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International Telecommunication Union

Radio Regulations

Resolutions and
Recommendations

Edition of 2004



International
Telecommunication
Union

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

Radio Regulations

**Resolutions and
Recommendations**

Edition of 2004

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Note by the Secretariat

This revision of the Radio Regulations, complementing the Constitution and the Convention of the International Telecommunication Union, incorporates the decisions of the World Radio-communication Conferences of 1995 (WRC-95), 1997 (WRC-97), 2000 (WRC-2000) and 2003 (WRC-03). The majority of the provisions of these Regulations shall enter into force as from 1 January 2005; the remaining provisions shall apply as from the special dates of application indicated in Article **59** of the revised Radio Regulations.

In preparing the Radio Regulations, edition of 2004, the Secretariat corrected the typographical errors that were drawn to the attention of WRC-03 and which were approved by WRC-03.

This edition uses the same numbering scheme as the 2001 edition of the Radio Regulations, notably:

With respect to *Article numbers*, this edition follows the standard sequential numbering. The Article numbers are not followed by any abbreviation (such as “(WRC-97)”, “(WRC-2000)” or “(WRC-03)”). Consequently, any reference to an Article, in any of the provisions of these Radio Regulations (e.g. in No. **13.1** of Article **13**), in the texts of the Appendices as contained in Volume 2 of this edition (e.g. in § 1 of Appendix **2**), in the texts of the Resolutions included in Volume 3 of this edition (e.g. in Resolution **1 (Rev.WRC-97)**), and in the texts of the Recommendations included in Volume 3 of this edition (e.g. in Recommendation **8**), is considered as a reference to the text of the concerned Article which appears in this edition, unless otherwise specified.

With respect to *provision numbers in Articles*, this edition continues to use composite numbers indicating the number of the Article and the provision number within that Article (e.g. No. 9.2B means provision No. 2B of Article **9**). The abbreviation “(WRC-03)”, “(WRC-2000)” or “(WRC-97)” at the end of such a provision means that the relevant provision was modified or added by WRC-03, by WRC-2000 or by WRC-97, as applicable. The absence of an abbreviation at the end of the provision means that the provision is identical with the provision of the simplified Radio Regulations as approved by WRC-95, and whose complete text was contained in Document 2 of WRC-97.

With respect to *Appendix numbers*, this edition follows the standard sequential numbering, with the addition of the appropriate abbreviation after the Appendix number (such as “(WRC-97)”, “(WRC-2000)” or “(WRC-03)”), where applicable. As a rule, any reference to an Appendix, in any of the provisions of these Radio Regulations, in the texts of the Appendices as contained in Volume 2 of this edition, in the texts of the Resolutions and of the Recommendations included in Volume 3 of this edition, is presented in the standard manner (e.g. “Appendix **30 (Rev.WRC-03)**”) if not explicitly described in the text (e.g. Appendix **4** as modified by WRC-03). In the texts of Appendices that were partially modified by WRC-03, the provisions that were modified by WRC-03 are indicated with the abbreviation “(WRC-03)” at the end of the concerned text.

Within the text of the Radio Regulations, the symbol, ↑, has been used to represent quantities associated with an uplink. Similarly, the symbol, ↓, has been used to represent quantities associated with a downlink.

Abbreviations have generally been used for the names of world administrative radio conferences and world radiocommunication conferences. These abbreviations are shown below.

Abbreviation	Conference
WARC Mar	World Administrative Radio Conference to Deal with Matters Relating to the Maritime Mobile Service (Geneva, 1967)
WARC-71	World Administrative Radio Conference for Space Telecommunications (Geneva, 1971)
WMARC-74	World Maritime Administrative Radio Conference (Geneva, 1974)
WARC SAT-77	World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977)
WARC-Aer2	World Administrative Radio Conference on the Aeronautical Mobile (R) Service (Geneva, 1978)
WARC-79	World Administrative Radio Conference (Geneva, 1979)
WARC Mob-83	World Administrative Radio Conference for the Mobile Services (Geneva, 1983)
WARC HFBC-84	World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1984)
WARC Orb-85	World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilising It (First Session – Geneva, 1985)
WARC HFBC-87	World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987)
WARC Mob-87	World Administrative Radio Conference for the Mobile Services (Geneva, 1987)
WARC Orb-88	World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilising It (Second Session – Geneva, 1988)
WARC-92	World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992)
WRC-95	World Radiocommunication Conference (Geneva, 1995)
WRC-97	World Radiocommunication Conference (Geneva, 1997)
WRC-2000	World Radiocommunication Conference (Istanbul, 2000)
WRC-03	World Radiocommunication Conference, (Geneva, 2003)
WRC-07/10	World Radiocommunication Conference, 2007/2010 ¹

¹ The date of this Conference has not been finalized.

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RESOLUTIONS

RESOLUTION 1 (Rev.WRC-97)
Notification of frequency assignments¹

The World Radiocommunication Conference (Geneva, 1997),

referring to

- the Preamble of the Constitution,
- Article **42** of the Constitution (Special Arrangements),
- Article **6** of the Radio Regulations (Special agreements),
- Article **11** of the Radio Regulations (Notification and recording of frequency assignments),
- Article **12** of the Radio Regulations (Seasonal Planning of the HF bands allocated to the broadcasting Service between 5 900 kHz and 26 100 kHz),

resolves

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

¹ WRC-97 made editorial amendments to this Resolution.

RESOLUTION 2 (Rev.WRC-03)

Equitable use, by all countries, with equal rights, of the geostationary-satellite and other satellite orbits and of frequency bands for space radiocommunication services

The World Radiocommunication Conference (Geneva, 2003),

considering

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

taking into account

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

resolves

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

2 that, accordingly, a country or a group of countries having registered with the Bureau frequencies for their space radiocommunication services need to take all practicable measures to facilitate the use of new space systems by other countries or groups of countries, in particular those of developing countries and least developed countries, so desiring;

3 that *resolves* 1 and 2 of this Resolution shall be taken into account by the administrations and the Bureau.

RESOLUTION 4 (Rev.WRC-03)

**Period of validity of frequency assignments to space stations
using the geostationary-satellite and other satellite orbits¹**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that rational and efficient use must be made of the frequency spectrum and the geostationary-satellite orbit and that account should be taken of the provisions of Resolution 2 (**Rev.WRC-03**) relating to the use by all countries, with equal rights and equitable access to the frequency bands and the associated satellite orbits for space radiocommunication services;
- b)* that limiting the period of validity of frequency assignments to space stations using the geostationary-satellite orbit and other satellite orbits is a concept which would promote the attainment of these objectives;
- c)* that amortizing the considerable investments made in connection with the development of space radiocommunications is a heavy burden for all administrations and that these investments should be spread over a predetermined and realistic period;
- d)* that every effort should be made to encourage administrations in a position to do so to develop techniques designed to improve the utilization of the frequency spectrum and the geostationary-satellite orbit and other satellite orbits with a view to increasing the total radiocommunication facilities available to the world community;
- e)* that an experimental procedure to gain experience from application of the new concept of notifying the period of validity of an assignment in space radiocommunication was introduced by WARC-79 and has been used by the Radiocommunication Bureau and administrations since then but that it is not possible to impose on administrations a statutory period identical in all cases;
- f)* that administrations should be left to propose the period of validity themselves in the light of their operational service requirements and of the common interest, however the period of validity shall take into account, *inter alia*, the operational lifetime of the satellite systems, including space and earth stations, and the type of service provided,

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

resolves

1 that, until this Resolution is reviewed by the next competent world radiocommunication conference, frequency assignments to space radiocommunication stations located on the geostationary-satellite and other satellite orbits, noting *considering e) and f)*, shall not be considered perpetual and shall be dealt with as follows:

1.1 a frequency assignment to a space station² shall be deemed definitively discontinued after the expiry of the period of operation shown on the assignment notice, reckoned from the date on which the assignment was brought into service. This period shall be limited to that for which the satellite network was designed. The Bureau shall then invite the notifying administration to take steps to cancel the assignment. If the Bureau receives no reply within three months following the expiry of the period of operation, it shall insert a symbol in the Remarks Column of the Master Register to indicate that the assignment is not in conformity with this Resolution;

1.2 if a notifying administration which wishes to extend the period of operation originally shown on the assignment notice of a frequency assignment of an existing space station² informs the Bureau accordingly more than three years before the expiry of the period in question and if all other basic characteristics of that assignment remain unchanged, the Bureau shall amend as requested the period of operation originally recorded in the Master Register and publish that information in a special section of the Bureau's International Frequency Information Circular (BR IFIC);

1.3 if, at least three years before the expiry of the period of operation recorded in the Master Register of a frequency assignment to an existing space station², an administration initiates the coordination procedure specified in No. **9.7** to bring into service a new space station using the same assigned frequency and the same orbital position but with different technical characteristics, and if the Bureau finds after the notification that the new assignment conforms with the provisions of No. **11.31** and does not increase, in relation to the preceding assignment, the probability of interference to the detriment of a frequency assignment recorded in the Master Register or involved in the coordination procedure, the new assignment shall be given a favourable finding and shall be entered in the Master Register;

1.4 a notifying administration which wishes to modify a basic characteristic of a frequency assignment of a space station² recorded in the Master Register shall initiate, in any case other than those covered by *resolves* 1.2 and 1.3, the appropriate modification procedure in accordance with the provisions of Nos. **11.43A** to **11.46**;

2 that, for the application of the provisions of *resolves* 1.1 above, the information concerning the period of validity of frequency assignments to space stations shall be notified in addition to that contained in Appendix 4;

3 that the application of this Resolution shall not prejudice in any way the decisions of future radiocommunication conferences,

² The expression "space station" may apply to more than one satellite provided that only one satellite is in operation at any particular moment and that the stations installed on board successive satellites have identical basic characteristics.

invites ITU-R

to undertake studies with respect to the implementation of this Resolution,

invites the next competent world radiocommunication conference

to take cognizance of the results of ITU-R studies undertaken as a result of this Resolution and take action, as appropriate,

instructs the Secretary-General

to bring this Resolution to the attention of the Council.

RESOLUTION 5 (Rev.WRC-03)

Technical cooperation with the developing countries in the study of propagation in tropical and similar areas

The World Radiocommunication Conference (Geneva, 2003),

having noted

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

aware

a) of the fact that the developing countries, particularly those in tropical and similar areas, (including the area referred to as zone C in the Final Acts of the Regional Administrative Conference for the Planning of VHF/UHF Television Broadcasting in the African Broadcasting Area and Neighbouring Countries (Geneva, 1989), the Red Sea, East Mediterranean, etc.), require adequate knowledge of radiowave propagation in their territories in order to make rational and economical use of the radio-frequency spectrum;

b) of the importance of propagation in radiocommunications;

c) of the importance of the work of ITU-T and ITU-R Study Groups for the development of telecommunications in general and radiocommunications in particular,

considering

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

b) the scarcity of resources available in these countries,

resolves to instruct the Secretary-General

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

RES5-2

2 to assist these countries, if necessary with the collaboration of international and regional organizations such as the Asia-Pacific Broadcasting Union (ABU), Arab States Broadcasting Union (ASBU), African Telecommunication Union (ATU) and the Union of National Radio and Television Organizations of Africa (URTNA) which may be concerned, in carrying out national propagation measurement programmes, including collecting appropriate meteorological data, on the basis of ITU-R Recommendations and Questions in order to improve the use of the radio-frequency spectrum;

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

resolves to instruct the Director of the Radiocommunication Bureau

to include this activity in the operational plan, within existing budgetary resources of the Sector,

invites administrations

to submit the results of these propagation measurements to ITU-R for consideration in its studies,

invites the Council

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

RESOLUTION 7 (Rev.WRC-03)

Development of national radio frequency management

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the Radio Regulations contain, *inter alia*, procedures for the coordination, notification and registration of frequencies which specify the rights and obligations of Member States;
- b)* that the application of the above-mentioned procedures necessitates an appropriate radio frequency management unit in each Member State;
- c)* that the existence of such a unit helps Member States to safeguard their rights and to discharge their obligations under the Radio Regulations;
- d)* that the application of the Radio Regulations through the agency of such units is in the interest of the international community as a whole,

noting

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

noting further

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

recommends

that the administrations of such countries take appropriate action,

resolves

- 1 that meetings shall be organized between representatives of the Radiocommunication Bureau and the personnel involved in frequency management matters from administrations of developing and developed countries;
- 2 that such meetings shall be aimed at designing standard structures suitable for administrations of developing countries and include discussions concerning the establishment and operation of radio frequency management units;
- 3 that such meetings should also identify the particular needs of developing countries in establishing such units, and the means required to meet those needs,

RES7-2

recommends

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

invites the Council

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

instructs the Secretary-General

1 to circulate this Resolution to all Member States, drawing their attention to its importance;

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

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

instructs the Director of the Radiocommunication Bureau

to include this activity in the Operational Plan, within existing budgetary resources of the Sector,

draws the attention of the next Plenipotentiary Conference to

1 the particular problems identified in this Resolution;

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

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

RESOLUTION 10 (Rev.WRC-2000)

Use of two-way wireless telecommunications by the International Red Cross and Red Crescent Movement

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that the worldwide humanitarian operations carried out by the International Red Cross and Red Crescent Movement – composed of the International Committee of the Red Cross, the International Federation of Red Cross and Red Crescent Societies and national Red Cross and Red Crescent societies – are of great importance and often indispensable;
- b) that in such circumstances normal communication facilities are frequently overloaded, damaged, completely interrupted or not available;
- c) that it is necessary to facilitate by all possible measures the reliable intervention of these national and international organizations;
- d) that rapid and independent contact is essential to the intervention of these organizations;
- e) that for the efficient and safe conduct of their humanitarian operations, these organizations rely heavily on two-way wireless telecommunication facilities, and particularly on an extensive HF and VHF radio network,

resolves to urge administrations

- 1 to take account of the possible needs of the International Red Cross and Red Crescent Movement for two-way wireless telecommunication means when normal communication facilities are interrupted or not available;
- 2 to assign to these organizations the minimum number of necessary working frequencies in accordance with the Radio Regulations;
- 3 to take all practicable steps to protect such communications from harmful interference.

RESOLUTION 13 (Rev.WRC-97)

Formation of call signs and allocation of new international series

The World Radiocommunication Conference (Geneva, 1997),

considering

the increasing demand for call signs justified by the increased number of Member States and by the increased requirements of countries which are already Member States,

believing

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

noting

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

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

resolves

1 that the Director of the Radiocommunication Bureau shall continue to urge administrations:

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

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

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

3 that if, nevertheless, before the next competent world radiocommunication conference, it appears that all the possibilities of the present system of forming call signs will be exhausted, the Director of the Radiocommunication Bureau shall:

3.1 explore the possibility of extending the present allocations of international call-sign series by lifting the limitation on use of the letter "Q" and the digits "0" and "1";

RES13-2

3.2 issue a circular-letter:

3.2.1 explaining the position;

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

4 that, from the information thus submitted, the Director of the Radiocommunication Bureau shall prepare a report, together with his comments and suggestions, for submission to the next competent world radiocommunication conference.

RESOLUTION 15 (Rev.WRC-03)

**International cooperation and technical assistance
in the field of space radiocommunications**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that a large number of Member States are not in a position to take immediate advantage of satellite techniques for the development of their telecommunication services;
- b) that such Member States would benefit immensely through the technical assistance programmes sponsored by the Union,

recognizing

- a) that international satellite-communication systems are subject to the Convention and Regulations of the Union and that they permit participation of all countries including, in particular, the developing countries, in space communication systems;
- b) that a number of problems need to be solved in order that the developing countries may participate effectively in international space communication systems and integrate these systems with their national telecommunication networks,

resolves to instruct the Director of the Radiocommunication Bureau

to include this activity in the Operational Plan, within existing budgetary resources of the Sector,

invites the 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 States may be formulated and presented in order to secure maximum financial and other assistance, including the allocation of the funds in the regular budget of ITU for implementing this Resolution, preferably within the budget of the Sector identified for the implementation of this Resolution;
- 3 to consider how best to make use of funds made available by the United Nations in accordance with its Resolution 1721 to give technical and other assistance to administrations of Member States to make effective use of space communications;
- 4 to consider in what way the work of the ITU-T, ITU-R and ITU-D and other organs of the Union may be utilized in the most effective way for the information and assistance of administrations of Member States in the development of space radiocommunications.

RESOLUTION 18 (Mob-83)

Relating to the procedure for identifying and announcing the position of ships and aircraft of States not parties to an armed conflict¹

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

considers

- a) that ships and aircraft encounter considerable risk in the vicinity of an area of armed conflict;
- b) that for the safety of life and property it is desirable for ships and aircraft of States not parties to an armed conflict to be able to identify themselves and announce their position in such circumstances;
- c) that radiocommunication offers such ships and aircraft a rapid means of self-identification and providing location information prior to their entering areas of armed conflict and during their passage through the areas;
- d) that it is considered desirable to provide a supplementary signal and procedure for use, in accordance with customary practice, in the area of armed conflict by ships and aircraft of States representing themselves as not parties to an armed conflict;

resolves

1 that the frequencies for urgency signal and messages specified in Appendix 13 of the Radio Regulations may be used by ships and aircraft of States not parties to an armed conflict for self-identification and establishing communications. The transmission will consist of the urgency or safety signals, as appropriate, described in Appendix 13 followed by the addition of the single group "NNN" in radiotelegraphy and by the addition of the single word "NEUTRAL" pronounced as in French "neutral" in radiotelephony. As soon as practicable, communications shall be transferred to an appropriate working frequency;

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

- a) call sign or other recognized means of identification of such ship or aircraft;
- b) position of such ship or aircraft;
- c) number and type of such ships or aircraft;

¹ WRC-97 made editorial amendments to this Resolution.

RES18-2

- d) intended route;
- e) estimated time en route and of departure and arrival, as appropriate;
- f) any other information, such as flight altitude, radio frequencies guarded, languages and secondary surveillance radar modes and codes;

3 that the provisions of Appendix 13 relating to urgency and safety transmissions, and medical transports shall apply as appropriate to the use of the urgency and safety signals, respectively, by such ship or aircraft;

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

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

6 to encourage parties to a conflict to enter into such agreements,

requests the Secretary-General

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

requests ITU-R

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

RESOLUTION 20 (Rev.WRC-03)

**Technical cooperation with developing countries in
the field of aeronautical telecommunications**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the allocations of the frequency bands and the provisions concerning various aeronautical mobile services have been revised several times by recent conferences;
- b)* that some of these frequency bands and provisions support the worldwide implementation of new aeronautical telecommunication systems;
- c)* that on the other hand, some of these frequency bands and provisions support existing aeronautical systems that may be affected by the revision;
- d)* that, as a consequence of *a)*, *b)* and *c)*, technological modernization will be necessary in order to maintain and improve the safety and regularity of international civil aviation, the accuracy and security of aeronautical radionavigation and the efficiency of distress and rescue systems;
- e)* that the developing countries may require assistance in improving the training of technical staff, as well as in introducing new systems, in coping with technological modernization and enhancing the operation of aeronautical telecommunications,

recognizing

- a)* the value of the assistance which, in conjunction with other international organizations, the Union has provided and may continue to provide to developing countries in the field of telecommunications;
- b)* that the original version of Resolution **20 (Mob-87)** established a good basis for the technical cooperation with developing countries in the field of aeronautical telecommunications that has been undertaken by the International Civil Aviation Organization (ICAO),

resolves to instruct the Secretary-General

- 1 to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications, in particular by providing them with technical advice for the planning, establishment, operation and maintenance of equipment, as well as help with the training of staff, essentially in matters relating to the new technologies;
- 2 for this purpose, to seek the continued collaboration of ICAO, the United Nations Conference for Trade and Development (UNCTAD) and other specialized agencies of the United Nations, as appropriate;

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

invites the developing countries

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

RESOLUTION 21 (Rev.WRC-03)

**Implementation of changes in frequency allocations
between 5 900 kHz and 19 020 kHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that parts of the frequency bands between 5 900 kHz and 19 020 kHz which were previously allocated on an exclusive or shared basis to the fixed and mobile services have been reallocated to the broadcasting service;
- b)* that some existing fixed and mobile assignments may need to be removed progressively from those reallocated bands to make way for the broadcasting service;
- c)* that the assignments to be removed, termed “displaced assignments”, must be reaccommodated in other appropriate frequency bands;
- d)* that developing countries may require special assistance from the Radiocommunication Bureau in replacing their displaced assignments with appropriate protection;
- e)* that procedures already exist in Article 11 that may be used to this effect,

recognizing

the difficulties that administrations and the Bureau might encounter during the period of transition from the previous allocations to those made by WARC-92,

resolves

- 1 that the transition period shall be from 1 April 1992 to 1 April 2007;
- 2 that administrations should no longer notify any frequency assignments to stations of the fixed and mobile services in the reallocated bands. Assignments notified in these bands after 1 April 1992 shall bear a symbol to indicate that the finding will be examined by the Bureau as of 1 April 2007 in accordance with the provisions of No. 11.31;
- 3 that the Bureau shall undertake a continuing action to review the Master International Frequency Register with the help of administrations. In this respect, the Bureau shall periodically consult the administrations concerning the frequency assignments to links for which another satisfactory means of telecommunication exists, with a view to either downgrading assignments of class of operation A or deleting such assignments;

4 that administrations shall, for assignments of class of operation A in the reallocated bands, either notify the replacement frequencies to the Bureau or request the Bureau's assistance in selecting the replacement frequencies in application of Articles 7 and 13;

5 that the Bureau shall develop in due time a draft procedure to be used for the replacement of remaining frequency assignments and shall consult administrations in accordance with Article 14;

6 that the Bureau should modify the draft procedures taking into account, to the extent practicable, comments received from administrations, and propose replacement assignments at the latest three years before 1 April 2007. In so doing, the Bureau shall request administrations to take appropriate action to bring their assignments in conformity with the Table of Frequency Allocations by the due date;

7 that a replacement frequency assignment whose basic characteristics, with the exception of the assigned frequency, have not been modified in the above process, shall keep its original date. However, if these basic characteristics of a replacement frequency assignment are different from those of the displaced assignment, the replacement assignment shall be treated in accordance with the relevant provisions of Section II of Article 11,

invites administrations

when seeking reaccommodation of the displaced assignments for their fixed and mobile services in the bands between 5 900 kHz and 19 020 kHz which have been reallocated to the broadcasting service, to make every effort to find replacement assignments in the bands allocated to the fixed and mobile services concerned.

RESOLUTION 25 (Rev.WRC-03)

Operation of global satellite systems for personal communications

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that, in accordance with No. 6 of its Constitution (Geneva, 1992), one of the purposes of the Union is “to promote the extension of the benefits of the new telecommunication technologies to all the world’s inhabitants”;

b) that, to this end, the Union is fostering the use of new technologies in telecommunications and is studying questions relating to this use in the Radiocommunication and the Telecommunication Standardization Sectors;

c) that the Telecommunication Development Sector is studying questions aimed at identifying the benefits that developing countries may derive from using new technologies;

d) that, among these new technologies, some constellations of non-geostationary satellites may provide global coverage and facilitate low-cost communications;

e) that the theme “global mobile personal communications by satellite” (GMPCS) was discussed at the first World Telecommunication Policy Forum established by Resolution 2 (Kyoto, 1994) of the Plenipotentiary Conference;

f) that Council Resolution 1116 instructs the Secretary-General to act as depositary of the GMPCS Memorandum of Understanding (MoU) and its Arrangements, to act as the registry for type-approval procedures and terminal types and to authorize the use of the abbreviation “ITU” as part of the GMPCS-MoU mark;

g) Recommendations ITU-R M.1343 and ITU-R M.1480 on the essential technical requirements of GMPCS earth stations that should be used by administrations as a common technical basis facilitating the global circulation and use of such GMPCS terminals in conformity with these Recommendations,

recognizing

a) that the spectrum available to global satellite systems for personal communications is limited;

b) that successful coordination does not in any way imply licensing authorization to provide a service within the territory of a Member State,

considering further

that other countries intending to use these systems should be guaranteed that they will be operated in accordance with the Constitution, the Convention and the Administrative Regulations,

noting

a) that the Constitution recognizes the sovereign right of each State to regulate its telecommunications;

b) that the International Telecommunication Regulations “recognize the right of any Member, subject to national law and should it decide to do so, to require that administrations and private operating agencies, which operate in its territory and provide an international telecommunication service to the public, be authorized by that Member”, and specifies that “within the framework of the present Regulations, the provision and operation of international telecommunication services in each relation is pursuant to mutual agreement between administrations”;

c) that Article **18** specifies the authorities for licensing the operation of stations within any given territory;

d) the right of each Member State to decide on its participation in these systems, and the obligations for entities and organizations providing international or national telecommunication services by means of these systems to comply with the legal, financial and regulatory requirements of the administrations in whose territory these services are authorized,

resolves

that administrations licensing global satellite systems and stations intended to provide public personal communications by means of fixed, mobile or transportable terminals shall ensure, when licensing these systems and stations, that they can be operated only from the territory or territories of administrations having authorized such service and stations in compliance with Articles **17** and **18**, in particular No. **18.1**,

requests administrations

1 to continue cooperating with worldwide satellite system operators in improving the established arrangements for the provision of service within their territories and with the Secretary-General in implementing the GMPCS-MoU and its Arrangements;

2 to participate actively in ITU-R studies in developing and improving relevant Recommendations,

reminds operators of such systems

to take account, when contracting agreements on the operation of their systems from the territory of a country, of any potential loss of revenue that the country may suffer from a possible reduction of its international traffic existing at the time such agreements are executed.

