799·2	8 800·6	13 179·0	13 180·4	17 325·0	17 326·4	22 695·5	22 696·9
4 434·9	*4 436·3*	*6 518·6*	*6 520·0*	*8 802·4*	*8 803·8*	*13 182·5*	*13 183·9*	*17 328·5*	*17 329·9*	*22 699·0*	*22 700·4*
		6 521·8	6 523·2	8 805·6	8 807·0	13 186·0	13 187·4	17 332·0	17 333·4	22 702·5	22 703·9
				8 808·8*	8 810·2	13 189·5*	13 190·9	17 335·5*	17 336·9	22 706·0*	22 707·4
				8 812·0	8 813·4	13 193·0	13 194·4	17 339·0	17 340·4	22 709·5	22 710·9
						13 196·5*	13 197·9	17 342·5*	17 343·9	22 713·0*	22 714·4
								17 346·0	17 347·4	22 716·5	22 717·9
								17 349·5*	17 350·9		
								17 353·0	17 354·4		
								17 356·5*	17 357·9		

* This carrier frequency may also be used for double sideband transmissions in accordance with Resolution No. Mar 15.

RESOLUTION No. Mar 12

Relating to the Implementation of the New Arrangement of Radiotelegraphy and Radiotelephony Bands Allocated to the Maritime Mobile Service between 4 000 and 27 500 kHz

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 13

Relating to the Use of Class of Emission A3B by Radiotelephone Stations in the Maritime Mobile Service in the Bands between 4 000 and 23 000 kHz

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 14

Relating to the Channel Spacing of Transmitting Frequencies Allotted to the International Maritime Mobile Service for Radiotelephony in the Band 156-174 MHz

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 15

Relating to the Use of the New High Frequency Channels made available for Maritime Radiotelephony by the Present Conference

The World Administrative Radio Conference, Geneva, 1967,

considering

a) that the Conference has decided to create as from 1 March 1970 new high frequency duplex radiotelephone channels to be included in Appendix 17 to the Radio Regulations and, without allotting them to countries, in Section III of Appendix 25 MOD;

b) that the Conference has also decided to recommend that a World Administrative Radio Conference be convened in 1973 to prepare a new frequency allotment plan for high frequency coast radiotelephone stations, covering the channels in the present Appendix 25 as well as the new channels referred to in *a)* above;

c) that, however, interim measures have to be taken by administrations and by the I.F.R.B. to provide for an orderly use of the new channels between the date when they become available for maritime radiotelephony and the date of entry into force of the new frequency allotment plan;

resolves

1. that during the interim period referred to in *c)* above, the new channels should be used for single sideband operation, and also for double sideband operation where technically feasible, in accordance with the time-table for conversion to single sideband operation determined by the present Conference; the peak envelope power of the transmitters shall be limited to 5 kW per speech channel for coast stations[1] and to 1·5 kW for ship stations;

---

[1] For class A3H emissions a peak envelope power of 7 kW may be used. For class A3 emissions a mean power of 10 kW may be used.

2. that the I.F.R.B. shall collect from administrations their requirements for use of these new channels;

urges administrations

3. in view of the limited number of new channels available for maritime radiotelephony, to submit only those requirements considered essential for use during the interim period referred to in *c)* above;

further resolves

4. that, after compilation of the requirements collected from administrations, the I.F.R.B., in consultation, where appropriate, with the administrations concerned, shall endeavour to distribute such requirements amongst the new channels, dealing with them in the following order, in the frequency bands covered by Appendix 25 MOD, band by band:

4.1 requirements from those countries which, in a particular frequency band, have no allotments in the present Appendix 25, have no assignments to high frequency coast radiotelephone stations recorded in the Master International Frequency Register in that band and are in urgent need of frequencies for maritime radiotelephony in that band;

4.2 requirements from those countries which have assignments to high frequency coast radiotelephone stations recorded in the Master Register, but which have a large volume of traffic to handle and whose assignments are causing or experiencing harmful interference;

5. that the distribution of requirements amongst the new channels in accordance with paragraph 4 above shall be circulated to all administrations at least six months before the new channels become available for maritime radiotelephony;

6. that the channels distributed in accordance with paragraph 4 above shall be regarded as allotments to the countries concerned from the point of view of the frequency notification and registration procedure to be applied as from the date the channels become available;

7. that, as from that date, the relevant provisions of Nos. **541** to **551** of the Radio Regulations, in so far as they refer to Section I of Appendix 25, shall apply also to the frequency bands covered by the new channels (Section III of Appendix 25 MOD), for the examination by the I.F.R.B. of frequency assignment notices for transmission or reception by coast stations;

8. that the dates to be entered in Column 2a or Column 2b of the Master Register depending upon the findings reached by the I.F.R.B., after the examination referred to in paragraph 7 above, shall be in accordance with the relevant provisions of Nos. **577** to **586** of the Radio Regulations;

9. that the above procedure, which should be discontinued on the date of entry into force of the new frequency allotment plan to be prepared by the Radio Conference referred to in Recommendation No. Mar 6, is of an interim nature and shall not prejudge the decisions to be taken by the above-mentioned Conference; a suitable remark to this effect shall be entered in the Master Register for the frequency assignments in the bands concerned.

RESOLUTION No. Mar 16

Relating to the Introduction of a Radiocommunication Operator's General Certificate for the Maritime Mobile Service

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Mar 17

Relating to the Need for keeping adequate Watch by Ship Stations on the International Distress Frequency for Radiotelephony

The World Administrative Radio Conference, Geneva, 1967,

considering

a) that this Conference has adopted the necessary amendments to the Radio Regulations, Geneva, 1959, concerning the operation of emergency position-indicating radiobeacons on the international distress frequency for radiotelephony;

b) that ship stations which are equipped for radiotelegraphy but are also equipped for radiotelephony are required to keep watch only on the international distress frequency for radiotelegraphy;

c) that ship stations keeping watch only on the international distress frequency for radiotelegraphy will not hear distress calls from small craft calling on the distress frequency for radiotelephony;

d) that if radiotelegraph ship stations in a position to do so would keep watch on both the radiotelephony and radiotelegraphy international distress frequencies, it would increase the safety of ships and especially of those fitted for radiotelephony only;

e) that a watch on both the radiotelephony and radiotelegraphy international distress frequencies would improve the efficacy of assistance to the survivors from any maritime distress incident;

is of the opinion

that an increased watch is necessary by ship stations on the radiotelephony distress frequency;

resolves

that the Inter-Governmental Maritime Consultative Organization be invited to consider this matter, as part of the study currently being undertaken on the maritime safety system, taking into account the possibility of eventual amendment to the pertinent provisions of the International Convention for the Safety of Life at Sea (London, 1960);

requests the Secretary-General

to communicate this Resolution to the Inter-Governmental Maritime Consultative Organization.

RESOLUTION No. Mar 18

Relating to the Examination of Pertinent Portions of the Revised International Code of Signals

(Abrogated by Resolution No. Mar2-1)

RESOLUTION No. Mar 19

Relating to the Manner in which the I.F.R.B. shall treat Notifications dealing with Frequency Assignments to Oceanographic Stations

The World Administrative Radio Conference, Geneva, 1967,

considering

a) that the Conference has adopted Resolution No. Mar 20, concerning the establishment of a co-ordinated world-wide system for the collection of data relating to oceanography; and

b) that the I.F.R.B. requires instructions regarding the notification and registration in the Master International Frequency Register of assignments to oceanographic stations;

resolves

that the I.F.R.B. be instructed to accept for registration in the Master International Frequency Register only such notifications, submitted by administrations in accordance with Nos. **486** and **487**, as pertain to transmitting and receiving oceanographic stations which are land based and which are in conformity with Resolution No. Mar 20. Such notifications shall be treated by the Board in accordance with No. **505** of the Regulations. These entries in the Master Register shall not prejudice any decisions to be taken by the next Administrative Radio Conference competent to deal with the maritime mobile service.

RESOLUTION No. Mar 20

Concerning the Establishment of a Co-ordinated World-wide System for the Collection of Data relating to Oceanography

The World Administrative Radio Conference, Geneva, 1967,

considering

a) the expressed desire for the establishment of a co-ordinated world-wide system for the collection of data relating to oceanography;

b) that in each of the six high frequency bands allocated exclusively to the maritime mobile service a frequency band has been designated for use in the collection of data relating to oceanography in accordance with Appendix 15 to the Radio Regulations;

c) that use of these frequencies with maximum effectiveness is dependent upon co-operation and co-ordination among administrations;

d) that certain administrations expressed the desire that a co-ordinated world-wide system for the transmission of data relating to oceanography be established on the basis of a co-ordinated plan in the bands allocated by the present 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 the present Conference;

f) that, consequently, a co-ordinated 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 (I.O.C.) and the World Meteorological Organization (W.M.O.) have been in

consultation since 1962 with respect to co-operative efforts in the collection of data relating to oceanography (e.g. the W.M.O./I.O.C. Panel of Experts on Co-ordination of Requirements, Geneva, 19-21 July, 1967);

resolves

1. that the I.O.C. and W.M.O. be invited to develop jointly, in consultation with the I.F.R.B., and in consultation with administrations of the Members and Associate Members of the Union, as appropriate, a co-ordinated plan designed to meet existing and future requirements of all interested Members and Associate 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 the present 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 I.O.C. and W.M.O. for the portion of the world-wide system over which they have jurisdiction;

3. that the I.O.C. and W.M.O. be invited further to assume jointly the responsibility, in consultation with the I.F.R.B., for keeping such a plan current, in the light of changing requirements for data relating to oceanography;

4. that the plan developed under points 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. Spa2 – 2

Relating to the Establishment of Agreements and Associated Plans for the Broadcasting-Satellite Service

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

considering

a) that it is important to make the best possible use of the geostationary-satellite orbit and of the frequency bands allocated to the broadcasting-satellite service;

b) that the great number of receiving installations using such directional antennae as could be set up for a broadcasting-satellite service may be an obstacle to changing the location of space stations in that service on the geostationary-satellite orbit, from the date of their bringing into use;

c) that satellite broadcasts may create harmful interference over a large area of the Earth's surface;

d) that the other services with allocations in the same band need to use the band before the broadcasting-satellite service is set up;

resolves

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;

2. that the Administrative Council be requested to examine as soon as possible the question of a World Administrative Conference, and/or Regional Administrative Conferences as required, with a view to fixing suitable dates, places and agenda;

3. that during the period before the entry into force of such agreements and associated plans the administrations and the I.F.R.B. shall apply the procedure contained in Resolution No. Spa2–3.

RESOLUTION No. Spa2 – 3

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

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

considering

a) that while Resolution No.Spa2–2 has been adopted by this Conference, envisaging 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 procedure specified in Article 9A of the Radio Regulations contains no provisions for co-ordination between space stations in the broadcasting-satellite service and terrestrial stations and between space stations in that service and space systems of other administrations;

resolves

1. that the following procedure shall be applied until agreements and associated plans pursuant to Resolution No. Spa2–2 enter into force:

Section A: Co-ordination Procedure between Space Stations in the Broadcasting-Satellite Service and Terrestrial Stations

2.1 Before an administration notifies to the I.F.R.B. 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 co-ordinate the use of this assignment with any other administration whose terrestrial radiocommunication services may be affected. For this purpose, it shall inform the Board of all the technical characteristics of the station, as listed in the relevant sections of Appendix 1A to the Radio Regulations, which are necessary to assess the risk of interference to a terrestrial radiocommunication service[1].

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

2.3 Any administration which considers that its terrestrial radiocommunication services may be affected shall forward its comments to the administration seeking co-ordination and, in any case, to the Board. These comments must be forwarded within one hundred and twenty days from the date of the relevant I.F.R.B. weekly circular. It shall be deemed that any administration which has not forwarded comments within that period considers that its terrestrial radiocommunication services are unlikely to be affected.

---

[1] The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations as accepted by the administrations concerned under the terms of Resolution No. Spa2-6. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

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

2.5 The administration which plans to bring into use a 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 co-ordination procedure.

2.6 If the assistance of the Board has been sought and there is a continuing disagreement between the administration seeking co-ordination and the administration which has forwarded its comments, the administration seeking co-ordination may, after a total period of one hundred and eighty days, from the date of the relevant I.F.R B. weekly circular, send to the Board its notice concerning the frequency assignment in question.

Section B: Co-ordination 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 co-ordination with space systems of other administrations, apply the following provisions of Article 9A of the Radio Regulations:

3.1 Nos. **639AA** to **639AI** inclusive.

3.2.1 No. **639AJ** [1].

[1] The technical data to be used in effecting co-ordination should be based on the most recent C.C.I.R. Recommendations as accepted by the administrations concerned under the terms of Resolution No. Spa2-6. In the absence of relevant C.C.I.R. Recommendations, the technical data to be used in effecting co-ordination shall be determined by agreement among the administrations concerned.

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

3.2.3 Nos. **639AL**, **639AM**, **639AO**, **639AS** *a*), *c*), *e*), *f*), **639AT**, **639AU**, **639AV**, **639AW**, **639AX**, **639AY**, **639AZ**.

Section C: Notification, Examination and Recording in the Master Register of Assignments to 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. **639BE**, **639BF** and **639BG** of the Radio Regulations.

4.2 Notices made under paragraph 4.1 shall initially be treated in accordance with No. **639BH** of the Radio Regulations.

5.1 The Board shall examine each notice with respect to:

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

---

[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 *Master Register*).

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

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

5.5 *d)* where appropriate, the probability of harmful interference to the service rendered by a station in a space or terrestrial radiocommunication service for which a frequency assignment has already been recorded in the Master Register in conformity with the provisions of No. **501** or **639BM** 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. **501** or **639BM** 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 and with such suggestions as the Board may be 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 co-ordination procedures mentioned in paragraphs 5.3 and 5.4 have been successfully completed with all administrations whose services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Board of the notice shall be entered in 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 No. Spa2–2.

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

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

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

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 co-ordination 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 and with such suggestions as the Board may be 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 one hundred and twenty days without any complaint of harmful interference having been received. The date of receipt by the Board of the original notice shall be entered in Column 2d of the Master Register, with the remark mentioned in paragraph 6.4. An appropriate remark shall be placed in Column 13 to indicate that the assignment is not in conformity with the provisions of paragraphs 5.2, 5.3, 5.4 or 5.5, as appropriate. In the event that the administration concerned receives no complaint of harmful interference concerning the operation of the station in question for a period of one year from the commencement of operation, the Board shall review its finding.

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. **639CP** 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.

639BM, **639BN**, **639BO**, **639BP**, **639BQ** and **639BR** of the Radio Regulations, 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. **501** of the Radio Regulations, 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 paragraph 5.2 of this Resolution, or with No. **501**, **570AB** or **639BM** of the Radio Regulations, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

RESOLUTION No. Spa2 – 4

Relating to the experimental Use of Radio Waves by Ionospheric Research Satellites

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

considering

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

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

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

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

e) that 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;

resolves

that administrations may continue to permit the transmission of radio waves from ionospheric research satellites in orbit above the ionosphere in the MF and HF bands provided that suitable means are available for controlling the transmission from these satellites as required by No. **470V** of the Radio Regulations to prevent harmful interference to other services.

RESOLUTION No. Spa2 – 5

Relating to the Use of the Band 156 – 174 MHz by the Maritime Mobile-Satellite Service

(Abrogated by Resolution No. Mar2 – 1)

RESOLUTION No. Spa2 – 6

Relating to the Technical Criteria recommended by the C.C.I.R. for Sharing Frequency Bands between Space Radiocommunication and Terrestrial Radiocommunication Services or between Space Radiocommunication Services

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

considering

a) that, in frequency bands shared with equal rights by space radiocommunication and terrestrial radiocommunication services, it is necessary to impose certain technical limitations and co-ordination procedures on each of the sharing services in the interest of controlling mutual interference;

b) that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose co-ordination procedures in the interest of controlling mutual interference;

c) that the technical criteria and co-ordination procedures referred to in *a)* and *b)* above, and as set out in the Radio Regulations, are mainly based upon Recommendations of the C.C.I.R.;

d) that, in recognition of the successful sharing of frequency bands by space radiocommunication and terrestrial radiocommunication services, and the continuing improvements in space technology, each Plenary Assembly of the C.C.I.R. subsequent to the Xth Plenary Assembly, Geneva, 1963, has improved upon some of the technical criteria recommended by the preceding Plenary Assembly;

e) that Plenary Assemblies of the C.C.I.R. are held triennially whereas Administrative Radio Conferences, which are empowered to modify the Radio Regulations making substantial use of the Recommendations of the C.C.I.R., are in practice held less frequently and with much less regularity;

f) that the International Telecommunication Convention (Montreux, 1965) recognizes the right of Members and Associate Members of the Union to make special agreements on telecommunication matters; however, such agreements shall not be in conflict with the terms of the Convention or of the Regulations annexed thereto, so far as concerns the harmful interference to the radio services of other countries;

is of the opinion

a) that subsequent Plenary Assemblies of the C.C.I.R. are likely to make further changes in the recommended technical criteria; and

b) that administrations should be afforded the opportunity to take advantage of the current C.C.I.R. Recommendations on sharing criteria when planning systems for use in frequency bands shared with equal rights by space radiocommunication and terrestrial radiocommunication services, or between radiocommunication services;

therefore resolves that

1. each Plenary Assembly of the C.C.I.R. should arrange for the Secretary-General of the I.T.U. to be informed of those Recommendations of the C.C.I.R. affecting the technical criteria relating to sharing between space radiocommunication and terrestrial radiocommunication services or between space radiocommunication services;

2. following the distribution to administrations of the relevant C.C.I.R. texts, the Secretary-General shall write to administrations asking them to indicate within one hundred and twenty days, to which of the C.C.I.R. Recommendations or to which specific technical criteria defined in the Recommendations referred to in 1 above they agree for use in the application of the pertinent provisions of the Radio Regulations;

3. the administrations which do not respond to the Secretary-General's consultation within one hundred and twenty days shall be deemed to wish the specific technical criteria referred to in the current Radio Regulations to be applied for the time being;

4. in those cases where an administration, in its reply to the Secretary-General's consultation, indicates that a specific C.C.I.R. Recommendation or a specific technical criterion defined in those Recommendations is not acceptable to it, or where an administration has not replied to the Secretary-General's consultation as in paragraph 3 above, the relevant technical criteria defined in the Radio Regulations shall continue to apply with respect to cases involving that administration;

5. the Secretary-General shall publish, for the information of all administrations, a consolidated list prepared by the I.F.R.B. on the basis of the replies to the enquiry, of the C.C.I.R. Recommendations or of the specific relevant technical criteria defined in those Recommendations, and to which administrations each of those Recommendations or specific relevant technical criteria are acceptable or are not acceptable. This list shall also include those administrations mentioned in paragraph 3 above;

6. the I.F.R.B. be directed to take into account:

a) the applicability of the C.C.I.R. technical criteria in accordance with the list referred to in 5 above, when making technical examinations with respect to cases involving only administrations to which such criteria are acceptable;

b) the applicability of the technical criteria defined in the Radio Regulations in accordance with the list referred to in 5 above, when making technical examinations with respect to cases involving an administration which does not accept the relevant C.C.I.R. technical criteria;

7. if, at a later date, questions arise concerning the application of the relevant technical criterion or criteria to a case involving administrations described in paragraph 3 above, the I.F.R.B. shall enquire of the administrations concerned whether or not they would agree to the application of the technical criterion or criteria defined in the relevant C.C.I.R. Recommendations referred to in paragraph 1 above. The list published pursuant to paragraph 5 above shall be updated on the basis of the reply of the administration or of the absence of reply.

RESOLUTION No. Spa2 – 7

Relating to the Inclusion of additional Sections in List VIIIA (Article 20, Appendix 9)

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

considering

a) that it has modified the definitions which appeared in the Radio Regulations and has adopted a series of new definitions for the services;

b) that, within the framework of these modifications, it has changed, in Appendix 9 to Radio Regulations, the headings and the contents of the existing nine Sections of List VIIIA (List of Space Radiocommunication Stations and Radio Astronomy Stations);

c) that however, in List VIIIA so modified, it is not possible to include all the categories of earth and space stations notified to the I.F.R.B. for inclusion in the Master International Frequency Register;

d) that the Conference has not had the time to make the required modifications;

decides

to invite the Secretary-General, in collaboration with the I.F.R.B., to take the necessary steps, on the basis of the existing Sections of List VIIIA, to have additional Sections added to this List, so that the particulars of all the earth and space stations notified to the I.F.R.B. under Article 9A of the Radio Regulations, for recording in the Master International Frequency Register, be included.

RESOLUTION No. Spa2 – 8

Relating to the Abrogation of obsolete Resolutions and Recommendations of the Extraordinary Administrative Radio Conference to allocate Frequency Bands for Space Radiocommunication Purposes, Geneva, 1963 and a Recommendation of the Administrative Radio Conference, Geneva, 1959

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

considering

a) that all necessary action has been taken on the following Resolutions and Recommendations of the Extraordinary Administrative Radio Conference (Geneva, 1963):

Resolution No. Spa 1 Relating to the Provision and Use of Information regarding International Satellite Systems;

Resolution No. Spa 2 Relating to Space Vehicles in Distress and Emergency;

Resolution No. Spa 3 Relating to the Category of the Fixed and Mobile Services in the Band 1 525 - 1 540 MHz;

Recommendation No. Spa 1 Relating to the Calculation of Co-ordination Distance for Earth Stations;

Recommendation No. Spa 2 to the C.C.I.R. and to Administrations Relating to the Calculation of the Probability of Interference between Stations within Co-ordination Distance;

b) that Recommendation No. Spa 6 of the Extraordinary Administrative Radio Conference (Geneva, 1963) Relating to the Frequency Requirements in the HF Bands Exclusively Allocated to the Aeronautical Mobile (R) Service, is now obsolete;

c) that paragraphs 3 and 4 of Recommendation No. Spa 9 of the Extraordinary Administrative Radio Conference (Geneva, 1963) Relating to the Review of Progress in the Field of Space Radiocommunications, are now obsolete;

d) that Recommendation No. Spa 3 of the Extraordinary Administrative Radio Conference (Geneva, 1963) to the C.C.I.R. and to Administrations Relating to Frequency Bands shared between Space and Terrestrial Services has been replaced by Recommendation No. Spa2–15 of the present Conference;

e) that Recommendation No. 36 of the Administrative Radio Conference (Geneva, 1959) Relating to the Convening of an Extraordinary Administrative Radio Conference to allocate Frequency Bands for Space Radiocommunication Purposes, is no longer necessary;

resolves

that the said Resolutions and Recommendations or parts of Recommendation are abrogated.