RESOLUTION 26 (Rev.WRC-97)

**Footnotes to the Table of Frequency Allocations in
Article 5 of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 1997),

considering

- a)* that footnotes are an integral part of the Table of Frequency Allocations in the Radio Regulations and, as such, form part of an international treaty text;
- b)* that footnotes to the Table of Frequency Allocations should be clear, concise and easy to understand;
- c)* that footnotes should relate directly to matters of frequency allocation;
- d)* that, in order to ensure that footnotes allow modification of the Table of Frequency Allocations without introducing unnecessary complications, principles relating to the use of footnotes are needed;
- e)* that, currently, footnotes are adopted by competent world radiocommunication conferences and any addition, modification or deletion of a footnote is considered and adopted by the competent conference;
- f)* that some problems concerning country footnotes may be resolved through the application of a special agreement envisaged by Article 6;
- g)* that, in certain cases, administrations are confronted with major difficulties due to inconsistencies or omissions in footnotes;
- h)* that, in order to keep the footnotes to the Table of Frequency Allocations up to date, there should be clear and effective guidelines for additions, modifications and deletions of footnotes,

resolves

- 1 that, wherever possible, footnotes to the Table of Frequency Allocations should be confined to altering, limiting or otherwise changing the relevant allocations rather than dealing with the operation of stations, assignment of frequencies or other matters;
- 2 that the Table of Frequency Allocations should include only those footnotes which have international implications for the use of the radio-frequency spectrum;

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3 that new footnotes to the Table of Frequency Allocations should only be adopted in order to:

- a) achieve flexibility in the Table of Frequency Allocations;
- b) protect the relevant allocations in the body of the Table and in other footnotes in accordance with Section II of Article 5;
- c) introduce either transitional or permanent restrictions on a new service to achieve compatibility; or
- d) meet the specific requirements of a country or area when it is impracticable to satisfy such needs otherwise within the Table of Frequency Allocations;

4 that footnotes serving a common purpose should be in a common format, and, where possible, be grouped into a single footnote with appropriate references to the relevant frequency bands,

further resolves

1 that any addition of a new footnote or modification of an existing footnote should be considered by a world radiocommunication conference only when:

- a) the agenda of that conference explicitly includes the frequency band to which the proposed additional or modified footnote relates; or
- b) the frequency bands to which the desired additions or modifications of the footnote belong are considered during the conference and the conference decides to make a change in those bands; or
- c) the addition or modification of footnotes is specifically included in the agenda of the conference as a result of the consideration of proposals submitted by one or more interested administration(s);

2 that recommended agendas for future world radiocommunication conferences should include a standing agenda item which would allow for the consideration of proposals by administrations for deletion of country footnotes, or country names in footnotes, if no longer required;

3 that in cases not covered by *further resolves* 1 and 2, proposals for new footnotes or modification of existing footnotes could exceptionally be considered by a world radiocommunication conference if they concern corrections of obvious omissions, inconsistencies, ambiguities or editorial errors and have been submitted to ITU as stipulated in No. 316 of the Convention (Geneva, 1992),

urges administrations

1 to review footnotes periodically and to propose the deletion of their country footnotes or of their country names from footnotes, as appropriate;

2 to take account of the *further resolves* above in making proposals to world radiocommunication conferences.

RESOLUTION 27 (Rev.WRC-03)

Use of incorporation by reference in the Radio Regulations

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that the principles of incorporation by reference were adopted by WRC-95, revised by WRC-97 and further refined by WRC-2000 (see Annexes 1 and 2 to this Resolution);
- b) that there are provisions in the Radio Regulations containing references which fail to distinguish adequately whether the status of the referenced text is mandatory or non-mandatory,

noting

that references to Resolutions or Recommendations of a world radiocommunication conference (WRC) require no special procedures, and are acceptable for consideration, since such texts will have been agreed by a WRC,

resolves

- 1 that for the purposes of the Radio Regulations, the term “incorporation by reference” shall only apply to those references intended to be mandatory;
- 2 that when considering the introduction of new cases of incorporation by reference, such incorporation shall be kept to a minimum and made by applying the following criteria:
 - only texts which are relevant to a specific WRC agenda item may be considered;
 - the correct method of reference shall be determined on the basis of the principles set out in Annex 1 to this Resolution;
 - the guidance contained in Annex 2 to this Resolution shall be applied in order to ensure that the correct method of reference for the intended purpose is employed;
- 3 that the procedure described in Annex 3 to this Resolution shall be applied for approving the incorporation by reference of ITU-R Recommendations or parts thereof;
- 4 that existing references to ITU-R Recommendations shall be reviewed to clarify whether the reference is mandatory or non-mandatory in accordance with Annex 2 to this Resolution;

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5 that ITU-R Recommendations, or parts thereof, incorporated by reference at the conclusion of each WRC shall be collated and published in a volume of the Radio Regulations (see Annex 3 to this Resolution),

instructs the Director of the Radiocommunication Bureau

1 to bring this Resolution to the attention of the Radiocommunication Assembly and the ITU-R Study Groups;

2 to identify the provisions and footnotes of the Radio Regulations containing references to ITU-R Recommendations and make suggestions on any further action to the second session of the Conference Preparatory Meeting (CPM) for inclusion in its Report to the next WRC,

invites administrations

to submit proposals to future conferences, taking into account the CPM Report, in order to clarify the status of references, where ambiguities remain regarding the mandatory or non-mandatory status of the references in question, with a view to amending those references:

- i) that appear to be of a mandatory nature, identifying such references as being incorporated by reference by using clear linking language in accordance with Annex 2;
- ii) that are of a non-mandatory character, so as to refer to “the most recent version” of the Recommendations.

ANNEX 1 TO RESOLUTION 27 (Rev.WRC-03)

Principles of incorporation by reference

1 For the purposes of the Radio Regulations, the term “incorporation by reference” shall apply only to those references intended to be mandatory.

2 Where the relevant texts are brief, the referenced material should be placed in the body of the Radio Regulations rather than using incorporation by reference.

3 Texts which are of a non-mandatory nature or which refer to other texts of a non-mandatory nature shall not be considered for incorporation by reference.

4 If, on a case-by-case basis, it is decided to incorporate material by reference on a mandatory basis, then the following provisions shall apply:

4.1 the text incorporated by reference shall have the same treaty status as the Radio Regulations themselves;

4.2 the reference must be explicit, specifying the specific part of the text (if appropriate) and the version or issue number;

4.3 the text incorporated by reference must be submitted for adoption by a competent WRC in accordance with *resolves* 3;

4.4 all texts incorporated by reference shall be published following a WRC, in accordance with *resolves* 4.

5 If, between WRCs, a text incorporated by reference (e.g. an ITU-R Recommendation) is updated, the reference in the Radio Regulations shall continue to apply to the earlier version incorporated by reference until such time as a competent WRC agrees to incorporate the new version. The mechanism for considering such a step is given in Resolution **28 (Rev.WRC-03)**.

ANNEX 2 TO RESOLUTION 27 (Rev.WRC-03)

Application of incorporation by reference

When introducing new cases of incorporation by reference in the provisions of the Radio Regulations or reviewing existing cases of incorporation by reference, administrations and ITU-R should address the following factors in order to ensure that the correct method of reference is employed for the intended purpose:

1 whether each reference is mandatory, i.e. incorporated by reference, or non-mandatory;

2 mandatory references shall use clear linking language, i.e. “shall”;

3 mandatory references shall be explicitly and specifically identified, e.g. “Recommendation ITU-R M.541-8”;

4 if the intended reference material is, as a whole, unsuitable as treaty-status text, the reference shall be limited to just those portions of the material in question which are of a suitable nature, e.g. “Annex A to Recommendation ITU-R Z.123-4”;

5 non-mandatory references, or ambiguous references that are determined to be of a non-mandatory character, i.e. not incorporated by reference, shall use appropriate linking language, e.g. “should” or “may”, and would normally be made using the terminology “the most recent version” of a Recommendation.

ANNEX 3 TO RESOLUTION 27 (Rev.WRC-03)

**Procedures applicable by WRC for approving the incorporation
by reference of ITU-R Recommendations or parts thereof**

The referenced texts shall be made available to delegations in sufficient time for all administrations to consult them in the ITU languages. A single copy of the texts shall be made available to each administration as a conference document.

During the course of each WRC, a list of the texts incorporated by reference shall be developed and maintained by the committees. This list shall be published as a conference document in line with developments during the conference.

Following the end of each WRC, the Bureau and General Secretariat will update the volume of the Radio Regulations which serves as the repository of texts incorporated by reference in line with developments at the conference as recorded in the above-mentioned document.

RESOLUTION 28 (Rev.WRC-03)

**Revision of references to the text of ITU-R Recommendations
incorporated by reference in the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the Voluntary Group of Experts (VGE) on simplification of the Radio Regulations proposed the transfer of certain texts of the Radio Regulations to other documents, especially to ITU-R Recommendations, using the incorporation by reference procedure;
- b)* that, in some cases, the provisions of the Radio Regulations imply an obligation on Member States to conform to the criteria or specifications incorporated by reference;
- c)* that references to incorporated texts shall be explicit and shall refer to a precisely identified provision (see Resolution **27 (Rev.WRC-03)**);
- d)* that all texts of ITU-R Recommendations incorporated by reference are published in a volume of the Radio Regulations;
- e)* that, taking into account the rapid evolution of technology, ITU-R may revise the ITU-R Recommendations containing text incorporated by reference at short intervals;
- f)* that, following revision of an ITU-R Recommendation containing text incorporated by reference, the reference in the Radio Regulations shall continue to apply to the earlier version until such time as a competent world radiocommunication conference (WRC) agrees to incorporate the new version;
- g)* that it would be desirable that texts incorporated by reference reflect the most recent technical developments,

noting

that administrations need sufficient time to examine the potential consequences of changes to ITU-R Recommendations containing text incorporated by reference and would therefore benefit greatly from being advised, as early as possible, of which ITU-R Recommendations have been revised and approved during the elapsed study period or at the Radiocommunication Assembly preceding the WRC,

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resolves

- 1 that each radiocommunication assembly shall communicate to the following WRC a list of the ITU-R Recommendations containing text incorporated by reference in the Radio Regulations which have been revised and approved during the elapsed study period;
- 2 that, on this basis, WRC should examine those revised ITU-R Recommendations, and decide whether or not to update the corresponding references in the Radio Regulations;
- 3 that, if the WRC decides not to update the corresponding references, the currently referenced version shall be maintained in the Radio Regulations;
- 4 that WRCs shall place the examination of ITU-R Recommendations in conformity with *resolves* 1 and *resolves* 2 of this Resolution on the agenda of future WRCs,

instructs the Director of the Radiocommunication Bureau

to provide the CPM immediately preceding each WRC with a list, for inclusion in the CPM Report, of those ITU-R Recommendations containing texts incorporated by reference that have been revised or approved since the previous WRC, or that may be revised in time for the following WRC,

urges administrations

- 1 to participate actively in the work of the radiocommunication study groups and the radiocommunication assembly on revision of those Recommendations to which mandatory references are made in the Radio Regulations;
- 2 to examine any indicated revisions of ITU-R Recommendations containing text incorporated by reference and to prepare proposals on possible updating of relevant references in the Radio Regulations.

RESOLUTION 33 (Rev.WRC-03)

**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 Radiocommunication Conference (Geneva, 2003),

considering

- a)* that while Resolution **507 (Rev.WRC-03)** envisages plans for the broadcasting-satellite service (BSS), 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 BSS before such plans have been established;
- c)* that a space station in the BSS may cause harmful interference to terrestrial stations operating in the same frequency band, even if the latter are outside the service area of the space station;
- d)* that the procedures specified in Articles **9** to **14** and Appendix **5** contain provisions for coordination between stations in the BSS and terrestrial stations, between space systems in that service and space systems of other administrations;
- e)* that there are many existing and planned stations in the BSS not subject to agreements and associated plans that have submitted advance publication information (API) or a request for coordination under the existing Resolution **33** procedures and that some administrations are currently in coordination under these procedures,

resolves

- 1** that, except in those cases where agreements and associated plans for the BSS have been established and have entered into force, for satellite networks for which the API has been received following 1 January 1999, only the procedures of Articles **9** to **14*** shall be applied for the coordination and notification of stations in the BSS and coordination and notification of other services in respect of that service;

* Or procedures contained in other provisions of these Regulations when they replace any of those in Articles **9** to **14** for the broadcasting-satellite service.

2 that, except in those cases where agreements and associated plans for the BSS have been established and have entered into force, for satellite networks for which the API has been received by the Radiocommunication Bureau prior to 1 January 1999, only the procedure in Sections A to C in this Resolution shall be applied;

3 that a future conference review the requirement for the procedures in this Resolution.

Section A – Coordination procedure between space stations in the broadcasting-satellite service and terrestrial stations

2.1 Before an administration notifies to the Bureau or brings into use any frequency assignment to a space station in the BSS in a frequency band where this frequency band is allocated, with equal rights, to the BSS and to a terrestrial radiocommunication service, either in the same Region or sub-Region or in different Regions or sub-Regions, it shall coordinate the use of this assignment with any other administration whose terrestrial radiocommunication services may be affected. For this purpose, it shall inform the Bureau of all the technical characteristics of the station, as listed in the relevant sections of Appendix 4, which are necessary to assess the risk of interference to a terrestrial radiocommunication service¹.

2.2 The Bureau shall publish this information in a Special Section of its International Frequency Information Circular (BR IFIC) and shall also, when the BR IFIC contains such information, so advise all administrations by circular telegram.

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

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

2.5 The administration which plans to bring into use a space station in the BSS 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 Bureau at any time during the coordination procedure.

¹ The calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant ITU-R Recommendations agreed by the administrations concerned either as a result of Resolution 703 (Rev.WRC-03) or otherwise. In the event of disagreement on an ITU-R Recommendation or in the absence of such Recommendations, the methods and criteria shall be agreed between the administrations concerned. Such agreements shall be concluded without prejudice to other administrations.

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

Section B – Coordination procedure between space stations in the BSS and space systems of other administrations

3 An administration intending to bring into use a space station in the BSS shall, for the purpose of coordination with space systems of other administrations, apply the following provisions of Article 11 of the Radio Regulations (edition of 1990, revised in 1994):

3.1 Nos. 1041 to 1058 inclusive.

3.2.1 Nos. 1060 to 1065².

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

3.2.3 Nos. 1074 to 1105 inclusive.

Section C – Notification, examination and recording in the Master Register of assignments to space stations in the BSS dealt with under this Resolution

4.1 Any frequency assignment³ to a space station in the BSS shall be notified to the Bureau. The notifying administration shall apply for this purpose the provisions of Nos. 1495 to 1497 of the Radio Regulations (edition of 1990, revised in 1994).

4.2 Notices made under § 4.1 shall initially be treated in accordance with No. 1498 of the Radio Regulations (edition of 1990, revised in 1994).

5.1 The Bureau shall examine each notice with respect to:

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

² See footnote 1.

³ The expression *frequency assignment*, wherever it appears in this Resolution, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called the *Master Register*).

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

5.4 *c)* its conformity, where applicable, with the provisions of § 3.2.1 of Section B above, relating to coordination 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. **1240** or **1503** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate, if that assignment has not, in fact, caused harmful interference to the service rendered by a station for which an assignment has been previously recorded in the Master Register and which itself is in conformity with No. **1240** or **1503** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate.

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

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

6.3 Where the Bureau reaches a favourable finding with respect to § 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 § 5.3 and 5.4.

6.4 Where the Bureau finds that the coordination procedures mentioned in § 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 Bureau 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 prejudice in any way the decisions to be included in the agreements and associated plans referred to in Resolution **507 (Rev.WRC-03)**.

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

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

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

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

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

6.10 If the administration resubmits the notice unchanged with the insistence that it be reconsidered, but should the Bureau's unfavourable finding under § 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 Bureau that the assignment has been in use for at least four months without any complaint of harmful interference having been received. The date of receipt by the Bureau of the original notice shall be entered in Column 2d of the Master Register, with the remark mentioned in § 6.4. An appropriate remark shall be placed in Column 13 to indicate that the assignment is not in conformity with the provisions of § 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 Bureau shall review its finding.

6.11 If harmful interference is actually caused to the reception of any space station in the BSS whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to § 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 § 6.10 of this Resolution or of No. **1544** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.41**, as appropriate, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

6.12 If harmful interference is actually caused to the reception of any space radiocommunication station using an assignment recorded in the Master Register as a result of a favourable finding with respect to Nos. **1503** to **1512** of the Radio Regulations (edition of 1990, revised in 1994), or Nos. **11.31** to **11.34**, as appropriate, by the use of an assignment to a space station in the BSS which has been subsequently recorded in the Master Register in accordance with the provisions of § 6.10 of this Resolution, the station using the latter assignment must, on receipt of advice thereof, immediately eliminate this harmful interference.

6.13 If harmful interference is actually caused to the reception of any terrestrial station using an assignment recorded in the Master Register as a result of a favourable finding with respect to No. **1240** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate, by the use of an assignment to a space station in the BSS which has been subsequently recorded in the Master Register in accordance with the provisions of § 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 § 5.2 of this Resolution is actually caused by the use of a frequency assignment which is not in conformity with No. **1240**, **1352** or **1503** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

RESOLUTION 34 (Rev.WRC-03)

Establishment of the broadcasting-satellite service in Region 3 in the 12.5-12.75 GHz frequency band and sharing with space and terrestrial services in Regions 1, 2 and 3

The World Radiocommunication Conference (Geneva, 2003),

considering

that the World Administrative Conference (Geneva, 1979) has allocated the band 12.5-12.75 GHz to the broadcasting-satellite service for community reception in Region 3,

recognizing

that under Resolution **507 (Rev.WRC-03)** the Council may wish to empower a future competent radiocommunication conference to establish a plan for the broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3,

resolves

1 that, until such time as a plan may be established for the broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3, the relevant provisions of Sections A and B of Resolution **33 (Rev.WRC-03)** or of Article 9, as appropriate (see Resolution **33 (Rev.WRC-03)**) shall continue to apply to the coordination between stations in the broadcasting-satellite service in Region 3 and:

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

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

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

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3 that, until such time as technical provisions are developed by the ITU-R and accepted by administrations concerned under Resolution **703 (Rev.WRC-03)**, the sharing between space stations in the broadcasting-satellite service in Region 3 and terrestrial services in Regions 1, 2 and 3 shall be based on the following criteria as appropriate:

- a)* the power flux-density at the Earth's surface, produced by emissions from a space station in the broadcasting-satellite service in Region 3 for all conditions and for all methods of modulation shall not exceed the limits given in Annex 5 of Appendix **30**;
- b)* in addition to *resolves 3 a)* above, the provisions of Article **21** (Table **21-4**) shall apply in the countries mentioned in Nos. **5.494** and **5.496**;
- c)* the limits given in *resolves 3 a)* and *b)* above may be exceeded on the territory of any country provided the administration of that country has so agreed.

RESOLUTION 42 (Rev.WRC-03)

**Use of interim systems in Region 2 in the broadcasting-satellite and
fixed-satellite (feeder-link) services in Region 2 for the bands
covered by Appendices 30 and 30A**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2, Geneva, 1983, prepared a Plan for the broadcasting-satellite service in the band 12.2-12.7 GHz and a Plan for the associated feeder links in the band 17.3-17.8 GHz with provisions for implementing interim systems in accordance with Resolution 2 (Sat-R2);
- b)* that in the implementation of their assignments in the Plans, administrations of Region 2 may find it more appropriate to adopt a phased approach and initially use characteristics different from those appearing in the appropriate Region 2 Plan;
- c)* that some administrations of Region 2 may cooperate in the joint development of a space system with a view to covering two or more service areas from the same orbital position or to using a beam which would encompass two or more service areas;
- d)* that some administrations of Region 2 may cooperate in the joint development of a space system with a view to covering two or more feeder-link service areas from the same orbital position or to using a beam which encompasses two or more feeder-link service areas;
- e)* that interim systems shall not adversely affect the Plans nor hamper the implementation and evolution of the Plans;
- f)* that the number of assignments to be used in an interim system shall not in any case exceed the number of assignments appearing in the Region 2 Plan which are to be suspended;
- g)* that the interim systems shall not in any case use orbital positions that are not in the Region 2 Plan;
- h)* that an interim system shall not be introduced without the agreement of all administrations whose space and terrestrial services are considered to be affected;
- i)* that WRC-2000 revised Regions 1 and 3 downlink and feeder-link Plans and established Lists together with regulatory procedures, protection criteria and calculation methods for sharing between services in the frequency bands of Appendices 30 and 30A;
- j)* that this Conference has modified the regulatory procedures, protection criteria and calculation methods for sharing between services in the frequency bands of Appendices 30 and 30A,

resolves

that administrations and the Radiocommunication Bureau shall apply the procedure contained in the Annex to this Resolution, so long as Appendices 30 and 30A remain in force.

ANNEX TO RESOLUTION 42 (Rev.WRC-03)

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

1.1 For an interim system in the broadcasting-satellite service

- a) to use an increased e.i.r.p. in any direction relative to that appearing in the Region 2 Plan provided that the power flux-density does not exceed the limits given in Annex 5 to Appendix 30;
- b) to use modulation characteristics¹ different from those appearing in the Annexes to the Region 2 Plan and resulting in an increased probability of harmful interference or in a wider assigned bandwidth;
- c) to change the coverage area by displacing boresight, or by increasing the major or minor axis, or by rotating them from an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 Plan;
- d) to use a coverage area appearing in the Region 2 Plan or a coverage area encompassing two or more coverage areas appearing in the Region 2 Plan from an orbital position which shall be one of the corresponding positions appearing in the Region 2 Plan;
- e) to use a polarization different from that in the Region 2 Plan.

1.2 For an interim feeder-link system

- a) to use an increased e.i.r.p. in any direction relative to that appearing in the Region 2 feeder-link Plan;
- b) to use modulation characteristics¹ different from those appearing in the Annexes to the Plan and resulting in an increased probability of harmful interference or in a wider assigned bandwidth;
- c) to change the feeder-link beam area by displacing the boresight, or by increasing the major or minor axis, or by rotating them in relation to an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 feeder-link Plan;

¹ For example, modulation with sound channels frequency-multiplexed within the bandwidth of a television channel, digital modulation of sound and television signals, or other pre-emphasis characteristics.

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

2 In all cases, an interim system shall correspond to assignments in the appropriate Region 2 Plan; the number of assignments to be used in an interim system shall not in any case exceed the number of assignments appearing in the Region 2 Plan which are to be suspended. During the use of an interim system, the use of the corresponding assignments in the Region 2 Plan is suspended; they shall not be brought into use before the cessation of the use of the interim system. However, the suspended assignments, but not the interim system's assignments, of an administration shall be taken into account when other administrations apply the procedure of Article 4 of Appendix 30 or of Article 4 of Appendix 30A, as appropriate, in order to modify the Region 2 Plan or to include new or modified assignments in the Regions 1 and 3 List, or the procedure of this Annex in order to bring an interim system into use. The assignments of interim systems shall not be taken into account in applying the procedure of Article 6 or Article 7 of Appendix 30 and the procedure of Article 6 or Article 7 of Appendix 30A.

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

4 When an administration proposes to use an assignment in accordance with § 1, it shall communicate to the Bureau the information listed in Appendix 4 not earlier than eight years but, preferably, not later than two years before the date of bringing into use. An assignment shall lapse if it is not brought into use by that date². The administration shall also indicate:

- a) the maximum specified period during which the interim assignment is intended to remain in use;
- b) the assignments in the Region 2 Plans the use of which will remain suspended for the duration of the use of the corresponding interim assignment;
- c) the names of the administrations with which an agreement for the use of the interim assignment has been reached, together with any comment relating to the period of use so agreed and the names of administrations with which an agreement may be required but has not yet been reached.

² The provisions of Resolution 533 (Rev.WRC-2000) apply.

5 Administrations are considered to be affected as follows:

5.1 For an interim system in the broadcasting-satellite service

- a)* an administration of Region 2 is considered to be affected if any overall equivalent protection margin of one of its assignments in the Region 2 Plan, calculated in accordance with Annex 5 to Appendix **30** including the cumulative effect of all interim uses during the maximum specified period of use of the interim system, but excluding the corresponding suspended assignments (§ 4 *b*)), becomes negative or a former negative value is made more negative;
- b)* an administration of Region 1 or 3 is considered to be affected if it has an assignment which is in conformity with the Regions 1 and 3 Plan contained in Appendix **30** or with the List or in respect of which proposed new or modified assignments have been received by the Bureau in accordance with the provisions of Article 4 of that Appendix with a necessary bandwidth which falls within the necessary bandwidth of the proposed interim assignment and the appropriate limits of § 3 of Annex 1 to Appendix **30** are exceeded;
- c)* an administration of Region 1 or 3 is considered to be affected if it has a frequency assignment in the fixed-satellite service which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. **9.7** or under Article 7 of Appendix **30** or which has been published in accordance with No. **9.2B** and the appropriate limits of § 6 of Annex 1 to Appendix **30** are exceeded;
- d)* an administration of Region 1 or 3 is considered to be affected if, although having no frequency assignment in the appropriate Regions 1 and 3 Plan or List in the channel concerned, it nevertheless would receive on its territory a power flux-density value which exceeds the limits given in § 4 of Annex 1 to Appendix **30** as a result of the proposed interim assignment, or if it has such an assignment for which its associated service area does not cover the whole of the territory of the administration, and in its territory outside that service area the power flux-density from the interim system space station exceeds the above-mentioned limits;
- e)* an administration of Region 2 is considered to be affected if, although having no frequency assignment in the appropriate Region 2 Plan in the channel concerned, it nevertheless would receive on its territory a power flux-density value which exceeds the limits given in § 4 of Annex 1 to Appendix **30** as a result of the proposed interim assignment, or if it has such an assignment for which its associated service area does not cover the whole of the territory of the administration, and in its territory outside that service area the power flux-density from the interim system space station exceeds the above-mentioned limits;
- f)* an administration of Region 3 is considered to be affected if it has a frequency assignment to a space station in the broadcasting-satellite service in the band 12.5-12.7 GHz with a necessary bandwidth any portion of which falls within the necessary bandwidth of the proposed assignment, and which:
 - is recorded in the Master Register; *or*

- has been coordinated or is being coordinated under the provisions of Sections A and B of Resolution **33 (Rev.WRC-03)** or under the provisions of Articles **9** to **14**, as appropriate (see Resolution **33 (Rev.WRC-03)**); *or*
- appears in a Region 3 Plan to be adopted at a future radiocommunication conference, taking account of modifications which may be introduced subsequently in accordance with the Final Acts of that conference,

and the limits of § 3, Annex 1 to Appendix **30** are exceeded.

5.2 For interim feeder-link systems

- a) an administration of Region 2 is considered to be affected if any overall equivalent protection margin of one of its assignments in the Plan, calculated in accordance with Annex 3 to Appendix **30A** including the cumulative effect of all interim uses during the maximum specified period of use of the interim system, but excluding the corresponding suspended assignment(s) (§ 4 b)), becomes negative or a former negative value is made more negative;
- b) an administration in Region 1 or 3 is considered to be affected if it has an assignment for feeder links in the fixed-satellite service (Earth-to-space), any portion of the necessary bandwidth of which falls within the necessary bandwidth of the proposed assignment, which is in conformity with the feeder-link Plan or List for Regions 1 and 3, or in respect of which proposed new or modified assignments in the List have already been received by the Bureau in accordance with the provisions of Article 4 of Appendix **30A** and for which the limits set out in § 5 of Annex 1 to Appendix **30A** are exceeded.

6 The Bureau shall publish in a Special Section of its International Frequency Information Circular (BR IFIC) the information received under § 4, together with the names of the administrations which the Bureau has identified in applying § 5.

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

8 The Bureau shall send a telegram to the administrations listed in the Special Section of the BR IFIC, drawing their attention to the information it contains and shall send them the results of its calculations.

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

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

11 On the expiry of four months following the date of publication of the BR IFIC referred to in § 6, the Bureau shall review the matter, and, depending on the results obtained, shall inform the administration proposing the interim assignment that:

- a) it may notify its proposed use under Article 5 of Appendix **30** or Article 5 of Appendix **30A**, as appropriate, if no agreement is required or the required agreement has been obtained from the administrations concerned. In this case the Bureau shall update the Interim List;
- b) it may not bring into use its interim system before having obtained the agreement of the administrations affected, either directly or by applying the procedure described in Article 4 of Appendix **30** or Article 4 of Appendix **30A**, as appropriate, as a means of obtaining that agreement.

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

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

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

- a) enter a symbol in the Remarks Column of the Master Register to indicate the lack of response and that the entry is for information only;
- b) not take that assignment into account in the Interim List;
- c) inform the administrations concerned and affected of its action.

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

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

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

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

RESOLUTION 49 (Rev.WRC-03)

**Administrative due diligence applicable to some satellite
radiocommunication services**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that Resolution 18 of the Plenipotentiary Conference (Kyoto, 1994) instructed the Director of the Radiocommunication Bureau to initiate a review of some important issues concerning international satellite network coordination and to make a preliminary report to WRC-95 and a final report to WRC-97;
- b)* that the Director of the Bureau provided a comprehensive report to WRC-97, including a number of recommendations for action as soon as possible and for identifying areas requiring further study;
- c)* that one of the recommendations in the Director's report to WRC-97 was that administrative due diligence should be adopted as a means of addressing the problem of reservation of orbit and spectrum capacity without actual use;
- d)* that experience may need to be gained in the application of the administrative due diligence procedures adopted by WRC-97, and that several years may be needed to see whether administrative due diligence measures produce satisfactory results;
- e)* that new regulatory approaches may need to be carefully considered in order to avoid adverse effects on networks already going through the different phases of the procedures;
- f)* that Article 44 of the Constitution sets out the basic principles for the use of the radio-frequency spectrum and the geostationary-satellite and other satellite orbits, taking into account the needs of developing countries,

considering further

- g)* that WRC-97 decided to reduce the regulatory time-frame for bringing a satellite network into use;
- h)* that WRC-2000 has considered the results of the implementation of the administrative due diligence procedures and prepared a report to the 2002 Plenipotentiary Conference in response to Resolution 85 (Minneapolis, 1998),

resolves

1 that the administrative due diligence procedure contained in Annex 1 to this Resolution shall be applied as from 22 November 1997 for a satellite network or satellite system of the fixed-satellite service, mobile-satellite service or broadcasting-satellite service for which the advance publication information under No. **9.2B**, or for which the request for modifications of the Region 2 Plan under Article 4, § 4.2.1 *b*) of Appendices **30** and **30A** that involve the addition of new frequencies or orbit positions, or for which the request for modifications of the Region 2 Plan under Article 4, § 4.2.1 *a*) of Appendices **30** and **30A** that extend the service area to another country or countries in addition to the existing service area, or for which the request for additional uses in Regions 1 and 3 under § 4.1 of Article 4 of Appendices **30** and **30A**, or for which the submission of information under supplementary provisions applicable to additional uses in the planned bands as defined in Article 2 of Appendix **30B** (Section III of Article 6) has been received by the Bureau from 22 November 1997;

2 that for a satellite network or satellite system within the scope of § 1 or 3 of Annex 1 to this Resolution not yet recorded in the Master International Frequency Register (MIFR) by 22 November 1997, for which the advance publication information under No. **1042** of the Radio Regulations (edition of 1990, revised in 1994) or for the application of Section III of Article 6 of Appendix **30B** has been received by the Bureau before 22 November 1997, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 21 November 2004, or before the expiry of the notified period for bringing the satellite network into use, plus any extension period which shall not exceed three years pursuant to the application of No. **1550** of the Radio Regulations (edition of 1990, revised in 1994) or the dates specified in the relevant provisions Article 6 of Appendix **30B**, whichever date comes earlier. If the date of bringing into use, including extension specified above, is before 1 July 1998, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 1 July 1998;

2bis that for a satellite network or satellite system within the scope of § 2 of Annex 1 to this Resolution not recorded in the MIFR by 22 November 1997, for which the request for a modification to the Plans of Appendices **30** and **30A** has been received by the Bureau before 22 November 1997, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution as early as possible before the end of the period established as a limit to bringing into use in accordance with the relevant provisions of Article 4 of Appendix **30** and the relevant provisions of Article 4 of Appendix **30A**;

3 that for a satellite network or satellite system within the scope of § 1, 2 or 3 of Annex 1 to this Resolution recorded in the MIFR by 22 November 1997, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 21 November 2000, or before the notified date of bringing the satellite network into use (including any extension period), whichever date comes later;

4 that six months before the expiry date specified in *resolves 2* or *2bis* above, if the responsible administration has not submitted the due diligence information, the Bureau shall send a reminder to that administration;

5 that if the due diligence information is found to be incomplete, the Bureau shall immediately request the administration to submit the missing information. In any case, the complete due diligence information shall be received by the Bureau before the expiry date specified in *resolves 2* or *2bis* above, as appropriate, and shall be published by the Bureau in the International Frequency Information Circular (BR IFIC);

6 that if the complete due diligence information is not received by the Bureau before the expiry date specified in *resolves 2* or *2bis* above, the request for coordination or request for a modification to the Plans of Appendices **30** and **30A** or for application of Section III of Article 6 of Appendix **30B** as covered by *resolves 1* above submitted to the Bureau shall be cancelled. Any modifications of the Plans (Appendices **30** and **30A**) shall lapse and any recording in the MIFR as well as recordings in the Appendix **30B** List shall be deleted by the Bureau after it has informed the concerned administration. The Bureau shall publish this information in the BR IFIC,

further resolves

that the procedures in this Resolution are in addition to the provisions under Article **9** or **11** of the Radio Regulations or Appendices **30**, **30A** or **30B**, as applicable, and, in particular, do not affect the requirement to coordinate under those provisions (Appendices **30**, **30A**) in respect of extending the service area to another country or countries in addition to the existing service area,

instructs the Director of the Radiocommunication Bureau

to report to WRC-07 and future competent world radiocommunication conferences on the results of the implementation of the administrative due diligence procedure.

ANNEX 1 TO RESOLUTION 49 (Rev.WRC-03)

1 Any satellite network or satellite system of the fixed-satellite service, mobile-satellite service or broadcasting-satellite service with frequency assignments that are subject to coordination under Nos. **9.7**, **9.11**, **9.12**, **9.12A** and **9.13** and Resolution **33 (Rev.WRC-03)** shall be subject to these procedures.

2 Any request for modifications of the Region 2 Plan under the relevant provisions of Article 4 of Appendices **30** and **30A** that involve the addition of new frequencies or orbit positions or for modifications of the Region 2 Plan under the relevant provisions of Article 4 of Appendices **30** and **30A** that extend the service area to another country or countries in addition to the existing service area or request for additional uses in Regions 1 and 3 under the relevant provisions of Article 4 of Appendices **30** and **30A** shall be subject to these procedures.

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3 Any submission of information under supplementary provisions applicable to additional uses in the planned bands as defined in Article 2 of Appendix **30B** (Section III of Article 6) shall be subject to these procedures.

4 An administration requesting coordination for a satellite network under § 1 above shall send to the Bureau as early as possible before the end of the period established as a limit to bringing into use in No. **9.1**, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

5 An administration requesting a modification of the Region 2 Plan or additional uses in Regions 1 and 3 under Appendices **30** and **30A** under § 2 above shall send to the Bureau as early as possible before the end of the period established as a limit to bringing into use in accordance with the relevant provisions of Article 4 of Appendix **30** and the relevant provisions of Article 4 of Appendix **30A**, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

6 An administration applying Section III of Article 6 of Appendix **30B** relating to additional uses under § 3 above shall send to the Bureau as early as possible before the end of the period established as a limit to bringing into use in § 6.57 of that Article, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

7 The information to be submitted in accordance with § 4, 5 or 6 above shall be signed by an authorized official of the notifying administration or of an administration that is acting on behalf of a group of named administrations.

8 On receipt of the due diligence information under § 4, 5 or 6 above, the Bureau shall promptly examine that information for completeness. If the information is found to be complete, the Bureau shall publish the complete information in a special section of the BR IFIC within 30 days.

9 If the information is found to be incomplete, the Bureau shall immediately request the administration to submit the missing information. In all cases, the complete due diligence information shall be received by the Bureau within the appropriate time period specified in § 4, 5 or 6 above, as the case may be, relating to the date of bringing the satellite network into use.

10 Six months before expiry of the period specified in § 4, 5 or 6 above and if the administration responsible for the satellite network has not submitted the due diligence information under § 4, 5 or 6 above, the Bureau shall send a reminder to the responsible administration.

11 If the complete due diligence information is not received by the Bureau within the time limits specified in this Resolution, the networks covered by § 1, 2 or 3 above shall no longer be taken into account and shall not be recorded in the MIFR. The provisional recording in the MIFR shall be deleted by the Bureau after it has informed the concerned administration. The Bureau shall publish this information in the BR IFIC.

With respect to the request for modification of the Region 2 Plan or for additional uses in Regions 1 and 3 under Appendices **30** and **30A** under § 2 above, the modification shall lapse if the due diligence information is not submitted in accordance with this Resolution.

With respect to the request for application of Section III of Article 6 of Appendix **30B** under § 3 above, the network shall also be deleted from the Appendix **30B** List, if applicable.

12 An administration notifying a satellite network under § 1, 2 or 3 above for recording in the MIFR shall send to the Bureau, as early as possible before the date of bringing into use, the due diligence information relating to the identity of the satellite network and the launch services provider specified in Annex 2 to this Resolution.

13 When an administration has completely fulfilled the due diligence procedure but has not completed coordination, this does not preclude the application of No. **11.41** by that administration.

ANNEX 2 TO RESOLUTION 49 (Rev.WRC-03)

A Identity of the satellite network

- a)* Identity of the satellite network
- b)* Name of the administration
- c)* Country symbol
- d)* Reference to the advance publication information or to the request for modification of the Region 2 Plan or for additional uses in Regions 1 and 3 under Appendices **30** and **30A**; or reference to the information processed under Section III of Article 6 of Appendix **30B**
- e)* Reference to the request for coordination (not applicable for Appendices **30**, **30A** and **30B**)
- f)* Frequency band(s)
- g)* Name of the operator
- h)* Name of the satellite
- i)* Orbital characteristics.

B Spacecraft manufacturer*

- a)* Name of the spacecraft manufacturer
- b)* Date of execution of the contract
- c)* Contractual “delivery window”
- d)* Number of satellites procured.

C Launch services provider

- a)* Name of the launch vehicle provider
- b)* Date of execution of the contract
- c)* Launch or in-orbit delivery window
- d)* Name of the launch vehicle
- e)* Name and location of the launch facility.

* NOTE – In cases where a contract for satellite procurement covers more than one satellite, the relevant information shall be submitted for each satellite.

RESOLUTION 51 (Rev.WRC-2000)

**Transitional arrangements relating to the advance publication
and coordination of satellite networks**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that as a result of the review under Resolution 18 of the Plenipotentiary Conference, (Kyoto, 1994) a number of provisions relating to the advance publication, coordination and notification of assignments for satellite networks have been modified and these should be applied provisionally as soon as possible;
- b) that WRC-97 decided to reduce the regulatory time-frame for bringing a satellite network into use, and to delete the advance publication information (API) if not followed by the coordination data within 24 months of the date of receipt of the API;
- c) that there are a number of satellite networks for which the relevant information has been communicated to ITU prior to the end of WRC-97, and it is necessary to provide for some transitional measures for the treatment of this information by the Radiocommunication Bureau;
- d) that WRC-97 decided that the provisions of Sections I, IA and IB of Article **S9** and provisions of Article **S11** (Nos. **S11.43A**, **S11.44**, **S11.44B** to **S11.44I**, **S11.47** and **S11.48**), as revised by WRC-97, were to be applied by the Bureau and by administrations on a provisional basis from 22 November 1997;
- e) that WRC-97 decided that, for satellite networks which were subject to coordination for which the API had been received by the Bureau prior to 22 November 1997 but the coordination data had not been received by the Bureau prior to that date, the responsible administration would have until 22 November 1999 or the end of the period pursuant to the application of No. **1056A**, whichever date came earlier, to submit the coordination data in accordance with the applicable provisions of the Radio Regulations; otherwise the Bureau would cancel the relevant API in accordance with No. **1056A** or No. **9.5D** as applicable;
- f) that WRC-97 decided that the revised Appendix **S4** with respect to the API for satellite networks which were subject to coordination under Section II of Article **S9** was to be applied as of 22 November 1997,

resolves

that, for satellite networks for which the API was received by the Bureau prior to 22 November 1997, the maximum allowed time period from the date of publication of the API to bring the relevant frequency assignments into use shall be six years plus the extension pursuant to No. **1550** (see also Resolution **49 (WRC-97)***).

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

RESOLUTION 55 (WRC-2000)

Temporary procedures for improving satellite network coordination and notification procedures

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) Resolution 86 (Minneapolis, 1998) of the Plenipotentiary Conference;
- b) that there is now such a large backlog of satellite network coordination requests pending with the Radiocommunication Bureau that, at current processing rates and with no new filings, it could take the Bureau more than three years to absorb it;
- c) that 95% of this backlog consists of coordination requests for geostationary-satellite networks,

recognizing

- a) that, in view of the processing delays, an administration may have to wait three years for the Bureau to publish a coordination request and, because of the five-year limit for bringing a network into use, can thus be faced with a short time window in which to effect coordination;
- b) that extraordinary measures are needed to enable the Bureau to absorb the backlog in processing satellite network coordination requests;
- c) that the current breakdown of ITU's satellite coordination process seriously undermines the ability of such networks to provide services and compromises the role of ITU in this process;
- d) that this Conference needs to take extraordinary measures to ensure the continued viability and credibility of the ITU satellite coordination process,

resolves

1 that, for those networks for which complete coordination information is received by the Bureau on or after 3 June 2000, the Bureau and administrations shall apply the following provisions, as revised by this Conference:

- a) Nos. **9.36, 9.36.2, 9.41** and **9.42**;
- b) Section D of Annex 2A to Appendix **4**;
- c) No. **9.7** (GSO/GSO) in Table 5-1 of Appendix **5**;

2 that, as from 3 June 2000, for those networks for which complete coordination information has been received by the Bureau prior to 3 June 2000 but not yet published in a Special Section of the International Frequency Information Circular (BR IFIC), the Bureau and administrations shall apply the following provisions, as revised by this Conference:

- a) Nos. **9.36**, **9.36.2**, **9.41** and **9.42**;
- b) Section D of Annex 2A to Appendix **4**;
- c) No. **9.7** (GSO/GSO) in Table 5-1 of Appendix **5**;

3 that, when the Bureau, under No. **11.32**, conducts its examination of notifications of satellite networks in respect of compliance with the coordination procedure, it shall base its findings on the coordination requirements set by No. **9.7** (GSO/GSO) in Table 5-1 of Appendix **5**, as revised by this Conference, only for those networks published and coordinated pursuant to the provisions of this Resolution;

4 that an administration in need of assistance may inform the Bureau that it has previously filed systems which might be affected by the proposed satellite network, and may request the Bureau's assistance, under No. **9.41**, in determining the need for coordination by applying the provisions of No. **9.7** (GSO/GSO) in Table 5-1 of Appendix **5** (§ 1), 2) and 3) of the frequency band column), as revised by this Conference; this request shall be considered as a disagreement, pending the results of the analysis by the Bureau of the need for coordination;

5 that, as from 3 June 2000, all notice forms (AP4/II and AP4/III), radio astronomy notices (AP4/IV) and API (AP4/V and AP4/VI) and due diligence information (Resolution **49 (WRC-97)***) for satellite networks and earth stations submitted to the Radiocommunication Bureau pursuant to Articles **9** and **11** shall be submitted in electronic format which is compatible with the BR electronic notice form capture software (SpaceCap)¹:

- a) all notice forms submitted between 3 June and 3 September 2000 may initially be submitted in paper format if administrations deem it necessary;
- b) these forms must be resubmitted in electronic format not later than 3 October 2000, without any modification in relation to the paper filing, in order to retain the date of receipt of the original filing; the Bureau will not compare the paper and electronic filing, but both filings will be made available to administrations who may report inconsistencies to the Bureau until 1 March 2001;
- c) if these notice forms are not resubmitted in electronic format by 3 October 2000, they shall be considered as incomplete and returned to the administration;
- d) all notice forms initially submitted after 3 September 2000 shall be submitted in electronic format; if the data for these notice forms are not received in electronic format, the notice forms shall be considered as incomplete and returned to the administration;

¹ Administrations of developing countries making no more than three filings a year may continue to submit filings on paper until 3 June 2001.

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

6 that, as from 3 June 2000, all graphical data associated with the submissions addressed in *resolves* 5 should be submitted in graphics data format which is compatible with the Bureau's data capture software (graphical interference management system (GIMS)); submission of graphics in paper form will, however, continue to be accepted,

instructs the Radiocommunication Bureau

1 to keep Member States periodically informed of the results of these measures, and report on them to the next competent conference;

2 together with administrations, to monitor, in the interval until WRC-03, whether assistance to administrations in applying the provisions of this Resolution has been effective, or whether any further actions are necessary;

3 to make available coordination requests and notifications, "as received", on its BR IFIC CD-ROM, within 30 days of receipt, and also on its website;

4 to provide administrations with the latest versions of the capture and validation software and any necessary technical means, training and manuals, along with any assistance requested by administrations to enable them to comply with *resolves* 5 and 6 above;

5 to integrate the validation software with the capture software to the extent practicable,

urges administrations

1 to resubmit in electronic format notices previously submitted in paper format, after consultation with the Bureau;

2 to submit, as soon as practicable, the graphical data relating to their notices in a format compatible with the Bureau's graphic data capture software.

RESOLUTION 56 (Rev.WRC-03)

**Modification of the procedures and requirements
for advance publication**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) Resolution 86 (Marrakesh, 2002) of the Plenipotentiary Conference;
- b) that there is concern among a number of administrations that some of the current procedures and requirements for advance publication may give rise to inequalities in the satellite filing and coordination process,

resolves

- 1 that, as from 5 July 2003, the Radiocommunication Bureau and administrations shall apply the provisions of No. **9.2**, as revised by this Conference;
- 2 that any request for coordination or modifications to a previously submitted API received by the Bureau after 5 July 2003 shall be examined in accordance with the provisions of No. **9.2** as revised by this Conference.

RESOLUTION 57 (WRC-2000)*

**Modification of bringing into use and administrative due diligence
requirements as a consequence of allocation
changes above 71 GHz**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that, pursuant to agenda item 1.16 identified in Resolution **721 (WRC-97)**, the preparatory work for this Conference included consideration of the allocation of frequency bands above 71 GHz to the Earth exploration-satellite (passive) and radio astronomy services;
- b)* that agenda item 1.16 took into account Resolution **723 (WRC-97)****, which also included consideration of the allocation of frequency bands above 71 GHz to the space research service (passive);
- c)* that changes made to the allocations for these passive science services were accompanied by consequential changes to allocations above 71 GHz to active services;
- d)* that the allocation changes may cause delays in the design and development of space stations planning to use these allocations;
- e)* that the delays also have an impact on transmitters and receivers, on the same space stations, planning to use frequencies below 71 GHz;
- f)* that the Radiocommunication Bureau has already received advance publication and coordination information for satellite networks in the fixed-satellite, mobile-satellite or broadcasting-satellite services that includes the use of frequencies above 71 GHz;
- g)* that this advance publication or coordination information for satellite networks in the fixed-satellite, mobile-satellite or broadcasting-satellite services will have been based on the frequency allocations in force at the time the information was submitted;
- h)* that No. **11.44** requires that the notified date of bringing into use of any space station of a satellite network be no later than nine years (for advance publication information received prior to 22 November 1997) or seven years (for advance publication information received on or after 22 November 1997) after the date of receipt by the Bureau of the advance publication information under No. **9.1**;

* WRC-03 reviewed this Resolution and decided to suppress *resolves* 6.

** *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

i) that No. **11.44B** allows the notified date of bringing into use to be extended by the Bureau only if the due diligence information required by Resolution **49 (Rev.WRC-2000)** is provided for the satellite network; if the procedure for effecting coordination has commenced; and if the notifying administration certifies that the reason for the extension is one or more specific circumstances listed in Nos. **11.44C** to **11.44I**;

j) that none of the specific circumstances listed in Nos. **11.44C** to **11.44I** includes changes to the frequency allocations as a result of the decisions of a world radiocommunication conference;

k) that, in order to provide the necessary protection to the passive science services, satellite networks in the fixed-satellite, mobile-satellite or broadcasting-satellite services using frequencies above 71 GHz for which advance publication or coordination information is considered as having been received by the Bureau prior to 3 June 2000 must adhere to the revised Table of Frequency Allocations resulting from WRC-2000,

resolves

1 that, for satellite networks using frequencies above 71 GHz in the fixed-satellite, mobile-satellite or broadcasting-satellite services for which advance publication or coordination information is considered as having been received by the Bureau prior to 3 June 2000, the Bureau will extend the notified date of bringing into use under No. **11.44** up to 3 June 2007 at the request of the notifying administration;

2 that, notwithstanding the notified date of bringing into use in *resolves* 1, there shall be no change in the date that the advance publication or coordination information is considered as having been received by the Bureau;

3 that, for any satellite network subject to this Resolution, the notifying administration shall have until 31 December 2000 to resubmit to the Bureau the Appendix 4 advance publication information and coordination information for the space station reflecting the proposed modification in the frequency band above 71 GHz, and that this Appendix 4 information shall be excluded from the cost-recovery procedures;

4 that the provisions contained in Nos. **11.44B** to **11.44I** are applicable with respect to the date of bringing into use communicated to the Bureau under *resolves* 3;

5 that, for any satellite network subject to this Resolution and Resolution **49 (WRC-97)**, the notifying administration shall have until the new date of bringing into use under *resolves* 3 to send the administrative due diligence information to the Bureau, including any revision of administrative due diligence information submitted before 3 June 2000;

6 (SUP - WRC-03)

7 that, six months before the date specified in *resolves* 3, the Bureau will provide administrations with a list of the networks to which this Resolution applies, and the options under the above *resolves*;

8 that satellite networks using frequencies above 71 GHz for which the advanced publication or coordination information is considered as having been received by the Bureau prior to 3 June 2000 shall adhere to the revised Table of Frequency Allocations resulting from WRC-2000.