RESOLUTION No. Mar2 – 1

Relating to the Abrogation of obsolete Resolutions and Recommendations of the World Administrative Radio Conference, Geneva, 1967, and a Resolution of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that all necessary action has been taken on the following Resolutions and Recommendations of the World Administrative Radio Conference, Geneva, 1967:

Resolution No. Mar 10 Relating to the Transfer of certain Frequency Assignments for Coast Radiotelegraph Stations in the Frequency Bands Allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz;

Resolution No. Mar 12 Relating to the Implementation of the New Arrangement of Radiotelegraphy and Radiotelephony Bands Allocated to the Maritime Mobile Service between 4 000 and 27 500 kHz;

Resolution No. Mar 13 Relating to the Use of Class of Emission A3B by Radiotelephone Stations in the Maritime Mobile Service in the Bands between 4 000 and 23 000 kHz;

Resolution No. Mar 16 Relating to the Introduction of a Radiocommunication Operator's General Certificate for the Maritime Mobile Service;

Resolution No. Mar 18 Relating to the Examination of Pertinent Portions of the Revised International Code of Signals;

Recommendation No. Mar 1 Relating to a Reprint of the Radio Regulations and of the Additional Radio Regulations;

Recommendation No. Mar 7 Relating to Harmonic Relationship and Channel Spacing in the High Frequency Bands used by Ship Stations for Radiotelegraphy;

Recommendation No. Mar 8 Relating to the Study of a Selective Calling System for future operational Requirements of the Maritime Mobile Service;

b) that the following Resolutions of the World Administrative Radio Conference, Geneva, 1967, were replaced as indicated:

Resolution No. Mar 6 Relating to the Use of Single Sideband Technique in the Radiotelephone Maritime Mobile Service Bands between 4 000 and 23 000 kHz, by Resolution No. Mar2 – 13;

Resolution No. Mar 8 Relating to the Notification of Ship Station Frequencies used for Narrow-Band Direct-Printing Telegraph and Data Transmission Systems, by Resolution No. Mar2 – 8;

Resolution No. Mar 9 Relating to the Unauthorized Use of Frequencies in the Bands Allocated to the Maritime Mobile Service, by Resolution No. Mar2 – 15;

Resolution No. Mar 14 Relating to the Channel Spacing of Transmitting Frequencies Allotted to the International Maritime Mobile Service for Radiotelephony in the Band 156-174 MHz, by Resolution No. Mar2 – 14;

c) that the following Resolution and Recommendation of the World Administrative Radio Conference, Geneva, 1967, are now obsolete:

Resolution No. Mar 3 Relating to the Classes of Emissions to be used for Remote-Controlled Coast Stations in the Maritime Mobile Radiotelephone Service;

Recommendation No. Mar 4 Relating to Transmission by Television of Port Radar Images to Ships;

d) that Resolution No. Spa2 – 5 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, Relating to the Use of the Band 156-174 MHz by the Maritime Mobile-Satellite Service, was considered and found to be no longer necessary;

resolves

that all the said Resolutions and Recommendations are abrogated.

RESOLUTION No. Mar2 – 2

Relating to the Implementation of the New Arrangement of Radiotelegraphy and Radiotelephony Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 27 500 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that each of the high-frequency radiotelegraphy and radiotelephony bands allocated exclusively to the maritime mobile service by the Administrative Radio Conference, Geneva, 1959, and modified by the World Administrative Radio Conference, Geneva, 1967, has been further modified;

b) that a considerable number of both ship and coast stations will be transferred from existing frequencies to the new frequencies and channels designated by the present Conference;

c) that changes in frequency assignments should be made as soon as possible so that the advantages of the new arrangement of bands may be realized at the earliest opportunity;

d) that the transfer of assignments should be made with the least possible disruption of the service rendered by each station;

e) that the transfer of assignments should be made in such a manner that harmful interference between stations involved is avoided during the implementation period;

resolves

1. that the implementation of the decisions made by the present Conference relating to the new arrangement of the high-frequency bands allocated to the maritime mobile service should follow an orderly procedure for the transfer of the existing services from the old to the new assignments and for the introduction of new services;

2. that administrations shall make every effort to implement the new arrangement in accordance with the time schedule in Annexes 1 and 2.

Annex 1

Step of implementation (bands 4 000 - 23 000 kHz)	From old band (kHz)	To new band (kHz)	Starting date	Completion date
Step 1 *a)* Vacate old high traffic ship bands	4 172·25 - 4 178 6 258·25 - 6 267 8 341·75 - 8 356 12 503·25 - 12 534 16 660·5 - 16 712 22 184·5 - 22 222·5	–	As soon as possible	1 June 1976
b) Vacate old low traffic ship bands and commence using new A1 Morse telegraphy bands	4 187 - 4 188 4 219·4 - 4 231 6 280·5 - 6 282 6 325·4 - 6 345·5 8 374 - 8 376 8 435·4 - 8 459·5 12 561 - 12 564 12 652·3 - 12 689 16 748 - 16 752 16 859·4 - 16 917·5 22 310·5 - 22 374	4 188 - 4 219·4 6 282 - 6 325·4 8 357·75 - 8 359·75 8 376 - 8 435·4 12 526·75 - 12 539·6 12 564 - 12 652·3 16 705·8 - 16 719·8 16 752 - 16 859·4 22 250 - 22 310·5	As soon as possible	1 June 1976
Step 2 *a)* Transfer frequency assignments in coast radiotelegraphy bands in accordance with Resolution No. Mar2 – 3	4 349·4 - 4 361 6 493·9 - 6 514 8 704·4 - 8 728·5 13 070·8 - 13 107·5 17 196·9 - 17 255 22 561 - 22 624·5	4 219·4 - 4 231 6 325·4 - 6 345·5 8 435·4 - 8 459·5 12 652·3 - 12 689 16 859·4 - 16 917·5 22 310·5 - 22 374	2 June 1976	31 July 1976

(continued)

Annex 1
(continued)

Step of implementation (bands 4 000 - 23 000 kHz)	From old band (kHz)	To new band (kHz)	Starting date	Completion date
Step 2 b) Transfer ship calling frequencies to new telegraphy calling frequencies	4 178 - 4 187 6 267 - 6 280·5 8 356 - 8 374 12 534 - 12 561 16 712 - 16 748 22 222·5 - 22 267·5	See Appendix 15C	2 June 1976	31 May 1977
Step 3 a) Commence using new ship and coast digital selective calling frequencies	–	Ship station frequencies 4 187·6 6 281·4 8 375·2 12 562·3 12 562·8 16 749·9 16 750·4 22 248 and 22 248·5 Coast station frequencies 4 357 6 506 8 718·5 13 100 13 100·5 17 232 17 232·5 22 595 and 22 595·5	1 June 1977	–

(continued)

Annex 1
(continued)

Step of implementation (bands 4 000 - 23 000 kHz)	From old band (kHz)	To new band (kHz)	Starting date	Completion date
Step 3 *b)* Vacate old narrow-band direct-printing telegraphy ship frequencies and commence using new ship and coast paired and non-paired narrow-band direct-printing telegraphy frequencies (except non-paired frequencies in the 8 MHz band)	4 166 - 4 172·25 6 248 - 6 258·25 8 331·5 - 8 341·75 12 483 - 12 503·25 16 640 - 16 660·5 22 164 - 22 184·5	See Appendix 15A for paired frequencies and Appendix 15B for non-paired frequencies	1 June 1977	30 June 1977
Step 4 Transfer ship wide-band radiotelegraphy to new frequency bands	4 142·5 - 4 146·6 6 216·5 - 6 224·6 8 288 - 8 300 12 431·5 - 12 439·5 16 576 - 16 596·4 22 112 - 22 139·5	4 166 - 4 170 6 248 - 6 256 8 331·5 - 8 343·5 12 483 - 12 491 16 640 - 16 660 22 164 - 22 192	1 July 1977	15 July 1977
Step 5 [1] *a)* Transfer simplex radiotelephony to new frequency bands	4 139·5 - 4 142·5 6 210·4 - 6 216·5 8 281·2 - 8 288 12 421 - 12 431·5 16 565 - 16 576 22 094·5 - 22 112	4 143·6 - 4 146·6 6 218·6 - 6 224·6 8 291·1 - 8 297·3 12 429·2 - 12 439·5 16 587·1 - 16 596·4 22 124 - 22 139·5	16 July 1977	31 December 1977 *(continued)*

[1] The period from 16 July 1977 to 31 December 1977 should be used to prepare for changeover to the new arrangement of duplex radiotelephone channels.

Annex 1
(concluded)

Step of implementation (bands 4 000 - 23 000 kHz)	From old band (kHz)	To new band (kHz)	Starting date	Completion date
Step 5 *b)* Commence using new ship non-paired narrow-band direct-printing telegraphy frequencies in the 8 MHz band	8 331·5 8 341·75	See Appendix 15B	16 July 1977	–
Step 6 Commence using new ship and coast duplex radiotelephone channels in accordance with Resolution No. Mar2 – 12	–	Ship 4 139·5 - 4 143·6 6 210·4 - 6 218·6 8 281·2 - 8 291·1 12 421 - 12 429·2 16 565 - 16 587·1 22 094·5 - 22 124	00 01 G.M.T. 1 January 1978	–
	–	Coast 4 357·4 - 4 361 6 506·4 - 6 514 8 718·9 - 8 728·5 13 100·8 - 13 107·5 17 232·9 - 17 255 22 596 - 22 624·5		

Annex 2

Step of implementation (25 MHz band)	From old band (kHz)	To new band (kHz)	Starting date	Completion date
Step 1 *a)* Vacate old ship calling band	25 076 - 25 082·5	–	As soon as possible	1 June 1976
b) Transfer ship working frequencies to the new band	25 082·5 - 25 090·1	25 090·1 - 25 110	As soon as possible	1 June 1976
Step 2 Commence using new ship narrow-band direct-printing telegraphy frequencies	–	25 076 - 25 090·1	2 June 1976	–

RESOLUTION No. Mar2 – 3

Relating to the Transfer of certain Frequency Assignments of Stations operating in the Bands allocated exclusively to Coast Radiotelegraphy in the Maritime Mobile Service between 4 000 and 23 000 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the frequency band limits for coast radiotelegraphy have been modified as a result of the revision of Appendices 15 and 17 to the Radio Regulations;

b) that the new limits of the frequency bands for coast radiotelegraphy are:

4 219·4 – 4 349·4 kHz
6 325·4 – 6 493·9 kHz
8 435·4 – 8 704·4 kHz
12 652·3 – 13 070·8 kHz
16 859·4 – 17 196·9 kHz
22 310·5 – 22 561 kHz

recognizing

that the new arrangement of the frequency usage within the frequency bands allocated to the maritime mobile service should be carried out in several steps and that the transfer of certain frequency assignments in the coast radiotelegraphy bands governs any subsequent arrangements and should therefore be one of the steps of the new arrangement;

resolves

1. that the frequency assignments to stations in the coast radiotelegraphy bands which, on 1 June 1976, are recorded in the Master International Frequency Register, shall be transferred as follows:

– any frequency assignment f in the 4 349·4 – 4 361 kHz band shall be transferred to the frequency f–130 kHz;

– any frequency assignment f in the 6 493·9 – 6 514 kHz band shall be transferred to the frequency f–168·5 kHz;

– any frequency assignment f in the 8 704·4 – 8 728·5 kHz band shall be transferred to the frequency f–269 kHz;

– any frequency assignment f in the 13 070·8 – 13 107·5 kHz band shall be transferred to the frequency f–418·5 kHz;

– any frequency assignment f in the 17 196·9 – 17 255 kHz band shall be transferred to the frequency f– 337·5 kHz;

– any frequency assignment f in the 22 561 – 22 624·5 kHz band shall be transferred to the frequency f–250·5 kHz;

2. that between 2 June and 31 July 1976, administrations shall transfer the transmitting frequencies of their stations as indicated in paragraph 1 above. Administrations shall notify the I.F.R.B. of these transfers, in accordance with the provisions of Section I of Article 9 of the Radio Regulations;

3. provided that the notices received by the I.F.R.B. in accordance with paragraph 2 above do not contain any changes in the basic characteristics of the originally recorded assignment, other than the assigned frequency, the I.F.R.B. shall record the change in the Master Register. The dates to be entered in the appropriate parts of Column 2 shall be those of the original assignment. Should any other change in the basic characteristics of the original assignment be notified, this change shall be dealt with in accordance with the provisions of Article 9 of the Radio Regulations;

4. that on 1 August 1976, the I.F.R.B. shall also include in the Master Register, in respect of each original assignment the transfer of which has not at that time been notified to the Board, a provisional entry determined in accordance with paragraph 1 above. For such provisional entries, the dates in

Column 2 recorded for the original assignment shall be retained. The original entries shall be retained in the Master Register but with a special remark in the Remarks Column and any dates in Column 2a shall be transferred to Column 2b;

5. that 30 days after 1 August 1976, the I.F.R.B. shall send to those administrations which have not yet notified the transfer of frequency assignments to their stations in accordance with paragraphs 1 and 2 above, an extract from the Master Register showing the relevant entries contained therein on their behalf, and shall remind them of the provisions of this Resolution;

6. that if, 120 days after the despatch of these extracts, an administration has still not notified to the I.F.R.B. the transfer of an existing assignment in accordance with paragraphs 1 and 2 above, the corresponding provisional new entry shall be deleted from the Master Register. The original entry shall be retained, without a date in Column 2 and with a suitable remark in the Remarks Column. The administration concerned shall be informed of this action; if, however, that administration notifies the transfer during the 120 days' period, the provisions of paragraph 3 above shall apply;

7. that, in those cases where the foregoing transfer procedure will result in an increase in the probability of a specific frequency assignment causing or experiencing harmful interference, the I.F.R.B. shall render all necessary assistance to the administrations concerned in order to solve the problem. In so doing, the I.F.R.B. shall apply the provisions of No. **534** or Nos. **629** to **633** of the Radio Regulations, as the case may be.

RESOLUTION No. Mar2 – 4

Relating to the Implementation of the New Channelling Arrangement for A1 Morse Radiotelegraphy in the Bands allocated to the Maritime Mobile Service between 4 000 and 27 500 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that Recommendation No. Mar 7 of the World Administrative Radio Conference, Geneva, 1967, requested administrations to study the problems relating to the future use of harmonic relationship in ships' radio equipment;

b) that the present Conference has provided for use by ship stations calling and working frequencies for A1 Morse telegraphy which are not harmonically related;

c) that it is desirable to implement the new channelling arrangement as soon as possible;

recognizing

a) that there is a need to provide an amortization period for radio equipment dependent upon the harmonic relationship of calling and working frequencies;

b) that developments and advances in technique, and in frequency synthesizers in particular, have led to more stable and reliable radio equipment;

resolves

1. that ship stations dependent upon harmonically related calling and working frequency assignments made prior to 1 January 1976 may continue

to use such of their assignments as are within the ship calling and working bands for A1 Morse telegraphy shown in Appendix 15;

2. that, as soon as possible, ships should utilize equipment which is capable of operating in accordance with the new channelling arrangement contained in Appendix 15D for the frequencies required for their service;

3. that, after 1 January 1976, new installations of equipments shall be capable of operating in accordance with the new channelling arrangement contained in Appendix 15D for the frequencies required for their service.

RESOLUTION No. Mar2 – 5

Relating to the Introduction of New Calling Procedures for HF A1 Morse Telegraphy

The World Maritime Administrative Radio Conference, Geneva, 1974,

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 improve the effectiveness of calling in the HF A1 Morse telegraphy bands;

c) that the present Conference has adopted a new calling procedure for the HF A1 Morse telegraphy bands (Articles 29 and 32 and Appendix 15C);

d) that the effectiveness of the new calling procedure requires agreement between administrations with respect to the groups specified in Appendix 15C in accordance with a planned distribution of coast stations on a regional and traffic basis;

e) that the administrations at the present Conference have 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;

resolves

that these new arrangements should become fully operational at 0001 G.M.T. on 1 June 1977;

instructs the Secretary-General

1. to circulate this Resolution to all administrations not represented at the present Conference which are responsible for coast stations in countries or areas designated in the Distribution Plan in order to obtain their agreement to the Plan or an adjustment of the Plan to meet their needs;

2. in the light of the foregoing consultation with the administrations concerned, to publish the Distribution Plan as soon as practicable as an annex to the List of Coast Stations;

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 further

that, in advance of the publication of any revision of the Distribution Plan in the List of Coast Stations, any variation in the Plan should be notified through the monthly Operational Bulletin.

Distribution Plan for Group Channels
HF A1 Morse Coast Stations by Countries and Areas

Group 1		*Group 2*		*Group 3*		*Group 4*	
Azores	French Polynesia	Afars and Issas	Martinique (French Department)	Alaska (State of)	Turkey	Albania (People's Republic of)	Surinam
Afars and Issas	Puerto Rico	Algeria (Algerian Democratic and Popular Republic)	Mexico	Argentine Republic	Union of Soviet Socialist Republics (Far East and European Area)	Germany (Fed. Rep. of)	Togolese Republic
Angola	Reunion (French Department)	Netherlands Antilles	New Caledonia and Dependencies	Burma (Socialist Republic of the Union of)	Venezuela (Republic of)	Saudi Arabia (Kingdom of) (East)	Tunisia
Bahamas	Roumania (Socialist Republic of)	Saudi Arabia (Kingdom of) (West)	New Hebrides	Canada (East Coast and Eastern Arctic)	Yugoslavia (Socialist Federal Republic of)	Australia	Union of Soviet Socialist Republics (European Area and Arctic)
Bahrain	United Kingdom of Great Britain and Northern Ireland	Barbados	Panama (Republic of)	China (People's Republic of)		Bulgaria (People's Republic of)	Uruguay (Oriental Republic of)
Bangladesh (People's Republic of)	Singapore (Republic of)	Belgium	Paraguay (Republic of)	Denmark		China (People's Republic of) (Province of Taiwan)	Viet-Nam (Republic of)
Bermuda	Switzerland (Confederation of)	Cameroon (United Republic of)	Netherlands (Kingdom of the)	United States of America (West Coast)		Spain (except the Canary Islands)	Yemen (People's Dem. Rep. of)
Brazil (Federative Republic of)	S. Thome and Principe	Cape Verde Islands	Peru	Finland		Fiji	Zaire (Republic of)
Canada (West Coast and Western Arctic)	Union of Soviet Socialist Republics (Ukraine and South Asia)	Christmas Islands (Indian Ocean)	Poland (People's Republic of)	Ghana		Equatorial Guinea (Republic of)	
Chile		Colombia (Republic of)	French Polynesia	Guam		India (Republic of) (East)	
Cyprus (Republic of)		Congo (People's Rep. of the)	Reunion (French Department)	Guinea-Bissau		Indonesia (Republic of)	
Ivory Coast (Republic of the)		Cook Islands	United Kingdom of Great Britain and Northern Ireland (22 MHz only)	Guinea (Republic of)		Iraq (Republic of)	
Ecuador		Korea (Republic of)	Sudan (Democratic Republic of the)	Guyana		Japan	
Spain (Canary Islands)		Costa Rica	Sri Lanka (Ceylon) (Republic of)	Hawaii (State of)		Jordan (Hashemite Kingdom of)	
United States of America (East Coast)		Cuba	Czechoslovak Socialist Republic	Iran		Kuwait (State of)	
Ethiopia		Dahomey (Republic of)	Thailand	Iceland		Malaysia	
France		Dominican Republic	Union of Soviet Socialist Republics (North West and Far East)	Jamaica		Malta	
India (Republic of) (West)		Egypt (Arab Republic of)	Yemen Arab Republic	Libyan Arab Republic		Mauritania (Islamic Republic of)	
Ireland		United States of America (Gulf Coast)		Madeira		New Zealand	
Israel (State of)		Falkland Islands (Malvinas)		Mariana Islands		Papua New Guinea	
Kenya (Republic of)		France		Morocco (Kingdom of)		Pitcairn Island	
Liberia (Republic of)		Gabon Republic		Mozambique		Portugal	
Malagasy Republic		Gambia (Republic of the)		Nauru (Republic of)		Syrian Arab Republic	
Martinique (French Department)		Greece		Nigeria (Federal Republic of)		Solomon Islands	
Mauritius		Hong Kong		Norway		American Samoa	
New Caledonia and Dependencies		Hungarian People's Republic		Pakistan		Senegal (Republic of the)	
New Hebrides		Italy		German Democratic Republic		Seychelles	
Oman (Sultanate of)		Khmer Republic		Sweden		Sierra Leone	
Philippines (Republic of the)		Lebanon		Trinidad and Tobago		South Africa (Rep. of)	

RESOLUTION No. Mar2 – 6

Relating to the Implementation of the Rearrangement of the Coast Radiotelegraphy and Radiotelephony Bands between 4 000 and 27 500 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that each of the high-frequency radiotelegraphy and radiotelephony bands allocated exclusively to the maritime mobile service by the Administrative Radio Conference, Geneva, 1959, was modified by the World Administrative Radio Conference, Geneva, 1967;

b) that these Conferences set up procedures, to be followed by administrations, relating to the implementation of the rearrangements;

c) that the I.F.R.B. was provided with the necessary instructions to carry out those procedures;

recognizing

d) that certain administrations have not yet applied these procedures for some of their frequency assignments and that these assignments are now within the bands allocated to other uses in the maritime mobile service;

e) that, as a result, harmful interference is likely to be caused to services rendered by stations operating in accordance with the Radio Regulations;

resolves

1. that the assignments referred to in *d)* above shall be treated as follows:

1.1 the I.F.R.B. will send relevant extracts from the Master Register to the administrations concerned, within 30 days from 1 January 1976, advising them that, in accordance with the terms of the present Resolution, the assignments concerned are to be transferred to the appropriate bands within a period of 180 days after the despatch of the extracts;

1.2 if an administration does not notify the transfer within the prescribed period, the original entry shall be retained in the Master Register without a date in Column 2 and with a suitable remark in the Remarks Column. The administration concerned shall be advised of this action.

2. that, if an administration so desires, the I.F.R.B. shall give it all necessary assistance. In so doing, the I.F.R.B. shall apply the provisions of Nos. **629** to **633** of the Radio Regulations.

RESOLUTION No. Mar2 – 7

Relating to the Use and Notification of Paired Frequencies Reserved for Narrow-Band Direct-Printing Telegraph and Data Transmission Systems in the HF Bands allocated to the Maritime Mobile Service

(see Appendix 15A)

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that certain sections of the HF bands allocated to the maritime mobile service have been reserved for narrow-band direct-printing telegraph and data transmission systems for use on a paired frequency basis only;

b) that the number of paired frequencies in each band is limited;

c) that although several administrations have systems in operation, the general introduction of such systems is still in the early stages;

d) that a future competent conference may provide for wider bands for narrow-band direct-printing than those available at present;

e) that for this reason it is inopportune to draw up a plan at present but that such a plan might later be rendered necessary by the congested state of channels;

f) that, however, interim measures have to be taken by administrations and by the I.F.R.B. to provide for the orderly introduction of these new paired frequencies;

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, and shall be notified 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 to achieve efficient frequency usage each administration shall choose the pairs of frequencies to be assigned to coast stations according to its requirements, with the assistance of the I.F.R.B.;

1.3 the assignments thus selected and brought into service shall be notified to the I.F.R.B. on 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. If the assignments conform to the Table of Frequency Allocations, to the related provisions of the Radio Regulations and to the present Resolution, the Board shall enter them for information in Part 1A of its weekly circular and in the Master Register. No date will be entered in Column 2 of the Master Register and no finding resulting from a technical examination of compatibility with an existing assignment will be issued. However, the date of receipt of the notice by the Board will be entered in Part 1A of the weekly circular and in the Remarks Column of the Master Register. A reference to the present Resolution shall also be entered in the Remarks Column;

1.4 any notice not in conformity with the above-mentioned provisions of the Radio Regulations or with the present Resolution shall be returned to the notifying administration by the I.F.R.B., together with any suggestion which the Board may be able to submit in this respect;

1.5 should difficulties arise between countries using the same channel, the matter shall be settled by mutual arrangements between the administrations concerned;

2. that a future competent conference be invited to examine any difficulties which may have arisen in the application of this Resolution and to take a decision, if necessary, on the status to be given to the above-mentioned assignments or on the conditions for drawing up a plan for the bands and systems in question. The entries in the Master Register under this Resolution shall in no way prejudge any decisions which may be taken by the aforementioned conference;

3. that the present Resolution shall apply to assignments of paired frequencies for narrow-band direct-printing telegraphy as shown in 1.1 above, notwithstanding any other provisions of the Radio Regulations and existing Resolutions of Administrative Radio Conferences that may conflict with this Resolution.

RESOLUTION No. Mar2 – 8

Relating to the Notification of Non-Paired Ship Station Frequencies used for Narrow-Band Direct-Printing Telegraph and Data Transmission Systems

(see Appendix 15B)

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that certain sections of the HF bands allocated to the maritime mobile service are reserved for narrow-band direct-printing telegraph and data transmission systems operating on a non-paired frequency basis;

b) that although several administrations have systems in operation, the general introduction of such systems is still in the early stages;

c) that in consequence the present Conference is not in a position to decide the extent to which it is necessary to regulate the orderly use of frequencies for the transmission by ship stations of non-paired direct-printing telegraph signals or on what basis this might be done;

d) that these questions should be considered by a subsequent competent conference;

e) that the existing provisions of the Radio Regulations do not provide administrations with appropriate guidance for the period between the coming into force of the Final Acts of the present Conference and the coming into force of those of the conference mentioned in *d)* above;

resolves

1. that, during the period referred to in *e)* above, any administration operating or bringing into operation non-paired narrow-band direct-printing

telegraph or data transmission systems for ships, shall notify to the International Frequency Registration Board, for recording in the Master International Frequency Register, the frequencies on which ship stations participating in the service will be required to transmit;

2. that these notices concerning frequencies used for reception by coast stations shall not be subject to technical examination by the Board, and that the assignments notified shall be recorded in the Master Register for information only, bearing no date in Column 2, but with a suitable remark in the Remarks Column merely referring to this Resolution;

3. that these entries in the Master Register shall not prejudge any decisions which may be taken by the conference referred to in *d)* above.

RESOLUTION No. Mar2 – 9

Relating to the Power Limits for Coast Radiotelephone Stations operating in the Maritime Mobile Bands between 1 605 and 4 000 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that, under No. **1322BA** of the Radio Regulations, coast radiotelephone stations employing class A3H, A3A or A3J emissions and operating in the maritime mobile bands between 1 605 and 4 000 kHz shall at no time use peak envelope power in excess of 5 kW when they are situated north of parallel 32° N and 10 kW when they are situated south of parallel 32° N;

b) that a number of coast radiotelephone stations which have been brought into use and notified to the International Frequency Registration Board for inclusion in the Master Register have peak envelope power listed in Column 8 in excess of the maximum powers defined in No. **1322BA**;

c) that there is an urgent need to reduce harmful interference in these bands;

resolves

1. that by 1 January 1976 the administrations concerned shall reduce the peak envelope power of their coast radiotelephone stations to a value not exceeding that laid down in No. **1322BA** and shall so notify the I.F.R.B. in accordance with Section I of Article 9 of the Radio Regulations;

2. that, provided the notice received by the I.F.R.B. in accordance with paragraph 1 above does not contain any change in the basic characteristics of the original recorded assignment, other than the power reduction, the I.F.R.B. shall record the change in the Master Register; the

dates of the original assignment in the appropriate parts of Column 2 shall be maintained. Should any other change be notified in the basic characteristics of the original assignment, the notice shall be dealt with in accordance with the provisions of Article 9 of the Radio Regulations;

3. that 30 days after the date referred to in paragraph 1 above, the I.F.R.B. shall send to those administrations which have not notified the reduction of power of their coast radiotelephone stations in accordance with paragraph 1 above, an extract from the Master Register showing the relevant entries contained therein on their behalf, and shall remind them of the provisions of this Resolution;

4. that if, 90 days after the date specified in paragraph 1, an administration has still not notified to the I.F.R.B. the reduction of power in accordance with this Resolution, the I.F.R.B. shall apply the provisions of No. **621** of the Radio Regulations.

RESOLUTION No. Mar2 – 10

Relating to the Power Limits for Coast Radiotelephone Stations operating in the Maritime Mobile Bands between 4 000 and 23 000 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that under No. **1351C** of the Radio Regulations coast radiotelephone stations employing class A3H, A3A or A3J emissions and operating in the maritime mobile bands between 4 000 and 23 000 kHz shall at no time use peak envelope power in excess of 10 kW;

b) that a number of assignments to coast radiotelephone stations recorded in the Master International Frequency Register have powers listed in Column 8 in excess of 10 kW peak envelope power;

c) that there is an urgent need to reduce harmful interference in these bands;

resolves

1. that, notwithstanding the provisions of Resolution No. Mar2 – 12 relating to the date of entry into force of Appendix 25 Mar2, the administrations concerned shall, by 1 January 1976, reduce the peak envelope power of their coast radiotelephone stations to a value not exceeding 10 kW and shall so notify the I.F.R.B. in accordance with Section I of Article 9 of the Radio Regulations;

2. that, provided the notice received by the I.F.R.B. in accordance with paragraph 1 above does not contain any change in the basic characteristics of the original recorded assignment, other than the power reduction, the I.F.R.B. shall record the change in the Master Register; the

dates of the original assignment in the appropriate parts of Column 2 shall be maintained. Should any other change be notified in the basic characteristics of the original assignment, the notice shall be dealt with in accordance with the provisions of Article 9 of the Radio Regulations;

3. that 30 days after the date referred to in paragraph 1 above, the I.F.R.B. shall send to those administrations which have not notified the reduction of power of their coast radiotelephone stations in accordance with paragraph 1 above, an extract from the Master Register showing the relevant entries contained therein on their behalf, and shall remind them of the provisions of this Resolution;

4. that if, 90 days after the date referred to in paragraph 1 above, an administration has still not notified to the I.F.R.B. the reduction of power in accordance with this Resolution, the I.F.R.B. shall apply the provisions of No. **621** of the Radio Regulations.

RESOLUTION No. Mar2 – 11

Relating to Coordination Prior to Notifying to the I.F.R.B. Frequency Assignments pursuant to Resolution No. Mar2 – 12

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the change of coast radiotelephone station frequencies on 1 January 1978 as a result of the entry into force of Appendix 25 Mar2 might create difficulties in sharing a given channel among the administrations to which the channel is allotted;

b) that these sharing difficulties may affect the service rendered by the coast stations of each administration concerned unless there are appropriate means of coordinating the use of each channel in Appendix 25 Mar2 before that Appendix comes into force;

c) the essential duties of the I.F.R.B. defined in Article 10 of the International Telecommunication Convention (Malaga-Torremolinos, 1973) and its functions defined in Article 8 of the Radio Regulations;

resolves

1. that by 1 January 1976, administrations shall send to the I.F.R.B. provisional notices of frequency assignments in conformity with Appendix 25 Mar2, which they propose to bring into use on 1 January 1978, together with any useful information on technical and operational conditions;

2. upon receipt of this information, the I.F.R.B. shall examine the possibilities in each channel of sharing between the administrations concerned and submit to these administrations by 1 January 1977 such recommendations as may enable the improvement of the sharing possibilities;

3. that the I.F.R.B., in making the above examination, shall take into account the latest results of the study by the C.C.I.R. concerning the technical and operational sharing criteria in relation to the use of HF coast radiotelephone channels in the bands allocated exclusively to the maritime mobile service (see Recommendation No. Mar2 – 7); the I.F.R.B. may, if necessary, ask the administrations to supply additional information to facilitate the examination.

RESOLUTION No. Mar2 – 12

Relating to the Implementation of Appendix 17 Rev., Section A, and Appendix 25 Mar2

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that it has adopted a uniform spacing of 3·1 kHz for all duplex radiotelephone channels in the exclusive maritime mobile bands between 4 000 and 23 000 kHz, thus providing for additional duplex radiotelephone channels;

b) that it has further provided for additional radiotelephone channels by means of a rearrangement of the exclusive maritime mobile bands between 4 000 and 27 500 kHz (see Resolution No. Mar2 – 2);

c) that in Recommendation No. Mar 6, the World Administrative Radio Conference, Geneva, 1967, recommended that the present Conference be convened in order to establish a new Frequency Allotment Plan for high-frequency radiotelephone coast stations;

d) that in conformity with Resolution No. Mar2 – 13, class A3 emissions by ship stations and all class A3B emissions will cease by 1 January 1978;

e) that consequent upon *a)* to *d)* inclusive, Appendix 17 Rev., Section A and Appendix 25 Mar2 have been drawn up by the present Conference;

f) that provision has to be made for recording the new allotments in the Master International Frequency Register to bring it up to date;

resolves

1. that the present Appendix 25 MOD will remain in force up to and including 31 December 1977 except as far as the provisions of No. **1351C** of the Radio Regulations and Resolution No. Mar2 – 10 are concerned;

2. that as from 1 January 1978, Appendix 17, Sections A and B, shall be replaced by Appendix 17 Rev., Section A;

3. that as from 1 January 1978, Appendix 25 MOD to the Radio Regulations shall be replaced by Appendix 25 Mar2 which contains the radiotelephone channels of the maritime mobile service as they are listed in Appendix 17 Rev., Section A;

4. that at 0001 G.M.T. on 1 January 1978, coast and ship radiotelephone stations shall change their transmitting and receiving frequencies to bring them into conformity with Appendix 17 Rev., Section A;

5. that on 1 January 1978, the allotments included in Appendix 25 MOD which were listed in the Master International Frequency Register in accordance with the provisions of paragraph 2.1 *c)* of Resolution No. 1 of the Administrative Radio Conference, Geneva, 1959, and the provisions of Resolution No. Mar 11 of the Administrative Radio Conference, Geneva, 1967, shall be cancelled;

6. that on the same date the allotments included in Appendix 25 Mar2 shall be recorded in the Master International Frequency Register; thereafter, the provisions of No. **639EV** of the Radio Regulations shall apply;

7. that administrations shall notify to the I.F.R.B. in accordance with the provisions of Article 9 of the Radio Regulations the frequencies assigned to their coast radiotelephone station indicating, in the Remarks Column, the channel numbers of the corresponding allotments in Appendix 25 Mar2 and the previous frequency assignments to be replaced;

7.1 that provided the notice received by the I.F.R.B. is in accordance with Appendix 25 Mar2 and the other pertinent provisions of the

Radio Regulations, the I.F.R.B. shall record the assignment in the Master Register with the date 7 June 1974 in Column 2a and delete the original entry;

7.2 that notices received by the I.F.R.B. relating to frequency assignments notified before 1 January 1978 to which no allotments correspond in Appendix 25 Mar2 shall be entered in the Master Register with their existing 2b dates against the channels indicated by the administration; the original entries shall be deleted;

7.3 that on 1 April 1978, the I.F.R.B. shall examine all assignments in the frequency band allocated exclusively to the maritime mobile service between 4 000 and 23 000 kHz, with respect to their conformity with frequencies listed in Appendix 17 Rev., Section A, and shall send to those administrations which have not yet notified the transfer of frequency assignments to their coast radiotelephone stations, in accordance with paragraph 7 above, an extract from the Master Register showing the relevant entries contained therein on their behalf and shall remind them of the provisions of this Resolution;

8. that on 1 June 1978, an entry in respect of which the I.F.R.B. has not received a notice of change shall be maintained and the corresponding date in Column 2a or 2b shall be replaced by the date of 1 January 1976 in Column 2b, and in each case a special remark will be entered in the Remarks Column of the Master Register;

9. that if the provisions of paragraph 4 of Resolution No. Mar2–10 or those of paragraph 8 of the present Resolution were applied to a frequency assignment, this assignment cannot be re-established with a date in Column 2a unless the administration concerned applies the procedure of Article 9B vis-à-vis all other administrations which have allotments in the same channel entered in the Plan after 1 January 1976 in the first case and 1 January 1978 in the second case;

10. that the revised provisions of Article 9 of the Radio Regulations (Nos. **540** to **551**, Nos. **577** to **586** and No. **635**) shall enter into force on 1 January 1978. Until that date, administrations and the I.F.R.B. shall apply the relevant provisions of Article 9 as adopted by the Administrative Radio Conference, Geneva, 1959, and mentioned in the Annex to the present Resolution.

ANNEX

Provisions applicable until 1 January 1978 to frequency assignments to coast radiotelephone stations for transmission and for reception in the bands allocated exclusively to the maritime mobile service between 4 000 and 23 000 kHz:

. . . . . .

540 **Aer*** (5) The provisions of Nos. **537** to **539** do not apply to frequency assignments which are in conformity with the Allotment Plans appearing in Appendices 25 MOD, 26 and 27 to these Regulations; such frequency assignments shall be entered in the Master Register on receipt of the notice by the Board.

541 § 19. (1) *Examination of Notices concerning Frequency Assignments to Radiotelephone Coast Stations in the Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz for Radiotelephone Coast Stations (see No.* **500**).

542* (2) The Board shall examine each notice covered by No. **541** to determine whether the notified assignment is in conformity with an allotment in Section I or Section II of the Allotment Plan contained in Appendix 25 MOD to these Regulations, i.e. whether the frequency, the area of allotment, the power and any limitations are those specified in that Appendix.

543 (3) Any frequency assignment for which the finding is favourable with respect to No. **542** shall be recorded in the Master Register (see also No. **540**). The date to be entered in Column 2a or 2b shall be that determined according to the relevant provisions of Section III of this Article.

544 (4) If a notice relates to an amendment to an assignment in conformity with an allotment in Section I or Section II of the Allotment Plan, which is only a change in the characteristics (including the frequency) of the emission of a radiotelephone coast station,

without extending the necessary bandwidth beyond the upper or lower limits of the band provided for double sideband emissions in accordance with the Table in Appendix 17, the original assignment shall be amended according to the notice. The date to be entered in Column 2a or 2b shall be that determined according to the relevant provisions of Section III of this Article.

545 (5) In the case of a notice which is not in conformity with the provisions of Nos. **542** or **544**, the Board shall examine this notice with respect to the probability of harmful interference to the service rendered by a radiotelephone coast station for which a frequency assignment:

a) is in conformity with one of the allotments in Section I or II of the Plan and is already recorded in the Master Register or may be so recorded in the future; or

b) was recorded in the Master Register on a frequency specified in Appendix 17 as a result of a favourable finding with respect to Nos. **544** or **545**; or

c) was recorded in the Master Register on a frequency specified in Appendix 17 after an unfavourable finding with respect to Nos. **544** or **545**, but has not, in fact, caused harmful interference to any frequency assignment to a radiotelephone coast station previously recorded in the Master Register.

546 (6) According to the finding of the Board with respect to No. **545**, further action shall be in accordance with the provisions of Nos. **509** to **518** inclusive, or Nos. **532** to **534** inclusive, as appropriate, it being understood that in those provisions No. **545** shall be read for Nos. **501** and **502**.

547 § 20. (1) *Examination of Notices concerning Frequencies used for Reception by Radiotelephone Coast Stations in the Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz for Radiotelephone Ship Stations (see Nos.* **487** *and* **500***).*

548* (2) The Board shall examine each notice covered by No. **547** to determine whether the notified assignment corresponds to a frequency associated, according to Appendix 17, with a frequency allotted to the notifying administration under Section I or Section II of the Allotment Plan contained in Appendix 25 MOD to these Regulations.

549 (3) Any frequency assignment for which the finding is favourable with respect to No. **548** shall be recorded in the Master Register. The date to be entered in Column 2a or 2b shall be that determined according to the relevant provisions of Section III of this Article.

550 (4) Where a notice relates to an amendment to an assignment of a frequency which is associated, according to Appendix 17, with a frequency allotted to the notifying administration under Section I or Section II of the Plan, and this amendment is only a change in the characteristics (including the frequency) of the emission of radiotelephone ship stations, without extending the necessary bandwidth beyond the upper or lower limits of the band provided for double sideband emissions in accordance with the Table in Appendix 17, the original assignment shall be amended according to the notice. The date to be entered in Column 2a or 2b shall be that determined according to the relevant provisions of Section III of this Article.

551 (5) Any assignment of a frequency for reception by a radiotelephone coast station which is not in conformity with No. **548** shall be recorded in the Master Register. The date to be entered in Column 2b shall be that determined according to the relevant provisions of Section III of this Article.

. . . . . .

577 § 27. (1) *Frequency Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz for Radiotelephone Coast Stations.*

578 (2) If the finding is favourable with respect to No. **542**, the date of 3 December 1951 shall be entered in Column 2a in the case of an allotment in Section I of the Plan; in the case of an allotment in Section II, the date of 4 December 1951 shall be entered in Column 2b.

579 (3) If the provisions of No. **544** are found to be applicable, the date originally entered in Column 2a or 2b, as the case may be, shall be retained.

580 (4) For all other cases referred to in No. **541**, the relevant date shall be entered in Column 2b (see Nos. **510**, **514**, **515**, **518**, **533** and **534**).

581 (5) For assignments to stations other than radiotelephone coast stations, the relevant date shall be entered in Column 2b (see Nos. **525**, **526**, **530** and **531**).

582 § 28. (1) *Frequency Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz for Radiotelephone Ship Stations.*

583 (2) If the finding is favourable with respect to No. **548**, the date of 3 December 1951 shall be entered in Column 2a if the associated allotment appears in Section I of the Plan; if it appears in Section II, the date of 4 December 1951 shall be entered in Column 2b.

584 (3) If the provisions of No. **550** are found to be applicable, the date originally entered in Column 2a or 2b, as the case may be, shall be retained.

585 (4) In all other cases covered by No. **547**, the date of receipt of the notice by the Board shall be entered in Column 2b.

586 (5) For assignments other than assignments of frequencies for reception by radiotelephone coast stations, the relevant date shall be entered in Column 2b (see Nos. **525**, **526**, **530** and **531**).

. . . . . .

635 **Aer*** § 47. The provisions of Sections V, VI (excepting No. **619**) and VII of this Article shall not be applied to frequency assignments in conformity with the Allotment Plans contained in Appendices 25 MOD, 26 and 27 to these Regulations.

RESOLUTION No. Mar2 – 13

Relating to the Use of Single Sideband Technique in the Radiotelephone Maritime Mobile Service Bands between 4 000 and 23 000 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) Recommendation No. 28 and Resolution No. 3 of the Administrative Radio Conference, Geneva, 1959;

b) Recommendation No. 3 contained in the Final Report of the Panel of Experts convened for the purpose of devising ways and means of reducing the congestion in the bands between 4 and 27·5 MHz, Geneva, 1963;

c) the desirability of replacing double sideband emissions by single sideband emissions as early as possible in the maritime mobile service bands between 4 000 and 23 000 kHz;

d) that the preliminary action to achieve the conversion from double sideband emissions to single sideband emissions has been completed in compliance with Resolution No. Mar 6 of the World Administrative Radio Conference, Geneva, 1967;

resolves

that, unless otherwise specified in the Final Acts of the present Conference, radiotelephone stations in the maritime mobile service operating in the bands between 4 000 and 23 000 kHz shall comply with the following provisions:

1. new installation of double sideband equipment in ship stations shall not be permitted;

2. coast stations shall use only single sideband emissions;

3. until 1 January 1978, coast and ship stations equipped for single sideband operation shall be able to use class A3H emissions in addition to class A3A and A3J emissions;

4. exceptionally, until 1 January 1978, coast and ship stations may use class A3B emission;

5. as from 1 January 1978, class A3A and A3J emissions only shall be authorized.

RESOLUTION No. Mar2 – 14

Relating to the Channel Spacing of Frequencies allocated to the Maritime Mobile Service in the Band 156-174 MHz

(see Appendix 18 and Article 35)

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) the expanding use of the maritime mobile frequencies in the VHF bands between 156 and 174 MHz;

b) the increasing demand for VHF channels for port operations;

c) the increasing demand for VHF channels for public correspondence in the maritime mobile service;

d) the need for VHF channels for the ship movement service;

e) the need to provide VHF channels for uses other than radiotelephony, such as facsimile and narrow-band direct-printing telegraphy;

f) the need to provide VHF channels for communication between helicopters or light aircraft and ships in connection with anti-pollution, search and rescue, ice breaking and the operation of ships;

noting

that, in consequence of the revision of the Radio Regulations (Geneva, 1959) made by the World Administrative Radio Conference, Geneva, 1967,

a) the channel spacing for the maritime mobile VHF radiotelephone service is being reduced from 50 kHz to 25 kHz;

b) additional channels have been obtained by interleaving the 25 kHz channels midway between the 50 kHz channels of Appendix 18 to the Radio Regulations, Geneva, 1959, and have been numbered from 60 to 88;

c) the 25 kHz channels should be allocated on an international basis;

d) the transition from a channel spacing of 50 kHz to that of 25 kHz was scheduled as follows:

1. date by which modification of transmitters to a maximum deviation of ±5 kHz and of receivers to increase the audio gain, where necessary, may commence . . . . . 1 January 1972

2. date by which the modifications specified in paragraph *d)* 1 shall be completed for all existing equipments . . . . . 1 January 1973

3. date up to which coast stations should maintain capability to receive transmissions with a maximum deviation of ±15 kHz and after which the modification of coast station receivers should take place as early as practicable to meet the selectivity requirements for a channel spacing of 25 kHz . . . . . 1 January 1973

4. date by which all new equipments shall conform to 25 kHz standards . . . . . 1 January 1973

5. date by which all equipments shall conform to 25 kHz standards and all interleaved channels may be generally introduced . . . . . 1 January 1983

resolves

1. that administrations may, in areas where this is found to be necessary, authorize the use of channels 60 to 88, excluding channels 75 and 76 which were designated as guard-bands for channel 16;

2. that the technical characteristics of equipment for 25 kHz channel spacing in the maritime mobile VHF service shall be in accordance with Appendix 19;

3. that, by 1 January 1983, all equipments shall conform to 25 kHz standards; thereafter, all interleaved channels may be generally introduced.