RESOLUTION 58 (WRC-2000)

**Transitional measures for coordination between certain specific geostationary
fixed-satellite service receive earth stations and non-geostationary
fixed-satellite service transmit space stations in the frequency
bands 10.7-12.75 GHz, 17.8-18.6 GHz, and
19.7-20.2 GHz where $epfd_{\downarrow}$ limits apply**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that WRC-97 adopted, in Article 22, provisional equivalent power flux-density ($epfd$) limits to be met by non-geostationary fixed-satellite service (non-GSO FSS) systems in order to protect GSO FSS and GSO broadcasting-satellite service networks in parts of the frequency range 10.7-30 GHz;
- b) that this Conference has revised these limits to ensure that they provide adequate protection to GSO systems without causing undue constraints to any of the systems and services sharing these frequency bands;
- c) that additional protection above that provided by the revised $epfd_{\downarrow}$ limits in *considering b)* is required for certain GSO FSS networks with specific receive earth stations having all of the following characteristics:
 - earth station antenna maximum isotropic gain greater than or equal to 64 dBi for the frequency band 10.7-12.75 GHz or 68 dBi for the frequency bands 17.8-18.6 GHz and 19.7-20.2 GHz;
 - G/T of 44 dB/K or higher; and
 - emission bandwidth of 250 MHz or more for the frequency bands below 12.75 GHz or 800 MHz or more for the frequency bands above 17.8 GHz;
- d) that, as a consequence, this Conference adopted an alternative regulatory procedure to protect the earth stations referred to in *considering c)*;
- e) that this regulatory procedure, specified in Nos. 9.7A and 9.7B and associated provisions in Articles 9 (Nos. 9.7A, 9.7B, 9.7A.1 and 9.7B.1, and 9.7A.2 and 9.7B.2), 11 (Nos. 11.32A and 11.32A.1), and 22 and Appendices 4 and 5, defines the conditions for effecting coordination between a specific earth station referred to in *considering c)* in respect of a non-GSO FSS system, and between a non-GSO FSS system in respect of a specific earth station referred to in *considering c)*;

f) that there was no requirement to provide the specific locations of earth stations referred to in *considering c)* prior to WRC-2000, except in respect of coordination with terrestrial stations or earth stations operating in the opposite direction of transmission under Nos. **9.17** and **9.17A**;

g) that coordination of an earth station referred to in *considering c)* shall remain within the authority of the administration on whose territory the station is located;

h) that complete coordination information for GSO FSS networks with typical earth stations having all the characteristics specified in *considering c)* have been received by the Radiocommunication Bureau before WRC-2000;

i) that complete notification or coordination information, as appropriate, for non-GSO FSS systems has been received by the Bureau prior to WRC-2000 and, in some cases, prior to WRC-97,

recognizing

that transitional measures are needed for the regulatory procedures referred to in *considering e)*,

resolves

1 that, in the frequency bands 10.7-12.75 GHz, 17.8-18.6 GHz and 19.7-20.2 GHz, the requirement for coordination and associated provisions referred to in *considering e)* shall be applied as from 3 June 2000;

2 that, in the frequency bands 10.7-12.75 GHz, 17.8-18.6 GHz and 19.7-20.2 GHz, the requirement for coordination under No. **9.7A** shall be applied to specific earth stations for which complete coordination or notification information, as appropriate, is considered as having been received by the Bureau prior to 3 June 2000;

3 that, in the frequency bands 10.7-12.75 GHz, 17.8-18.6 GHz and 19.7-20.2 GHz, the requirement for coordination under No. **9.7B** shall be applied to non-GSO FSS systems for which complete coordination or notification information, as appropriate, has been received by the Bureau after 21 November 1997;

4 that, in the frequency bands 10.7-12.75 GHz, 17.8-18.6 GHz and 19.7-20.2 GHz, the requirement for coordination under No. **9.7B** shall not apply to non-GSO FSS systems for which complete coordination or notification information, as appropriate, has been received by the Bureau before 22 November 1997 but No. **22.2** shall apply in respect of any specific earth stations for which complete coordination information is considered as having been received before 22 November 1997 if coordination under No. **9.7A** has not been concluded;

5 that coordination information relating to a specific earth station received by the Bureau prior to 30 June 2000 shall be considered as complete information under No. **9.7A** or No. **9.7B** as from the date of receipt of complete coordination information of the associated GSO FSS satellite network under No. **9.7**, provided that:

5.1 the maximum isotropic gain, lowest total receiving system noise temperature and necessary bandwidth of the specific earth station are the same as those of any typical earth station included in the GSO FSS network that has previously entered coordination;

5.2 the coordination or notification information, as appropriate, of the GSO FSS network containing the typical earth station referred to in *resolves* 5.1 was received by the Bureau prior to 8 May 2000;

6 that, in cases other than those covered in *resolves* 5, the date of receipt by the Bureau of the complete coordination information under Nos. **9.7A** or **9.7B** or the complete coordination or notification information, as appropriate, of the associated GSO network, whichever is later, shall be used;

7 that the administration on whose territory the specific earth station is located shall submit the coordination information contained in Annex 1 to this Resolution,

instructs the Director of the Radiocommunication Bureau

1 to draw up appropriate forms of notice and instructions to assist administrations in providing the information in Annex 1 of this Resolution immediately after this Conference, taking into account the deadline established by *resolves* 5;

2 as of the end of WRC-2000, to review and, if appropriate, identify in accordance with No. **9.27**, any administration with which coordination may need to be effected in accordance with Nos. **9.7A** or **9.7B** in cases covered by *resolves* 2 and 3.

ANNEX 1 TO RESOLUTION 58 (WRC-2000)

Appendix 4 characteristics to be provided for specific receive GSO FSS earth stations

A.1.e.1 Type of earth station (i.e. specific)

A.1.e.2 Earth station name

A.1.e.3 Country and geographical coordinates of the antenna site

A.2.a Date of bringing into use

RES58-4

- A.3 Operating administration or agency
- A.4.c Identity of associated space station (i.e. name and nominal orbital longitude)
- A.13 As appropriate, reference to the special section of the Bureau's International Frequency Information Circular (BR IFIC)
- B.1 Associated satellite transmitting beam designation
- B.5.a Maximum isotropic gain
- B.5.c Earth station antenna reference radiation pattern
- C.2.a Assigned frequency
- C.3.a Assigned frequency band
- C.4 Class of station and nature of service
- C.5.b Lowest total receiving system noise temperature
- C.7.a Class of emission and the necessary bandwidth

RESOLUTION 63 (Rev.WRC-03)

**Protection of radiocommunication services against interference
caused by radiation from industrial, scientific
and medical (ISM) equipment**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that ISM equipment generates and uses locally radio frequency energy, whereby outward radiation cannot always be avoided;
- b)* that there is an increasing amount of ISM equipment working on various frequencies throughout the spectrum;
- c)* that in some cases a considerable part of the energy may be radiated by ISM equipment outside its working frequency;
- d)* that Recommendation ITU-R SM.1056 recommends to administrations the use of International Special Committee on Radio Interference (CISPR) Publication 11 as a guide for ISM equipment to protect radiocommunication services, but that CISPR 11 does not yet fully specify radiation limits for all frequency bands;
- e)* that some radio services, especially those using low field strengths, may suffer interference caused by radiation from ISM equipment, a risk which is unacceptable particularly in the case of radionavigation or other safety services;
- f)* that, in order to limit the risks of interference to specified parts of the spectrum:
 - the preceding Radio Conferences of Atlantic City, 1947, and Geneva, 1959, designated some frequency bands within which the radiocommunication services must accept harmful interference produced by ISM equipment;
 - WARC-79 accepted an increase in the number of bands to be designated for ISM equipment, but only on the condition that limits of radiation from such equipment be specified within the bands newly designated for worldwide use and outside all the bands designated for ISM equipment,

resolves

that, to ensure that radiocommunication services are adequately protected, studies are required on the limits to be imposed on the radiation from ISM equipment within the frequency bands designated in the Radio Regulations for this use and outside of those bands,

RES63-2

invites ITU-R

to continue, in collaboration with CISPR, its studies relating to radiation from ISM equipment within the frequency bands designated in the Radio Regulations for this use and outside of those bands in order to ensure adequate protection of radiocommunication services, with priority being given to the completion of studies which would permit CISPR to define limits in Publication CISPR 11 on radiation from ISM equipment inside all the bands designated in the Radio Regulations for the use of such equipment.

RESOLUTION 72 (Rev.WRC-2000)

Regional preparations for world radiocommunication conferences

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that many regional telecommunication organizations have coordinated their preparations for WRC-2000;
- b) that many common proposals have been submitted to this Conference from administrations participating in the preparations of regional telecommunication organizations;
- c) that this consolidation of views at regional level, together with the opportunity for interregional discussions prior to the Conference, has eased the task of reaching a consensus during the Conference;
- d) that the burden of preparation for future conferences is likely to increase;
- e) that there is consequently great benefit to the Member States of coordination of preparations at regional level;
- f) that the success of future conferences will depend on greater efficiency of regional coordination and interaction at interregional level prior to future conferences;
- g) that some regional organizations lack the necessary resources to adequately organize and to participate in such preparations;
- h) that there is a need for overall coordination of the interregional consultations,

recognizing

- a) *resolves* 2 of Resolution 80 (Minneapolis, 1998) of the Plenipotentiary Conference:

“to support the regional harmonization of common proposals, as stated in Resolution 72 (WRC-97), for submission to world radiocommunication conferences”;

- b) *resolves* 3 of Resolution 80 (Minneapolis, 1998) of the Plenipotentiary Conference:

“to encourage both formal and informal collaboration in the interval between conferences with a view to resolving differences on items already on the agenda of a conference or new items”,

noting

- a) that at the World Telecommunication Development Conference (Valletta, 1998) many regional telecommunication organizations expressed the need for the Union to cooperate more closely with regional telecommunication organizations;
- b) that, consequently, the Plenipotentiary Conference (Minneapolis, 1998) resolved that the Union should develop stronger relations with regional telecommunication organizations;
- c) that the Radiocommunication Assembly (Istanbul, 2000) adopted Resolution ITU-R 48 which sought a strengthening of the regional presence in ITU-R study group work, including WRC-related studies,

further noting

that in some regions the relationship with the ITU-D regional offices has proved to be of great benefit,

resolves to instruct the Director of the Radiocommunication Bureau

1 to continue consulting the regional telecommunication organizations on the means by which assistance can be given to their preparations for future world radiocommunication conferences in the following areas:

- organization of regional preparatory meetings;
- organization of information sessions, preferably before and after the second session of the Conference Preparatory Meeting (CPM);
- development of coordination methods;
- identification of major issues to be resolved by the future world radiocommunication conference;
- facilitation of regional and interregional informal and formal meetings, with the objective of reaching a convergence of interregional views on major issues;

2 pursuant to Resolution ITU-R 2-3 of the Radiocommunication Assembly on the CPM, to assist in ensuring that overview presentations of the chapters of the CPM Report will be made by the CPM management at an early stage in the CPM session, as part of the regularly scheduled meetings, in order to help all participants understand the contents of the CPM Report;

3 to submit a report on the results of such consultations to both the next Plenipotentiary Conference and WRC-03,

invites the Director of the Telecommunication Development Bureau

to collaborate with the Director of the Radiocommunication Bureau in implementing this Resolution.

RESOLUTION 73 (Rev.WRC-2000)

Measures to solve the incompatibility between the broadcasting-satellite service in Region 1 and the fixed-satellite service in Region 3 in the frequency band 12.2-12.5 GHz

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that the band 12.2-12.5 GHz is allocated on a primary basis to the broadcasting-satellite service (BSS) in Region 1 and to the fixed-satellite service (FSS) in Region 3;
- b) that both services should have equitable access to the orbit and spectrum;
- c) that several modifications to the Regions 1 and 3 BSS Plan, which have assignments in the band 12.2-12.5 GHz, have entered into the Plan by successfully applying Article 4 of Appendix 30 procedure and that some of these assignments have already been brought into use;
- d) that some Region 3 FSS systems are currently operating, or are under coordination, applying relevant provisions of the Radio Regulations;
- e) that the WRC-97 Regions 1 and 3 Plan included frequency assignments which may not be compatible with Region 3 FSS networks for which notification or coordination data as per Appendix 3* or Appendix 4 information had been received by the Radiocommunication Bureau before 27 October 1997;
- f) that WRC-97, in its Resolution 73 (WRC-97), adopted measures to resolve such incompatibilities between the BSS in Region 1 and the FSS in Region 3 in the frequency band 12.2-12.5 GHz which included instructions to the Bureau to identify both the administrations whose assignments affect Region 1 BSS networks in the 12.2-12.5 GHz band, and also to identify those administrations whose assignments affect Region 3 FSS networks in the 12.2-12.5 GHz band;
- g) that this Conference has adopted procedures in Appendix 30 for coordination between the BSS in Region 1 and the FSS in Region 3 in the frequency band 12.2-12.5 GHz,

noting

that, in response to Resolution 73 (WRC-97), the Bureau has developed necessary software tools for analysing the incompatibility situations mentioned under *considering f)*,

* *Note by the Secretariat:* Edition of 1990, revised in 1994.

RES73-2

resolves

- 1 that, upon request, the Bureau shall provide the results of the analysis carried out in response to Resolution **73 (WRC-97)** regarding incompatibilities between the BSS in Region 1 and the FSS in Region 3 in the frequency band 12.2-12.5 GHz to the administrations concerned;
- 2 that the administrations which have been identified by the Bureau in *resolves* 1 above shall make all possible mutual efforts to solve the interference problems;
- 3 that provision of this assistance shall in no way have any implications regarding the status of assignments in both the BSS and the FSS as identified by the Bureau.

RESOLUTION 74 (Rev.WRC-03)

Process to keep the technical bases of Appendix 7 current

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that Appendix 7 provides the method for the determination of the coordination area of an earth station, and the assumed technical coordination parameters for unknown terrestrial stations or earth stations;
- b)* that the technical coordination parameters are contained in Tables 7, 8 and 9 of Annex 7 to Appendix 7;
- c)* that the technical coordination parameter tables are based on Recommendation ITU-R SM.1448;
- d)* that ITU-R studies on methods for the determination of the coordination area of an earth station are continuing, and the conclusions of these studies could lead to revision of Appendix 7; these methods under study are:
 - methods considering the cumulative impact in determining the coordination areas for high-density earth stations (fixed and mobile);
 - methods to address the modelling of VHF/UHF frequencies for percentages of time less than 1%;
 - methods to address propagation mode (1) water vapour density for both radio climatic Zones B and C;
 - refinements to propagation mode (2) to address elevation angle dependency and the displacement of the centre of the propagation mode (2) contour from the coordinating earth station;
- e)* that the technical coordination parameter tables may also need to be modified when changes are made to the Table of Frequency Allocations at future world radiocommunication conferences (WRCs), or due to changes in technology or in applications;
- f)* that the technical coordination parameter tables do not include values for all the necessary parameters of certain space radiocommunication services and terrestrial radiocommunication services sharing frequency bands with equal rights,

recognizing

- a)* that Recommendation ITU-R SM.1448 was developed by ITU-R as a basis for the revision of Appendix 7;

RES74-2

b) that there is a need for future WRCs to keep Appendix 7 current with the latest techniques and to ensure protection of other radiocommunication services sharing the same frequency bands with equal rights, particularly through revision of the tables of technical coordination parameters,

invites ITU-R

1 to continue its study, as required, of the technical bases used for determination of the coordination area of an earth station, including recommended values for the missing entries in the tables of technical coordination parameters (Annex 7 to Appendix 7);

2 to maintain the relevant ITU-R texts in a format which would facilitate the future revision of Appendix 7;

3 to assess the significance of changes to the technical bases,

resolves

1 that when ITU-R concludes, based on its studies of the methods in *considering d)* for determination of the coordination area of an earth station and/or the values of technical coordination parameters, that a revision of Appendix 7 is warranted, the matter shall be brought to the attention of the Radiocommunication Assembly;

2 that, if the Radiocommunication Assembly confirms the improvements of the methods in *considering d)* for determination of the coordination area of an earth station and/or the values of technical coordination parameters which have been presented by ITU-R, the Director of the Radiocommunication Bureau shall identify the matter in the Director's report to the following WRC,

invites

1 WRCs, when presented with any significant changes through the Director's report, to consider the revision of Appendix 7 in light of the recommendation of the Radiocommunication Assembly, pursuant to *resolves* 1 and 2 above;

2 each WRC, when modifying the Table of Frequency Allocations, to consider any consequential changes that may be required to the technical coordination parameters of Annex 7 to Appendix 7 and, if necessary, request ITU-R to study the matter.

RESOLUTION 75 (WRC-2000)

Development of the technical basis for determining the coordination area for coordination of a receiving earth station in the space research service (deep space) with transmitting stations of high-density systems in the fixed service in the 31.8-32.3 GHz and 37-38 GHz bands

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that the band 31.8-32.3 GHz is allocated to the space research service for deep space operations only, the band 37-38 GHz is allocated to the space research service (space-to-Earth), and both bands are allocated to the fixed service for the use of high-density applications and to other services on a primary basis;
- b) that the 31.8-32.3 GHz band offers unique advantages in support of deep-space missions;
- c) that space research service earth stations operating in these bands employ very high-gain antennas and very low-noise amplifiers in order to receive weak signals from deep space;
- d) that fixed-service stations in these bands are expected to be deployed in large numbers over urban areas of large geographical extent;
- e) that studies are being initiated to characterize short-term (of the order of 0.001% of the time, commensurate with the protection criteria given in Recommendations ITU-R SA.1396 and ITU-R SA.1157) anomalous propagation from transmitting stations dispersed over a large geographical area to a single receiving earth station (area-to-point propagation);
- f) that preliminary ITU-R studies have indicated that the coordination distance between a space research service (deep space) earth station and a single urban area may be of the order of 250 km;
- g) that there are currently three space research service (deep space) earth stations in operation or planned for operation near Goldstone (United States of America), Madrid (Spain) and Canberra (Australia), and there are up to ten more earth stations planned in the future,

noting

that Resolution **74 (WRC-2000)*** provides a mechanism to update Appendix 7 as required,

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

RES75-2

resolves to invite ITU-R

to develop, as a matter of urgency, the technical basis for determining the coordination area for coordination of a receiving earth station in the space research service (deep space) with transmitting stations of high-density systems in the fixed service in the 31.8-32.3 GHz and 37-38 GHz bands,

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R.

RESOLUTION 76 (WRC-2000)

Protection of geostationary fixed-satellite service and geostationary broadcasting-satellite service networks from the maximum aggregate equivalent power flux-density produced by multiple non-geostationary fixed-satellite service systems in frequency bands where equivalent power flux-density limits have been adopted

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that WRC-97 adopted, in Article **22**, provisional equivalent power flux-density (epfd) limits to be met by non-geostationary fixed-satellite service (non-GSO FSS) systems in order to protect GSO FSS and GSO broadcasting-satellite service (BSS) networks in parts of the frequency range 10.7-30 GHz;
- b)* that this Conference has revised Article **22** to ensure the limits contained therein provide adequate protection to GSO systems without placing undue constraints on any of the systems and services sharing these frequency bands;
- c)* that this Conference has decided that a combination of single-entry validation, single-entry operational and, for certain antenna sizes, single-entry additional operational epfd limits, contained in Article **22**, along with the aggregate limits in Tables 1A to 1D as contained in Annex 1 to this Resolution, which apply to non-GSO FSS systems, protects GSO networks in these bands;
- d)* that these single-entry validation limits have been derived from aggregate epfd masks contained in Tables 1A to 1D, assuming a maximum effective number of non-GSO FSS systems of 3.5;
- e)* that the aggregate interference caused by all co-frequency non-GSO FSS systems in these bands into GSO FSS systems should not exceed the aggregate epfd levels in Tables 1A to 1D;
- f)* that WRC-97 decided, and this Conference has confirmed, that non-GSO FSS systems in the bands in question are to mutually coordinate the use of frequencies in these bands under the provisions of No. **9.12**;
- g)* that the orbital characteristics of such systems are likely to be inhomogeneous;

h) that, as a result of this likely inhomogeneity, the aggregate epfd levels from multiple non-GSO FSS systems will not be directly related to the actual number of systems sharing a frequency band, and the number of such systems operating co-frequency is likely to be small;

i) that the possible misapplication of single-entry limits should be avoided,

recognizing

a) that non-GSO FSS systems are likely to need to implement interference mitigation techniques to mutually share frequencies;

b) that, on account of the use of such interference mitigation techniques, it is likely that the number of non-GSO systems will remain small, as will the aggregate interference caused by non-GSO FSS systems into GSO systems;

c) that, notwithstanding *considering d)* and *e)* and *recognizing b)*, there may be instances where the aggregate interference from non-GSO systems could exceed the interference levels given in Tables 1A to 1D;

d) that administrations operating GSO systems may wish to ensure that the aggregate epfd produced by all operating co-frequency non-GSO FSS systems in the frequency bands referred to in *considering a)* above into GSO FSS and/or GSO BSS networks does not exceed the aggregate interference levels given in Tables 1A to 1D,

resolves

1 that administrations operating or planning to operate non-GSO FSS systems, for which coordination or notification information, as appropriate, was received after 21 November 1997, in the frequency bands referred to in *considering a)* above, individually or in collaboration, shall take all possible steps, including, if necessary, by means of appropriate modifications to their systems, to ensure that the aggregate interference into GSO FSS and GSO BSS networks caused by such systems operating co-frequency in these frequency bands does not cause the aggregate power levels given in Tables 1A to 1D to be exceeded (see No. **22.5K**);

2 that, in the event that the aggregate interference levels in Tables 1A to 1D are exceeded, administrations operating non-GSO FSS systems in these frequency bands shall take all necessary measures expeditiously to reduce the aggregate epfd levels to those given in Tables 1A to 1D, or to higher levels where those levels are acceptable to the affected GSO administration (see No. **22.5K**),

invites ITU-R

1 to develop, as a matter of urgency and in time for the next WRC, a suitable methodology for calculating the aggregate epfd produced by all non-GSO FSS systems operating or planning to operate co-frequency in the frequency bands referred to in *considering a)* above into GSO FSS and GSO BSS networks, which may be used to determine whether the systems are in compliance with the aggregate power levels given in Tables 1A to 1D;

2 to continue its studies and to develop, as a matter of urgency, a Recommendation on the accurate modelling of interference from non-GSO FSS systems into GSO FSS and GSO BSS networks in the frequency bands referred to in *considering a)* above, in order to assist administrations planning or operating non-GSO FSS systems in their efforts to limit the aggregate epfd levels produced by their systems into GSO networks, and to provide guidance to GSO network designers on the maximum epfd_↓ levels expected to be produced by all non-GSO FSS systems when accurate modelling assumptions are used;

3 to develop, as a matter of urgency, a Recommendation containing procedures to be used among administrations in order to ensure that the aggregate epfd limits given in Tables 1A to 1D are not exceeded by operators of non-GSO FSS systems;

4 to attempt to develop measurement techniques to identify the interference levels from non-GSO systems in excess of the aggregate limits given in Tables 1A to 1D, and to confirm compliance with these limits,

instructs the Director of the Radiocommunication Bureau

1 to assist in the development of the methodology referred to in *invites ITU-R 1* above;

2 to report to WRC-03 on the results of studies in *invites ITU-R 1* and *3* above.

ANNEX 1 TO RESOLUTION 76 (WRC-2000)

TABLE 1A^{1, 2, 3}Limits on aggregate epfd_{\downarrow} radiated by non-GSO FSS systems in certain frequency bands

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern ⁴
10.7-11.7 in all Regions	-170	0	40	60 cm
11.7-12.2 in Region 2	-168.6	90		Recommendation
12.2-12.5 in Region 3	-165.3	99		ITU-R S.1428
12.5-12.75 in Regions 1 and 3	-160.4	99.97		
	-160	99.99		
	-160	100		
	-176.5	0	40	1.2 m
	-173	99.5		Recommendation
	-164	99.84		ITU-R S.1428
	-161.6	99.945		
	-161.4	99.97		
	-160.8	99.99		
	-160.5	99.99		
	-160	99.9975		
	-160	100		
	-185	0	40	3 m ⁵
	-184	90		Recommendation
	-182	99.5		ITU-R S.1428
	-168	99.9		
	-164	99.96		
	-162	99.982		
	-160	99.997		
	-160	100		
	-190	0	40	10 m ⁵
	-190	99		Recommendation
	-166	99.99		ITU-R S.1428
	-160	99.998		
	-160	100		

¹ For certain GSO FSS receive earth stations, see also Nos. **9.7A** and **9.7B**.

² In addition to the limits shown in Table 1A, the following aggregate epfd_{\downarrow} limits apply to all antenna sizes greater than 60 cm in the frequency bands listed in Table 1A:

100% of the time epfd_{\downarrow} (dB(W/(m ² · 40 kHz)))	Latitude (North or South) (degrees)
-160	0 ≤ Latitude ≤ 57.5
$-160 + 3.4(57.5 - \text{Latitude})/4$	57.5 < Latitude ≤ 63.75
-165.3	63.75 < Latitude

³ For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd_{\downarrow} levels and logarithmic for the time percentages, with straight lines joining the data points.

⁴ For this Table, reference patterns in Recommendation ITU-R S.1428 shall be used only for the calculation of interference from non-GSO FSS systems into GSO FSS systems.

⁵ The values for the 3 m and 10 m antennas are applicable only for the methodology referred to *invites ITU-R 1*.

TABLE 1B^{1, 2, 3}**Limits on aggregate epfd_{\downarrow} radiated by non-GSO FSS systems in certain frequency bands**

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern ⁴
17.8-18.6	-170	0	40	1 m Recommendation ITU-R S.1428
	-170	90		
	-164	99.9		
	-164	100		
	-156	0	1 000	2 m Recommendation ITU-R S.1428
	-156	90		
	-150	99.9		
	-150	100		
	-173	0	40	5 m Recommendation ITU-R S.1428
	-173	99.4		
	-166	99.9		
	-164	99.92		
	-164	100		5 m Recommendation ITU-R S.1428
	-159	0	1 000	
	-159	99.4		
	-152	99.9		
	-150	99.92		
	-150	100		5 m Recommendation ITU-R S.1428
	-180	0	40	
	-180	99.8		
	-172	99.8		
	-164	99.992		
	-164	100		5 m Recommendation ITU-R S.1428
	-166	0	1 000	
	-166	99.8		
	-158	99.8		
	-150	99.992		
	-150	100		

¹ For certain GSO FSS receive earth stations, see also Nos. **9.7A** and **9.7B**.

² For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd_{\downarrow} levels and logarithmic for the time percentages, with straight lines joining the data points.

³ A non-GSO system shall meet the limits of this Table in both the 40 kHz and the 1 MHz reference bandwidths.

⁴ For this Table, reference patterns in Recommendation ITU-R S.1428 shall be used only for the calculation of interference from non-GSO FSS systems into GSO FSS systems.

TABLE 1C^{1, 2, 3}Limits on aggregate epfd_{\downarrow} radiated by non-GSO FSS systems in certain frequency bands

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern ⁴
19.7-20.2	-182 -172 -154 -154	0 90 99.94 100	40	70 cm Recommendation ITU-R S.1428
	-168 -158 -140 -140	0 90 99.94 100	1 000	
	-185 -176 -165 -160 -154 -154	0 91 99.8 99.8 99.99 100	40	90 cm Recommendation ITU-R S.1428
	-171 -162 -151 -146 -140 -140	0 91 99.8 99.8 99.99 100	1 000	
	-191 -162 -154 -154	0 99.933 99.998 100	40	2.5 m Recommendation ITU-R S.1428
	-177 -148 -140 -140	0 99.933 99.998 100	1 000	
	-195 -184 -175 -161 -154 -154	0 90 99.6 99.984 99.9992 100	40	5 m Recommendation ITU-R S.1428
	-181 -170 -161 -147 -140 -140	0 90 99.6 99.984 99.9992 100	1 000	

¹ For certain GSO FSS receive earth stations, see also Nos. **9.7A** and **9.7B**.² For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd_{\downarrow} levels and logarithmic for the time percentages, with straight lines joining the data points.³ A non-GSO system shall meet the limits of this Table in both the 40 kHz and the 1 MHz reference bandwidths.⁴ For this Table, reference patterns in Recommendation ITU-R S.1428 shall be used only for the calculation of interference from non-GSO FSS systems into GSO FSS systems.