RESOLUTION No. Mar2 – 15

Relating to the Unauthorized Use of Frequencies in the Bands allocated to the Maritime Mobile Service

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that monitoring observations of the use of frequencies in the band 2 170 – 2 194 kHz and the bands allocated exclusively to the maritime mobile service between 4 063 and 25 110 kHz show that a number of frequencies in these bands are still being used by stations of services other than the maritime mobile service, notably by high-powered broadcasting stations, some of which are operating in contravention of No. **422** of the Radio Regulations;

b) that these stations are causing harmful interference to the maritime mobile service and that a considerable number of emissions, the sources of which could not be positively identified, were observed in these bands;

c) that radio is the sole means of communication of the maritime mobile service;

considering in particular

d) that it is of paramount importance that the distress and safety channels be kept free from harmful interference, since they are essential for the protection of 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. **115**, **208**, **209**, **211**, **213** or **415** of the Radio Regulations;

2. to continue to make every effort to identify and locate the source of any unauthorized emission capable of endangering human life and property, and to communicate their findings to the I.F.R.B.;

3. to participate in the monitoring programmes that the I.F.R.B. may organize pursuant to the present Resolution;

4. to request their Governments to enact such legislation as is necessary to prevent stations located off their coasts operating in contravention of No. **422** of the Radio Regulations;

requests the International Frequency Registration Board

1. to continue to organize monitoring programmes, at regular intervals, in the distress and safety channels and their guard-bands, and, in the bands allocated exclusively to the maritime mobile service between 4 063 and 25 110 kHz, with a view to identifying the out-of-band stations;

2. to take the necessary steps with a view to the elimination of the emissions of out-of-band stations which cause or are likely to cause harmful interference to the maritime mobile service;

3. to seek, as appropriate, the cooperation of administrations in identifying the sources of out-of-band emissions by all available means, and in securing the cessation of these emissions.

RESOLUTION No. Mar2 – 16

Relating to References in the Radio Regulations and Additional Radio Regulations to the Telegraph Regulations and the Telephone Regulations, Geneva, 1958

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the Telegraph Regulations and the Telephone Regulations, Geneva, 1973, enter into force on 1 September 1974;

b) that the revised provisions of the Radio Regulations and Additional Radio Regulations adopted by this Conference will not enter into force until some time after 1 September 1974;

resolves

that in the period between 1 September 1974 and the date of entry into force of the revised provisions of the Radio Regulations and Additional Radio Regulations, references in the Radio Regulations and the Additional Radio Regulations to the Telegraph Regulations and Telephone Regulations shall be considered as referring to the Telegraph Regulations and the Telephone Regulations, Geneva, 1958, including the annexed Final Protocols.

RESOLUTION No. Mar2 – 17

Relating to the Establishment of a Manual for Use by the Maritime Mobile and Maritime Mobile-Satellite Services

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that provision has been made in Appendix 11 to the Radio Regulations for the carriage by ship stations of a manual for use by the maritime mobile and maritime mobile-satellite services;

b) that the World Administrative Telegraph and Telephone Conference, Geneva, 1973, revised the Telegraph Regulations and the Telephone Regulations, and adopted new provisions to meet the requirements of the telegraph and telephone services including the transfer of certain provisions from the Regulations to the C.C.I.T.T. Recommendations;

resolves

1. that those provisions of

   a) the Radio Regulations (including Appendices thereto) and the Additional Radio Regulations, as revised by the World Maritime Administrative Radio Conference, Geneva, 1974,

   b) the Telegraph Regulations and the Telephone Regulations,

   c) the International Telecommunication Convention, and

   d) the C.C.I.T.T. Recommendations of the Vth C.C.I.T.T. Plenary Assembly, Geneva, 1972,

which are applicable or useful to stations in the maritime mobile and maritime mobile-satellite services shall be assembled by the Secretary-General for inclusion in a revision of the manual entitled "Manual for Use by the Maritime Mobile Service" published in 1968;

2. that the Secretary-General shall publish a revision of this manual in the form of loose-leaf amendments, bearing a new title "Manual for Use by the Maritime Mobile and Maritime Mobile-Satellite Services" and shall make it available at least six months prior to the date of entry into force of the revisions adopted by the present Conference;

3. that the Secretary-General may consult the following administrations on questions relating to tasks entrusted to him in accordance with paragraphs 1 and 2 above:

United States of America
France
Italy
Kingdom of the Netherlands
United Kingdom of Great Britain and
Northern Ireland
Sweden;

4. that the Secretary-General shall publish such amendments, as are applicable, of the C.C.I.T.T. Recommendations after each C.C.I.T.T. Plenary Assembly.

RESOLUTION No. Mar2 – 18

Relating to Technical Cooperation with the Developing Countries in Maritime Telecommunications

The World Maritime Administrative Radio Conference, Geneva, 1974,

noting

that the assistance the Union has commenced to render to developing countries, in the field of maritime telecommunications, in collaboration with other organizations, notably the Inter-Governmental Maritime Consultative Organization (I.M.C.O.), 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;

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; and
- 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;

resolves to request the Secretary-General

1. to offer the assistance of the Union to the developing countries endeavouring to improve their maritime telecommunications, especially by providing technical advice in the establishment, operation and maintenance of equipment and by assisting in training staff;

2. in this context, to seek the collaboration of I.M.C.O., the United Nations Conference for Trade and Development (UNCTAD) and other specialized agencies of the United Nations, as appropriate; and

3. to seek the aid of the United Nations Development Programme 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 support, to the extent of their capabilities and their technical advancement, the Union's technical cooperation with the developing countries in the field of maritime telecommunications by facilitating the recruitment of experts for missions to and 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, as needed, in their country programmes for external technical assistance, projects in the field of maritime telecommunications and to support inter-country projects in this field.

RESOLUTION No. Mar2 – 19

Relating to the Introduction of a Digital Selective Calling System to meet the Requirements of the Maritime Mobile Service

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that there is an urgent need for a single digital selective calling system to provide for the world-wide requirements of the maritime mobile service;

b) that the Inter-Governmental Maritime Consultative Organization (I.M.C.O.) had indicated[1] to the present Conference, as well as to the C.C.I.R., its requirements for a general purpose selective calling system capable of facilitating the transmission and reception of all communications;

c) that Articles 7, 19, 28A, 32, 33 and 35 of the Radio Regulations provide for the use of such a system;

d) that the studies, in response to C.C.I.R. Question 9/8, concerning the operational and technical characteristics of such a system, are in an advanced stage;

e) that in the Radio Regulations, the technical provisions relating to systems are mainly based upon the Recommendations of the C.C.I.R.;

f) that Plenary Assemblies of the C.C.I.R. are held triennially whereas Administrative Radio Conferences, which are empowered to modify the Radio Regulations making substantial use of the Recommendations of the C.C.I.R., are held less frequently and less regularly;

---

[1] I.M.C.O. Resolution No. A.283 (VIII).

is of the opinion

a) that the Plenary Assemblies of the C.C.I.R. are likely to make appropriate Recommendations as to the operational and technical characteristics of a single digital selective calling system;

b) that administrations should be afforded the opportunity to take advantage of the current C.C.I.R. Recommendations on selective calling systems for the maritime mobile service;

therefore resolves that

1. the C.C.I.R. be invited, in response to Question 9/8, to complete its studies and establish as soon as possible Recommendations for the operational and technical characteristics of a digital selective calling system;

2. each Plenary Assembly of the C.C.I.R. should arrange for the Secretary-General of the I.T.U. to be informed of those Recommendations of the C.C.I.R. which affect the operational and technical criteria relating to the introduction of a single digital selective calling system for the maritime mobile service;

3. following the distribution to administrations of the relevant C.C.I.R. texts, the Secretary-General shall write to administrations asking them to indicate within 120 days which of the C.C.I.R. Recommendations, or which specific operational and technical criteria defined in the Recommendations referred to in 1 above, they agree to use in applying the pertinent provisions of the Radio Regulations;

4. after this period the Secretary-General shall distribute to administrations a summary of the replies received.

RESOLUTION No. Mar2 – 20

Relating to the Use of Class A3A and A3J Emissions for Distress and Safety Purposes on the Carrier Frequency 2 182 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

noting

a) that the Radio Regulations require the use on the carrier frequency 2 182 kHz of:

- class A3 or A3H emissions by ship, aircraft and survival craft stations;
- class A3H emissions by coast stations;
- the classes of emission, specified in Appendix 20A, by emergency position-indicating radiobeacons;

b) that the main object of these provisions is to maintain reliable distress and safety communications by using proven techniques;

noting also

a) the Final Report of the Panel of Experts, Geneva, 1963;

b) the relevant C.C.I.R. studies concerning single sideband techniques, in particular those relating to Question 19/8;

recognizing

that the use of class A3A and A3J emissions on the carrier frequency 2 182 kHz would provide the operational advantages inherent in single sideband techniques;

considering

a) that a large number of equipments employing class A3 and A3H emissions will still be in use for distress and safety purposes on 1 January 1982;

b) that single sideband equipment must be designed to work with closer frequency tolerances and higher technical standards than those necessary for double sideband equipment;

c) that equipment designed for safety purposes, particularly survival craft equipment, should:

- be capable of reliable operation in varying environments, and after long periods of storage;
- be easy to operate by an inexperienced person in all circumstances;
- be relatively low priced;

d) that the requirement for direction-finding and homing must be satisfied;

e) that the need to transmit and receive the two-tone radiotelephone alarm signal, including signals from emergency position-indicating radiobeacons, must also be satisfied, taking into account the frequency tolerances in Appendix 20A and the relevant C.C.I.R. Recommendations;

resolves

1. that study of the use of class A3A and A3J emissions for distress and safety purposes is required;

2. that this study should be completed in time for a decision on the date for the final conversion to class A3A and A3J emissions on the carrier frequency 2 182 kHz to be made by the next competent World Administrative Radio Conference;

requests the C.C.I.R.

to study the above-mentioned subject as a matter of urgency and, if possible, to issue Recommendations sufficiently in advance of the above-mentioned conference;

requests the Secretary-General

to communicate this Resolution to the Inter-Governmental Maritime Consultative Organization;

invites the Inter-Governmental Maritime Consultative Organization

to consider the matter as part of the study currently being undertaken of the maritime distress and safety system.

RESOLUTION No. Mar2 – 21

Relating to the Use of Class A3A and A3J Emissions on the Carrier Frequencies 4 136·3 kHz and 6 204 kHz[1] used to Supplement the Carrier Frequency 2 182 kHz for Distress and Safety Purposes

The World Maritime Administrative Radio Conference, Geneva, 1974,

noting

a) that the Radio Regulations permit, until 1 January 1984, the use, on the carrier frequencies 4 136·3 kHz and 6 204 kHz,[1] of class A3H emissions by coast, ship and aircraft stations (see No. **1351I** of the Radio Regulations);

b) that the main object of these provisions is to maintain reliable distress and safety communications using proven techniques;

noting also

a) the Final Report of the Panel of Experts, Geneva, 1963;

b) relevant C.C.I.R. studies concerning single sideband techniques, in particular, those relating to Question 19/8;

recognizing

that the use of class A3A and A3J emissions on the carrier frequencies 4 136·3 kHz and 6 204 kHz [1] would provide the operational advantages inherent in single sideband techniques;

---

[1] These frequencies will have replaced the carrier frequencies 4 136·3 kHz and 6 204 kHz as from 1 January 1978.

considering

a) that a large number of equipments employing class A3H emissions will still be in use for distress and safety purposes after 1 January 1978;

b) that equipment employing class A3A and A3J emissions must be designed to work with closer frequency tolerances and higher technical standards than those necessary for equipment employing class A3H emission and envelope detection in the receiver;

c) that equipment designed for safety purposes should, in all circumstances, be capable of reliable operation and be easy to operate by an inexperienced person;

resolves

that study is required of the use of class A3A and A3J emissions for distress and safety purposes and that this study should be completed in advance of the agreed date for the cessation of class A3H emissions on the carrier frequencies 4 125 kHz and 6 215·5 kHz[1];

requests the C.C.I.R.

to study this subject as a matter of urgency and, if possible, to issue Recommendations well in advance of the next competent World Administrative Radio Conference;

requests the Secretary-General

to communicate this Resolution to the Inter-Governmental Maritime Consultative Organization;

---

[1] These frequencies will have replaced the carrier frequencies 4 136·3 kHz and 6 204 kHz as from 1 January 1978.

invites

1. the Inter-Governmental Maritime Consultative Organization to consider the matter as part of the study currently being undertaken of the maritime distress and safety system;

2. the next competent World Administrative Radio Conference to consider this matter further.

RESOLUTION No. Mar2 – 22

Relating to Accounting for Public Correspondence in Maritime Radiocommunications

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the existing methods of accounting for public correspondence in maritime radiocommunications are complex and expensive for administrations and the recognized private operating agencies concerned with such accounting.

b) that proposals were made to this Conference to amend the existing regulations relating to methods of accounting and particularly not to include ship charges in the radio maritime accounts exchanged between administrations and the recognized private operating agencies concerned with radio maritime accounting;

c) that modern accounting aids are available which might improve and expedite the preparation and exchange of accounts;

d) that, for example, there is already a need for improved accounting methods to provide for:

- automatic access between ship stations and stations on land, and
- direct access by telex and telephone between subscribers in one country and ship stations via coast stations in another country;

e) that there may be a future need for an accounting system common to both the maritime mobile service and the maritime mobile-satellite service or, at least, two systems based on the same principles;

resolves

that a study should be undertaken with a view to improving the present accounting methods for public correspondence in maritime radiocommunications and providing for foreseeable developments;

requests the C.C.I.T.T.

1. to undertake a study of the annexed question as a matter of urgency with a view to reducing, as soon as possible, the work load upon administrations and recognized private operating agencies concerned with radio maritime accounting;

2. to ask administrations to send delegates particularly concerned with maritime accounting to the relevant Study Group meetings;

3. to ensure that the results of the study are included in the Study Group Reports to its Sixth Plenary Assembly in 1976 and that these Reports, as approved by that Plenary Assembly, are distributed to the administrations of all Members of the Union before 1 January 1977 to enable them to prepare proposals for the World Administrative Radio Conference foreseen for 1979;

invites

administrations and recognized private operating agencies concerned with such accounting, pending the results of this study, to take all steps calculated to mitigate, as far as possible, the inconvenience caused by accounting for ship charges.

ANNEX

NEW QUESTION TO THE C.C.I.T.T.

What amendments to the principles and methods of accounting for public correspondence in maritime radiocommunications are necessary to improve present methods, including accounting for ship charges, and to provide for foreseeable future developments?

RESOLUTION No. Mar2 – 23

Relating to the Interpretation of the Provisions affecting the Public Correspondence Services

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the World Administrative Telegraph and Telephone Conference, Geneva, 1973, has adopted simplified Telegraph Regulations and Telephone Regulations containing basic provisions only;

b) that the above Conference has transferred detailed provisions concerning operational and rate-fixing procedures from the Telegraph Regulations and the Telephone Regulations, to the C.C.I.T.T. Recommendations;

c) that the above Conference, in pursuance of Resolution No. 37 of the Plenipotentiary Conference, Montreux, 1965, had taken steps (see Article 13 of the Telegraph Regulations and Article 9 of the Telephone Regulations) to introduce into the Telegraph Regulations and into the Telephone Regulations:

- such provisions, if any, as the present Conference may deem necessary to incorporate into these Regulations;
- such provisions of the Radio Regulations and Additional Radio Regulations (1971 Revision) as the present Conference may see fit to transfer;
- any amendment of the provisions or any new provisions of the Radio Regulations or the Additional Radio Regulations adopted by the present Conference;

d) that the World Administrative Telegraph and Telephone Conference, Geneva, 1973, foresaw that difficulties might arise from the foregoing (see Opinion No. 2 of the Telegraph Regulations and Opinion No. 3 of the Telephone Regulations);

e) that in implementing the principles of the Regulations (Article 1 of the Telegraph and of the Telephone Regulations), administrations and recognized private operating agencies should comply with the C.C.I.T.T. Recommendations, including any instructions forming part of those Recommendations;

f) that the Telegraph and Telephone Regulations shall apply to radiocommunications in so far as the Radio Regulations and the Additional Radio Regulations do not provide otherwise;

g) that various administrations, for example those of Denmark, Norway and Sweden, have submitted to the present Conference detailed proposals for revision of all or part of Chapter IX of the Radio Regulations, and of the Additional Regulations;

recognizing

a) that Chapter IX of the Radio Regulations and the Additional Radio Regulations in particular contain many provisions which stem from previous Telegraph and Telephone Regulations and in many cases are simply duplications of provisions in the said Regulations;

b) that with certain exceptions the radio traffic in the maritime mobile service is handled in accordance with the requirements of the Telegraph and Telephone Regulations and the related C.C.I.T.T. Recommendations;

c) that the provisions of the Radio Regulations and the Additional Regulations, as revised by the present Conference, will remain in force for the next six to seven years;

d) that the corresponding provisions which are now to be found in the C.C.I.T.T. Recommendations will be amended because their nature makes them more easily adaptable according to changing operating conditions, and because the C.C.I.T.T. has been instructed by the World Administrative Telegraph and Telephone Conference, Geneva, 1973, to continue to study the questions in the study programme concerning the simplification of the public telegram service and the revision or elaboration of Recommendations relating to the telex service;

RECOMMENDATIONS

RECOMMENDATIONS

Note by the General Secretariat:

The Recommendations are arranged in the chronological order of the Conferences at which they were adopted, i.e.:

- Administrative Radio Conference (Geneva, 1959) (REC 1, etc.)
- Space Conference (Geneva, 1963) (REC Spa 1, etc.)
- Aeronautical Conference (Geneva, 1966) (REC Aer 1, etc.)
- Maritime Conference (Geneva, 1967) (REC Mar 1, etc.)
- Space Conference (Geneva, 1971) (REC Spa2–1, etc.)
- Maritime Conference (Geneva, 1974) (REC Mar2–1, etc.)

RECOMMENDATION No. 1

to the C.C.I.R. Relating to the Frequency Tolerances of Transmitters

The Administrative Radio Conference, Geneva, 1959,

considering

a) that Appendix 3 to the Radio Regulations specifies the permissible frequency tolerances for transmitters ;

b) that the principal objective of this Appendix 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, a reduction in frequency tolerance to the lowest value possible in 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 further reduction of frequency tolerance would not in practice increase the number of available channels ;

e) that in particular frequency bands, the frequency tolerances specified in Appendix 3 to these Radio Regulations 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 ;

g) that in certain cases, reduction of frequency tolerances is subject to economic limitations, which should be known and taken into account ;

invites the C.C.I.R.

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 3 to the Radio Regulations have already attained these ultimate values.

RECOMMENDATION No. 2

Relating to the Technical Standards of the I.F.R.B.

The Administrative Radio Conference, Geneva, 1959,

recognizing

that the Technical Standards of the International Frequency Registration Board (I.F.R.B.) are in daily use in the technical examination of frequency assignment notices,

urges the C.C.I.R.

to expedite all phases of the programme of studies which will assist the I.F.R.B. in the further refinement of its Technical Standards,

and invites the administrations

in their participation in the work of the C.C.I.R. and its study groups, to give special priority to those studies.

RECOMMENDATION No. 3

to the C.C.I.R. Relating to Signal to Interference Protection Ratios and Minimum Field Strengths Required

The Administrative Radio Conference, Geneva, 1959,

recognizing

that the available information on signal to interference 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 C.C.I.R.

1. to continue to study the signal to interference 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 International Frequency Registration Board.

RECOMMENDATION No. 4

to the C.C.I.R.
Relating to Studies of Radio Propagation and Radio Noise

The Administrative Radio Conference, Geneva, 1959,

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 radio services can be facilitated by improvements, where these are necessary, in the technical standards at present used by the I.F.R.B. ;

c) that, in accordance with Appendix A, administrations will endeavour to promote further studies on radio propagation and radio noise through the medium of the C.C.I.R. ;

d) that the C.C.I.R. has adopted a programme of studies covering many of these problems ;

invites the C.C.I.R.

1. to continue the studies of radio propagation and radio noise and to take measures for the co-ordination of the results of these studies carried out in different countries ;

2. to give particular attention to those studies which will assist in the further refinement of the technical standards used by the I.F.R.B. ;

3. to report regularly on these matters, even if the studies have not been completed ;

4. to continue regular consultation with other organizations undertaking studies of propagation such as the International Scientific Radio Union, in order to attain the maximum possible degree of co-ordination.

RECOMMENDATION No. 5

to the C.C.I.R. and to Administrations
Relating to International Monitoring in the Bands Below 28 000 kHz

The Administrative Radio Conference, Geneva, 1959,

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, 1959, 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 ;

invites the C.C.I.R.

in collaboration with the Board, to study and make technical recommendations concerning the additional facilities required to provide adequate coverage in all areas of the world for the purposes of Articles 8, 9 and 13 of the Radio Regulations, and

invites Administrations

1. to make every effort to develop monitoring facilities as envisaged in Article 13 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 co-operate in such monitoring programmes as may be requested by the Board.

RECOMMENDATION No. 6

to the C.C.I.R. Relating to Studies of the Technical Characteristics of Equipment

The Administrative Radio Conference, Geneva, 1959,

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 C.C.I.R.

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 ;

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 International Frequency Registration Board.

RECOMMENDATION No. 7

Relating to Specifications of Broadcasting Receivers at Low Cost

The Administrative Radio Conference, Geneva, 1959.

considering

a) that the advantages of broadcasting should be made more easily available to the populations of the countries where at present the density of receivers is particularly low due to economic, geographic or technical reasons ;

b) that to this end it is desirable that efficient broadcasting receivers should be available at prices low enough to secure their wide distribution in these countries ;

c) that general agreement on the performance of suitable broadcasting receivers would prove most useful to radio receiver manufacturers by assisting them to produce suitable receivers having an agreed adequate standard performance at the lowest possible cost ;

invites the C.C.I.R.

1. to draw up performance specifications for one or more types of sound broadcasting receivers suitable for production in large quantities at the lowest possible cost, the receivers to meet the requirements of listeners in the countries mentioned in the considering *a)* above. These specifications should cover receivers for amplitude modulated transmissions in the low, medium, and/or high frequency bands (bands 5, 6 and/or 7) as well as those for frequency modulated transmissions in the VHF band (band 8) according to the needs of the countries ;

2. to avoid duplication of effort, and complete the work in as short a time as possible, collaboration should be maintained with other international bodies working in this field;

and requests the Secretary-General

to communicate the result of this study, together with suggestions as to the action to be taken, to the Director-General of UNESCO.

RECOMMENDATION No. 8

Relating to the Classification of Emissions

The Administrative Radio Conference, Geneva, 1959,

considering

a) that Article 2, Section I, of the Radio Regulations classifies emissions for the purpose of designation ;

b) that certain symbols are used for classes of emission which are not precisely specified ;

c) that it may be necessary to specify new classes of emissions in the future ;

d) that in the recording processes used by the International Frequency Registration Board and by certain administrations, particularly in mechanical recording processes, a simple and precise method of designation is required, using the smallest practicable number of symbols for each designation to provide all the essential information ;

e) that it may be useful to combine in a single series of symbols the information now classified as supplementary characteristics with that giving the type of modulation of the main carrier ;

f) that the present method of classifying emissions does not adequately provide for systems employing multiple modulation processes ;

g) that the increasing use of multichannel telephone and telegraph systems makes it desirable to classify them in categories and to adopt a uniform designation for the channels of such systems ;

h) that pulse modulation is not intrinsically a basic modulation process but is a form of signal stimulus which gives rise to amplitude, frequency or phase modulation or a combination of these modulations ;

i) that the Board sometimes receives or requires from administrations additional significant information of a supplementary nature—e.g., carrier level and telegraph signal code information, which is not always provided for in the present system of designation ;

j) that the present system of designation does not enable all emissions to be specified precisely or completely ;

k) that the terms emission, radiation and transmission are not defined in the Radio Regulations and that they are liable to confusion not only when they are translated from one language to another, but also when they are used in the same language ;

recommends that the C.C.I.R.

1. consider, in conjunction with the Board, all emissions and characteristics requiring classification ;

2. study, in conjunction with the Board, various methods of designating and classifying emissions, and develop a method which could be used over a long period and which would enable all the essential information to be provided ;

3. report their conclusions on these matters, and make a Recommendation in time for a decision to be taken at the next Administrative Radio Conference ;

4. define the terms emission, radiation and transmission so that they may be used consistently and without confusion and be readily translated from one working language to another.

RECOMMENDATION No. 9

Relating to the Use of the Rationalized M.K.S. System of Units

The Administrative Radio Conference, Geneva, 1959,

recognizing

the wide use of the rationalized M.K.S. system of units (also known as the rationalized Giorgi system) by radio engineers and authors of radio publications, and its wide use in the C.C.I.R. and other permanent organs of the Union ;

recommends

that administrations shall endeavour to adopt that system gradually in their relations with the Union and its permanent organs.

RECOMMENDATION No. 10

Relating to the Means of Reducing the Congestion in Band 7 (3-30 MHz)

The Administrative Radio Conference, Geneva, 1959,

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 development 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 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.

RECOMMENDATION No. 11

Relating to the More Efficient Consolidation of National and International Radiocommunication Circuits operating in the Bands between 4 000 and 27 500 kHz

The Administrative Radio Conference, Geneva, 1959,

considering

a) the ever-increasing need for frequencies particularly in the bands between 4 000 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 Convention concerning the rational use of frequencies and spectrum space (Article 45*));

and 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;

recommends

1. that, wherever possible, administrations should contribute to reducing the pressure on bands between 4 000 and 27 500 kHz by a more efficient consolidation of lightly-loaded radio circuits;

---

*) *Note by the General Secretariat:* Article 33 of the Malaga-Torremolinos Convention (1973).

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 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 1 to 3 above.

RECOMMENDATION No. 12

Relating to the Use of the Band 9 300-9 500 MHz

The Administrative Radio Conference, Geneva, 1959,

noting

a) that there are in existence two main classes of airborne weather radar, using the bands 5 350-5 460 MHz and 9 300-9 500 MHz respectively;

b) that there is in existence a very considerable number of shipborne radars, the majority in the band 9 300-9 500 MHz;

c) that there are also ground-based radars of the maritime and aeronautical radionavigation services and of the meteorological service in the band 9 300-9 500 MHz;

d) that in the band 5 350-5 460 MHz airborne radars have the exclusive use of the sole primary allocation which is to the aeronautical radionavigation service;

e) that in the bands 2 900-3 100 MHz and 5 470-5 650 MHz shipborne radars have the use of the sole primary allocation to the radionavigation service and the maritime radionavigation service respectively, which they share only with land-based radars;

f) that it has proved necessary to allocate the band 9 300-9 500 MHz on an equality basis to both the aeronautical and the maritime radionavigation services;

considering

a) that it is of the utmost importance to ensure that harmful interference is not caused to radionavigation services providing a safety of life function;

b) that the operating conditions of a safety of life service should be uniform throughout the world;

c) that an uncoordinated increase in the use of the band 9 300-9 500 MHz can only lead to an increase in the probability of harmful interference between the aeronautical and maritime radionavigation services ;

recommends

1. that administrations, the International Civil Aviation Organization and the Inter-Governmental Maritime Consultative Organization study this matter at the earliest opportunity ; and especially

2. that they determine whether, and to what extent, interference which is recognized to be technically possible between the two services becomes harmful in operational circumstances ;

3. that they investigate, in the event that it is established that there may be harmful interference between the two services, the possibility of reducing such interference by technical, operational and procedural means, including the principle that new equipments should always be of the highest technical standard ;

invites

administrations, the International Civil Aviation Organization and the Inter-Governmental Maritime Consultative Organization to communicate to the Union the results of their studies together with their views and proposals resulting therefrom.

RECOMMENDATION No. 13

Relating to the Technical Standards to be applied when preparing Plans for the Broadcasting Stations in the Bands 68-73 MHz and 76-87·5 MHz

The Administrative Radio Conference, Geneva, 1959,

recommends

that in the preparation of plans for broadcasting stations in the bands 68-73 MHz and 76-87·5 MHz at the Special Regional Conference referred to in No. **250** of the Radio Regulations, Geneva, 1959, the following factors shall be taken into consideration :

a) the minimum median field strengths to be protected for the broadcasting and for the fixed and mobile services should be the field strengths required for satisfactory service at the limit of the service area in rural areas. For frequency modulated sound broadcasting, the figures given in C.C.I.R. (Los Angeles, 1959) Recommendation No. 263 should be taken as a guide. For television, the same values of minimum field strength as for frequency modulated sound broadcasting should be used. For the fixed and mobile services a tentative figure of 5 microvolts per metre should be taken ;

b) the protection ratios required for frequency modulated sound broadcasting are given in C.C.I.R. (Los Angeles, 1959) Recommendation No. 263, and for television in C.C.I.R. (Los Angeles, 1959) Report No. 125. For the fixed and mobile services the protection ratio should be at least 6 dB;

c) when determining the required protection ratios, due account shall be taken of the occupied bandwidth and the receiver selectivity when there is a difference between the frequencies of the desired and interfering signals, and of the additional protection resulting from the use of cross-polarization ;

d) all services should be protected for not less than 90 % of the time ;

e) in evaluating the possible degree of interference due regard should be given to the conditions of propagation. The tropospheric wave propagation curves of C.C.I.R. (Los Angeles, 1959) Recommendation No. 312 should be used where they apply.

RECOMMENDATION No. 14

to Administrations in Region 1. Relating to the Broadcasting Service in the Band 100-108 MHz

The Administrative Radio Conference, Geneva, 1959,

considering

a) that, so far as possible, there should be a common allocation of frequency bands to the broadcasting service in the three Regions, so that administrations may more readily coordinate their use of frequencies and thereby achieve maximum frequency economy;

b) that a growing demand is foreseen in Region 1 for assignable frequencies in Band 8 for sound broadcasting;

c) that, for technical reasons, and in particular, in order to avoid complication in the manufacture of receivers, any future extension of the broadcasting band 87·5-100 MHz, should take place in an adjacent band;

d) that the band 100-108 MHz is now allocated to the broadcasting service in Regions 2 and 3, and in some countries in Region 1;

e) that a number of administrations in Region 1 have expressed their desire to use the band 100-104 MHz for the broadcasting service;

recommends

that, at the next Administrative Radio Conference, administrations of Region 1 consider the possibility of proposing a new allocation to services in the band 100-108 MHz, with special reference to the needs of the broadcasting service.

RECOMMENDATION No. 15

Relating to Frequency Modulation Transmissions

The Administrative Radio Conference, Geneva, 1959,

considering

a) that listeners should be enabled to hear national broadcasting transmissions free of interference from other stations ;

b that in many regions, the overloading of Bands 5 and 6 is such that listening is becoming increasingly difficult ;

c) that experience has shown that where frequency modulated transmissions are broadcast in Band 8, listeners in those countries are assured of improved reception ;

recommends

that the Members and Associate Members of the Union should consider the possibility of using frequency modulated transmissions in the Band 8 for their national broadcasting services.

RECOMMENDATION No. 16

Relating to the Measures to be taken to prevent the Operation of Broadcasting Stations on Board Ships or Aircraft outside National Territories

The Administrative Radio Conference, Geneva, 1959,

considering

a) that the operation of broadcasting stations on board ships or aircraft outside national territories is in conflict with the provisions of Nos. **422** and **962** 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;

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 the Members and Associate Members of the Union accordingly.

RECOMMENDATION No. 17

Relating to the Adoption of Standard Forms for Ship Station Licences and Aircraft Station Licences

The Administrative Radio Conference, Geneva, 1959,

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. **732** of the Radio Regulations;

has formulated

d) a set of principles for the draft of a standard licence form (See Annex 1) and

e) specimens of a ship station licence and of an aircraft station licence (See Annexes 2 and 3);

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

Principles for the Formulation of Standard Ship and Aircraft Station Licences

The Administrative Radio Conference, Geneva, 1959, considers 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 licences 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

(Full Name of the Authority issuing the Licence, in the national language)

.....*

SHIP STATION LICENCE
LICENCE DE STATION DE NAVIRE
LICENCIA DE LA 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

(Full Name of the Authority issuing the Licence, in the national language)

.....*

AIRCRAFT STATION LICENCE
LICENCE DE STATION D'AÉRONEF
LICENCIA DE LA 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. 18

Relating to Operator Certificates

The Administrative Radio Conference, Geneva, 1959,

considering

a) that Article 23 of the Radio Regulations provides that Operator Certificates for ship and aircraft stations are classified as radiotelegraph, and radiotelephone ;

b) that with the introduction of new modes of telecommunication, including the use of automatic communication devices, it becomes increasingly difficult to categorize such modes as either radiotelegraph or radiotelephone ;

c) that all such devices, as well as radiotelephone stations, may be operated by holders of radiotelegraph operator certificates ; and many automatic communication devices may be operated by holders of radiotelephone certificates ;

d) that, in particular, it may be desirable to modify the present categories of operator certificates ;

recommends

that administrations consider this problem and submit to the next Administrative Radio Conference proposals for the amendment of Article 23 taking into account the use of such new communication techniques

RECOMMENDATION No. 19

Relating to International Co-ordination in the Selection of an appropriate Frequency Band for the Development of Air-Ground Public Correspondence Systems

The Administrative Radio Conference, Geneva, 1959,

considering

a) that there is not at present an adequate air-ground public correspondence system ;

b) that such systems are specifically excluded by the Radio Regulations from operating in frequency bands allocated exclusively to the aeronautical mobile (R) service ;

c) that some administrations are actively engaged in the development of such systems without the benefit of international co-ordination on the subject of the appropriate frequency bands for such development ;

d) that, because of the international character of the aeronautical service, it is essential that international agreement be reached on the appropriate frequency bands ;

e) that transmissions from aircraft may cause interference over considerable distances ;

recommends

1. that administrations now engaged, or planning to engage, in the development of an air-ground public correspondence system advise the International Frequency Registration Board of the relevant details of their planning so that the Board can advise all other administrations of the current trends in development ;

2. that administrations ensure, by frequency co-ordination or otherwise, that no interference is caused to the services of other countries by the operation of air-ground public correspondence systems.

RECOMMENDATION No. 20

Concerning the Matter of providing a Suitable Frequency Allocation for a Collision Avoidance System in the Aeronautical Radionavigation Service

The Administrative Radio Conference, Geneva, 1959,

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 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.

RECOMMENDATION No. 21

Relating to Technical Provisions for Maritime Radiobeacons in the African Area

The Administrative Radio Conference, Geneva, 1959,

considering

the need to facilitate the planning for new maritime radiobeacons in the band 285 - 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 Arrangement for Maritime Radiobeacons in the European Area of Region 1 ", Paris, 1951.

RECOMMENDATION No. 22

to the Inter-governmental Maritime Consultative Organization, the International Civil Aviation Organization and to Administrations

Relating to an International Radiotelephone Code for the Maritime Mobile Service

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 23

Recommendation to the Safety of Life at Sea Conference relating to the Use of the Term "Emergency (Reserve)"

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 24

to the Governments Signatory to the International Convention for the Safety of Life at Sea Relating to the Adoption of a Radiotelephone Alarm Signal

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 25

to the International Conference on Safety of Life at Sea Relating to Distress, Urgency and Safety Communications

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 26

Relating to a Re-Classification of International Public Correspondence Categories of Ship Stations

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 27

Relating to Hours of Service for Ship Stations

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 28

Relating to the Use of Single Sideband Systems by the Maritime Mobile Service

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 29

Relating to the Pronunciation of Words in the Phonetic Alphabet

The Administrative Radio Conference, Geneva, 1959,

noting

a) that agreement has been reached on a world-wide phonetic alphabet (see Appendix 16);

b) that the pronunciation of the words in this alphabet may vary according to the language habits of the speakers;

c) that in order to minimise the wide variations in pronunciation, a record has been prepared by the International Civil Aviation Organization which gives the pronunciation desired of the words in the newly adopted phonetic alphabet;

d) that this record contains preambles in English, French and Spanish, and is readily available;

considering

that a similar record would be very useful;

recommends

1. that the Secretary General be instructed to make similar records available as one of the publications of the Union;

2. that for this purpose the Secretary General may investigate the possibility of making use of records that already exist.

RECOMMENDATION No. 30

Relating to the Phonetic Figure Table

(Abrogated by Resolution No. Mar 1)

RECOMMENDATION No. 31

Relating to the Protection of Standard Frequency Guard-Bands for Use by Radio Astronomy

The Administrative Radio Conference, Geneva, 1959,

considering

a) that interference-free reception of standard frequency and time signals in the standard frequency bands centred on 2·5, 5, 10, 15, 20 and 25 MHz, allocated to the standard frequency service in the Table of Frequency Allocations, is of world-wide interest;

b) that these bands may be used most efficiently for the observation of cosmic radiations by radio astronomers only if they are free from appreciable energy due to emissions of services other than the standard frequency service;

c) that the bands 10 003-10 005 kHz and 19 990-20 010 kHz may be used for space research;

recommends

that administrations take all practicable measures to safeguard the standard frequency bands from any harmful interference.

RECOMMENDATION No. 32

Relating to the Radio Astronomy Service

The Administrative Radio Conference, Geneva, 1959,

considering that

a) recognition has now been given to the radio astronomy service in the Regulations, and that allocations to this service are included in the Table of Frequency Allocations ;

b) the radio astronomy service is devoted to the reception of extremely low-level electromagnetic radiations of extra-terrestrial origin, and needs therefore to be protected from radiations of man-made origin, to the maximum degree practicable ;

c) the radio astronomy service must compete for spectrum space with other existing and expanding radio services ;

d) the ability of the radio astronomy service to share frequency bands with other radio services is limited ;

e) in the case of many radio astronomy service installations it would be very difficult, once they were established, to change the frequency bands being observed or locations to avoid harmful interference ;

f) the radio astronomy service should be assured a reasonable degree of stability in the frequency bands allocated to it, so as to permit long-term study programmes ;

g) the desired protection for the radio astronomy service in many of the bands allocated for its use will be difficult to obtain and can be achieved only on a long-term basis ;

h) the provisions of the new Table of Frequency Allocations do not

meet fully the stated requirements of the radio astronomy service, particularly in Band 8 and the lower part of Band 9 ;

i) it will assist administrations to protect the radio astronomy service if information is available showing the locations of the observatories, and those of the bands allocated in the Table of Frequency Allocations that are in use at each observatory ;

recommends that

1. administrations, when preparing for the next Administrative Radio Conference, should consider further the question of frequency allocations for the radio astronomy service ;

2. the possibility of making a firm allocation in the range 37–41 MHz be specially considered and that, in the meantime, when assigning frequencies to stations of other services, administrations should avoid, as far as practicable, the bands 38·0 ± 0·25 MHz or 40·68 ± 0·25 MHz, which are in use, or are proposed for use for radio astronomical observations in certain countries ;

3. administrations when drawing up frequency assignment plans should leave, as far as practicable, the band 606–614 MHz free for radio astronomical observations or should assign frequencies to stations of other services in this band in such a way as to afford the maximum practicable protection for the radio astronomy service ;

4. administrations should notify to the Secretary General the locations of observatories in their countries and those of the bands allocated in the Table of Frequency Allocations that are in use at each observatory ; and that the Secretary General should communicate this information to Members and Assiocate Members of the Union;

draws the attention of organizations concerned with radio astronomy to the following:

1. the relevant provisions of the Radio Regulations;
2. the need to maintain close co-ordination with their national administrations on matters of frequency usage;
3. the need to select, for observatories, sites that are as remote as possible from sources of radio interference.

RECOMMENDATION No. 33

Relating to the Meteorological Aids Service in the band 27·5-28 MHz

The Administrative Radio Conference, Geneva, 1959,

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 co-ordination among administrations as appears necessary.

RECOMMENDATION No. 34

Relating to the Use of Radiotelegraph and Radiotelephone Links by Red Cross Organizations

The Administrative Radio Conference, Geneva, 1959,

considering

a) that the world-wide relief work of the Red Cross Organizations is of increasing importance particularly in the event of disasters, catastrophes, etc. ;

b) that in such circumstances normal communication facilities are frequently overloaded, damaged or even completely interrupted ;

c) that it is necessary to facilitate by all possible measures the rapid intervention of the Red Cross, national and international ;

d) that rapid and independent contact is essential to the intervention of the national Red Cross Societies (Red Crescent, Red Lion and Sun) ;

e) that for international relief work it is necessary that the national Red Cross Societies involved 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 ;

recommends

1. that administrations take account of the possible need of the Red Cross for rapid communication by radio when normal communication facilities are disrupted ;

2. that administrations study the possibility of assigning, for this purpose, at the upper or lower limits of the amateur bands, one or more common frequencies to stations of the Red Cross;

3. that the next Administrative Radio Conference should consider whether any further action is necessary.

RECOMMENDATION No. 35

Relating to the Practical Needs of Countries in Need of Special Assistance

The Administrative Radio Conference, Geneva, 1959,

recommends

1. that administrations of countries in need of special assistance should establish their own facilities for processing and adjusting quartz crystals, and obtain crystal-stabilized variable frequency oscillators to be employed as a temporary means of frequency control of their transmitters pending availability of crystals adjusted to precise operating frequencies. When assistance in this matter is requested, it should be provided through the appropriate technical assistance organs of the United Nations ;

2. that all administrations should make special efforts to co-operate 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 International Frequency Registration Board

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.

RECOMMENDATION No. 36

Relating to the Convening of an Extraordinary Administrative Radio Conference to allocate Frequency Bands for Space Radiocommunication Purposes

(Abrogated by Resolution No. Spa2-8)

RECOMMENDATION No. 37

Relating to a Study by a Panel of Experts of Measures to Reduce Congestion in the Bands between 4 and 27·5 MHz

(See Resolution No. 3)

The Administrative Radio Conference, Geneva, 1959,

noting

a) the trend towards congestion in the bands between 4 and 27·5 MHz;

b) the need to adopt new policies for the solution of the frequency problems confronting administrations in the use of these bands;

realizing

a) that, before administrations will be willing to undertake a programme to relieve congestion in the bands between 4 and 27·5 MHz, they will require a clear statement of the issues involved and of the measures that need to be taken;

b) that the ability of administrations to undertake such a programme is intimately linked to the financial implications involved;

considers

a) that the first step in the direction of reform should be a review of possibilities before taking the necessary policy decisions;

b) that this could best be done by a Panel of Experts convened for the sole purpose of devising ways and means of relieving the pressure on the bands concerned;

REC37-2

recommends

1. that a Panel of Experts should be convened for the sole purpose of devising ways and means to relieve the pressure on the bands between 4 and 27·5 MHz. This Panel should prepare a report on its work which should be submitted with a detailed and specific agenda which, when approved by the Administrative Council, would be the agenda for whatever body is to consider the policy decisions necessary to relieve the pressure on these bands ;

2. that the Panel meet in Geneva for a period of approximately 30 days in 1961 and approximately 30 days in 1962 ;

3. that each administration making one or more experts available be invited to make suitable arrangements for payment of the salaries of such experts ; these salaries shall not be a charge to the Union.

RECOMMENDATION No. Spa 1

Relating to the Calculation of Co-ordination Distance for Earth Stations

(Abrogated by Resolution No. Spa2-8)

RECOMMENDATION No. Spa 2

to the C.C.I.R. and to Administrations Relating to the Calculation of the Probability of Interference between Stations within Co-ordination Distance

(Abrogated by Resolution No. Spa2-8)

RECOMMENDATION No. Spa 3

to the C.C.I.R. and to Administrations Relating to Frequency Bands shared between Space and Terrestrial Services

(Abrogated by Resolution No. Spa2-8)

RECOMMENDATION No. Spa 4

to the C.C.I.R. Relating to the Study of Modulation Methods for Radio-Relay Systems in Relation to Sharing with Communication-Satellite Systems

The Extraordinary Administrative Radio Conference, Geneva, 1963,

considering

a) that Article 5 of the Radio Regulations permits the sharing of certain frequency bands by the communication-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 Article 7;

c) that among many factors of over-all efficiency of utilization of frequency bands it seems that the reduction of interference between two services is most important;

noting

a) that the over-all 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 communication-satellite systems are to be carried out under Study Programme 235D (IV) of the C.C.I.R.;

recommends

that the C.C.I.R. should study especially, under the general framework of Question 236 (IV), 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 communication-satellite systems.

RECOMMENDATION No. Spa 5

to the C.C.I.R. Relating to the Broadcasting-Satellite Service

The Extraordinary Administrative Radio Conference, Geneva, 1963,

considering

a) that the use of satellite transmissions for direct reception by the general public of sound and television broadcasts may be possible in the future;

b) that the C.C.I.R. is studying the technical feasibility of sound and television broadcasting from satellites, the technically suitable frequency bands for such a service, including the possibility of sharing with terrestrial services;

recommends

that the C.C.I.R. expedite its studies and make early recommendations on Question 241 (IV), Geneva, 1963, in particular, regarding those parts of the question relating to the technical feasibility of broadcasting from satellites, the optimum technical characteristics of the systems to be used, what bands would be technically suitable and whether and under what conditions those bands could be shared between the broadcasting-satellite and terrestrial services.

RECOMMENDATION No. Spa 6

Relating to the Frequency Requirements in the HF Bands Exclusively Allocated to the Aeronautical Mobile (R) Service

(Abrogated by Resolution No. Spa2-8)

RECOMMENDATION No. Spa 7

Relating to the Use of the Band 136-137 MHz by the Fixed and Mobile Services

The Extraordinary Administrative Radio Conference, Geneva, 1963,

considering

a) that the Table of Frequency Allocations, Geneva, 1959, made provisions for the fixed and mobile services together with space services in the band 136-137 MHz;

b) that a number of administrations have fixed and mobile services operating in accordance with these provisions;

c) that the modified Table of Frequency Allocations, Geneva, 1963, makes provision for the space research service on a primary basis in the band 136-137 MHz, and makes provision for the continued operation of the fixed and mobile services on a primary basis in this band;

d) the great importance of affording the space research service protection against interference from stations in the fixed and mobile services, taking into account the very weak signals which may be used in the space research service;

recommends

1. that administrations of all Regions operating, or intending to operate, stations in the fixed and mobile services in the band 136-137 MHz take all possible steps to give the required protection to the space research service and to cease the operation of stations of the fixed and mobile services as soon as possible;

2. that administrations notify the International Frequency Registration Board, preferably in advance, of the date when these stations will have ceased operations, and that specific reference should be made to this Recommendation;

and requests the International Frequency Registration Board

to publish this information every six months.