TABLE 1D^{1,2}

Limits on aggregate $epfd_{\downarrow}$ radiated by non-GSO FSS systems in certain frequency bands into 30 cm, 45 cm, 60 cm, 90 cm, 120 cm, 180 cm, 240 cm and 300 cm BSS antennas

Frequency band (GHz)	$epfd_{\downarrow}$ (dB(W/m²))	Percentage of time during which $epfd_{\downarrow}$ may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern³
11.7-12.5 in Region 1 11.7-12.2 and 12.5-12.75 in Region 3 12.2-12.7 in Region 2	-160.4	0	40	30 cm Recommendation ITU-R BO.1443, Annex 1
	-160.1	25		
	-158.6	96		
	-158.6	98		
	-158.33	98		
	-158.33	100		
	-170	0	40	45 cm Recommendation ITU-R BO.1443, Annex 1
	-167	66		
	-164	97.75		
	-160.75	99.33		
	-160	99.95		
	-160	100		
	-171	0	40	60 cm Recommendation ITU-R BO.1443, Annex 1
	-168.75	90		
	-167.75	97.8		
	-162	99.6		
	-161	99.8		
	-160.2	99.9		
	-160	99.99		
	-160	100		
	-173.75	0	40	90 cm Recommendation ITU-R BO.1443, Annex 1
	-173	33		
	-171	98		
	-165.5	99.1		
	-163	99.5		
	-161	99.8		
	-160	99.97		
	-160	100		
	-177	0	40	120 cm Recommendation ITU-R BO.1443, Annex 1
	-175.25	90		
	-173.75	98.9		
	-173	98.9		
	-169.5	99.5		
	-167.8	99.7		
	-164	99.82		
	-161.9	99.9		
	-161	99.965		
	-160.4	99.993		
	-160	100		

TABLE 1D^{1, 2} (end)

Frequency band (GHz)	epfd _↓ (dB(W/m ²))	Percentage of time during which epfd _↓ may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern ³
11.7-12.5 in Region 1 11.7-12.2 and 12.5-12.75 in Region 3 12.2-12.7 in Region 2	-179.5	0	40	180 cm Recommendation ITU-R BO.1443, Annex 1
	-178.66	33		
	-176.25	98.5		
	-163.25	99.81		
	-161.5	99.91		
	-160.35	99.975		
	-160	99.995		
	-160	100		
	-182	0	40	240 cm Recommendation ITU-R BO.1443, Annex 1
	-180.9	33		
	-178	99.25		
	-164.4	99.85		
	-161.9	99.94		
	-160.5	99.98		
	-160	99.995		
	-160	100		
	-186.5	0	40	300 cm Recommendation ITU-R BO.1443, Annex 1
	-184	33		
	-180.5	99.5		
	-173	99.7		
	-167	99.83		
	-162	99.94		
	-160	99.97		
	-160	100		

¹ For BSS antenna diameters of 180 cm, 240 cm and 300 cm, in addition to the aggregate limits shown in Table 1D, the following aggregate 100% of the time epfd_↓ limits also apply:

100% of the time epfd _↓ (dB(W/(m ² · 40 kHz))	Latitude (North or South) (degrees)
-160	0 ≤ Latitude ≤ 57.5
-160 + 3.4(57.5 - Latitude)/4	57.5 < Latitude ≤ 63.75
-165.3	63.75 < Latitude

² For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd_↓ levels and logarithmic for the time percentages, with straight lines joining the data points. For BSS antenna of diameter 240 cm, in addition to the above aggregate 100% of the time epfd_↓ limit, a -167 dB(W/(m² · 40 kHz)) aggregate 100% of the time operational epfd_↓ limit also applies to receive antennas located in Region 2, west of 140° W, north of 60° N, pointing toward GSO BSS satellites at 91° W, 101° W, 110° W, 119° W and 148° W with elevation angles greater than 5°. This limit is implemented during a transition period of 15 years.

³ For this Table, reference patterns in the Annex 1 to Recommendation ITU-R BO.1443 shall be used only for the calculation of interference from non-GSO FSS systems into GSO BSS systems.

RESOLUTION 79 (WRC-2000)

Development of the technical basis for coordination of radio astronomy stations with transmitting high-density fixed systems in the fixed service, in the band 42.5-43.5 GHz

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that this Conference has decided that the band 42.5-43.5 GHz, which is allocated to the fixed service, should become available for high-density applications;
- b) that the 42.5-43.5 GHz band is also allocated to the radio astronomy service on a primary basis worldwide, and is used intensively for both continuum and spectral line observations, at a limited number of sites;
- c) that radio astronomy observatories operating in the band are generally located far from urban population centres, employ very high-gain antennas and very low-noise amplifiers to receive extremely weak cosmic radio emissions over which astronomers have no control;
- d) that high-density fixed system (HDFS) stations are expected to be deployed in large numbers over areas of large geographical extent in urban population centres;
- e) that studies are being initiated to characterize short-term anomalous propagation from transmitting stations dispersed over a large geographical area to a single receiving earth station (area-to-point propagation);
- f) that no studies are yet available on the coordination distance that may be required to protect a radio astronomy station from HDFS transmissions associated with a single urban population centre, but that, based on preliminary studies made at lower frequencies, a provisional coordination distance of 250 km may be appropriate,

resolves to invite ITU-R

to conduct studies on the coordination distance between radio astronomy stations operating in the 42.5-43.5 GHz band and HDFS stations with a view to developing ITU-R Recommendations,

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R.

RESOLUTION 80 (Rev.WRC-2000)

Due diligence in applying the principles embodied in the Constitution

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that Articles 12 and 44 of the Constitution lay down the basic principles for the use of the radio-frequency spectrum and the geostationary-satellite and other satellite orbits;
- b) that those principles have been included in the Radio Regulations;
- c) that Article I of the Agreement between the United Nations and the International Telecommunication Union provides that “the United Nations recognizes the International Telecommunication Union (hereinafter called “the Union”) as the specialized agency responsible for taking such action as may be appropriate under its basic instrument for the accomplishment of the purposes set forth therein”;
- d) that, in accordance with Nos. **11.30**, **11.31** and **11.31.2**, notices shall be examined with respect to the provisions of the Radio Regulations, including the provision relating to the basic principles, appropriate rules of procedure being developed for the purpose;
- e) that WRC-97 instructed the Radio Regulations Board (RRB) to develop, within the framework of Nos. **11.30**, **11.31** and **11.31.2**, rules of procedure to be followed in order to be in compliance with the principles in No. **0.3**;
- f) that the Board, in accordance with Resolution **80 (WRC-97)**, submitted a report to this Conference suggesting possible solutions and stating that, after examining the Radio Regulations, it had concluded that there are no provisions currently in the Radio Regulations that link the formal notification or coordination procedures with the principles stated in No. **0.3** of the Preamble to the Radio Regulations;
- g) that the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space of the United Nations General Assembly has drawn up recommendations in this respect,

noting

- a) that, in accordance with the provisions of No. 127 of the Convention, the Conference may give instructions to the Sectors of the Union;
- b) that, according to No. 160C of the Convention, the Radiocommunication Advisory Group shall review any matter as directed by a conference;

c) that in the RRB report to the Conference, several members of the Board noted some difficulties likely to be experienced by administrations, particularly administrations of developing countries, as follows:

- the “first-come first-served” concept restricts and sometimes prevents access to and use of certain frequency bands and orbit positions;
- a relative disadvantage for developing countries in coordination negotiations due to various reasons such as a lack of resources and expertise;
- perceived differences in consistency of application of the Radio Regulations;
- the submitting of “paper” satellites that restricts access options;
- the growing use of the bands of the Plans of Appendices 30 and 30A by regional, multichannel systems, which may modify the main purpose of these Plans to provide equitable access to all countries;
- the considerable processing delays in the Radiocommunication Bureau are due to the very complex procedures required and the large number of filings submitted; these delays contribute to a coordination backlog of 18 months which could extend to three years and creates uncertain regulatory situations, additional delay in the coordination process that cannot be overcome by administrations, and the possible loss of the assignment because the allotted time is exceeded;
- satellite systems may already be in orbit before completion of coordination;
- statutory time-frames, such as those in No. 11.48, may often be insufficient for developing countries to be able to complete the regulatory requirements as well as the design, construction and launch of satellite systems;
- no provisions for international monitoring to confirm the bringing into use of satellite networks (assignments and orbits),

resolves

1 to instruct the Radiocommunication Advisory Group to carry out studies and consider possible draft recommendations and draft provisions linking the formal notification, coordination and registration procedures with the principles contained in Article 44 of the Constitution and No. 0.3 in the Preamble to the Radio Regulations; the studies will take into account, *inter alia*, the report of the Radio Regulations Board to this Conference (Document 29), in particular the difficulties pointed out in § 3.2 thereof, and contributions, if any, from members;

2 to instruct the Radio Regulations Board to carry out studies and consider possible draft recommendations and draft provisions linking the formal notification, coordination and registration procedures with the principles contained in Article 44 of the Constitution and No. 0.3 in the Preamble to the Radio Regulations, and to report to WRC-03 with regard to this Resolution;

3 to instruct the Director of the Radiocommunication Bureau to submit to WRC-03 a detailed report on the action taken on this Resolution,

invites

the other organs of the ITU-R to make contributions to the Director of the Radiocommunication Bureau for inclusion in his report to WRC-03 under *resolves* 3.

RESOLUTION 81 (WRC-2000)

**Evaluation of the administrative due diligence procedure
for satellite networks**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that WRC-97 adopted Resolution **49 (WRC-97)*** establishing administrative due diligence procedure applicable to some satellite radiocommunication services with effect from 22 November 1997;
- b) that the Plenipotentiary Conference adopted Resolution 85 (Minneapolis, 1998) on evaluation of the administrative due diligence procedure for satellite networks;
- c) that Resolution 85 (Minneapolis, 1998) instructs the Director of the Radiocommunication Bureau to inform WRC-2000 about the effectiveness of the administrative due diligence procedure, in accordance with Resolution **49 (WRC-97)***;
- d) that Resolution 85 (Minneapolis, 1998) resolves that WRC-2000 shall evaluate the results of the implementation of the administrative due diligence procedure and shall inform the next Plenipotentiary Conference, in 2002, of its conclusions in that regard;
- e) the report of the Director of the Radiocommunication Bureau on the administrative due diligence procedure applicable to some satellite networks;
- f) the proposals made to this Conference to strengthen the administrative due diligence procedure, and to adopt financial due diligence procedures,

noting

- a) that the Bureau has not encountered any administrative difficulty in applying the provisions and in gathering and publishing information;
- b) that the Bureau has taken action pursuant to *resolves* 6 of Resolution **49 (WRC-97)*** to cancel the submissions, and accordingly publish the related special sections, in respect of 36 satellite networks;
- c) that, for all of these cancellations, the maximum (nine-year) period for bringing into use pursuant to *resolves* 1 and 2 of Resolution **51 (WRC-97)** and No. **11.44** had been reached and hence the submissions would have been cancelled in any event;

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

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d) that, when requested to provide due diligence information (triggered by the original date of bringing into use of their satellite networks), administrations have generally requested, wherever possible, extensions of the regulatory period for bringing into use up to the maximum limit authorized by the Radio Regulations;

e) that the effect of the administrative due diligence procedure may not, therefore, be fully apparent until at least 21 November 2003,

recognizing

that the administrative due diligence procedure has not yet had any impact on the problem of reservation of orbit and spectrum capacity without actual use,

resolves

1 that further experience is needed in the application of the administrative due diligence procedures adopted by WRC-97, and that several years may be needed to see whether the procedure produces satisfactory results;

2 that it is premature to consider the adoption, among other procedures, of any financial due diligence procedures,

instructs the Director of the Radiocommunication Bureau

to report to the 2002 Plenipotentiary Conference on the results of the implementation of the administrative due diligence procedure,

instructs the Secretary-General

to bring this Resolution to the attention of the 2002 Plenipotentiary Conference.

RESOLUTION 85 (WRC-03)

Application of Article 22 of the Radio Regulations to the protection of geostationary fixed-satellite service and broadcasting-satellite service networks from non-geostationary fixed-satellite service systems

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 adopted, in Article **22**, single-entry limits applicable to non-geostationary (non-GSO) fixed-satellite service (FSS) systems in certain parts of the frequency range 10.7-30 GHz to protect geostationary-satellite (GSO) networks operating in the same frequency bands;
- b)* that, taking into account Nos. **22.5H** and **22.5I**, wherever the limits referred to in *considering a)* are exceeded by a non-GSO FSS system to which the limits apply without the agreement of the concerned administrations, this constitutes a violation of the obligations under No. **22.2**;
- c)* that ITU-R has developed Recommendation ITU-R S.1503 to provide a functional description to be used in developing software tools for determining the conformity of non-GSO FSS networks with limits contained in Article **22**;
- d)* that there is currently no software tool available to the Radiocommunication Bureau for epfd examinations;
- e)* that the Bureau has issued Circular Letters CR/176 and CR/182, which request additional information from non-GSO systems in order to examine them for compliance with the Article **22** epfd limits;
- f)* that, since no epfd validation software is available, the Bureau has requested commitments from the notifying administrations that they will meet the epfd limits in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**, and that under these commitments the Bureau gives qualified favourable findings to their systems;
- g)* that the Bureau is not in a position to perform its duties in relation to Nos. **9.7A** and **9.7B** due to the lack of epfd validation software;
- h)* that during the examination under Nos. **9.35** and **11.31**, the Bureau examines non-GSO FSS systems to ensure their compliance with the single-entry epfd limits given in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**,

resolves

1 that since the Bureau is unable to examine non-GSO FSS systems subject to Nos. **22.5C**, **22.5D** and **22.5F** under Nos. **9.35** and/or **11.31**, the notifying administration shall send to the Bureau a commitment that the non-GSO FSS system complies with the limits given in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3** in addition to the information submitted under Nos. **9.30** and **11.15**;

2 that the Bureau shall issue either a qualified favourable finding under No. **9.35** or a favourable finding with a date of review under No. **11.31** with respect to the limits contained in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**, if *resolves* 1 is satisfied, otherwise the non-GSO FSS system will receive a definitive unfavourable finding;

3 that if an administration believes that a non-GSO FSS system, for which the commitment referred to in *resolves* 1 was sent, has the potential to exceed the limits given in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**, it may request from the notifying administration additional information with regard to the compliance with the limits mentioned above. Both administrations shall cooperate to resolve any difficulties, with the assistance of the Bureau, if so requested by either of the parties, and may exchange any additional relevant information that may be available;

4 that the Bureau shall determine coordination requirements between GSO FSS earth stations and non-GSO FSS systems under Nos. **9.7A** and **9.7B** based on bandwidth overlap, and GSO FSS earth station antenna maximum isotropic gain, *G/T* and emission bandwidth;

5 that this Resolution shall no longer be applied after the Bureau has communicated to all administrations via a Circular Letter that the epfd validation software is available and the Bureau is able to verify compliance with the limits in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3** and to determine the coordination requirements under Nos. **9.7A** and **9.7B**,

further resolves

that those provisions of the Radio Regulations that have been amended by this Conference and that are referred to in *resolves* 5 shall provisionally apply as from 5 July 2003,

instructs the Director of the Radiocommunication Bureau

1 to encourage administrations to develop the epfd validation software;

2 to review, once the epfd validation software is available, its findings made in accordance with Nos. **9.35** and **11.31**;

3 to review, once the epfd validation software is available, the coordination requirements under Nos. **9.7A** and **9.7B**.

RESOLUTION 86 (WRC-03)

**Scope and criteria to be used for the implementation of
Resolution 86 (Rev. Marrakesh, 2002) of the
Plenipotentiary Conference**

The World Radiocommunication Conference (Geneva, 2003),

considering

that the Plenipotentiary Conference discussed the application of Resolution 86 (Rev. Marrakesh, 2002) and decided to request this Conference to determine the scope and criteria to be used by future world radiocommunication conferences (WRCs) in the application of Resolution 86 (Rev. Marrakesh, 2002),

resolves

that the scope and criteria of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference to be considered by future WRCs be as follows:

- 1 to consider any proposals which deal with deficiencies in the advance publication, coordination and notification procedures of the Radio Regulations for space services which have either been identified by the Board and included in the Rules of Procedure or which have been identified by administrations or by the Radiocommunication Bureau, as appropriate;
- 2 to consider any proposals which are intended to transform the content of the Rules of Procedure into a regulatory text;
- 3 to ensure that these procedures, characteristics and appendices reflect the latest technologies, as far as possible;
- 4 to consider any proposals intended to facilitate, in accordance with Article 44 of the Constitution, the rational, efficient and economical use of radio frequencies and the associated orbits including the geostationary orbit in accordance with *resolves* 2 of Resolution **80 (Rev.WRC-2000)** and *resolves to request the 2003 and subsequent world radiocommunication conferences* of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;
- 5 to consider any changes to provisions of the Radio Regulations for space services that would result in the simplification of the procedures and the work of the Bureau and/or administrations;
- 6 to consider any changes to the Radio Regulations that follow from decisions of a Plenipotentiary Conference on space matters.

RESOLUTION 87 (WRC-03)

**Date of entry into force of certain provisions of the Radio Regulations
relating to the non-payment of cost-recovery fees**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 adopted certain provisions in Article 9, Appendix 30, Appendix 30A and Appendix 30B relating to the consequences of non-payment of cost-recovery fees as adopted by the Council in Decision 482;
- b)* that WRC-2000 recommended that the Plenipotentiary Conference (Marrakesh, 2002) (PP-02) consider the date at which those provisions shall enter into force;
- c)* that PP-02 decided that the date of entry into force of those provisions shall be 1 August 2003;
- d)* that PP-02 recommended WRC-03 to implement that decision;
- e)* that with the PP-02 decision setting a date of entry into force of 1 August 2003, it may not be possible in all cases to give a reminder two months in advance (see No. 9.38.1 of the Radio Regulations),

recognizing

that Resolution 88 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference recognizes that the provisions adopted by WRC-2000 established a linkage between the rights acquired by Member States in applying the relevant procedures of the Radio Regulations after 7 November 1998 and the payment of the fees for cost recovery for satellite network filings,

noting

that PP-02 instructed the Director of the Radiocommunication Bureau to send reminders 60 days before 1 August 2003,

resolves

- 1 that the date of entry into force of the footnotes to Nos. 9.2B and 9.38 in Article 9, to § 4.1.5, 4.1.15, 4.2.8 and 4.2.19 of Appendix 30, to § 4.1.5, 4.1.15, 4.2.8 and 4.2.19 of Appendix 30A and to the title of Article 6 of Appendix 30B shall be 1 August 2003;
- 2 that for those filings for which the deadline for payment is between 7 July 2003 and 5 September 2003, the reminder shall be sent out on 7 July 2003 and the provisions specified in *resolves* 1 above shall not be applied until 5 September 2003.

RESOLUTION 88 (WRC-03)

Rationalization of Articles 9 and 11 of the Radio Regulations

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the need for comprehensive simplification of the Radio Regulations was recognized formally by the ITU Plenipotentiary Conference (Nice, 1989), which went on to establish a Voluntary Group of Experts (VGE) with the remit to study the issues involved in improving the allocation and use of the radio-frequency spectrum and the simplification of the Radio Regulations, having particular regard to simplifying the coordination and notification procedures for satellite networks;
- b)* that the VGE made proposals to WRC-95 on the simplification of the Radio Regulations that resulted in the present structure of the simplified Radio Regulations in which the general procedures for the coordination and notification of radiocommunication services are contained in the current Articles 9 and 11, respectively;
- c)* that WRC-97 and WRC-2000 both continued the lengthy process of refining the provisions of Articles 9 and 11 with a view to eliminating inconsistencies and remedying omissions from their procedures;
- d)* that following the simplification process and the additions made by subsequent conferences, the provisions of Articles 9 and 11 have become difficult to read due to extensive cross-referencing, the lack of a logical progress in the sequence of the provisions and the complexity of the resulting text;
- e)* that due to the problems identified in *considering d)* there has been extensive development of the Rules of Procedure to facilitate the understanding and interpretation of these Articles with consequential increased time and costs expended by for both administrations and the Radiocommunication Bureau;
- f)* that the complexity of the Articles 9 and 11 provisions can present particular difficulties for developing countries,

noting

- a)* that the Plenipotentiary Conference (Minneapolis, 1998) adopted Resolution 86 which, together with the subsequent revisions made by the Plenipotentiary Conference (Marrakesh, 2002), requires each world radiocommunication conference (WRC) to review and update the advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, including the associated technical characteristics, and the related Appendices of the Radio Regulations;

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b) that the Satellite Backlog Action Group (SAT-BAG) established by the Council at its 2001 session, in its report to WCR-03, recommends that this conference initiate a study of the relevant regulatory procedures in order to systematically remove unnecessary duplication, inconsistency and complexity;

c) that an example dealing with the inconsistencies and omissions in the provisions of Article **9** and **11** has been provided to this conference,

resolves

1 that the rationalization and clarification of Articles **9** and **11** be considered by a future competence conference under Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;

2 that WRC-07 should review the results of the studies to be undertaken by ITU-R and take appropriate action,

requests ITU-R

to undertake studies leading to the rationalization of the coordination and notification procedures, taking due account of No. **0.3**,

invites administrations

to assist in the rationalization and clarification of the procedures for coordination and notification of radiocommunication services by submitting contributions to ITU-R relating to the above-mentioned difficulties.

RESOLUTION 89 (WRC-03)

Backlog in satellite filings

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the backlog in the processing of satellite filings by the Radiocommunication Bureau continues to be a problem and that this backlog has an impact on administrations and the Bureau in trying to comply with the provisions of the Radio Regulations (RR);
- b)* that the Council, at its 2001 session, adopted Resolution 1182 in which it was recommended that the Board develop, as a matter of urgency, a set of Rules of Procedure, consistent with the RR, intended to eliminate the backlog;
- c)* that, in response to Resolution 1182, the Board, at its meeting in December 2001, adopted a number of provisional Rules of Procedure;
- d)* that measures other than the adoption of Rules of Procedure will also be necessary in order to resolve the backlog,

recognizing

- a)* that the need to resolve this backlog in the processing of satellite filings is in the interest of all Member States;
- b)* that exceptional measures are needed to enable the Bureau to absorb the backlog in the processing of satellite filings,

resolves to invite administrations

to submit contributions with a view to removing any unnecessary data in Appendix 4 so as to reduce the processing time of a notice,

instructs the Director of the Radiocommunication Bureau, within financial limitations,

- 1 to identify inconsistencies in Appendix 4 and suggest improvements in its structure;
- 2 to provide administrations with a more user-friendly software for the validation of all electronic filings in order to minimize/eliminate the exchange of correspondence between administrations and the Bureau, as well as the submission of incorrect or inadequate data elements to the Bureau;
- 3 to provide administrations with up-to-date information on the validation rules and course of action for each error message,

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invites ITU-R

- 1 to conduct studies relating to data elements, data structure and the database, where appropriate, for Appendix **4**;
- 2 to conduct studies on the development of software for examining all forms of notice for compliance with Article **5**.

RESOLUTION 95 (Rev.WRC-03)

**General review of the Resolutions and Recommendations of
world administrative radio conferences and world
radiocommunication conferences**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that it is important to keep the Resolutions and Recommendations of past world administrative radio conferences and world radiocommunication conferences under constant review, in order to keep them up to date;
- b)* that the reports of the Director of the Radiocommunication Bureau submitted to previous conferences provided a useful basis for a general review of the Resolutions and Recommendations of past conferences;
- c)* that some principles and guidelines are necessary for future conferences to treat the Resolutions and Recommendations of previous conferences which are not related to the agenda of the Conference,

resolves to invite future competent world radiocommunication conferences

- 1 to review the Resolutions and Recommendations of previous conferences that are related to the agenda of the Conference with a view to their possible revision, replacement or abrogation and to take appropriate action;
- 2 to review the Resolutions and Recommendations of previous conferences that are not related to any agenda item of the Conference with a view to:
 - abrogating those Resolutions and Recommendations that have served their purpose or have become no longer necessary;
 - reviewing the need for those Resolutions and Recommendations, or parts thereof, requesting ITU-R studies on which no progress has been made during the last two periods between conferences;
 - updating and modifying Resolutions and Recommendations, or parts thereof that have become out of date, and to correct obvious omissions, inconsistencies, ambiguities or editorial errors and effect any necessary alignment;
- 3 at the beginning of the conference, to determine which committee within the conference has the primary responsibility to review each of the Resolutions and Recommendations referred to in *resolves* 1 and 2 above,

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instructs the Director of the Radiocommunication Bureau

1 to conduct a general review of the Resolutions and Recommendations of previous conferences and, after consultation with the Radiocommunication Advisory Group and the Chairmen and Vice-Chairmen of the Radiocommunication Study Groups, submit a report to the second session of the Conference Preparatory Meeting in respect of *resolves* 1 and *resolves* 2, including an indication of any associated agenda items;

2 to include in the above report, with the cooperation of the chairmen of the Radiocommunication Study Groups, the progress reports of ITU-R studies on the issues which have been requested by the Resolutions and Recommendations of previous conferences, but which are not placed on the agendas of the forthcoming two conferences,

invites the Conference Preparatory Meeting

to include, in its Report, the results of a general review of the Resolutions and Recommendations of previous conferences.