RECOMMENDATION No. Spa 8

Relating to the Need to Cease Operations of the Fixed and Mobile Services in the Bands 149·9-150·05 MHz and 399·9-400·05 MHz Allocated to the Radionavigation-Satellite Service

The Extraordinary Administrative Radio Conference, Geneva, 1963,

considering

a) that the frequency bands 149·9-150·05 MHz and 399·9-400·05 MHz have been allocated to the radionavigation-satellite service on an exclusive world-wide basis;

b) that many administrations require an extended period of time to re-accommodate existing fixed and mobile operations in other appropriately allocated bands;

c) that early implementation of the radionavigation-satellite service will be of benefit to all administrations, particularly in its application to marine navigation;

d) that interference to users of the radionavigation-satellite service could constitute a hazard to the safety of life and property;

e) that the C.C.I.R. is studying the feasibility of sharing frequency bands between the radionavigation-satellite service and terrestrial services but has not yet been able to reach a conclusion in this regard;

recommends

1. that, pending an affirmative determination by the C.C.I.R. that sharing is possible and practicable between stations of the radionavigation-satellite service and the fixed and mobile services, administrations take all possible steps to protect from harmful interference the operations of mobile earth stations using the radionavigation-satellite service;

2. that, in the light of 1) above, administrations be urged to cease operation of their fixed and mobile stations in the bands 149·9-150·05 MHz and 399·9-400·05 MHz as soon as practicable, with particular emphasis on those stations located in coastal areas.

RECOMMENDATION No. Spa 9

Relating to the Review of Progress in the Field of Space Radiocommunications

The Extraordinary Administrative Radio Conference, Geneva, 1963,

considering

a) that man is progressing rapidly in the conquest of outer space, that all nations will benefit, and that this progress depends upon efficient and orderly space communications;

b) that this Conference has taken the first steps in the field of development of space radiocommunications in having allocated frequency bands for space radiocommunications and having established technical criteria and frequency registration and notification procedures designed to facilitate the further development of space radiocommunications;

recognizing

a) that the development of space services will go on in parallel with the development of terrestrial communication systems;

b) that all Members of the Union have an interest in the rational use of frequency bands allocated for space communication services, in the avoidance of harmful interference to space and other services, and in the international regulation of the use of these frequency bands;

c) that the decisions of the Conference may be subject to increasing refinement and improvement by future Conferences of the Union;

d) that there will be available additional data relating to space radiocommunications resulting from further experimental and operational experience;

believing

that such refinement and improvement is in the best interests of all Members and Associate Members of the Union if the full benefits of new technology are to be realized;

recommends

1. that Members and Associate Members of the Union make available, to the appropriate permanent organs of the Union, pertinent

data resulting from experimental and operational experience relating to space radiocommunications, as well as their proposals concerning space radiocommunications;

2. that the Administrative Council of the Union should review annually the progress in space radiocommunications made by Administrations, and the available reports and recommendations of the permanent organs of the Union with respect thereto;

and further recommends

3. *(Abrogated by Resolution No. Spa2-8)*

4. *(Abrogated by Resolution No. Spa2-8)*

RECOMMENDATION No. Spa 10

Relating to the Utilization and Sharing of Frequency Bands Allocated to Space Radiocommunications

The Extraordinary Administrative Radio Conference, Geneva, 1963,

considering

Resolutions 1721 (XVI) part D and 1802 (XVII) part IV para. 3 of the General Assembly of the United Nations 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 recently expressed in the report prepared for Members and Associate Members of U.N.E.S.C.O. in accordance with the decision of the 12th session of its General Conference in December 1962;

recognizing

that all Members and Associate Members of the Union have an interest in and right to an equitable and rational use of frequency bands allocated for space communications;

recommends

to all Members and Associate Members of the I.T.U.

that the utilization and exploitation of the frequency spectrum for space communications be subject to international agreements based on principles of justice and equity permitting the use and sharing of allocated frequency bands in the mutual interest of all nations.

RECOMMENDATION No. Spa 11

Relating to the Radio Astronomy Service

The Extraordinary Administrative Radio Conference, Geneva, 1963,

considering that

a) by definitions 74, 75 and 75A in Article 1 of the Radio Regulations, 1959, Radio Astronomy is a service using reception only;

b) research in Radio Astronomy is conducted with the use of receiving equipment of the highest attainable sensitivity;

c) at the Extraordinary Administrative Radio Conference, Geneva, 1963, considerable recognition was given to the needs of the Radio Astronomy service;

d) in addition to the exclusive allocation of one band on a worldwide basis, some administrations have been able to provide exclusive frequency allocations for Radio Astronomy in some other bands;

e) the greatest practicable protection from interference is essential to the advancement of the science of Radio Astronomy;

recommends that

1. the next Ordinary Administrative Radio Conference should give further consideration to the provision of improved frequency allocations for Radio Astronomy;

2. in the meantime, administrations should afford all practicable protection to the frequencies now allocated to Radio Astronomy on a shared basis with other radio services.

RECOMMENDATION No. Aer 1

relating to the development of techniques which would help to reduce congestion in the high frequency bands allocated to the aeronautical mobile (R) service

The Extraordinary Administrative Radio Conference, Geneva, 1966,

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 remotely controlled VHF stations, high-powered VHF transmitters employing 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 (I.C.A.O.) is actively engaged in coordinating the operational use of such techniques ;

invites

administrations engaged in such developments to inform the I.F.R.B. periodically of the progress achieved ;

requests

the I.F.R.B. periodically to circulate the information so obtained to administrations and to I.C.A.O.

RECOMMENDATION No. Aer 2

relating to a study of the utilization of space communication techniques in the aeronautical mobile (R) service

The Extraordinary Administrative Radio Conference, Geneva, 1966,

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 and 27·5 MHz; and

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 and 27·5 MHz;

b) that tests have demonstrated the capability of effecting communication between aircraft and aeronautical stations by relay via a stationary satellite ;

c) that the state of the art in space radiocommunication techniques is rapidly advancing ;

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 (I.C.A.O.) is the international body primarily concerned with the establishment of standards and recommended practices governing communication systems and techniques used to support international civil aviation ; and that Organization has included the subject of space radiocommunication techniques on the agenda of its Communications/Operations Divisional Meeting scheduled to convene in October 1966 ;

h) that the C.C.I.R. has a Study Group on Space Systems and Radioastronomy as well as a Study Group on Mobile Services and that close co-ordination of the work of the C.C.I.R. and I.C.A.O. in this field is desirable ;

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 ; and

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. Aer 2

(*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 space radiocommunication techniques by the aeronautical mobile (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 of aeronautical (R) 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 aeronautical (R) station (terminal) facilities.

d) Need for a selective calling system (SELCAL).

e) Other considerations.

4. Method of operation and location of aeronautical (R) 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 aeronautical (R) 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 aeronautical (R) 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 relaychannels 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. Mar 1

Relating to a Reprint of the Radio Regulations and of the Additional Radio Regulations

(Abrogated by Resolution No. Mar2-1)

RECOMMENDATION No. Mar 2

Relating to a Regrouping of the Radio Regulations and the Additional Radio Regulations appertaining to the Maritime Mobile Service

The World Administrative Radio Conference, Geneva, 1967,

in view of

the terms of Administrative Council Resolutions Nos. 522, 549 and Decision No. 346 relating to a possible revision of the structure of the Radio Regulations and the Additional Radio Regulations;

considering

a) that it is desirable that those provisions of the Radio Regulations and of the Additional Radio Regulations which relate to the maritime mobile service be segregated from those relating to other services and regrouped in logical sequence;

b) that the Administration of the United Kingdom of Great Britain and Northern Ireland submitted to the present Conference in Document No. 117 a proposal for regrouping the provisions of the Radio Regulations and of the Additional Radio Regulations relating to the maritime mobile service, but that time did not permit its detailed examination;

c) that it is in general very difficult for a conference of limited duration, charged with the revision of the substance of only part of the Regulations, to undertake at a sufficiently early stage in its work a revision of the order in which they are arranged;

recommends

1. that the Administrative Council should bear in mind:

   a) the desirability of including a regrouping of the Radio Regulations and of the Additional Radio Regulations relating to the maritime

mobile service in the agenda of the first World Administrative Radio Conference at which, in the Council's opinion, it would be practicable to undertake this task; and

b) in particular, the possibility that it might be included in the agenda of the Conference referred to in Recommendation No. Mar 6 of the present Conference;

2. that the Secretary-General should ask all administrations to take the present Recommendation into account in connection with any studies they may be making in accordance with Administrative Council Decision No. 346;

requests

the Secretary-General and the I.F.R.B. also to study this question and to submit their suggestions to administrations in due time.

RECOMMENDATION No. Mar 3

Relating to the Utilization of Space Communication Techniques in the Maritime Mobile Service

The World Administrative Radio Conference, Geneva, 1967,

considering

a) the efforts of the International Telecommunication Union to reduce congestion in the frequency bands available to the maritime mobile service;

b) the fact that ships at sea are completely dependent upon the use of radio for communication; and

c) the potential value of adapting satellite relay techniques to the communication requirements of the maritime mobile service;

noting

a) that limited tests have demonstrated the feasibility of effecting communications between ships and coast stations by means of relaying through a stationary satellite;

b) that no provision is made for the use of space communication techniques in any of the frequency bands at present allocated to the maritime mobile service;

c) that the frequencies available to the maritime mobile service by virtue of Appendix 18 to the Radio Regulations are technically suitable for the use of space communication techniques, but that the congestion foreseen from terrestrial maritime mobile usage, even after implementation of reduced channel spacing, is expected to preclude the accommodation of an operational system employing space communication techniques;

d) that the Inter-Governmental Maritime Consultative Organization (I.M.C.O.) has undertaken a study of the requirements for maritime safety

and navigation that may be satisfied by utilization of space communication techniques;

e) that the C.C.I.R. has a study group on space systems and radio-astronomy as well as a study group on mobile services and that close co-ordination of the work of the C.C.I.R. and I.M.C.O. in these fields is desirable; and

f) that the Scientific and Technical Sub-Committee of the United Nations Committee on the Peaceful Use of Outer Space has also established a working group which is studying the need for, the feasibility and ways and means of establishing a navigation satellite system;

invites administrations

to determine the foreseeable operational requirements of the maritime mobile service that can be accommodated by means of space communication techniques;

invites the Inter-Governmental Maritime Consultative Organization

to continue to study the requirements and other considerations where benefit may accrue to the safety and navigation of ships at sea through application of space communication techniques;

invites the C.C.I.R.

to study the technical aspects of systems which offer the potential of fulfilling these maritime requirements and to recommend a practical system with particular attention to the environment in which ships operate;

and invites both administrations and the C.C.I.R.

to consider in these studies a technically suitable frequency band higher in the spectrum than band 8 and of sufficient bandwidth to accommodate the overall needs of the maritime mobile service. In this connection, particular attention may be given to bands 9 and 10 for the link between the mobile station and the relaying satellite.

RECOMMENDATION No. Mar 4

Relating to Transmission by Television of Port Radar Images to Ships

(Abrogated by Resolution No. Mar2-1)

RECOMMENDATION No. Mar 5

Relating to the Designation of Common Frequencies in the Medium Frequency Bands for Use by Coast Radiotelephone Stations for Communicating with Ships of other Nationalities

The World Administrative Radio Conference, Geneva, 1967,

noting

a) that, on small ships fitted with single sideband equipment, a crystal-controlled fixed frequency receiver is essential to facilitate correct tuning;

b) that, if such ships make international voyages and communicate with coast stations of other nationalities, they need to be provided with a considerable number of additional crystals;

c) that, by reducing the number of receiver crystals required, the cost of single sideband receivers can be kept to a satisfactory level;

considering

a) that international working frequencies should be assigned to all coast stations for working with ships of other nationalities, without precluding their use for national purposes;

b) that, according to the Master International Frequency Register, no frequencies appear to be available for common use by all coast stations for working with ships of other nationalities, either on a world-wide or on a regional basis;

recommends

1. that administrations study this question at the earliest opportunity with a view to formulating proposals for consideration by the next Administrative Radio Conference competent to deal with the matter;

2. that, in the meantime, countries should explore the possibility of concluding regional, bilateral or multilateral arrangements to provide common frequencies for coast stations working with ship stations of other nationalities.

RECOMMENDATION No. Mar 6

Relating to the Preparation of a new Frequency Allotment Plan for High Frequency Coast Radiotelephone Stations

The World Administrative Radio Conference, Geneva, 1967,

considering

a) that the present Frequency Allotment Plan for coast radiotelephone stations contained in Appendix 25 to the Radio Regulations, Geneva, 1959, was initially prepared by the Provisional Frequency Board in the years from 1948 to 1950 and was subject to amendments by the Extraordinary Administrative Radio Conference, Geneva, 1951, and by the Administrative Radio Conference, Geneva, 1959;

b) that the Plan has already been implemented to a great extent, this being illustrated by the assignments, corresponding to allotments, recorded in the Master International Frequency Register;

c) that a number of additional assignments has also been recorded in the Master Register;

d) that the introduction of single sideband technique in the maritime high frequency radiotelephone bands has already started on the basis of the provisions of Appendix 17 to the Radio Regulations, Geneva, 1959, and that the conversion from double sideband to single sideband will continue, guided by the time-table and the supplementary technical specifications adopted by the present Conference;

e) that double sideband operation in the frequency bands concerned will continue until 1 January 1972 for coast stations and 1 January 1978 for ship stations;

f) that the Conference has decided to create as from 1 March 1970, new high frequency duplex radiotelephone channels to be used in accor-

dance with the provisions of Resolution No. Mar 15, to include such new channels in Appendix 17 to the Radio Regulations and, without allotting them to countries, in Section III of Appendix 25 MOD;

g) that it was found impracticable for the present Conference to prepare a new Frequency Allotment Plan, but it was found necessary that such a Plan be prepared by a subsequent conference;

h) that it is desirable to have in advance of that conference proposals for the technical bases for the establishment of a frequency allotment plan;

in view of

the provisions of Nos. **60** and **61** of the International Telecommunication Convention, Montreux, 1965;

recommends

1. that a World Administrative Radio Conference be convened:

1.1 to establish on the basis of single sideband operation a new Frequency Allotment Plan for high-frequency radiotelephone coast stations, covering the channels in the present Appendix 25 as well as the new channels referred to in *f)* above;

1.2 to amend the associated provisions of the Radio Regulations;

2. that such a conference be convened in 1973;

3. that the Administrative Council determine the exact date and place of such a conference, in accordance with No. **64** of the International Telecommunication Convention, Montreux, 1965;

4. that this conference be preceded by a preparatory meeting, in accordance with No. **73** of that Convention.

RECOMMENDATION No. Mar 7

Relating to Harmonic Relationship and Channel Spacing in the High Frequency Bands used by Ship Stations for Radiotelegraphy

(Abrogated by Resolution No. Mar2-1)

RECOMMENDATION No. Mar 8

Relating to the Study of a Selective Calling System for future operational Requirements of the Maritime Mobile Service

(Abrogated by Resolution No. Mar2-1)

RECOMMENDATION No. Spa2 – 1

Relating to the Examination by World Administrative Radio Conferences of the Situation with Regard to Occupation of the Frequency Spectrum in Space Radiocommunications

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

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;

g) that despite the provisions of Article 9A of the Radio Regulations and the principles adopted by this Conference, which provide for full consultation and co-ordination between administrations with a view to the optimum accommodation of all space systems, it is possible that as the use of frequencies and orbital positions increases, administrations may encounter

undue difficulty in one or more frequency bands in meeting their requirements for space radiocommunication;

recommends

that the next appropriate 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 a situation 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. Spa2 – 2

Relating to the preferred Frequency Bands for Tropospheric Scatter Systems

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

considering

the technical and operational difficulties pointed out by the C.C.I.R., particularly in the Report of the Special Joint Meeting (Geneva, 1971) in bands shared by tropospheric scatter systems and space systems;

recognizing, however,

that administrations will wish to continue to use tropospheric scatter systems in order to satisfy certain telecommunication requirements;

noting

that the proliferation of such systems in all frequency bands, particularly those shared with space systems, will only serve to aggravate an already difficult situation;

requests

that the C.C.I.R. urgently study the radio-frequency requirements for tropospheric scatter systems and recommend the preferred radio frequencies for such systems;

invites the Administrative Council

to arrange that a future World Administrative Radio Conference consider which frequency bands of the fixed service shall be preferably used by new tropospheric scatter systems, taking into account the allocations to the space radiocommunication services.

RECOMMENDATION No. Spa2 – 3

Relating to the future Use of Bands allocated to the Inter-Satellite Service

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

considering

a) that the bands 54·25 - 58·2 GHz, 59 - 64 GHz, 105 - 130 GHz, 170 - 182 GHz and 185 - 190 GHz have been allocated to the inter-satellite service;

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

and recognizing

that the inter-satellite and terrestrial radiocommunication services are protected from mutual interference by the attenuation due to atmospheric absorption;

recommends

that a future World Administrative Radio Conference should consider allocating these bands also to terrestrial radiocommunication (except the aeronautical mobile) services.

RECOMMENDATION No. Spa2 – 4

Relating to the future Use of certain Frequency Bands between 40 and 275 GHz

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

considering

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

— aeronautical mobile-satellite

— maritime mobile-satellite

— aeronautical radionavigation-satellite

— maritime radionavigation-satellite;

recognizing

that it is not desirable for compatibility considerations that at a later date these bands should be shared with terrestrial radiocommunication services other than the aeronautical and maritime mobile services and/or the aeronautical and maritime radionavigation services;

recommends

that a future competent World Administrative Radio Conference should consider allocating, in addition, the 43 - 48 GHz, 66 - 71 GHz, 95 - 101 GHz, 142 - 150 GHz, 190 - 200 GHz and 250 - 265 GHz bands to the following services:

— aeronautical mobile

— maritime mobile

— aeronautical radionavigation

— maritime radionavigation

in an appropriate manner.

RECOMMENDATION No. Spa2 – 5

Relating to the future Use of the 41 - 43 GHz Band by the Fixed and Mobile Services

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

considering

that the 41 - 43 GHz band has been allocated to the broadcasting-satellite service;

recognizing

that it is possible, by appropriate co-ordination, for a frequency band to be shared by the broadcasting-satellite service, on the one hand, and the fixed and mobile services, on the other;

recommends

that a future competent World Administrative Radio Conference should consider allocating, in addition, the 41 - 43 GHz band to the fixed and mobile services.

RECOMMENDATION No. Spa2 – 6

Relating to future Frequency Allocation Requirements for the Maritime Mobile-Satellite Service

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

having noted

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

further noting

that the C.C.I.R. Special Joint Meeting (Geneva, 1971) concluded that the present Conference should be invited to examine the possibility of providing exclusive channels for the maritime mobile-satellite service at about 400 MHz and that provision of such channels is desirable;

considering

a) that ship stations and survival craft stations are completely dependent upon the use of radio for communication;

b) that the use of space techniques will provide the maritime mobile service with a reliable and more efficient method of communication;

c) that reliable maritime mobile-satellite service communications will greatly assist in the saving of lives and property;

d) that although the Conference has made certain provisions for the maritime mobile-satellite service, there is some uncertainty with respect to the adequacy and usefulness of these provisions, particularly insofar as small ships and survival craft are concerned;

e) that general participation of small ships in a service using space techniques would not only benefit the efficient and safe operation of these ships but would also improve the safety service for larger ships and survival craft;

f) that future conferences might find it necessary to make additional allocations for such uses nearer to the optimum portions of the spectrum;

g) that for some communications functions, such as certain broadcasting and fixed applications, other means than radio could be used, thereby making portions of the spectrum available for services which are dependent on radio;

recommends

1. that administrations and appropriate international organizations continue to review the requirements for the maritime mobile-satellite service and the suitability of current frequency allocations in meeting those requirements;

2. that the C.C.I.R. continue its studies to determine the optimum portions of the frequency spectrum and related sharing conditions to accommodate maritime mobile-satellite service requirements, taking into consideration advances in space radiocommunication technology;

3. that a competent World Administrative Radio Conference review the requirements of the maritime mobile-satellite and safety services, and if necessary, provide the frequency allocations to satisfy these requirements.

RECOMMENDATION No. Spa2 – 7

Relating to the future Provision of a Band near 10 MHz for the Radio Astronomy Service

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

considering

a) the requirements of the radio astronomy service, as expressed by the Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science (I.U.C.A.F.), for a frequency allocation near 10 MHz;

b) that the use of the standard frequency guard bands has not satisfied the needs of the radio astronomy service at a frequency near 10 MHz;

c) that propagation conditions at a frequency near 10 MHz are such that a transmitter operating anywhere on the Earth might cause interference to the radio astronomy service and as a consequence an exclusive world-wide allocation is necessary for long term observations;

d) that successful radio astronomy measurements have, at times, been made at frequencies near 10 MHz;

e) that I.U.C.A.F. is co-ordinating the needs of radio astronomers for frequency allocations;

recommends

1. that administrations keep under review the possibility of releasing a band of frequencies 50 kHz wide for the use of the radio astronomy service between 10 MHz and 15 MHz;

2. that administrations give close attention to any future recommendation of the I.U.C.A.F. concerning the specific frequency band between 10 MHz and 15 MHz required by the radio astronomy service;

3. that a future World Administrative Radio Conference consider granting to the radio astronomy service an exclusive allocation in this region of the spectrum.

RECOMMENDATION No. Spa2 – 8

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

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

considering

a) that radio astronomy observations at frequencies below the ionospheric critical frequencies and above 100 GHz are hampered or prevented by absorption in the Earth's atmosphere;

b) that successful radio astronomy observations require complete freedom from harmful interference;

c) that the shielded area of the Moon offers unique opportunities for observations which are not affected by such absorption;

d) that the shielded area of the Moon appears to be the potentially most useful area accessible to man which is completely free from interference from terrestrial transmissions;

e) that the shielded area of the Moon refers to the area of the Moon which is more than 23·2° beyond the mean limb of the Moon as seen from the centre of the Earth;

f) that the transmissions by radio of data from observation stations to collection points will be in the frequency bands allocated for this purpose;

noting

the desirability of maintaining the shielded area of the Moon as an area of maximum value for observations by the radio astronomy service and by passive space research and consequently as free as possible from transmissions;

recommends

1. that the C.C.I.R. study the frequency bands most suitable for radio astronomy observations on the shielded area of the Moon and work out recommendations concerning these bands as well as criteria for their application and protection;

2. that in the meantime, administrations, in accordance with the intent of this Recommendation, take all practicable steps to ensure that there will be no interference to radio astronomy observations on the shielded area of the Moon; and

3. that administrations apply such Recommendations as may be provided on this matter by the C.C.I.R. pending the convening of the next World Administrative Radio Conference.

RECOMMENDATION No. Spa2 – 9

Relating to the Co-ordination of Earth Stations

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

considering

a) that under the terms of Article 9A of the Radio Regulations, frequency assignments to earth stations in certain bands shared with equal rights between terrestrial radiocommunication services and space radiocommunication services must be co-ordinated with a view to preventing mutual harmful interference;

b) that the calculation method described in Appendix 28 to the Radio Regulations applies solely to frequencies in the 1 - 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 C.C.I.R.

to continue as a matter of urgency its study:

— 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;

— of the formulation of calculation methods for determining the co-ordination 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:

— any C.C.I.R. Recommendation, if applicable, for the values missing from Tables I and II of Appendix 28 to the Radio Regulations;

— the methods of determining the co-ordination area for frequencies below 1 GHz and above 40 GHz, which may be the subject of a C.C.I.R. Recommendation.

RECOMMENDATION No. Spa2 – 10

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

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

considering

a) that, within the band 620 - 790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service;

b) that it is necessary to have a power flux density limit which will provide adequate protection to the terrestrial broadcasting service;

taking into account

a) that the conclusions of the Special Joint Meeting of the C.C.I.R. (Geneva, 1971), indicated that the following power flux density limits are necessary to protect the terrestrial broadcasting service:

-121 dBW/m^2	$\delta \leqslant 20°$
$-121 + 0{\cdot}4\,(\delta - 20)$ dBW/m^2	$20° < \delta \leqslant 60°$
-105 dBW/m^2	$60° < \delta \leqslant 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

b) that additional tests carried out by one administration after the Special Joint Meeting of the C.C.I.R., indicated that the following more conservative power flux density limits may be necessary:

-130 dBW/m^2	$\delta \leqslant 20°$
$-130 + 0{\cdot}4\,(\delta - 20)$ dBW/m^2	$20° < \delta \leqslant 60°$
-114 dBW/m^2	$60° < \delta \leqslant 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

c) that additional information is required on the protection ratio for interference from an FM television signal into a VSB television signal for both the 625- and 525-line systems;

d) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in C.C.I.R. Recommendation 417-2;

e) that account may have to be taken of ground reflections;

f) that energy dispersal techniques may reduce the required protection ratio and should be used if shown to be effective;

recommends

1. that in view of the absence of sufficient information on tests under operational conditions and in order to provide sharing criteria, on a provisional basis, the maximum power flux density produced at the surface of the Earth within the service area of a terrestrial broadcasting station (see C.C.I.R. Recommendation 417-2), by a space station in the broadcasting-satellite service in the band 620 - 790 MHz should not exceed:

-129 dBW/m^2	$\delta \leqslant 20°$
$-129 + 0{\cdot}4\,(\delta - 20)$ dBW/m^2	$20° < \delta \leqslant 60°$
-113 dBW/m^2	$60° < \delta \leqslant 90°$

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 C.C.I.R. urgently study the sharing criteria to be applied to frequency sharing between the broadcasting-satellite service and the terrestrial broadcasting service in the band 620 - 790 MHz and prepare a Recommendation on power flux densities to be used in lieu of the above provisional limits;

5. that in its studies the C.C.I.R. consider in particular the following aspects:

5.1 the required protection ratio for both 525- and 625-line systems for interference from an FM television signal into a VSB television signal;

5.2 the minimum field strength to be protected for the terrestrial television service taking into account the current state of the art;

5.3 the effect of ground reflections;

5.4 the number of broadcasting satellites that may be visible from a terrestrial broadcasting receiver;

5.5 the effect of polarization discrimination;

5.6 the effect of antenna directivity;

6. that in its studies the C.C.I.R. should consider the advantages of energy dispersal techniques in the broadcasting-satellite service (television).

RECOMMENDATION No. Spa2 – 11

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

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

considering

a) that use of carrier energy dispersal techniques in systems in the fixed-satellite service can result in a substantial reduction of interference to stations of a terrestrial service operating in the same frequency bands;

b) that the use of such techniques can result in a substantial reduction in the level of interference between systems in the fixed-satellite service operating in the same frequency bands;

c) that such techniques are being regularly and successfully employed in systems in the fixed-satellite service without noticeable deterioration of the quality of operation;

recommends

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

2. that systems in the fixed-satellite service employing digital modulation should use carrier energy dispersal techniques when this becomes technically feasible and is practical.

RECOMMENDATION No. Spa2 – 12

Relating to Technical Standards for the Assessment of harmful Interference in the Frequency Bands above 28 MHz

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

considering

a) that the definition of harmful interference (No. **93** of the Radio Regulations), being of a qualitative nature, leads to a purely subjective estimation of the nuisance;

b) that, for the accomplishment of its regulatory tasks, the I.F.R.B. has adopted in its technical standards, for the frequency bands below 28 MHz, values for the ratio between the wanted signal and the interfering signal, below which harmful interference may be expected;

c) that "harmful interference" implies a considerable degree, or probability, of interference;

d) that, as a consequence, it is desirable to determine the level of interference by which any emission, radiation or induction affects a radiocommunication service beyond specific limits established to ensure the quality and reliability of performance required by the nature of the service;

e) that the assessment of interference levels is related to various factors such as the nature of the services concerned, number of interference sources, percentages of time during which the interfering signal affects the wanted signal;

and noting

a) that the I.F.R.B. has been considering the maximum allowable values of interference given in the pertinent C.C.I.R. Recommendations to be values which ensure a satisfactory service;

b) that, however, the I.F.R.B. does not possess data on the extent to which these recommended values and the associated percentages of time may be exceeded without affecting a service beyond the specific limits established to ensure the quality and reliability of performance required by the nature of the service;

invites the C.C.I.R.

to study this subject and to recommend the technical criteria for the frequency bands above 28 MHz, allocated to space radiocommunication, radio astronomy, and the terrestrial radiocommunication services concerned, in order to enable the I.F.R.B. and administrations to apply such criteria for these bands;

and invites the I.F.R.B.

to publish, for the information of administrations, its technical standards based upon the relevant provisions of the Radio Regulations and Appendices thereto, the decisions of Administrative Conferences of the Union as appropriate, the Recommendations of the C.C.I.R., the state of the radio art, and the development of transmission techniques.

RECOMMENDATION No. Spa2 – 13

Relating to the Use of Space Radiocommunication Systems in the Event of natural Disasters, Epidemics, Famines and similar Emergencies

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

considering

a) that in the case of natural disasters, epidemics, famines and similar emergencies lives can be saved by prompt and effective relief;

b) that rapid and reliable telecommunications are essential for relief operations;

c) that, through damage or from other causes, the normal telecommunications facilities in disaster areas are often inadequate for relief operations and cannot be restored or supplemented quickly through local resources;

d) that use of space radiocommunication systems is one of the means by which rapid and reliable telecommunications could be provided for relief operations;

noting

a) that known planning of space radiocommunication systems makes no provision for specific frequencies or channels for emergency communications;

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

recommends

1. that administrations, individually or in collaboration, provide for the needs of eventual relief operations in planning their space radiocommunication systems and identify for this purpose preferred radio-frequency channels and facilities which could quickly be made available for relief operations;

2. that administrations concerned waive the coordination procedures provided for in the Radio Regulations in the case of transportable earth stations used for relief operations;

invites

the C.C.I.R. to study standard specifications and preferred frequencies for transportable earth stations and for compatible mobile and transportable fixed radiocommunications equipment for relief operations;

requests

the Secretary-General to bring this Recommendation to the attention of the United Nations, the Specialized Agencies, and other International Organizations concerned, in order to ensure full cooperation in the implementation of this Recommendation.

RECOMMENDATION No. Spa2 – 14

Relating to a revised Presentation of the Sections of Article 1 of the Radio Regulations

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

considering

a) that, as a result of the amendments made to Article 1 of the Radio Regulations, the terms specified in that Article are no longer arranged in logical order;

b) that it would therefore be desirable to rearrange Article 1 of the Radio Regulations in a more appropriate form;

recognizing

that this Conference was unable to perform this task;

recommends

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

* * *

ANNEX TO RECOMMENDATION No. Spa2 – 14

ARTICLE 1

Section I. General Terms

Section II. Radio Systems

Section III. Radio Services and Stations

Sub-Section IIIA. Terrestrial Radiocommunication

Sub-Section IIIB. Space Radiocommunication

Sub-Section IIIC. Radio Astronomy

Section IV. Technical Characteristics

RECOMMENDATION No. Spa2 – 15

To the C.C.I.R. and to Administrations relating to Frequency Bands shared between Space Radiocommunication Services and between Space and Terrestrial Radiocommunication Services

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

recognizing

a) the value to the Conference of the material contained in Document No. 64 (results of C.C.I.R. studies relating to space telecommunications concluded at its Special Joint Meeting, Geneva, 1971);

b) that further studies on a wide range of problems dealing with space radiocommunications form the subject of C.C.I.R. Questions and Study Programmes approved by the XIIth Plenary Assembly;

considering however

a) that certain C.C.I.R. Recommendations, listed below, call for further work and study:

Recommendation 355-1	"FREQUENCY SHARING BETWEEN ACTIVE COMMUNICATION-SATELLITE SYSTEMS AND TERRESTRIAL RADIO SERVICES IN THE SAME FREQUENCY BANDS"
Recommendation 465	"GENERALIZED EARTH-STATION ANTENNA RADIATION PATTERN FOR USE IN INTERFERENCE CALCULATIONS, INCLUDING COORDINATION PROCEDURES, IN THE FREQUENCY RANGE 2-10 GHz"

Recommendation 466 "COMMUNICATION-SATELLITE SYSTEMS FOR TELEPHONY USING FREQUENCY-DIVISION MULTIPLEX. MAXIMUM ALLOWABLE VALUES OF INTERFERENCE IN A TELEPHONE CHANNEL OF A GEOSTATIONARY COMMUNICATION-SATELLITE SYSTEM EMPLOYING FREQUENCY MODULATION, CAUSED BY OTHER GEOSTATIONARY COMMUNICATION-SATELLITE SYSTEMS"

b) that as a result of the deliberations of this Conference, particularly in relation to the provisions of Article 7, Sections VII, VIII and IX, and to other relevant Articles of the Radio Regulations, further information is required to reply to the following current Questions and Study Programmes of the C.C.I.R.:

Question 1-1/4 "ANTENNAE FOR SPACE SYSTEMS"

under Decides 2: the state of development in antenna design and fabrication;

under Decides 3: the state of development of antennae with improved side- and back-lobe characteristics;

under Decides 4: the polarization characteristics of antennae, particularly in the side-lobe regions and in planes other than the principal planes.

Question 2-1/4 "TECHNICAL CHARACTERISTICS OF COMMUNICATION-SATELLITE SYSTEMS FOR FIXED AND MOBILE, EXCLUDING AERONAUTICAL AND MARITIME MOBILE, SERVICES"

under Decides 3: under what conditions and to what extent would it be feasible for communication-satellites, operating in the same system or operating in different systems, to share preferred frequency bands;

under Decides 4: under what conditions and to what extent would it be feasible for communication-satellite systems to share preferred frequency bands with terrestrial services.

Study Programme 2-1A-1/4 "FEASIBILITY OF FREQUENCY SHARING BETWEEN COMMUNICATION-SATELLITE SYSTEMS AND TERRESTRIAL SERVICES"

under Decides 2: the determination of the preferred technical characteristics of transmitting and receiving antennae for earth stations at fixed locations, from the standpoint of spectrum sharing with other radio services.

Study Programme 2-1C/4 "COMMUNICATION-SATELLITE SYSTEMS. FEASIBILITY OF FREQUENCY SHARING AMONG COMMUNICATION-SATELLITE SYSTEMS"

under Decides 1: the criteria which affect interference among communication-satellites in a given system and between communication-satellite systems, taking into account the two directions of transmission;

under Decides 2: the preferred technical characteristics of transmitting and receiving antennae for earth stations, from the standpoint of frequency sharing within the same system and with other communication-satellite systems.

Study Programme 2-1J/4 "COMMUNICATION-SATELLITE SYSTEMS. TECHNICAL FACTORS INFLUENCING THE EFFICIENCY OF USE OF THE GEOSTATIONARY SATELLITE ORBIT BY COMMUNICATION-SATELLITES SHARING THE SAME FREQUENCY BANDS"

under Decides 1: the technical characteristics of communication-satellite systems which affect the utilization of the geostationary satellite orbit, and the inter-relationships between them;

under Decides 3: the extent to which it may be feasible and desirable to adopt preferred technical characteristics for different geostationary communication-satellites and earth stations;

under Note 1: Some of the factors which should be taken into account in carrying out these studies:

— the tolerable levels of interference noise in different communication-satellite systems;

— the radiation patterns of the earth station and satellite antennae;

— factors affecting the multiple use of the same frequencies within a single communication satellite;

— polarization discrimination;

c) that it would be useful to have a clear definition of the term "system noise temperature";

d) that it would be useful to have clear definitions of the terms "acceptable (or unacceptable) interference" and "harmful interference" for the space radiocommunication, radio astronomy, and terrestrial radiocommunication services;

e) 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;

f) that frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) has been adopted in the frequency band 14·0 to 14·3 GHz, and between the radionavigation-satellite service and the fixed-satellite service (Earth-to-space) in the frequency band 14·3 to 14·4 GHz;

recommends

1. that administrations, recognized private operating agencies, and other participants in the work of the C.C.I.R., consider as a matter of priority, the submission of contributions on these subjects, so that draft Recommendations on them can be prepared at the meetings of the relevant Study Groups for consideration by the Plenary Assembly of the C.C.I.R.;

2. that the C.C.I.R. 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 the present Conference, in order to permit the determination of:

2.5.1 the co-ordination distance and the probability of interference between stations within that distance;

2.5.2 the necessary limits of power flux density set up at the Earth's surface by space stations;

2.6 the maximum 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 co-ordination 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 the present Conference with a view to issuing appropriate Recommendations as soon as possible so that administrations and the International Frequency Registration Board shall have the necessary technical data required to carry out examination procedures, in particular regarding Articles 9 and 9A of the Radio Regulations and those in Resolution No. Spa2 – 3;

2.11 the term "system noise temperature" with a view to formulating a clear definition of this term applicable to space radiocommunication systems;

2.12 the terms "acceptable (or unacceptable) interference" and "harmful interference" with a view to formulating clear definitions appropriate to the radio astronomy service and to the various space radiocommunication and terrestrial radiocommunication services;

2.13 the power flux densities required for individual and community reception in the broadcasting-satellite service, with a view to specifying numerical values which will differentiate between these types of reception;

2.14 the criteria for frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) in the frequency band 14·0 to 14·3 GHz and between the radionavigation-satellite service and the fixed-satellite service (Earth-to-space) in the frequency band 14·3 to 14·4 GHz.

RECOMMENDATION No. Mar2 – 1

Relating to the Use of Low Power Radiolocation Stations in the Bands between 1 605 and 2 850 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that in many coastal areas there is an increasing need for short-range radiolocation facilities providing an accuracy of a few metres;

b) that, for physical reasons and in view of the multi-user mode of operation required, this need can best be met in the frequency bands between 1 605 and 2 850 kHz;

c) that these radiolocation stations require low powers, narrow bandwidths and small portions of the frequency spectrum widely spread over the bands mentioned so as to accommodate several stations in the same area;

d) that owing to the present provisions of the Table of Frequency Allocations many of these stations are only able to operate subject to the uncertainties arising from No. **115** of the Radio Regulations;

e) that the present Conference is not in a position to alter this situation;

invites administrations

1. to study the possibility of affording adequate protection for low power radiolocation stations operating in coastal areas, e.g. by providing a limited number of specific frequencies for this purpose in the bands between 1 605 and 2 850 kHz;

2. to submit proposals on this matter for consideration by the next appropriate World Administrative Radio Conference;

recommends

that in the meantime countries should explore the possibility of concluding bilateral, multilateral or regional arrangements to provide adequate protection for these stations.

RECOMMENDATION No. Mar2 – 2

On the Choice of a Frequency in the Mobile Maritime Bands between 1 605 and 3 800 kHz to be reserved for Safety Requirements

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that MF radiotelephony is of increasing usefulness for the safety of ships since:

i) the International Convention on Safety of Life at Sea (London, 1960) requires that cargo ships of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage, unless fitted with a radiotelegraph station, shall be fitted with a radiotelephone station;

ii) the Inter-Governmental Maritime Consultative Organization recommends[1] that ships compulsorily fitted with either a radiotelegraph (i.e. 1,600 tons gross tonnage and upwards) or a radiotelephone installation shall have in addition facilities for listening continuously, while at sea, on the radiotelephone distress frequency; that the fitting of radiotelegraph ships with a radiotelephone transmitter capable of operating in the 2 MHz band should be encouraged; and that each administration should consider introducing a national requirement that ships to which the Convention on Safety of Life at Sea (London, 1960) does not apply should be fitted with a radiotelephone distress frequency watch receiver;

b) that, notwithstanding, in many areas the watch on the MF radiotelephone distress frequency is very difficult because of the large number of routine traffic calls sent on that frequency;

---

[1] Resolution A.217 (VII).

c) that similar difficulties would occur even if watch and alarm systems more advanced than those used at present were adopted;

d) that in some areas MF radiotelephone traffic is constantly increasing;

requests

the C.C.I.R. to undertake, as a matter of urgency, the study of the technical and operational aspects of these matters;

recommends

that the next appropriate World Administrative Radio Conference determine, in the light of the results of the work of the C.C.I.R.:

a) a frequency reserved for transmitting – to the exclusion of any routine traffic calls – distress calls and messages and, possibly, urgency signals and messages, safety signals and certain safety messages;

b) a frequency, different from the preceding, for voice or selective calling for routine traffic;

c) suitable guard-bands for both these frequencies.

RECOMMENDATION No. Mar2 – 3

Relating to the Improvement of the Present Use by the Maritime Mobile Service of the Bands between 1 605 and 4 000 kHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the present distribution of frequencies to stations of the maritime mobile service in the bands betwenn 1 605 and 4 000 kHz derives its origin from the Plans and Lists adopted by the Extraordinary Administrative Radio Conference, Geneva, 1951, but that, since 1959, the assignment of frequencies to such stations is governed by the procedure of Article 9 of the Radio Regulations;

b) that consequently no plan for assignments in the maritime mobile service bands between 1 605 and 4 000 kHz is now in force;

c) that the present situation in these bands entails considerable drawbacks such as:

- no fixed channel spacing,
- no fixed duplex frequency spacing, and
- no international shore-to-ship, ship-to shore and intership channels;

d) that the introduction of single sideband technique in the maritime mobile radiotelephone service on the basis of the provisions of Resolution No. Mar 5 of the World Administrative Radio Conference, Geneva, 1967, has already started, and that the conversion from double sideband to single sideband will continue in accordance with the time-table and the supplementary technical specifications adopted by that Conference and as amended by the present Conference;

e) that the introduction of the single sideband technique will only partly remove the existing drawbacks;

f) the desirability of achieving a more effective use of the frequency bands allocated to the maritime mobile service between 1 605 and 4 000 kHz, for example, by:

- creating an international channel plan, preferably for all these bands allocated to the maritime mobile service;
- using, where necessary, paired single sideband assignments with fixed channel spacing;
- establishing an appropriate world-wide frequency assignment plan or regional plans;

g) that the present Conference is not authorized to deal with all the tasks referred to in *f)* above;

h) that it is desirable to have proposals for the technical bases for the work to be undertaken;

invites administrations

to study the problem and to communicate to the Union the results of their studies together with their views and proposals;

recommends

that the next competent World Administrative Radio Conference study:

- the establishment of a channel plan which should include some common international shore-to-ship, ship-to-shore and intership channels, to be used by the maritime mobile service in the bands between 1 605 and 4 000 kHz;

- the means for establishing as soon as possible, if necessary after the Conference, regional assignment plans which take account of the world-wide needs of the maritime mobile service;

consequently invites

the Administrative Council to include in the draft agenda of the next competent World Administrative Radio Conference such items as will enable that Conference to take the necessary decisions.

RECOMMENDATION Mar2 – 4

Relating to the Use of the Carrier Frequencies 4 136·3 kHz and 6 204 kHz[1] to supplement the Carrier Frequency 2 182 kHz for Distress and Safety and for Call and Reply Purposes in the Zone of Regions 1 and 2 South of Latitude 15° North, but including Mexico, and in the Zone of Region 3 South of Latitude 25° North

The World Maritime Administrative Radio Conference, Geneva, 1974,

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 zones have established watches at their coast stations for distress and safety and for call and reply purposes on the carrier frequencies 4 136·3 kHz and 6 204 kHz;[1] 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 frequency 4 136·3 kHz[1] to be used in the zone of Regions 1 and 2 south of latitude 15° North, including Mexico, and in the zone of Region 3 south of latitude 25° North and also for the carrier frequency 6 204 kHz[1] to be used in the zone of Region 3 south of latitude 25° North as supplementary frequencies to 2 182 kHz for distress and safety and for call and reply purposes;

---

[1] As from 1 January 1978, the carrier frequencies 4 136·3 kHz and 6 204 kHz are to be replaced by the carrier frequencies 4 125 kHz and 6 215·5 kHz, respectively.

e) that it could be in the interests of ships equipped only for radiotelephony and operating in these zones to have facilities to send and receive on the carrier frequencies 4 136·3 kHz and 6 204 kHz [1] 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 frequency 4 136·3 kHz [1] to supplement the carrier frequency 2 182 kHz in the zone of Regions 1 and 2 south of latitude 15° North, including Mexico, and in the zone of Region 3 south of latitude 25° North and also for the carrier frequency 6 204 kHz [1] to be used in the zone of Region 3 south of latitude 25° North;

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 4 136·3 kHz and 6 204 kHz, [1] it may be essential for the safety of radiotelephony ships operating in the above-mentioned zones to have such facilities.

---

[1] As from 1 January 1978, the carrier frequencies 4 136·3 kHz and 6 204 kHz are to be replaced by the carrier frequencies 4 125 kHz and 6 215·5 kHz, respectively.

RECOMMENDATION No. Mar2 – 5

Relating to the Introduction of an Additional Tone after the Radiotelephone Alarm Signal transmitted by Coast Stations

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that coast stations receive numerous radiotelephone alarm signals which cannot be identified because no voice announcement follows the alarm or because the announcement is unintelligible owing to low modulation or interference;

b) that coast stations have an obligation to take action to identify all alarm signals received and to alert search and rescue services for subsequent action;

c) that many radiotelephone alarm signals which precede the MAYDAY RELAY announcement are from coast stations at considerable distances from the receiving coast stations;

d) that it could be of considerable value if the radiotelephone alarm signal transmitted by coast stations were distinguishable from that transmitted by ship stations;

recognizing

a) that no characteristics introduced to distinguish the radiotelephone alarm signal transmitted by coast stations from that transmitted by ship stations should affect the normal reception of the radiotelephone alarm signal;

b) that proposals have been made to the present Conference to add a single tone following the radiotelephone alarm signal transmitted by coast stations, and that practical tests conducted in the North Sea area during the present Conference indicate that a 1 300 Hz tone for a period of 10 seconds is suitable;

c) that the cost of the necessary changes to existing equipment in coast stations is expected to be small;

recommends

that the radiotelephone alarm signal transmitted by coast stations be followed by a single tone of 1 300 Hz, for a period of 10 seconds (see No. **1466AA**).