RESOLUTION 96 (WRC-03)

**Provisional application of certain provisions of the Radio Regulations
as revised by WRC-03 and abrogation of certain
Resolutions and Recommendations**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference has adopted a partial revision to the Radio Regulations (RR) in accordance with its terms of reference which will enter into force on 1 January 2005;
- b)* that some of the provisions, as amended by this Conference, need to apply provisionally as of an earlier date;
- c)* that as a general rule, new and revised Resolutions and Recommendations enter into force at the time of signing of the Final Acts of a conference;
- d)* that as a general rule, Resolutions and Recommendations which a WRC has decided to suppress are abrogated at the time of the signing of the Final Acts of the conference,

resolves

1 that, as of 5 July 2003, the following provisions of the RR, as revised or established by this Conference, shall provisionally apply: Nos. **1.189, 5.197A, 5.311, 5.328A, 5.328B, 5.329, 5.331, 5.334, 5.380A, 5.386, 5.388A, 5.388B, 5.416, 5.417A, 5.417B, 5.417C, 5.417D, 5.418, 5.418A, 5.418B, 5.418C, 5.424A, 5.443B** and the associated allocations in the Table of Article 5 to the radionavigation-satellite service in the bands 1 164-1 215 MHz, 1 215-1 300 MHz, 1 559-1 610 MHz, 5 000-5 010 MHz and 5 010-5 030 MHz, No. **5.460** and the associated allocation in the Table of Article 5 in the band 7 145-7 235 MHz and the associated modifications to Table 21-2 and Table 21-3, Nos. **5.502, 5.503, 5.504B, 5.504C, 5.508A, 5.509A** and the associated allocations in the Table of Article 5 to the aeronautical mobile-satellite service on a secondary basis in the band 14-14.5 GHz, Nos. **5.457A, 5.457B, 5.504A, 5.506A, 5.506B, 5.516A** and the associated allocation in the Table of Article 5 to the fixed-satellite service (space-to-Earth) in the band 17.3-17.7 GHz, Nos. **5.446A, 5.446B, 5.447, 5.447E, 5.447F, 5.448A, 5.448B, 5.448C, 5.448D, 5.450A, 5.450B, 5.453** and the associated allocations in the Table of Article 5 to the mobile except aeronautical mobile, Earth exploration-satellite (active) and space research (active), and radiolocation services, Nos. **5.488, 5.537A, 5.543A, 5.547, 7.4A, A.9.6A, A.9.7, 9.1, 9.2, 9.5D, 9.6, 9.6.3, 9.14, A.11.4A, A.11.5, 11.44, 11.48, 19.50.1, 19.68, 19.68A, 19.72, 19.82A, 21.13A, 21.16.15, 21.16.16, 21.16.17, 21.16.18, 21.18, Table 21-4, Nos. 22.5C, 22.5CA, Table 22-1A, Table 22-1B, Table 22-1C, Table 22-1D, Table 22-1E, Table 22-2, Nos. 22.5H, 22.5I, 25.1 to 25.8, 25.9A, 25.9B, 25.11 and 52.221A, Table 5-1 of Appendix 5, Appendix 17 (Part A, Part B – Section I, § 5), Appendix 42;**

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2 that, as of 1 August 2003, the following provisions of the RR, as revised or established by this Conference, shall provisionally apply: Nos. **9.2B.1** and **9.38.1**;

3 that, as of 1 January 2004, the following provisions of the RR, as revised or established by this Conference, shall provisionally apply: Article **12**, Appendix **4**;

4 that, as of 4 January 2004, the following provisions of the RR, as revised or established by this Conference, shall provisionally apply: Nos. **5.551H** and **5.551I**;

5 that, as of 5 July 2003, the following provisions of the RR, which are suppressed by this Conference, shall be abrogated: Nos. **11.44B** to **11.44I**, **19.49**, **19.115** and **19.116**,

further resolves

1 to abrogate the following Resolutions as of 5 July 2003:

Resolution **29 (WRC-97)**,
Resolution **44 (Mob-87)**,
Resolution **46 (Rev.WRC-97)**,
Resolution **53 (Rev.WRC-2000)**,
Resolution **59 (WRC-2000)**,
Resolution **77 (WRC-2000)**,
Resolution **78 (WRC-2000)**,
Resolution **82 (WRC-2000)**,
Resolution **83 (WRC-2000)**,
Resolution **84 (WRC-2000)**,
Resolution **127 (Rev.WRC-2000)**,
Resolution **128 (Rev.WRC-2000)**,
Resolution **135 (WRC-2000)**,
Resolution **137 (WRC-2000)**,
Resolution **138 (WRC-2000)**,
Resolution **209 (Mob-87)**,
Resolution **214 (Rev.WRC-2000)**,
Resolution **216 (Rev.WRC-2000)**,
Resolution **226 (WRC-2000)**,
Resolution **227 (WRC-2000)**,
Resolution **300 (Rev.WRC-2000)**,
Resolution **310 (Rev.WRC-97)**,
Resolution **312 (Rev.WRC-97)**,
Resolution **341 (WRC-97)**,
Resolution **346 (WRC-97)**,
Resolution **347 (WRC-97)**,
Resolution **348 (WRC-97)**,

Resolution **350 (WRC-2000)**,
Resolution **532 (WRC-97)**,
Resolution **537 (WRC-97)**,
Resolution **540 (WRC-2000)**,
Resolution **541 (WRC-2000)**,
Resolution **542 (WRC-2000)**,
Resolution **602 (Mob-87)**,
Resolution **603 (WRC-2000)**,
Resolution **604 (WRC-2000)**,
Resolution **605 (WRC-2000)**,
Resolution **606 (WRC-2000)**,
Resolution **607 (WRC-2000)**,
Resolution **645 (WRC-2000)**,
Resolution **706 (Rev.WRC-2000)**,
Resolution **715 (Rev.WRC-97)**,
Resolution **723 (Rev.WRC-2000)**,
Resolution **724 (WRC-97)**,
Resolution **725 (WRC-97)**,
Resolution **727 (Rev.WRC-2000)**,
Resolution **730 (WRC-2000)**,
Resolution **733 (WRC-2000)**,
Resolution **735 (WRC-2000)**,
Resolution **736 (WRC-2000)**,
Resolution **737 (WRC-2000)**,
Resolution **800 (WRC-2000)**,
Resolution **801 (WRC-2000)**;

2 to abrogate the following Recommendations as of 5 July 2003:

Recommendation **35 (WRC-95)**,
Recommendation **64**,
Recommendation **66 (Rev.WRC-2000)**,
Recommendation **319 (Mob-87)**,
Recommendation **402**,
Recommendation **515 (Rev.WRC-97)**,
Recommendation **519 (WARC-92)**,
Recommendation **521 (WRC-95)**,

Recommendation **700**,
Recommendation **701**,
Recommendation **702**,
Recommendation **709**,
Recommendation **710**,
Recommendation **715 (Orb-88)**,
Recommendation **718 (WARC-92)**,
Recommendation **719 (WARC-92)**.

RESOLUTION 105 (Orb-88)

Improvement of the quality of certain allotments in Part A of the fixed-satellite service Plan¹

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

considering

- a)* that the delegations of the administrations participating in this Conference have made intensive efforts to achieve the goals identified in the agenda of the Conference;
- b)* that the Conference has made intensive use of the ITU computer facilities and associated software to develop an Allotment Plan for the fixed-satellite service in the frequency bands identified for the Plan;
- c)* that a Plan has been developed which guarantees one coverage for each administration (Part A of the Plan) and accommodates existing systems (Part B of the Plan);
- d)* that, in the case of a small number of allotments in the Plan, the reference value of 26 dB has not been achieved for the *C/I* ratio,

noting

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

noting further

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

recognizing

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

believing

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

¹ WRC-97 made editorial amendments to this Resolution.

resolves

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

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

invites administrations

to implement the provision of this Resolution in the spirit of cooperation which characterizes the relations between Member States,

calls upon

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

RESOLUTION 111 (Orb-88)

**Planning of the fixed-satellite service in the bands 18.1-18.3 GHz,
18.3-20.2 GHz and 27-30 GHz¹**

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

considering

- a) that WARC Orb-85 in its Report to WARC Orb-88, requested the ITU-R to study the technical characteristics of the fixed-satellite service in the bands 18.1-18.3 GHz, 18.3-20.2 GHz and 27-30 GHz with a view to a decision on the future planning of these bands for the fixed-satellite service being taken by a future competent conference;
- b) that the ITU-R concluded that it would be extremely unwise for these bands to be subject to planning at this time and that further study would be necessary,

recognizing

- 1 that these bands have not been exploited extensively due to technical and economic reasons, although they potentially have great capacity;
- 2 that the required satellite orbital spacing may be reduced, thus resulting in easier coordination between satellite networks because narrower satellite antenna beamwidths can be achieved than in the lower frequency bands;
- 3 that different performance criteria may well be necessary from those which currently exist for frequency bands below 15 GHz, since the propagation characteristics are different,

resolves

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

invites the ITU-R

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

¹ WRC-97 made editorial amendments to this Resolution.

RESOLUTION 114 (Rev.WRC-03)

Studies on compatibility between new systems of the aeronautical radionavigation service and the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in the frequency band 5 091-5 150 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* the current allocation of the frequency band 5 000-5 250 MHz to the aeronautical radionavigation service;
- b)* the requirements of both the aeronautical radionavigation and the fixed-satellite (FSS) (Earth-to-space) (limited to feeder links of non-geostationary satellite (non-GSO) systems in the mobile-satellite service (MSS)) services in the above-mentioned band,

recognizing

- a)* that precedence must be given to the microwave landing system (MLS) in accordance with No. **5.444** and to other international standard systems of the aeronautical radionavigation service in the frequency band 5 030-5 150 MHz;
- b)* that, in accordance with Annex 10 of the Convention of the International Civil Aviation Organization (ICAO) on international civil aviation, it may be necessary to use the frequency band 5 091-5 150 MHz for the MLS if its requirements cannot be satisfied in the frequency band 5 030-5 091 MHz;
- c)* that the FSS providing feeder links for non-GSO systems in the MSS will need access to the frequency band 5 091-5 150 MHz in the short term,

noting

- a)* that Recommendation ITU-R S.1342 describes a method for determining coordination distances between international standard MLS stations operating in the band 5 030-5 091 MHz and FSS earth stations providing Earth-to-space feeder links in the band 5 091-5 150 MHz;
- b)* the small number of FSS stations to be considered;
- c)* the development of new systems that will provide supplemental navigation information integral to the aeronautical radionavigation service,

resolves

- 1 that administrations authorizing stations providing feeder links for non-GSO systems in the MSS in the frequency band 5 091-5 150 MHz shall ensure that they do not cause harmful interference to stations of the aeronautical radionavigation service;
- 2 that the allocation to the aeronautical radionavigation service and the FSS in the frequency band 5 091-5 150 MHz should be reviewed at a future competent conference prior to 2018;
- 3 that studies be undertaken on compatibility between new systems of the aeronautical radionavigation service and systems of the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space),

invites administrations

when assigning frequencies in the band 5 091-5 150 MHz before 1 January 2018 to stations of the aeronautical radionavigation service or to stations of the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space), to take all practicable steps to avoid mutual interference between them,

invites ITU-R

to study the technical and operational issues relating to sharing of this band between new systems of the aeronautical radionavigation service and the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space),

invites

- 1 ICAO to supply technical and operational criteria suitable for sharing studies for new aeronautical systems;
- 2 all Members of the Radiocommunication Sector, and especially ICAO, to participate actively in such studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 122 (Rev.WRC-03)

Use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by high altitude platform stations (HAPS) in the fixed service and by other services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the band 47.2-50.2 GHz is allocated to the fixed, mobile and fixed-satellite services on a co-primary basis;
- b)* that WRC-97 made provision for operation of HAPS, also known as stratospheric repeaters, within the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- c)* that ITU has among its purposes “to promote the extension of the benefits of the new telecommunication technologies to all the world’s inhabitants” (No. 6 of the Constitution);
- d)* that systems based on new technologies using high altitude platforms will be able to provide high-capacity, competitive services to urban and rural areas;
- e)* that the development of any service requires major investment and that manufacturers and operators should be given the confidence to make the necessary investment;
- f)* that high altitude platform systems are in an advanced stage of development and some countries have notified such systems to ITU in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- g)* that Recommendation ITU-R F.1500 contains the characteristics of systems in the fixed service using HAPS;
- h)* that while the decision to deploy HAPS can be taken on a national basis, such deployment may affect neighbouring administrations, particularly in small countries;
- i)* that ITU-R has completed studies dealing with sharing between systems using HAPS in the fixed service and other types of systems in the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- j)* that the radio astronomy service has a primary allocation in the band 48.94-49.04 GHz;
- k)* that further studies are required on sharing between systems using HAPS and the radio astronomy service;

l) that No. 5.552 urges administrations to reserve fixed-satellite service (FSS) use of the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service (BSS), and that ITU-R studies indicate that HAPS in the fixed service may share with BSS feeder links;

m) that Recommendation ITU-R SF.1481 provides useful reference information in regard to sharing between systems using HAPS and geostationary FSS systems but also notes that further study of operational scenarios and mitigation techniques is required, and that such study would enable greater confidence in the feasibility of sharing of the radio spectrum in the 47.2-47.5 GHz band and 47.9-48.2 GHz band, which have been designated for systems using HAPS;

n) that studies such as described in *considering m)* are already in progress in ITU-R,

resolves

1 to encourage administrations to facilitate coordination between systems in the fixed service using HAPS operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz and systems of the co-primary satellite services in the same bands;

2 that, on a provisional basis, the procedures of Article 9 shall be used for coordination between satellite systems and systems using HAPS in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;

3 to invite WRC-07 to review, for the bands 47.2-47.5 GHz and 47.9-48.2 GHz, the results of the studies specified in *invites ITU-R* below and consider refinement of the regulatory provisions applicable to HAPS stations in the fixed service in these bands,

invites ITU-R

1 to study, as a matter of urgency, power limitations applicable for HAPS ground stations to facilitate sharing with space station receivers;

2 to study the regulatory provisions that might be needed in order to address those cases where the deployment of HAPS in the territory of one administration may affect other administrations;

3 to continue to carry out studies in a most efficient and harmonized manner on the appropriate technical sharing criteria for the situations referred to in *considering k)* and *m)*, taking into account the operational environments and the requirements of systems in the FSS,

instructs the Director of the Radiocommunication Bureau

1 to maintain notices concerning HAPS that were received by the Bureau prior to 22 November 1997 and provisionally recorded in the Master International Frequency Register, until a date to be decided by a future WRC;

2 with effect from 5 July 2003, and pending review of the sharing studies in *considering k)* and *m)* and review of the notification process by WRC-07:

- to accept notices in the bands 47.2-47.5 GHz and 47.9-48.2 GHz only for HAPS in the fixed service and for feeder links for the BSS, and, for Region 2, for earth stations and geostationary space stations operating FSS networks providing service exclusively within Region 2;
- to defer the examination of such systems under Nos. **9.36** and **11.32** as well as the application of any Article 9 coordination procedure between the satellite systems and HAPS until further decision by WRC-07;
- to continue to process notices for FSS networks (except for feeder links for the BSS) for which complete information for advance publication has been received prior to 27 October 1997; and
- to inform the notifying administrations accordingly.

RESOLUTION 124 (Rev.WRC-2000)

**Protection of the fixed service in the frequency band 8 025-8 400 MHz
sharing with geostationary-satellite systems of the Earth
exploration-satellite service (space-to-Earth)**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that prior to WRC-97, the band 8 025-8 400 MHz was allocated to the Earth exploration-satellite service (space-to-Earth) on a secondary basis in Regions 1 and 3, except for those countries listed in former No. **5.464**;
- b) that the power flux-density limits given in Table **21-4** of Article **21** apply to emissions from space stations of the Earth exploration-satellite service (space-to-Earth);
- c) that, for those administrations where the secondary allocation applied before WRC-97, geostationary orbital avoidance was not required for the fixed service and, therefore, the power flux-density limits given in Table **21-4** of Article **21** may give rise to excessive interference to the fixed service;
- d) that WRC-97 adopted provisional power flux-density limits as specified in No. **5.462A** which are lower than those shown in Table **21-4** of Article **21** to protect the fixed service;
- e) that, prior to WRC-97, no studies had been conducted in this frequency band by ITU-R on the power flux-density values to apply to space stations of geostationary-satellite systems in the Earth exploration-satellite service where geostationary orbital avoidance had not been implemented by stations of the fixed service,

considering further

- a) that the band 8 025-8 400 MHz is used extensively by the fixed service in accordance with ITU-R radio-frequency channel arrangements for the 8 GHz band (see Recommendation ITU-R F.386) and is also used by some countries for television outside broadcast applications;
- b) that Recommendation ITU-R F.1502, which was developed in response to Resolution **124 (WRC-97)** and approved by the Radiocommunication Assembly (Istanbul, 2000), recommends power flux-density limits different from those in No. **5.462A**,

resolves

to invite a future competent world radiocommunication conference to review No. **5.462A**, taking into account Recommendation ITU-R F.1502, and to take appropriate action.

RESOLUTION 125 (WRC-97)

**Frequency sharing in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz
between the mobile-satellite service and the radio astronomy service**

The World Radiocommunication Conference (Geneva, 1997),

with a view

to enabling the mobile-satellite service (MSS) and the radio astronomy service to make the most efficient use of frequency bands allocated to them, having due regard to the other services to which those bands are also allocated,

considering

- a) that the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz are allocated to the radio astronomy service and the MSS (Earth-to-space) on a co-primary basis;
- b) that No. **5.372** states that “Harmful interference shall not be caused to stations of the radio astronomy service using the band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies)”; and that Article **29** also points out that emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service;
- c) that the nature of objects studied by the radio astronomy service in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz demands maximum flexibility in the planning of observation frequencies;
- d) that, in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz, which are shared between the radio astronomy service and the MSS, operational constraints are necessary for MSS mobile earth stations;
- e) that a former ITU-R Recommendation relating to sharing between the MSS and the radio astronomy service in the band 1 660-1 660.5 MHz noted that further studies were required, particularly in the areas of propagation models and assumptions used for the determination of separation distances;
- f) that Recommendation ITU-R M.1316 may be used in order to facilitate coordination between mobile earth stations and radio astronomy stations in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz;
- g) that no experience has been gained up to now with the use of the Recommendation mentioned in *considering f)*;
- h) that the threshold levels of interference detrimental to the radio astronomy service are given in Recommendation ITU-R RA.769-1,

RES125-2

resolves

that a future competent conference should evaluate frequency sharing in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz between the MSS and the radio astronomy service, based upon the experience gained with the use of ITU-R M.1316 and other relevant ITU-R Recommendations,

invites ITU-R

to submit a report to that future conference on evaluating the effectiveness of Recommendations aiming to facilitate sharing between the MSS and the radio astronomy service,

urges administrations

to participate actively in this evaluation.

RESOLUTION 132 (WRC-97)

Use of the bands 18.8-19.3 GHz and 28.6-29.1 GHz by networks operating in the fixed-satellite service

The World Radiocommunication Conference (Geneva, 1997),

considering

- a) that, by the former Resolution **118 (WRC-95)***, WRC-95 recommended that this Conference review the results of studies carried out by ITU-R relating to the use of the frequency bands 20/30 GHz;
- b) that it also recommended that this Conference take appropriate action, including adjustments to spectrum allocations, for the harmonious development of geostationary-satellite orbit (GSO) and non-geostationary-satellite orbit (non-GSO) systems and terrestrial services in the same bands;
- c) that it has reviewed the above studies, and has taken appropriate action in relation to the use of the frequency bands 18.8-18.9 GHz and 28.6-28.7 GHz as indicated in No. **5.523A**;
- d) that, in its Resolution **118 (WRC-95)***, WRC-95 considered:
 - that the development of GSO and non-GSO systems in the bands 18.8-19.3 GHz and 28.6-29.1 GHz entails major global investment and, consequently, their reciprocal coordination needs the firm commitment of all parties concerned on the basis of application of Resolution **46 (Rev.WRC-97)****;
 - that this Conference considered the non-application of No. **22.2/2613** in the bands 18.8-19.3 GHz and 28.6-29.1 GHz in light of the spectrum requirements for non-GSO fixed-satellite service (FSS) systems;
- e) that WRC-95 adopted in *resolves* 1 to 5 of Resolution **118 (WRC-95)*** the procedures applicable to the frequency bands 18.9-19.3 GHz and 28.7-29.1 GHz only;
- f) that, in the light of *considering* d) and e) above, GSO and non-GSO FSS systems referred to in **5.523A** are being developed in the bands 18.8-19.3 GHz and 28.6-29.1 GHz;
- g) that **5.523A** will enter into force on the date indicated in Article **59**;
- h) that this Conference decided to delete Resolution **118 (WRC-95)***, as of 22 November 1997,

* This Resolution was abrogated by WRC-97.

** *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

noting

that the band 18.8-19.3 GHz is heavily used by the fixed service and there is a need to continue the use of this band in many countries,

resolves

1 that, as of 18 November 1995, the provisions of Resolution **46 (Rev.WRC-95)** (Resolution **46 (Rev.WRC-97)****/No. **9.11A** as of 22 November 1997) shall apply and No. **22.2** shall not apply in the bands 18.8-19.3 GHz and 28.6-29.1 GHz, to frequency assignments of GSO and non-GSO FSS systems;

2 that should modifications arise to frequency assignments of non-GSO FSS systems which were notified before 18 November 1995, when coordination was not required, then no coordination is required when the characteristics of the modified frequency assignment are within the limits of those of the original notification,

instructs the Radiocommunication Bureau

to apply the provisions of No. **5.523A**, in the bands 18.8-19.3 GHz and 28.6-29.1 GHz, as from 22 November 1997.

RESOLUTION 136 (Rev.WRC-03)

**Frequency sharing in the range 37.5-50.2 GHz between geostationary
fixed-satellite service networks and non-geostationary
fixed-satellite service systems**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 made provisions for the operation of geostationary fixed-satellite service (GSO FSS) networks and non-geostationary fixed-satellite service (non-GSO FSS) systems in the 10-30 GHz frequency range;
- b)* that there is an emerging interest in operating GSO FSS networks and non-GSO FSS systems in the 37.5-50.2 GHz frequency range;
- c)* that there is a need to provide for the orderly development and implementation of new satellite technologies in the 37.5-50.2 GHz frequency range;
- d)* that systems based on the use of new technologies associated with both GSO FSS networks and non-GSO FSS systems are capable of providing the most isolated regions of the world with high-capacity and low-cost means of communication;
- e)* that there should be equitable access to the radio-frequency spectrum and orbital resources in a mutually acceptable manner that allows for new entrants in the provision of services;
- f)* that the Radio Regulations should be sufficiently flexible to accommodate the introduction and implementation of innovative technologies as they evolve;
- g)* that in the frequency range 37.5-50.2 GHz where there has been little or no deployment of satellite systems to date, administrations concerned with both GSO FSS and non-GSO FSS systems should be expected to exhibit flexibility in achieving the appropriate balance in the sharing environment;
- h)* that this Conference, having considered the outcome of the ITU-R studies on this subject, as summarized in the CPM Report to this Conference, has decided that further studies are needed before the conditions for non-GSO FSS systems to share these bands with GSO FSS networks can reliably be determined,

resolves to invite administrations

to seek balanced sharing arrangements between GSO FSS networks and non-GSO FSS systems in the application of Article 22 to such systems in the 37.5-50.2 GHz frequency range, prior to the review by WRC-10 of the results of the studies called for by this Resolution,

invites ITU-R

1 to undertake, as a matter of urgency, further technical, operational and regulatory studies on sharing arrangements which achieve an appropriate balance between GSO FSS networks and non-GSO FSS systems in the frequency range 37.5-50.2 GHz. Such further studies should include, but not necessarily be limited to:

a) techniques which individually or in combination avoid, or otherwise adequately mitigate, main beam-to-main beam coupling of interference in both directions between non-GSO FSS systems and GSO FSS networks at “in-line” instants. The studies should be based on the key parameters of systems firmly planned to operate in the bands concerned, and should be pursued sufficiently far to establish appropriate long-term and short-term interference criteria and to compute the time statistics of interference from non-GSO systems to GSO networks, and from GSO networks to non-GSO systems, to determine whether those criteria would be met. The computations and comparisons should be made firstly assuming no mitigation, and subsequently with each of the various mitigation techniques or combinations of mitigation techniques envisaged. The mitigation techniques thus investigated should include:

- satellite diversity or arc avoidance;
- geographical isolation between earth stations;
- site diversity;
- adaptive coding;
- link balancing;
- other appropriate techniques, if any;

b) the development of technical, operational and regulatory guidance which would enable WRC-10 to decide whether or not to include, in the Radio Regulations, equivalent power flux-density (epfd) limits on non-GSO FSS systems for the protection of GSO FSS networks, and off-axis e.i.r.p. density limits on earth stations in GSO FSS networks for the protection of non-GSO FSS systems, in the frequency range 37.5-50.2 GHz. Such guidance should include quantitative values for suitable $epfd_{\downarrow}$, $epfd_{\uparrow}$ and off-axis e.i.r.p. density limits;

2 to report the results of these studies to WRC-10.

RESOLUTION 139 (WRC-2000)

Use of fixed-satellite service systems for the provision of direct-to-home television broadcasting

The World Radiocommunication Conference (Istanbul, 2000),

noting

- a) that, in some regions, a number of fixed-satellite service (FSS) systems provide direct-to-home (DTH) television broadcasting;
- b) that FSS frequency bands are used for a wide variety of services and applications;
- c) that, however, the adoption of the revised Regions 1 and 3 broadcasting-satellite service (BSS) Plans contained in Appendices 30 and 30A will encourage greater use of the BSS bands,

considering

- a) that, in the minutes of the thirteenth Plenary Meeting of WRC-97, the Inter-conference Representative Group (IRG) was requested to review the possibility of combining DTH transmission services by satellite and satellite-broadcasting services in the planned and non-planned bands and its implications for the relevant Articles of the Radio Regulations;
- b) that some administrations proposed that the above item be included in the agenda of WRC-03;
- c) that other administrations were of the view that more studies are required before placing such an item on the agenda of a WRC,

resolves to invite ITU-R

to study the current and expected future use of FSS allocations for DTH television transmissions in the different ITU Regions, as a matter of urgency, and the technical, operational and regulatory aspects of DTH television broadcasting in the FSS bands,

instructs the Director of the Radiocommunication Bureau

to report the results of these studies to WRC-03 for consideration, as appropriate, in the development of future conference agendas.

RESOLUTION 140 (WRC-03)

Measures and studies associated with the equivalent power flux-density (epfd) limits in the band 19.7-20.2 GHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, after several years of study, WRC-2000 adopted epfd limits in a number of frequency bands to give practical effect to No. **22.2**, in order to facilitate non-geostationary-orbit (non-GSO) systems in the fixed-satellite service (FSS) systems to operate while still ensuring protection of GSO FSS networks from unacceptable interference;
- b)* that in Resolution **76 (WRC-2000)** WRC-2000 also adopted aggregate epfd_↓ limits in the same bands for the protection of GSO FSS systems;
- c)* that a small number of systems based on constellations of satellites in highly elliptical orbits (HEOs), in certain FSS bands, have been operating for many years;
- d)* that since the late 1990s, especially after WRC-2000, there has been a growing interest in HEOs in a number of bands and for several space services, predominantly in the FSS allocations below 30 GHz;
- e)* that ITU-R studies reported to this Conference considered HEO systems to be a sub-category of non-GSO systems and characterized their operational features;
- f)* that in the period between WRC-2000 and this Conference, ITU-R developed Recommendations concerning frequency sharing between HEO FSS systems and other systems, including GSO, low Earth orbit (LEO), medium Earth orbit (MEO) and HEO systems;
- g)* that certain types of HEO system would have difficulty in meeting the long-term portion of epfd_↓ limits in force in the 19.7-20.2 GHz band,

noting

- a)* that, in the long-term portion, the epfd_↓ limits in the band 19.7-20.2 GHz are considerably more stringent than those in the 17.8-18.6 GHz band;
- b)* that Nos. **9.7A** and **9.7B** apply in this band;

RES140-2

c) that the 19.7-20.2 GHz band is one of the few bands identified by this Conference on a global basis for high-density applications in the fixed-satellite service,

resolves to invite ITU-R

to develop, during this ITU-R study period, criteria which would protect GSO FSS networks in the band 19.7-20.2 GHz from unacceptable interference by HEO FSS systems taking account of the combined effect of interference into downlinks of the GSO FSS networks from HEO FSS systems and other non-GSO FSS systems,

invites administrations

to consider using the relevant ITU-R Recommendations regarding the protection of GSO FSS satellite networks from interference by non-GSO FSS systems as a guideline for consultation between administrations, to fulfil their obligations under No. **22.2** in the band 19.7-20.2 GHz, and in the case where an administration responsible for a non-GSO FSS system requests the application of No. **22.5CA**,

instructs the Radiocommunication Bureau

in cases where an administration responsible for a non-GSO FSS system indicates in its coordination request its wish to apply No. **22.5CA** with respect to the $epfd_{\downarrow}$ limits in Table **22-1C** in the 19.7-20.2 GHz band but has not yet reached the necessary agreements, to make a qualified favourable finding with respect to this provision. This provisional finding regarding compliance with $epfd_{\downarrow}$ limits shall be changed to a definitive favourable finding at the notification stage, only if all explicit agreements from administrations for which $epfd$ limits are exceeded are obtained and an indication thereof is provided to the Bureau within two years from the date of receipt of the coordination request. Otherwise, this provisional finding shall be changed to a definitive unfavourable finding.

RESOLUTION 141 (WRC-03)

**Sharing between certain types of non-geostationary-satellite systems
in the fixed-satellite service and stations in the fixed service
in the 17.7-19.7 GHz band**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that a small number of non-geostationary satellite orbit (non-GSO) systems based on constellations of satellites in highly-inclined orbits have operated successfully in the fixed-satellite service (FSS) for many years, including in the 17.7-19.7 GHz band;
- b)* that since the late 1990s there has been a growing interest in non-GSO systems in a number of bands and for several space services, predominantly in the FSS allocations below 30 GHz;
- c)* that ITU-R studies reported to this Conference considered highly-inclined orbit systems to be a sub-category of non-GSO satellite systems and characterized their operational features;
- d)* that WRC-2000 modified the Article 21 power flux-density (pfd) limits for non-GSO satellite systems in the FSS in the band 17.7-19.3 GHz based on technical sharing studies involving non-GSO satellite systems using low-Earth orbits;
- e)* that ITU-R has commenced studies of the impact on fixed service stations of the pfd produced or to be produced by non-GSO FSS space stations using highly-inclined orbits;
- f)* that the band 17.7-19.7 GHz is heavily used in many countries for the fixed service, in particular for mobile telephone network infrastructure;
- g)* that ITU-R has not determined whether the current pfd limits for non-GSO FSS systems in Article 21 are adequate to protect the fixed service in the 17.7-19.7 GHz band from non-GSO satellite systems using highly-inclined orbits having an apogee altitude greater than 18 000 km and an orbital inclination between 35° and 145°,

invites ITU-R

- 1 to conduct, as a matter of urgency and in time for WRC-07, the appropriate technical studies to determine whether the current pfd limits for non-GSO FSS systems in Article 21 are adequate to protect the fixed service in the 17.7-19.7 GHz band from non-GSO systems described in *considering g)* without unduly constraining the use of these non-GSO FSS systems;

RES141-2

2 to determine whether there are technical and operational measures in the band 17.7-19.7 GHz that could be implemented in the fixed service to mitigate interference from FSS space stations as described in *considering g*),

resolves

to recommend that WRC-07 consider, taking into account the results of the studies referred to in *invites ITU-R 1*, the appropriate pfd limits for non-GSO space stations in the band 17.7-19.7 GHz described in *considering g*),

instructs the Radiocommunication Bureau

as of the end of WRC-07, to review, based on the values in Article **21** as adopted by WRC-07, and, if appropriate, revise any findings made on the compliance with the limits contained in Article **21** of a non-GSO FSS system, as described in *considering g*), for which complete advance publication information has not been received prior to 5 July 2003.

RESOLUTION 142 (WRC-03)

**Transitional arrangements relating to use of the frequency
band 11.7-12.2 GHz by geostationary-satellite networks
in the fixed-satellite service in Region 2**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in Region 2, the band 11.7-12.1 GHz is allocated on a co-primary basis to terrestrial services (except in the countries listed in No. **5.486**) and to the fixed-satellite service (FSS);
- b)* that, in Region 2, the band 12.1-12.2 GHz is allocated on a co-primary basis to terrestrial services in Peru (see No. **5.489**) and to the FSS;
- c)* that, in Regions 1 and 3, the band 11.7-12.2 GHz is allocated on a co-primary basis to terrestrial services and to the broadcasting-satellite service (BSS);
- d)* that WRC-2000 adopted Resolution **77** to protect terrestrial services in Regions 1, 2 and 3 from geostationary-satellite (GSO) networks in the FSS in Region 2, but did not clarify which procedures should be applied;
- e)* that the Rule of Procedure concerning No. **5.488** extended the applicability of Resolution **77** to coordination requests received from 1 January 1999 and to coordination requests received prior to 1 January 1999 for which Special Sections under former Article **14** had not been published;
- f)* that this Conference suppressed Resolution **77** and, through revision of No. **5.488**, replaced it with application of No. **9.14** for FSS in Region 2 to coordinate with stations in terrestrial services in all three Regions,

recognizing

that transitional measures are needed to address implementation of No. **9.14** for GSO FSS in Region 2 in the band 11.7-12.2 GHz,

resolves

- 1 that, for requests for coordination under Article **9** for GSO networks in the FSS in Region 2 in the band 11.7-12.2 GHz for which complete Appendix **4** information was received after 1 May 2002 by the Bureau, the Bureau shall apply No. **9.14** as adopted at this Conference;

RES142-2

2 that, for requests for coordination processed previously under Resolution **77**, the Bureau shall apply No. **9.14** as adopted at this Conference which may involve publication of a list of such networks to initiate the No. **9.14** process;

3 that, for requests for notification under Article **11** involving networks processed under *resolves* 1 and 2 above, the provisions in Article **11** associated with No. **9.14** shall be applied;

4 that the provisions of Nos. **5.488**, **9.14** and the part of Table 5-1 of Appendix **5 (Rev.WRC-03)** referring to No. **9.14** as amended by this Conference shall be provisionally applied as from 5 July 2003.

RESOLUTION 143 (WRC-03)

Guidelines for the implementation of high-density applications in the fixed-satellite service in frequency bands identified for these applications

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that demand has been increasing steadily for global broadband communication services throughout the world, such as those provided by high-density applications in the fixed-satellite service (HDFSS);
- b)* that HDFSS systems are characterized by flexible, rapid and ubiquitous deployment of large numbers of cost-optimized earth stations employing small antennas and having common technical characteristics;
- c)* that HDFSS is an advanced broadband communication application concept that will provide access to a wide range of broadband telecommunication applications supported by fixed telecommunication networks (including the Internet), and thus will complement other telecommunication systems;
- d)* that, as with other FSS systems, HDFSS offers great potential to establish telecommunication infrastructure rapidly;
- e)* that HDFSS applications can be provided by satellites of any orbital type;
- f)* that interference mitigation techniques have been and continue to be studied in ITU-R to facilitate sharing between HDFSS earth stations and terrestrial services;
- g)* that to date, studies have not concluded on the practicability of implementation of interference mitigation techniques for all HDFSS earth stations,

noting

- a)* that No. **5.516B** identifies bands for HDFSS;
- b)* that, in some of these bands, the FSS allocations are co-primary with fixed and mobile service allocations as well as other services;
- c)* that this identification does not preclude the use of these bands by other services or by other FSS applications, and does not establish priority in these Radio Regulations among users of the bands;

RES143-2

- d)* that, in the band 18.6-18.8 GHz, the FSS allocation is co-primary with the Earth exploration-satellite service (EESS) (passive) with the restrictions of Nos. **5.522A** and **5.522B**;
- e)* that radio astronomy observations are carried out in the 48.94-49.04 GHz band, and that such observations require protection at notified radio astronomy stations;
- f)* that co-frequency sharing between transmitting HDFSS earth stations and terrestrial services is difficult in the same geographical area;
- g)* that co-frequency sharing between receiving HDFSS earth stations and terrestrial stations in the same geographical area may be facilitated through the implementation of interference mitigation techniques, if practicable;
- h)* that many FSS systems with other types of earth stations and characteristics have already been brought into use or are planned to be brought into use in some of the frequency bands identified for HDFSS in No. **5.516B**;
- i)* that HDFSS stations in these bands are expected to be deployed in large numbers over urban, suburban and rural areas of large geographical extent;
- j)* that the 50.2-50.4 GHz band, adjacent to the band 48.2-50.2 GHz (Earth-to-space) identified for HDFSS in Region 2, is allocated to the EESS (passive),

recognizing

- a)* that in cases where FSS earth stations use bands that are shared on a co-primary basis with terrestrial services, the Radio Regulations stipulate that earth stations of the FSS shall be individually notified to the Bureau when their coordination contours extend into the territory of another administration;
- b)* that, as a consequence of their general characteristics, it is expected that the coordination of HDFSS earth stations with fixed service stations on an individual site-by-site basis between administrations will be a difficult and long process;
- c)* that, to minimize the burden for administrations, simplified coordination procedures and provisions can be agreed by administrations for large numbers of similar HDFSS earth stations associated with a given satellite system;
- d)* that harmonized worldwide bands for HDFSS would facilitate the implementation of HDFSS, thereby helping to maximize global access and economies of scale,

recognizing further

that HDFSS applications implemented on FSS networks and systems are subject to all provisions of the Radio Regulations applicable to the FSS, such as coordination and notification pursuant to Articles **9** and **11**, including any requirements to coordinate with terrestrial services across international borders, and the provisions of Articles **21** and **22**,

resolves

that administrations which implement HDFSS should consider the following guidelines:

- a) making some or all of the frequency bands identified in No. **5.516B** available for HDFSS applications;
- b) in making frequency bands available under *resolves a)*, take into account:
 - that HDFSS deployment will be simplified in bands that are not shared with terrestrial services;
 - in bands shared with terrestrial services, the impact that the further deployment of terrestrial stations would have on the existing and future development of HDFSS, and the further deployment of HDFSS earth stations would have on the existing and future development of terrestrial services;
- c) take into account the relevant technical characteristics applicable to HDFSS, as identified by ITU-R Recommendations (e.g. Recommendations ITU-R S.524-7 and ITU-R S.1594);
- d) take into account other existing and planned FSS systems, having different characteristics, in frequency bands where HDFSS is implemented in accordance with *resolves a)* above and the conditions specified in No. **5.516B**,

invites administrations

1 to give due consideration to the benefits of harmonized utilization of the spectrum for HDFSS on a global basis, taking into account the use and planned use of these bands by all other services to which these bands are allocated, as well as other types of FSS applications;

2 to consider implementing simplified procedures and provisions that facilitate the deployment of HDFSS systems in some or all of the bands identified in No. **5.516B**;

3 when considering the deployment of HDFSS systems in the upper portion of the band 48.2-50.2 GHz, to take into account as appropriate the potential impact such deployment may have on the satellite passive services in the adjacent band 50.2-50.4 GHz, and to participate in ITU-R studies on the compatibility between these services, taking into account No. **5.340**;

4 to consider, given *invites administrations* 3 above, and where practicable, starting the deployment of HDFSS earth stations in the lower part of the band 48.2-50.2 GHz.

RESOLUTION 144 (WRC-03)

**Special requirements of geographically small or narrow countries
operating earth stations in the fixed-satellite service
in the band 13.75-14 GHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WARC-92 made an additional allocation to the fixed-satellite service (FSS) (Earth-to-space) in the band 13.75-14 GHz;
- b)* that this band is shared with the radiolocation and radionavigation services;
- c)* that, following a decision by WRC-2000 and the completion of ITU-R studies, this Conference reviewed and revised the sharing conditions for the services in this band and adopted new regulations which govern sharing between the FSS, radiolocation and radionavigation services (see No. **5.502**);
- d)* that these revised sharing conditions additionally permit the operation of geostationary FSS earth stations in the band 13.75-14 GHz with antennas having diameters between 1.2 m and 4.5 m,

recognizing

- a)* that these sharing conditions of No. **5.502** will mean that countries which are geographically small or narrow will have significant difficulties deploying geostationary FSS earth stations in this band with antennas having diameters between 1.2 m and 4.5 m;
- b)* that in order to further facilitate sharing between the FSS and the maritime radiolocation systems operating in the radiolocation service, there may be a need to develop technical and operational methods;
- c)* that these technical and operational methods may be used to allow a greater deployment of FSS earth stations in the band 13.75-14 GHz in conformity with No. **5.502** while protecting the radiolocation service,

resolves

- 1 to invite ITU-R, as a matter of urgency, to conduct studies with a view to developing ITU-R Recommendations, which will establish technical or operational methods which will further facilitate sharing and may allow greater flexibility in the deployment of FSS earth stations in the band 13.75-14 GHz, in conformity with No. **5.502**, and which may also be used as a basis for the establishment of bilateral agreements between administrations;

RES144-2

2 that the administrations of geographically small or narrow countries may exceed the limitations on FSS earth station power flux-density at the low-water mark in No. **5.502** if such operation is in conformance with bilateral agreements with administrations deploying maritime radiolocation systems in the band 13.75-14 GHz,

encourages

administrations deploying maritime and land mobile radiolocation systems in the band 13.75-14 GHz rapidly to reach bilateral agreements relating to the operation of FSS earth stations in this band with administrations of those geographically small and narrow countries deploying these FSS earth stations,

invites

administrations deploying maritime radiolocation systems in the band 13.75 to 14 GHz to participate actively in the ITU-R studies referred to in *resolves* 1.

RESOLUTION 145 (WRC-03)

**Potential use of the bands 27.5-28.35 GHz and 31-31.3 GHz
by high altitude platform stations (HAPS)
in the fixed service**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-97 made provision for the operation of HAPS, also known as stratospheric repeaters, within a 2×300 MHz portion of the fixed-service allocation in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- b)* that WRC-97 adopted No. **4.15A** specifying that transmissions to or from HAPS shall be limited to the bands specifically identified in Article 5;
- c)* that at WRC-2000, several countries in Region 3 and one country in Region 1 expressed a need for a lower frequency band for HAPS due to the excessive rain attenuation that occurs at 47 GHz in these countries;
- d)* that at the present Conference, countries in Region 2 also expressed an interest in using a frequency range lower than those referred to in *considering a)*;
- e)* that, in order to accommodate the need expressed by the countries referred to in *considering c)*, WRC-2000 adopted Nos. **5.537A** and **5.543A**, which were modified at this Conference to permit the use of HAPS in the fixed service within 300 MHz of spectrum in the band 27.5-28.35 GHz and in the band 31-31.3 GHz in certain Region 3 countries and in one Region 1 country on a non-harmful interference, non-protection basis;
- f)* that the bands 27.5-28.35 GHz and 31-31.3 GHz are already heavily used or planned to be used by a number of different services and a number of other types of applications in the fixed service;
- g)* that while the decision to deploy HAPS can be taken on a national basis, such deployment may affect neighbouring administrations, particularly in small countries;
- h)* that the 31.3-31.8 GHz band is allocated to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services, and that this Conference amended No. **5.543A** to specify signal levels that would protect satellite passive services and radio astronomy stations;

- i)* that ITU-R has conducted studies dealing with sharing between systems using HAPS in the fixed service and other types of systems in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz leading to Recommendation ITU-R F.1609;
- j)* that results of some ITU-R studies indicate that, in the bands 27.5-28.35 GHz and 31-31.3 GHz, sharing between fixed-service systems using HAPS and other conventional fixed-service systems in the same area will require appropriate interference mitigation techniques to be developed and implemented;
- k)* that ITU-R has conducted studies dealing with compatibility between systems using HAPS and the passive services in the 31.3-31.8 GHz band leading to Recommendations ITU-R F.1570 and ITU-R F.1612;
- l)* that ITU-R has produced Recommendation ITU-R SF.1601 containing a methodology for evaluating interference from the fixed-service system using HAPS into GSO FSS systems in the band 27.5-28.35 GHz in order to facilitate further studies;
- m)* that HAPS technical and regulatory issues should continue to be studied in order to determine appropriate measures for protecting the fixed service and other co-primary services in the band 27.5-28.35 GHz;
- n)* that pending the completion of studies, administrations in Region 2 may wish to consider deployment of HAPS systems in the fixed service within 300 MHz of spectrum at 27.5-28.35 GHz and in 300 MHz of spectrum at 31-31.3 GHz and to have some provisional means by which to authorize such use of HAPS in their territories,

noting

that systems using HAPS may operate in the bands 27.5-28.35 GHz and 31-31.3 GHz under No. **4.4**,

resolves

1 to invite WRC-07 to review the results of the studies specified below and consider appropriate refinement of the regulatory provisions for the use of HAPS within the bands 27.5-28.35 GHz and 31-31.3 GHz;

2 that, notwithstanding No. **4.15A**, in Region 2 the use of HAPS within the fixed-service allocations within the 27.5-28.35 GHz and 31-31.3 GHz bands shall be limited, pending the completion of the studies specified in *invites ITU-R 1* below, to 300 MHz in each band, that such use shall not cause harmful interference to, nor claim protection from, other stations of services operating in accordance with the Table of Frequency Allocations of Article **5**, and, further, that the development of these other services shall proceed without constraints by HAPS operating pursuant to this Resolution;

3 that, pursuant to *resolves* 2 above, any use by HAPS of the fixed-service allocation at 27.5-28.35 GHz shall be limited to operation in the HAPS-to-ground direction, and that any use by HAPS of the fixed-service allocation at 31-31.3 GHz shall be limited to operation in the ground-to-HAPS direction;

4 that, on a provisional basis, the administrations listed in Nos. **5.537A** and **5.543A** and those administrations in Region 2 which intend to implement systems using HAPS in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz shall seek explicit agreement of concerned administrations with regard to their primary services to ensure that the conditions in Nos. **5.537A**, **5.543A**, *resolves* 2 and *resolves* 5 are met;

5 that systems using HAPS in the band 31-31.3 GHz, in accordance with *resolves* 2 above, shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into the HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions and may be increased up to -100 dB(W/MHz) under rainy conditions to take account of rain attenuation, provided that effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above,

invites ITU-R

1 to continue to conduct studies, as a matter of urgency, and taking into account the requirements of other fixed-service systems and other services, on the feasibility of identifying a suitable and preferably a common 300 MHz segment of the band 27.5-28.35 GHz paired with the 300 MHz band at 31-31.3 GHz, for use by HAPS in the countries listed in Nos. **5.537A** and **5.543A** or countries in Region 2 planning provisional operation;

2 to develop, one or more ITU-R Recommendations, technical sharing criteria or HAPS system design conditions that are necessary to ensure that HAPS applications in the fixed service operate successfully on a non-harmful interference, non-protected basis in the bands 27.5-28.35 GHz and 31-31.3 GHz;

3 to complete studies on the interference criteria and methodology for evaluating interference from the downlink (HAPS-to-ground direction) of systems using HAPS to the uplink of the GSO satellite networks in the FSS within the band 27.5-28.35 GHz, taking into account Recommendation ITU-R SF.1601 for the situations referred to in *considering l*);

4 to study the regulatory provisions that might be needed in order to address those cases where the deployment of HAPS in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz in the territory of one administration may affect other administrations;

5 to continue to carry out studies on the appropriate interference mitigation techniques for the situations referred to in *considering j*),

invites administrations

to advise the Radiocommunication Bureau of their intention to implement HAPS systems within the band 27.5-28.35 GHz and in the band 31-31.3 GHz, whether in countries listed in Nos. **5.537A** and **5.543A** or in accordance with *resolves* 2, and to specify the frequency bands (up to 300 MHz each within the 27.5-28.35 GHz and 31-31.3 GHz bands) they intend to use for such systems,

instructs the Director of the Radiocommunication Bureau

to publish in the International Frequency Information Circular (BR IFIC) a list of administrations who have so advised, and to publish the information on HAPS implementation received from administrations which intend to implement systems using HAPS in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz.

RESOLUTION 146 (WRC-03)

**Transitional arrangements for the application of
modified provisions of Appendix 30B**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the 1988 World Administrative Radio Conference (WARC Orb-88) established the fixed-satellite service (FSS) Plan contained in Appendix **30B**;
- b)* that some of the technical parameters used in characterizing the Plan referred to in *considering a)* were adopted by WARC Orb-88 and could be improved to reflect evolution of technologies, as called for in Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;
- c)* that only a limited number of satellite networks have been implemented under Appendix **30B**;
- d)* that ITU-R studied the possibility of using improved antenna patterns and lower *C/I* criteria in Appendix **30B** and concluded that using relaxed parameters would greatly simplify the coordination of new satellite networks submitted under this Appendix,

noting

- a)* that the Council, in Resolution 1182 adopted at its 2001 session, established the Satellite Backlog Action Group (SAT-BAG), to prepare and oversee a coordinated approach for treating the complex and related factors contributing to the backlog in the processing of satellite network filings by the Bureau;
- b)* that SAT-BAG made several recommendations for the attention of this Conference, suggesting that, wherever there is an opportunity, immediate action that would assist in resolving the backlog be taken,

noting further

that this Conference has adopted several modifications to Appendix **30B**,

resolves

- 1 that, as from 5 July 2003, § 6.34 and 6.50 of Appendix **30B** as revised by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

2 that, as from 5 July 2003, § 6.43*bis* and 6.56*bis* of Appendix **30B** as adopted by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

3 that, as from 5 July 2003, the Bureau shall, in its examination in application of Appendix **30B**, use the parameters given in Section 1.6 of Annex 1 of Appendix **30B**, as revised by this Conference;

4 that the Bureau shall, in its examination of submissions received as from 5 July 2003 in application of Appendix **30B**, use the following parameters:

- a single entry *C/I* ratio value of 27 dB;
- an aggregate *C/I* ratio value of 23 dB;

5 that, once the parameters referred to in *resolves* 3 have been implemented, the Bureau shall compute the reference situations of the FSS Plan and publish this information in a circular letter;

6 that once the parameters referred to in *resolves* 4 have been implemented, the Bureau shall compute the reference situations of the FSS Plan and publish this information in a circular letter;

7 that, as from 5 July 2003, § 6.1, 6.29, 6.38 and 6.57 of Appendix **30B** as revised by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

8 that, as from 5 July 2003, the Bureau shall send a letter to all the notifying administrations with assignments in the List and for which it has not received confirmation of the date of bringing into use, requesting them to confirm that these assignments have been brought into use in accordance with § 6.1, 6.29, 6.38 and 6.57 of Appendix **30B**, as appropriate. Any assignment for which the Bureau has not received such confirmation, as well as the corresponding notification information, by 1 January 2004 shall then be cancelled as stipulated in § 6.1, 6.29, 6.38 and 6.57 of Appendix **30B**, as appropriate;

9 that, as from 5 July 2003, Article 8 of Appendix **30B**, except § 8.2 thereof, as revised by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

10 that as from 1 January 2004, § 8.2 of Appendix **30B** shall apply,

invites ITU-R

to review, as a matter of urgency, the regulatory procedures and associated technical criteria of Appendix **30B** and to report the results to WRC-07.

RESOLUTION 205 (Rev.Mob-87)

Protection of the band 406-406.1 MHz allocated to the mobile-satellite service¹

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

considering

- a) that WARC-79 allocated the band 406-406.1 MHz to the mobile-satellite service in the Earth-to-space direction;
- b) that Nos. **5.266** and **5.267** limit the use of the band 406-406.1 MHz to low-power satellite emergency position-indicating radiobeacons (EPIRBs);
- c) that WARC Mob-83 made provision in the Radio Regulations for the introduction and development of a global distress and safety system;
- d) that the use of satellite EPIRBs is an essential element of this system;
- e) that, like any frequency band reserved for a distress and safety system, the band 406-406.1 MHz is entitled to full protection against all harmful interference;
- f) that WARC Mob-83 adopted Recommendation **604 (Rev.Mob-83)** which recommends that the ITU-R continue its studies on the technical and operational questions for EPIRBs, including those using the frequencies in the band 406-406.1 MHz;
- g) that the ITU-R has initiated a study of the compatibility between satellite EPIRBs in the band 406-406.1 MHz and services using adjacent bands,

considering further

- h) that some administrations have developed and implemented an operational low-altitude, near-polar orbiting satellite system (COSPAS-SARSAT) operating in the band 406-406.1 MHz to provide alerting and to aid in the locating of distress incidents;
- i) that the International Maritime Organization (IMO) has decided that EPIRBs operating in the COSPAS-SARSAT system will form part of the Global Maritime Distress and Safety System (GMDSS);
- j) that observations of the use of frequencies in the band 406-406.1 MHz show that they are being used by stations other than those authorized by No. **5.266**, and that these stations have caused harmful interference to the mobile-satellite service, and particularly to the reception of satellite EPIRB signals by the COSPAS-SARSAT system;

¹ WRC-97 made editorial amendments to this Resolution.