RECOMMENDATION No. Mar2 – 6

Relating to the Frequencies in Appendix 17, Section C, and Appendix 17 Rev., Section B, of the Radio Regulations, provided for World-Wide Use by Ships of all Categories and by Coast Stations

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the frequencies indicated in the table of single sideband transmitting frequencies for simplex (single-frequency) operation and for intership cross-band (two-frequency) operation are not yet in world-wide use for communications between ship and coast stations;

b) that there is a world-wide need for ocean-going vessels to be able to communicate with coast stations of any administration;

recommends

1. that, as far as possible, administrations provide a service on these frequencies at their main coast radiotelephone stations;

2. that administrations notify to the Secretary-General the particulars of these services for publication in the List of Coast Stations in accordance with Nos. **815** and **924** of the Radio Regulations.

RECOMMENDATION No. Mar2 – 7

Relating to the Improved Use of the HF Radiotelephone Channels for Coast Stations in the Bands allocated exclusively to the Maritime Mobile Service

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that a large number of requests for HF radiotelephony allotments was submitted to the Conference;

b) that the number of channels resulting from the revision of Appendix 17 is not sufficient to satisfy these requirements in optimum conditions;

c) that the resulting sharing patterns have been formed mainly by operational considerations;

d) that after the present Conference the optimal use of the HF radiotelephony channels in the bands allocated exclusively to the maritime mobile service will be of even greater importance;

e) that on each channel administrations should afford one another an equivalent quality of service;

f) that technical means are being developed 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, and that these may soon become available;

recommends

1. that administrations 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. that administrations 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. **413** and the provisions of No. **694** 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. **1291** of the Radio Regulations;

requests the C.C.I.R.

1. to study 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, and to complete this study before the next competent World Administrative Radio Conference;

2. to make every effort to obtain provisional results of this study as soon as possible, and in any case not later than 1 July 1976, with a view to facilitating the application of Resolution No. Mar2 – 11.

RECOMMENDATION No. Mar2 – 8

Relating to the Use of Frequency Bands between 23 000 and 27 500 kHz by the Maritime Mobile Service

The World Maritime Administrative Radio Conference, Geneva, 1974.

considering

a) that the 25 MHz band is very useful for the long-distance maritime radiocommunications;

b) that the present exclusive frequency allocations in the 25 MHz band to the maritime mobile service are not sufficient to meet the growing needs of maritime radiotelephony and narrow-band direct-printing in that band;

c) that the frequency bands between 25 010 and 25 070 kHz, 25 110 and 25 600 kHz and 26 100 and 27 500 kHz are allocated to the maritime mobile service on a shared basis with other services;

d) that with such shared use there is a possibility of harmful interference over long distances between assignments of different services and that the radio spectrum is not utilized in a rational way;

recommends

1. that administrations, when making frequency assignments to stations of the maritime mobile service operating in the bands 25 010 – 25 070 kHz and 26 100 – 26 174·1 kHz, should do so in accordance with the following distribution:

Frequency band	Use
25 010 – 25 070 kHz	*Ship stations,* telephony, duplex operation; 19 channels spaced 3·1 kHz, with the first carrier frequency at 25 010·5 kHz and the last carrier frequency at 25 066·3 kHz.

26 100 – 26 160 kHz	*Coast stations,* telephony, duplex operation; 19 channels spaced 3·1 kHz with the first carrier frequency at 26 101 kHz and the last carrier frequency at 26 156·8 kHz.
26 160 – 26 174·1 kHz	*Coast stations,* narrow-band direct-printing telegraphy and data transmission systems (frequencies paired with those in the 25 076 – 25 090·1 kHz band); 28 channels spaced 0·5 kHz, with the first assignable frequency at 26 160·3 kHz and the last assignable frequency at 26 173·8 kHz;

2. that administrations take the afore-mentioned distribution into account when submitting proposals to the next competent World Administrative Radio Conference.

RECOMMENDATION No. Mar2 – 9

Relating to a Study of the Feasibility of expanding the High-Frequency Bands allocated to the Maritime Mobile Service

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that the maritime mobile high-frequency bands are heavily loaded;

b) that traffic requirements of the maritime mobile service in these bands are steadily rising;

c) that ships at sea are completely dependent upon the use of radio for all their telecommunications;

d) that because of technical developments, some other services now route part of their traffic by other means, e.g. microwave, cable and satellite;

e) that as a result of these developments the need of these services for high-frequency allocations may have diminished;

considering further

that the present Conference is not competent to deal with frequency bands other than those already allocated to the maritime mobile service;

recommends

that administrations study the problem and take into account the needs of the maritime mobile service for increased allocations in the high-frequency bands when preparing their proposals for the next competent World Administrative Radio Conference.

RECOMMENDATION No. Mar2 – 10

Relating to the Establishment of a Watch by Coast Stations for Distress Purposes on the Frequency 156·8 MHz

The World Maritime Administrative Radio Conference, Geneva, 1974,

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 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.

RECOMMENDATION No. Mar2 – 11

Relating to the Use of Channels 15 and 17 of Appendix 18 by On-Board Communication Stations

The World Maritime Administrative Radio Conference, Geneva, 1974,

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 has been raised to 1 watt by the present Conference;

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;

recognizing

a) that several common channels for on-board communication are necessary internationally to meet world-wide 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 made available 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 world-wide 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;

requests the C.C.I.R.

to study the question whether UHF frequencies can meet the technical and operational requirements of on-board communication stations and report its findings to the next competent World Administrative Radio Conference.

RECOMMENDATION No. Mar2 – 12

Relating to the Future Use and Characteristics of Emergency Position-Indicating Radiobeacons

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that according to Article 36 of the Radio Regulations the essential purpose of the emergency position-indicating radiobeacon (EPIRB) signals is to facilitate determining the position of survivors in search and rescue operations;

b) that Inter-Governmental Maritime Consultative Organization (I.M.C.O.) Resolution A.91 (IV) provides that EPIRBs are intended primarily for homing; however, they may be used for alerting in appropriate circumstances;

c) that I.M.C.O. Resolution A.217 (VII) recommends that administrations require all ships and vessels, where appropriate, to be equipped with EPIRBs operating on the most appropriate radio frequencies;

d) that I.M.C.O. is considering compulsory fitting of EPIRBs on all passenger ships and cargo ships of 300 tons gross tonnage and upwards;

considering in particular

that I.M.C.O. has stressed in 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 and 243 MHz;

b) that the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, in the case of EPIRBs, reserved the

frequency band 406 – 406·1 MHz for the mobile-satellite service solely for the use and development of low-power EPIRB systems using space techniques;

c) that I.M.C.O. Resolution A.91 (IV) recommends the carrier frequency 2 182 kHz as the first choice operational frequency for EPIRBs;

d) that the technical characteristics of EPIRBs operating on the carrier frequency 2 182 kHz are contained in Article 36 and Appendix 20A of the Radio Regulations and in C.C.I.R. Recommendation 439;

e) that Resolution No. Mar 7 of the World Administrative Radio Conference, Geneva, 1967, resolved that EPIRBs operating on the frequencies 121·5 MHz and 243 MHz shall comply with the relevant C.C.I.R. recommendations and the standards and recommended practices of the International Civil Aviation Organization (I.C.A.O.);

recommends

1. that in view of their inter-relationship in this matter, I.M.C.O. and I.C.A.O. be invited, as a matter of urgency, to review their concepts for EPIRBs in regard to search and rescue operations and the safety of life at sea;

2. that the C.C.I.R. be requested, when I.M.C.O. and I.C.A.O. have stated their concepts, to study technical and operating questions for EPIRBs, including the preferred frequencies, in particular relation to the prime requirement for homing and the technical characteristics of such beacons with regard to the requirement for unification;

requests the Secretary-General

to communicate this Recommendation to the attention of I.M.C.O. and I.C.A.O.

RECOMMENDATION No. Mar2 – 13

Relating to the Development of Fixed Frequency Radar Beacons (Racons)

The World Maritime Administrative Radio Conference, Geneva, 1974,

having adopted

provisions relating to the development of fixed frequency radar beacons (racons) in the maritime radionavigation service in the two frequency bands 2 900 – 2 920 MHz and 9 300 – 9 320 MHz;

considering

a) that a ship's navigation can often be improved and groundings prevented with the proper use of the ship's radar;

b) that the use of radar beacons to mark aids and hazards to maritime navigation has provided a significant improvement in the radar navigation of vessels;

c) that several administrations at present operating swept frequency radar beacons to mark lighthouses, lightships, buoys and other aids or hazards to maritime navigation will continue to do so for an indefinite period of time;

d) that several administrations also plan to introduce fixed frequency radar beacons at an early date since studies and experiments indicate that for some purposes they are technically and operationally superior to the swept frequency type;

e) that such radar beacons may require protection from mutual interference and interference from other sources;

f) that the selection of the technical and other characteristics of radar beacons should be internationally agreed by the maritime interests and coordinated with other users of the same frequency bands whose operations might be affected;

requests the C.C.I.R.

to recommend, after consultation with appropriate international organizations, including the International Civil Aviation Organization, the technical parameters to be met by such devices, taking into account electromagnetic compatibility with other services having allocations in the same frequency band;

invites

administrations, the Inter-Governmental Maritime Consultative Organization and the International Association of Lighthouse Authorities to continue to evaluate the operational benefits which would result from the widespread use of fixed frequency radar beacons.

RECOMMENDATION No. Mar2 – 14

Relating to the Frequency Requirements for Shipborne Transponders[1]

The World Maritime Administrative Radio Conference, Geneva, 1974,

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;

f) that such shipborne transponders may require protection from interference;

g) that the selection of the frequency bands and other parameters for these transponders should be coordinated with other users of the radio frequency spectrum whose operations might be affected;

---

[1] A receiver-transmitter which emits a signal automatically when it receives the proper interrogation.

requests the C.C.I.R.

to recommend, after consultation with appropriate international organizations, the most suitable order of frequencies and bandwidth required for this purpose, and the technical parameters to be met by such devices taking into account electromagnetic compatibility with other services having allocations in the same frequency band;

invites

administrations and the Inter-Governmental Maritime Consultative Organization 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. Mar2 – 15

Relating to Temporary Provisions covering the Technical and Operational Aspects of the Maritime Mobile-Satellite Service

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that a minimum number of provisions to introduce the maritime mobile-satellite service in an orderly manner has been adopted;

b) that administrations have, as yet, little or no experience in operating a maritime mobile-satellite service;

c) that, consequently, it is impossible at the present time to establish comprehensive regulatory provisions covering in detail the technical and operational aspects of such a service;

d) that, nevertheless, temporary administrative, technical and operational provisions may become necessary before the next competent Administrative Radio Conference;

recommends

that, whilst gaining experience to provide a basis for the adoption of detailed regulations by the next appropriate Administrative Radio Conference, administrations participating in the maritime mobile-satellite service should agree temporary administrative, technical and operational provisions, notify them to the Secretary-General, and invite other administrations to adopt them, without prejudice.

RECOMMENDATION No. Mar2 – 16

Relating to Distress, Urgency and Safety Traffic

The World Maritime Administrative Radio Conference, Geneva, 1974,

having noted

a) that the Inter-Governmental Maritime Consultative Organization (I.M.C.O.) has completed a policy document on the subject of the future maritime distress system;

b) that this document contains:

– proposed improvements for the near future,

– a statement of requirements and proposed transitional measures for the distant future;

c) that I.M.C.O. intends to keep this document under review for adjustment, as necessary;

d) that a number of improvements for the near future distress system form part of the proposals for the work of the present Conference;

further noting

that studies having a bearing upon distress and safety measures as part of a maritime satellite radiocommunication system form the subject of C.C.I.R. questions and study programmes;

considering

a) that the I.M.C.O. requirement for the possible future fitting of automatic distress alerting, followed by the automatic transmission of additional information concerning the distress case, is of particular importance;

b) that automatic distress alerting, followed by the automatic transmission of additional information concerning the distress case, should take place on a single frequency or possibly more frequencies reserved for distress traffic;

c) that adequate frequencies must be made available for associated requirements for safety calling and communications;

d) that the transmission and the recorded reception of distress, urgency and safety messages should be able to take place without interruption and irrespective of human attendance;

recommends

1. that I.M.C.O. be invited to continue its studies with a view to early implementation of the future distress system;

2. that C.C.I.R. continue its studies to determine the role of maritime satellite radiocommunications in a coordinated distress system as well as in safety applications;

3. that administrations consider, in the light of continuing technological developments, the need to reserve one or, possibly, more frequencies for distress purposes;

4. that administrations consider, in the light of advancing techniques, the introduction of more automated telecommunication systems for the dissemination of distress, urgency and safety messages on a continuous basis, to replace Morse telegraphy and possibly radiotelephony;

5. that administrations have as an objective the taking of a decision in this matter at the next appropriate World Administrative Radio Conference.

RECOMMENDATION No. Mar2 – 17

Relating to the Use of Radiocommunications for Marking, Identifying, Locating, and Communicating with the Means of Transport protected under the Geneva Conventions of 12 August 1949, concerning the Protection of War Victims and any Additional Instruments of those Conventions, as well as for ensuring the Safety of Ships and Aircraft of States not Parties to an Armed Conflict

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) that it is desirable for the safety of human life to be able to identify and determine the position of the means of transport protected under the Geneva Conventions of 12 August 1949 and any additional instrument of those Conventions;

b) that several international Conferences have adopted resolutions on this question, notably the 1949 Geneva Diplomatic Conference for the elaboration of international Conventions for the protection of war victims (Resolution 6) and the International Red Cross Conferences of 1930 (Resolution XVII), 1934 (Resolution XXXII), 1965 (Resolution XXX), 1969 (Resolution XXVII) and 1973 (Resolution XIII);

c) that it is desirable to be able to identify and determine the position of neutral ships and aircraft in times of armed conflict;

d) that it is for the I.T.U. to fix basic radio regulatory provisions;

e) that the Administrative Radio Conference, Geneva, 1959, adopted Recommendation No. 34 relating to the use of radiotelegraph and radiotelephone links by Red Cross organizations;

f) that the Plenipotentiary Conference of the International Telecommunication Union, Malaga-Torremolinos, 1973, adopted Recommendation No. 2 relating to the use of radiocommunications for announcing and identifying hospital ships and medical aircraft protected under the Geneva Conventions of 1949, referring technical questions to the competent Administrative Conferences;

g) that, to ensure the necessary close coordination, it is desirable to refer the study of problems affecting several services simultaneously to a general World Administrative Radio Conference;

recommends

that the next general World Administrative Radio Conference, planned for 1979, study the technical and administrative aspects of the use of radiocommunications for marking, identifying, locating and communicating with the means of transport protected under the 1949 Geneva Conventions and any additional instruments of those Conventions, and for ensuring the safety of the ships and aircraft of States not parties to an armed conflict.

RECOMMENDATION No. Mar2 – 18

Relating to Accounting for Public Correspondence in Maritime Radiocommunications

The World Maritime Administrative Radio Conference, Geneva, 1974,

considering

a) Resolution No. Mar2 – 22;

b) that any regulatory provisions proposed by the C.C.I.T.T. in conformity with the above Resolution cannot be formally incorporated into the Radio Regulations before the World Administrative Radio Conference foreseen for 1979;

c) the detailed proposals for revision of all or part of Chapter IX of the Radio Regulations, and of the Additional Radio Regulations, submitted to the present Conference by the Administrations of Denmark, France, Norway and Sweden;

recommends

1. that the C.C.I.T.T. Report include basic as well as detailed provisions, forming a complete set of accounting rules, which should be produced as a C.C.I.T.T. Recommendation entitled "Draft Rules for Accounting in the Maritime Mobile Service";

2. that administrations and recognized private operating agencies bring these draft rules into use as soon as possible following their approval by the C.C.I.T.T. Plenary Assembly;

3. that administrations make proposals to the next competent World Administrative Radio Conference as to which, if any, of the draft rules should be included in the Radio Regulations.

RECOMMENDATION No. Mar2 – 19

Relating to Studies of the Interconnection of Maritime Mobile Radiocommunication Systems with the International Telephone and Telegraph Networks

The World Maritime Administrative Radio Conference, Geneva, 1974,

noting

a) that this Conference has adopted, and included in Article 28A, provisions for the use of a digital selective calling system;

b) that the C.C.I.R. has adopted Question 9/8 on the subject of a selective calling system for future operational requirements of the maritime mobile service;

c) that the operational and technical characteristics for a digital selective calling system are in an advanced state of study by the C.C.I.R.;

d) that the C.C.I.R. has adopted Question 23/8 relating to automated VHF maritime mobile telephone systems;

e) that the C.C.I.T.T. has adopted Question 15/XIII relating to the interconnection of the different international mobile telephone services – mainly of the maritime mobile service – and the international telephone network;

f) that the study of new Questions 7/I and 4/X relating to the interconnection of maritime satellite communication services with the international telex network is proposed to the C.C.I.T.T.;

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 C.C.I.R. and the C.C.I.T.T.

to undertake 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

invites administrations

to give priority to these studies in their participation in the work of the C.C.I.R. and the C.C.I.T.T.

RECOMMENDATION No. Mar2 – 20

Relating to the Presentation of Draft Amendments to the Radio Regulations

The World Maritime Administrative Radio Conference, Geneva, 1974,

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 and lay-out of their proposals to Administrative Conferences in accordance with the provisions of the International Telecommunication Convention and in their coordinated presentation to conferences;

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;

3. that a uniform presentation be used, through the different stages of preparing texts up to working group level, at forthcoming Administrative Radio Conferences.

RECOMMENDATION No. Mar2 – 21

Relating to the Possible Re-arrangement of the Radio Regulations and the Additional Radio Regulations

The World Maritime Administrative Radio Conference, Geneva, 1974,

in view of

the terms of Administrative Council Resolutions Nos. 494, 522, 549 and Decision No. 346 relating to a possible revision of the structure of the Radio Regulations and the Additional Radio Regulations;

considering

a) Resolution No. 28 entitled "World Administrative Radio Conference for the General Revision of the Radio Regulations", adopted by the Plenipotentiary Conference, Malaga-Torremolinos, 1973;

b) Recommendation No. Mar 2 of the World Administrative Radio Conference, Geneva, 1967 relating to the regrouping of the Radio Regulations and the Additional Radio Regulations appertaining to the maritime mobile service;

c) that the additions to the Radio Regulations and the Additional Radio Regulations resulting from the many Administrative Radio Conferences held since 1962 have made them even more difficult to use and increasingly more difficult to revise;

d) that it would be of considerable assistance to the World Administrative Radio Conference scheduled for 1979 if the Radio Regulations and Additional Radio Regulations had already been re-arranged in a more logical form;

e) that it would also be of considerable assistance to administrations and to permanent organs of the Union if proposals to the 1979 Conference could be submitted in a form appropriate to the re-arranged Radio Regulations;

recommends

1. that a Working Group should be convened for the purpose of pursuing the study of the possible re-arrangement of the Radio Regulations and the Additional Radio Regulations in order that the administrative Regulations should be separated from the operational Regulations and the latter separated for the various services concerned;

2. that the Working Group should be composed of experts from administrations assisted by representatives of the permanent organs of the Union each with respect to those parts of the Radio Regulations and the Additional Radio Regulations which are within its duties;

3. that the Working Group should report sufficiently early for its report to be sent to the administrations of all Members of the Union by 1 September 1976;

invites the Administrative Council

at its 29th Session in June 1974

1. to request administrations to nominate experts in the fields concerned to serve in the Working Group;

2. to make provision for the Working Group to meet and in this connection suggests that it might assist their work if they were to meet in two sessions; firstly, to separate the administrative Regulations from the operational Regulations and secondly, to separate the operational Regulations for the various services;

3. to arrange either for a preparatory meeting of the main session of the World Administrative Radio Conference, 1979, to be held early in 1977, or for an appropriate World Administrative Radio Conference scheduled for that time, to take the necessary decisions on the Report of the Working Group, taking into account also the results of the C.C.I.T.T. study in 1976 (see Resolution No. Mar2 – 23).

ANALYTICAL TABLE

ANALYTICAL TABLE

ANALYTICAL TABLE

Symbols:

AP	– Appendix
p.	– page
REC	– Recommendation
RES	– Resolution
Spa	– Space Conference (Geneva, 1963)
Aer	– Aeronautical Conference (Geneva, 1966)
Mar	– Maritime Conference (Geneva, 1967)
Spa2	– Space Conference (Geneva, 1971)
Mar2	– Maritime Conference (Geneva, 1974)

Numbers 1-1631 refer to the Radio Regulations, numbers 2001-2164 to the Additional Radio Regulations.

If several consecutive numbers deal with the same subject, only the first of these numbers is normally given.

A

(continued)

C.C.I.R. *(continuation)*

Frequency requirements for shipborne transponders REC Mar2-14

Frequency tolerances of transmitters REC 1

Future frequency allocation requirements for the maritime mobile service REC Spa2-6

Future use and characteristics of emergency position indicating radiobeacons REC Mar2-12

I.R.F.B. technical standards REC 2

Improved use of the HF radiotelephone channels for coast stations in the bands allocated exclusively to the maritime mobile service REC Mar2-7

Interconnection of maritime mobile radiocommunication systems with the international telephone and telegraph networks REC Mar2-19

International monitoring in the bands below 28 MHz REC 5

Modulation methods for radio-relay systems in relation to sharing with communication-satellite systems REC Spa 4

Preferred frequency bands for tropospheric scatter systems REC Spa2-2

Radio astronomy observations. Protection on the shielded area of the moon REC Spa2-8

Radio emissions from artificial satellites and other space vehicles RES 7

Radio propagation and radio noise REC 4

Signal to interference protection ratios and minimum field strengths required REC 3

Space radiocommunication systems in the event of natural disasters, epidemics, famines and similar emergencies REC Spa2-13

Space radiocommunication techniques

in the aeronautical mobile (R) service REC Aer 2

in the maritime mobile service REC Mar 3

Technical characteristics of equipment REC 6

Technical criteria for sharing frequency bands between space radiocommunication and terrestrial radiocommunication services or between space radiocommunication services RES Spa2-6

Technical standards for the assessment of harmful interference in the frequency bands above 28 MHz REC Spa2-12

Use of channels 15 and 17 of Appendix 18 by on-board communication stations REC Mar2-11

Use of class A3A and A3J emissions for distress and safety purposes on the carrier frequency 2 182 kHz RES Mar2-20

Use of class A3A and A3J emissions on the carrier frequencies 4 136.3 kHz and 6 204 kHz used to supplement the carrier frequency 2 182 kHz for distress and safety purposes RES Mar2-21

Role of the — in the field of emission of standard frequencies and time signals 1624

C.C.I.T.T. (International Telegraph and Telephone Consultative Committee)

RES and REC of concern to the —

(continued)

(continued)

D

(continued)

Definitions *(continuation)*

(continued)

Definitions, Service *(continuation)*

(continued)

E

(continued)

F

(continued)

(continued)

(continued)

G H

I

(continued)

(continued)

L M

N

O

P

(continued)

(continued)

(continued)

S

Service

(continued)

(continued)

(continued)

T

U W X Z