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

recognizing

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

resolves

to instruct the Radiocommunication Bureau

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

to urge administrations

1 to take part in monitoring programmes requested by the Bureau in accordance with No. **16.5**, in the band 406-406.1 MHz, with a view to identifying and locating stations of services other than those authorized in the band;

2 to ensure that stations other than those operated under No. **5.266** abstain from using frequencies in the band 406-406.1 MHz;

3 to take the appropriate measures to eliminate harmful interference caused to the distress and safety system,

invites the ITU-R

to continue on an urgent basis its study of compatibility between satellite EPIRBs in the band 406-406.1 MHz and services using adjacent bands.

RESOLUTION 207 (Rev.WRC-03)

Measures to address unauthorized use of and interference to frequencies in the bands allocated to the maritime mobile service and to the aeronautical mobile (R) service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the HF frequencies currently used by the aeronautical and maritime mobile services for distress, safety and other communications, including allotted operational frequencies, suffer from harmful interference and are often subject to difficult propagation conditions;
- b)* that WRC-97 considered some aspects of the use of the HF bands for distress and safety communications in the context of the Global Maritime Distress and Safety System (GMDSS), especially with regard to regulatory measures;
- c)* that unauthorized operations using maritime and aeronautical frequencies in the HF bands are continuing to increase and are already a serious risk to HF distress, safety and other communications;
- d)* that some administrations have resorted to, for example, transmitting warning messages on operational HF channels as a means of deterring unauthorized users;
- e)* that provisions of the Radio Regulations prohibit the unauthorized use of certain safety frequencies for communications other than those related to safety;
- f)* that enforcing compliance with these regulatory provisions is becoming increasingly difficult with the availability of low-cost HF single side-band (SSB) transceivers;
- g)* that monitoring observations of the use of frequencies in the band 2 170-2 194 kHz and in the bands allocated exclusively to the maritime mobile service between 4 063 kHz and 27 500 kHz and to the aeronautical mobile (R) service between 2 850 kHz and 22 000 kHz show that a number of frequencies in these bands are still being used by stations of other services, many of which are operating in contravention of No. 23.2;
- h)* that, in certain situations, HF radio is the sole means of communication for the maritime mobile service and that certain frequencies in the bands mentioned in *considering g)* are reserved for distress and safety purposes;

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i) that, in certain situations, HF radio is the sole means of communication for the aeronautical mobile (R) service and that this is a safety service;

j) that WRC-2000 and this Conference have reviewed the use of the HF bands by the aeronautical mobile (R) and maritime mobile services with a view to protecting operational, distress and safety communications;

k) that this Resolution identifies several interference mitigation techniques that can be employed by administrations on a non-mandatory basis,

considering in particular

a) that it is of paramount importance that the distress and safety channels of the maritime mobile service be kept free from harmful interference, since they are essential for the protection of the safety of life and property;

b) that it is also of paramount importance that channels directly concerned with the safe and regular conduct of aircraft operations be kept free from harmful interference, since they are essential for the safety of life and property,

resolves to invite ITU-R and ITU-D, as appropriate

to increase regional awareness of appropriate practices in order to help mitigate interference in the HF bands, especially on distress and safety channels,

invites 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 guardbands and in the bands allocated exclusively to that service, except under the conditions expressly specified in Nos. **4.4**, **5.128**, **5.129**, **5.137** and **4.13** to **4.15**; and to ensure that stations of services other than the aeronautical mobile (R) service abstain from using frequencies allocated to that service except under the conditions expressly specified in Nos. **4.4** and **4.13**;

2 to make every effort to identify and locate the source of any unauthorized emission capable of endangering human life or property and the safe and regular conduct of aircraft operations, and to communicate their findings to the Radiocommunication Bureau;

3 to participate, in accordance with item 4 in the Annex, in any monitoring programmes organized by the Bureau or administrations, if so agreed among those administrations, without adversely affecting the rights of other administrations or conflicting with any provisions of the Radio Regulations;

4 to make every effort to prevent unauthorized transmissions in bands allocated to the maritime mobile service and the aeronautical mobile (R) service;

5 to request their competent authorities to take, within their respective jurisdiction, such legislative or regulatory measures which they consider necessary or appropriate in order to prevent stations from unauthorized use of distress and safety channels or from operating in contravention of No. 23.2;

6 to take all necessary steps in such cases of contravention of No. 23.2 to ensure the cessation of any transmissions contravening the provisions of the Radio Regulations on the frequencies or in the bands referred to in this Resolution;

7 to employ as many of the interference mitigation techniques referred to in the Annex as are appropriate for the maritime mobile and aeronautical mobile (R) services,

instructs the Radiocommunication Bureau

1 to seek the cooperation of administrations in identifying the sources of those emissions by all available means and in securing the cessation of those emissions;

2 when the station of another service transmitting in a band allocated to the maritime mobile service or to the aeronautical mobile (R) service has been identified, to inform the administration concerned;

3 to include the problem of interference to maritime and aeronautical distress and safety channels on the agenda of relevant regional radiocommunication seminars,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization and the International Civil Aviation Organization for such actions as they may consider appropriate.

ANNEX TO RESOLUTION 207 (Rev.WRC-03)

Interference mitigation techniques

This Annex lists several possible HF interference mitigation techniques that may be used, either in combination or singly, depending on the resources of administrations. Use of any or all of these techniques is not mandatory.

1 Alternative modulation methods

The use of digitally modulated emissions, such as QPSK, to replace or supplement analogue SSB voice (J3E) and data (J2B) emissions. This initiative would need to be adopted internationally to allow the interoperability of equipment. For example, ICAO has adopted an HF data-link standard to provide packet data communications using automated link establishment and adaptive frequency control techniques as a supplement to analogue SSB voice communications (see ICAO Convention, Annex 10).

2 Passive and active/adaptive antenna systems

Use of passive and active/adaptive antenna systems to reject unwanted signals.

3 Channel barring

Administrations should ensure through their licensing, equipment standardization and inspection arrangements that, in compliance with No. **43.1**, HF radio equipment cannot transmit on frequencies exclusively allocated to the aeronautical mobile (R) service, as detailed in Appendix **27**, except for frequencies allocated for worldwide use and shared with the aeronautical mobile (OR) service (see Appendix **26/3.4**).

4 Regional HF monitoring and direction-finding facilities

Collaboration and cooperation between regional administrations to coordinate the use of monitoring and direction-finding facilities.

5 Transmission of warning messages

Transmission of multilanguage warning messages on specific channels affected by strong or persistent interference. Such transmissions should be conducted after coordination with the users of the affected services and the administration(s) or competent authorities concerned.

6 Education and publicity initiatives

Administrations should provide education and publicity initiatives on the proper use of the radio-frequency spectrum in these bands.

RESOLUTION 212 (Rev.WRC-97)

**Implementation of International Mobile
Telecommunications-2000 (IMT-2000)***

The World Radiocommunication Conference (Geneva, 1997),

considering

- a) that ITU-R has recommended the 1-3 GHz band as the most suitable for IMT-2000;
- b) that ITU-R has recommended approximately 60 MHz for use by personal stations and approximately 170 MHz for use by mobile stations;
- c) that ITU-R has recognized that space techniques are an integral part of IMT-2000;
- d) that, in No. **5.388**, this Conference has identified bands to accommodate this future service,

considering further

- a) that ITU-R has not completed its studies regarding duplexing methods, modulation techniques, channelling arrangements, signalling or communication protocols;
- b) that no worldwide intersystem numbering plan currently exists that would facilitate worldwide roaming,

noting

- a) that the implementation of the terrestrial component of IMT-2000 in the bands 1 885-2 025 MHz and 2 110-2 200 MHz is expected to commence around the year 2000, subject to market and technical considerations;
- b) that the availability of the satellite component of IMT-2000 in the bands 1 980-2 010 MHz and 2 170-2 200 MHz simultaneously with the terrestrial component of IMT-2000 in the bands identified in No. **5.388** would improve the overall implementation and the attractiveness of IMT-2000 to both developed and developing countries,

invites administrations

to give due consideration to the accommodation of other services currently operating in these bands when implementing IMT-2000,

* IMT-2000 was previously known as Future Public Land Mobile Telecommunication Systems (FPLMTS).

invites ITU-R

to continue its studies with a view to developing suitable and acceptable technical characteristics for IMT-2000 that will facilitate worldwide use and roaming, and ensure that IMT-2000 can also meet the telecommunication needs of the developing countries and rural areas,

invites ITU-T

- a)* to complete its studies of signalling and communication protocols;
- b)* to develop a common worldwide intersystem numbering plan and associated network capabilities that will facilitate worldwide roaming,

resolves

that administrations which implement IMT-2000:

- a)* should make the necessary frequencies available for system development;
- b)* should use those frequencies when IMT-2000 is implemented;
- c)* should use the relevant international technical characteristics, as identified by ITU-R and ITU-T Recommendations.

RESOLUTION 215 (Rev.WRC-97)

Coordination process among mobile-satellite systems and efficient use of the allocations to the mobile-satellite service in the 1-3 GHz range

The World Radiocommunication Conference (Geneva, 1997),

considering

- a)* that space-to-Earth transmissions of mobile-satellite systems are constrained to limit their power flux-density over areas where the frequency band is shared with terrestrial systems;
- b)* that a number of proposed mobile-satellite systems can provide a good service to users within the power flux-density limits given in Annex 2 to Resolution **46 (Rev.WRC-97)***/Annex 1 to Appendix 5;
- c)* that when maximum communication capacity is achieved by systems in the mobile-satellite service (MSS) a major portion of the interference into each of these systems will come from the other mobile-satellite systems sharing the frequency band, and, consequently, if one system starts to transmit at higher power, all others need to do the same in order to overcome mutual interference;
- d)* that ITU-R is studying the efficient use of the radio spectrum and frequency sharing within the MSS, that Recommendations ITU-R M.1186 and ITU-R M.1187 are a basis for further study, and that additional preliminary texts are available or can be provided by administrations on this matter;
- e)* that, in a codirectional, co-frequency and co-coverage sharing environment, capacities of systems using spread-spectrum multiple-access techniques are affected by technical and operational characteristics of other MSS systems using similar multiple-access techniques;
- f)* that in many parts of the world and in certain frequency bands in the 1-3 GHz range, significant congestion already exists due to use by other terrestrial and space services;
- g)* the need to make most efficient use of frequencies in the MSS allocations,

* *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

recognizing

that, as a means to ensure that the frequency bands allocated to the MSS can be used in an efficient manner, there is an urgent demand for:

- a) criteria to be established by ITU-R to be used in determining the need to coordinate between mobile-satellite systems; and
- b) detailed methods of interference calculation to be used by administrations in the coordination process;
- c) ITU-R studies which should not impede the timely deployment of any MSS systems,

resolves to invite ITU-R

- 1 to continue its studies on this subject and develop, as a matter of urgency, criteria for determining the need to coordinate and calculation methods for determining levels of interference, as well as the required protection ratios between MSS networks;
- 2 to study, as a matter of urgency, the use of technically and operationally feasible techniques to allow for improvements in spectrum efficiency in MSS systems,

further resolves

- 1 that ITU-R studies should be focused on the technical and operational characteristics of systems using spread-spectrum multiple-access techniques that can allow co-frequency, co-coverage, codirectional sharing but which involve cooperation among systems' operators to maximize the efficient use of spectrum by multiple MSS systems using such access techniques;
- 2 that administrations responsible for the introduction of mobile-satellite systems are urged to implement, as practicable, the latest available technologies to improve spectrum efficiency consistent with the requirement to offer viable MSS services;
- 3 to recommend that administrations be encouraged to use the most advanced technology available when preparing to implement their global MSS systems in the 1-3 GHz range so that they may operate, if necessary, in different frequency bands in different regions, in accordance with the MSS allocations in the 1-3 GHz range decided by this Conference.

RESOLUTION 217 (WRC-97)

Implementation of wind profiler radars

The World Radiocommunication Conference (Geneva, 1997),

having noted

a request to ITU from the Secretary-General of the World Meteorological Organization (WMO), in May 1989, for advice and assistance in the identification of appropriate frequencies near 50 MHz, 400 MHz and 1 000 MHz in order to accommodate allocations and assignments for wind profiler radars,

considering

- a) that wind profiler radars are vertically-directed Doppler radars exhibiting characteristics similar to radiolocation systems;
- b) that wind profiler radars are important meteorological systems used to measure wind direction and speed as a function of altitude;
- c) that it is necessary to use frequencies in different ranges in order to have options for different performance and technical characteristics;
- d) that, in order to conduct measurements up to a height of 30 km, it is necessary to allocate frequency bands for these radars in the general vicinity of 50 MHz (3 to 30 km), 400 MHz (500 m to about 10 km) and 1 000 MHz (100 m to 3 km);
- e) that some administrations have either already deployed, or plan to expand their use of, wind profiler radars in operational networks for studies of the atmosphere and to support weather monitoring, forecasting and warning programmes;
- f) that the Radiocommunication Study Groups have studied the technical and sharing considerations between wind profiler radars and other services allocated in bands near 50 MHz, 400 MHz and 1 000 MHz,

considering further

- a) that some administrations have addressed this matter nationally by assigning frequencies for use by wind profiler radars in existing radiolocation bands or on a non-interference basis in other bands;
- b) the work of the Voluntary Group of Experts on the Allocation and Improved Use of the Radio Frequency Spectrum and Simplification of the Radio Regulations supports increased flexibility in the allocation of frequency spectrum,

noting in particular

- a) that wind profiler radars operating in the meteorological aids service in the band 400.15-406 MHz interfere with satellite emergency position-indicating radio beacons operating in the mobile-satellite service in the band 406-406.1 MHz under No. **5.266**;
- b) that in accordance with No. **5.267**, any emission capable of causing harmful interference to the authorized uses of the band 406-406.1 MHz is prohibited,

resolves

1 to urge administrations to implement wind profiler radars as radiolocation service systems in the following bands, having due regard to the potential for incompatibility with other services and assignments to stations in these services, thereby taking due account of the principle of geographical separation, in particular with regard to neighbouring countries, and keeping in mind the category of service of each of these services:

46-68 MHz in accordance with No. **5.162A**

440-450 MHz

470-494 MHz in accordance with No. **5.291A**

904-928 MHz in Region 2 only

1 270-1 295 MHz

1 300-1 375 MHz;

2 that, in case compatibility between wind profiler radars and other radio applications operating in the band 440-450 MHz or 470-494 MHz cannot be achieved, the bands 420-435 MHz or 438-440 MHz could be considered for use;

3 to urge administrations to implement wind profiler radars in accordance with Recommendations ITU-R M.1226, ITU-R M.1085-1 and ITU-R M.1227 for the frequency bands around 50 MHz, 400 MHz and 1 000 MHz, respectively;

4 to urge administrations not to implement wind profiler radars in the band 400.15-406 MHz;

5 to urge administrations currently operating wind profiler radars in the band 400.15-406 MHz to discontinue them as soon as possible,

instructs the Secretary-General

to bring this Resolution to the attention of the International Civil Aviation Organization (ICAO), International Maritime Organization (IMO) and WMO.

RESOLUTION 221 (Rev.WRC-03)

**Use of high altitude platform stations providing IMT-2000 in the bands
1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz in Regions 1
and 3 and 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the bands 1 885-2 025 MHz and 2 110-2 200 MHz are identified in No. **5.388** as intended for use on a worldwide basis for IMT-2000, including the bands 1 980-2 010 MHz and 2 170-2 200 MHz for the terrestrial and satellite components of IMT-2000;
- b)* that a high altitude platform station (HAPS) is defined in No. **1.66A** as “a station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth”;
- c)* that HAPS may offer a new means of providing IMT-2000 services with minimal network infrastructure as they are capable of providing service to a large footprint together with a dense coverage;
- d)* that the use of HAPS as base stations within the terrestrial component of IMT-2000 is optional for administrations, and that such use should not have any priority over other terrestrial IMT-2000 use;
- e)* that, in accordance with No. **5.388** and Resolution **212 (Rev.WRC-97)**, administrations may use the bands identified for IMT-2000, including the bands referred to in this Resolution, for stations of other primary services to which they are allocated;
- f)* that these bands are allocated to the fixed and mobile services on a co-primary basis;
- g)* that, in accordance with No. **5.388A**, HAPS may be used as base stations within the terrestrial component of IMT-2000 in the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz in Regions 1 and 3 and 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2. Their use by IMT-2000 applications using HAPS as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations;
- h)* that ITU-R has studied sharing and coordination between HAPS and other stations within IMT-2000, has considered compatibility of HAPS within IMT-2000 with some services having allocations in the adjacent bands, and has approved Recommendation ITU-R M.1456;

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- i) that radio interfaces of IMT-2000 HAPS are compliant with Recommendation ITU-R M.1457;
- j) that ITU-R has addressed sharing between systems using HAPS and some existing systems, particularly PCS (personal communications system), MMDS (multichannel multipoint distribution system) and systems in the fixed service, which are currently operating in some countries in the bands 1 885-2 025 MHz and 2 110-2 200 MHz;
- k) that HAPS stations are intended to transmit in the band 2 110-2 170 MHz in Regions 1 and 3 and in the band 2 110-2 160 MHz in Region 2;
- l) that administrations planning to implement a HAPS as an IMT-2000 base station may need to exchange information, on a bilateral basis, with other concerned administrations, including data items describing the HAPS characteristics in a more detailed manner than the data items currently included in Annexes 1A and 1B of Appendix 4, as indicated in the Annex to this Resolution,

resolves

1 that:

1.1 for the purpose of protecting IMT-2000 mobile stations in neighbouring countries from co-channel interference, a HAPS operating as an IMT-2000 base station shall not exceed a co-channel power flux-density (pfd) of $-117 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS;

1.2 a HAPS operating as an IMT-2000 base station shall not transmit outside the frequency bands 2 110-2 170 MHz in Regions 1 and 3 and 2 110-2 160 MHz in Region 2;

1.3 in Region 2, for the purpose of protecting MMDS stations in some neighbouring countries in the band 2 150-2 160 MHz from co-channel interference, a HAPS operating as an IMT-2000 base station shall not exceed the following co-channel pfd at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of the HAPS;

- $-127 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival (θ) less than 7° above the horizontal plane;
- $-127 + 0.666 (\theta - 7) \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 7° and 22° above the horizontal plane; and
- $-117 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 22° and 90° above the horizontal plane;

1.4 in some countries (see No. **5.388B**), for the purpose of protecting fixed and mobile services, including IMT-2000 mobile stations, in their territories from co-channel interference caused by a HAPS operating as an IMT-2000 base station in accordance with No. **5.388A** in neighbouring countries, the limits of **5.388B** shall apply;

2 that the limits referred to in this Resolution shall apply to all HAPS operating in accordance with No. **5.388A**;

3 that administrations wishing to implement HAPS within a terrestrial IMT-2000 system shall comply with the following:

3.1 for the purpose of protecting IMT-2000 stations operating in neighbouring countries from co-channel interference, a HAPS operating as a base station within IMT-2000 shall use antennas that comply with the following antenna pattern:

$$G(\psi) = G_m - 3(\psi/\psi_b)^2 \quad \text{dBi} \quad \text{for } 0^\circ \leq \psi \leq \psi_1$$

$$G(\psi) = G_m + L_N \quad \text{dBi} \quad \text{for } \psi_1 < \psi \leq \psi_2$$

$$G(\psi) = X - 60 \log(\psi) \quad \text{dBi} \quad \text{for } \psi_2 < \psi \leq \psi_3$$

$$G(\psi) = L_F \quad \text{dBi} \quad \text{for } \psi_3 < \psi \leq 90^\circ$$

where:

$G(\psi)$: gain at the angle ψ from the main beam direction (dBi)

G_m : maximum gain in the main lobe (dBi)

ψ_b : one-half of the 3 dB beamwidth in the plane considered (3 dB below G_m) (degrees)

L_N : near side-lobe level (dB) relative to the peak gain required by the system design, and has a maximum value of -25 dB

L_F : far side-lobe level, $G_m - 73$ dBi

$$\psi_1 = \psi_b \sqrt{-L_N/3} \quad \text{degrees}$$

$$\psi_2 = 3.745 \psi_b \quad \text{degrees}$$

$$X = G_m + L_N + 60 \log(\psi_2) \quad \text{dBi}$$

$$\psi_3 = 10^{(X-L_F)/60} \quad \text{degrees}$$

The 3 dB beamwidth ($2\psi_b$) is estimated by:

$$(\psi_b)^2 = 7442/(10^{0.1G_m}) \quad \text{degrees}^2;$$

3.2 for the purpose of protecting mobile earth stations within the satellite component of IMT-2000 from interference, a HAPS operating as an IMT-2000 base station, shall not exceed an out-of-band pfd of -165 dB(W/(m² · 4 kHz)) at the Earth's surface in the bands 2 160-2 200 MHz in Region 2 and 2 170-2 200 MHz in Regions 1 and 3;

3.3 a HAPS operating as an IMT-2000 base station, in order to protect fixed stations from interference, shall not exceed the following limits of out-of-band power flux-density (pfd) at the Earth's surface in the bands 2 025-2 110 MHz:

- $-165 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival (θ) less than 5° above the horizontal plane;
- $-165 + 1.75 (\theta - 5) \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 5° and 25° above the horizontal plane; and
- $-130 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 25° and 90° above the horizontal plane;

4 that, for facilitating consultations between administrations, administrations planning to implement a HAPS as an IMT-2000 base station shall furnish to the concerned administrations the additional data elements listed in the Annex to this Resolution, if so requested;

5 that administrations planning to implement a HAPS as an IMT-2000 base station shall notify the radio-frequency spectrum assignment(s) by submitting all mandatory elements of Appendix 4 and the additional characteristics listed in Annex to this Resolution to the Radio-communication Bureau for the examination of compliance with *resolves* 1.1, 1.3 and 1.4 above;

6 that, as of 5 July 2003, the Bureau and administrations shall apply provisionally the provisions of Nos. **5.388A** and **5.388B** as revised by this Conference for the frequency assignments to HAPS referred to in this Resolution, including those received before this date but not yet processed by the Bureau,

invites ITU-R

to develop, as a matter of urgency, an ITU-R Recommendation providing technical guidance to facilitate consultations with neighbouring administrations.

ANNEX TO RESOLUTION 221 (Rev.WRC-03)

Characteristics of a HAPS operating as an IMT-2000 base station in the frequency bands in accordance with Resolution 221 (Rev.WRC-03)

A General characteristics to be provided for the station

A.1 Identity of the station

- a) Identity of the station
- b) Country

A.2 Date of bringing into use

The date (actual or foreseen, as appropriate) of bringing the frequency assignment (new or modified) into use.

A.3 Administration or operating agency

Symbols for the administration or operating agency and for the address of the administration to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the station (see Article 15).

A.4 Position information of the HAPS

- a)* The nominal geographical longitude for the HAPS
- b)* The nominal geographical latitude for the HAPS
- c)* The nominal altitude for the HAPS
- d)* The planned longitudinal and latitudinal tolerance for the HAPS
- e)* The planned tolerance of altitude for the HAPS

A.5 Agreements

If appropriate, the country symbol of any administration or administration representing a group of administrations with which agreement has been reached, including where the agreement is to exceed the limits prescribed in Resolution 221 (Rev.WRC-03).

B Characteristics to be provided for each antenna beam

B.1 HAPS antenna characteristics

- a)* The maximum isotropic gain (dBi).
- b)* HAPS antenna gain contours plotted on a map of the Earth's surface.

C Characteristics to be provided for each frequency assignment for HAPS antenna beam

C.1 Frequency range

C.2 Power density characteristics of the transmission

The maximum value of the maximum power density (dB(W/MHz)), averaged over the worst 1 MHz supplied to the input of the antenna.

D Calculated pfd limit produced over any country in visibility of HAPS

The maximum pfd calculated at the Earth's surface within each administration's territory over which the HAPS may be visible and over which these calculated pfd levels exceed the limits indicated in *resolves* 1.1, 1.3 and 1.4 of Resolution **221 (Rev.WRC-03)**.

E Table of characteristics to be submitted for a HAPS operating as an IMT-2000 base station in the frequency bands in accordance with Resolution 221 (Rev.WRC-03)

Item	Notification for HAPS station
A.1.a	X
A.1.b	X
A.2	X
A.3	O
A.4.a	X
A.4.b	X
A.4.c	X
A.4.d	X
A.4.e	X
A.5	+
B.1.a	X
B.1.b	X
C.1	X
C.2	X
D	X

X: Mandatory O: Optional +: Required in special cases

RESOLUTION 222 (WRC-2000)

**Use of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz
by the mobile-satellite service**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that prior to WRC-97, the bands 1 530-1 544 MHz (space-to-Earth) and 1 626.5-1 645.5 MHz (Earth-to-space) were allocated to the maritime mobile-satellite service and the bands 1 545-1 555 MHz (space-to-Earth) and 1 646.5-1 656.5 MHz (Earth-to-space) were allocated on an exclusive basis to the aeronautical mobile-satellite (R) service (AMS(R)S) in most countries;
- b)* that WRC-97 allocated the bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to multiple MSS systems in a flexible and efficient manner;
- c)* that WRC-97 adopted No. **5.353A** giving priority to accommodating spectrum requirements for and protecting from unacceptable interference distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS) in the bands 1 530-1 544 MHz and 1 626.5-1 645.5 MHz and No. **5.357A** giving priority to accommodating spectrum requirements for and protecting from unacceptable interference the AMS(R)S providing transmission of messages with priority categories 1 to 6 in Article 44 in the bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz,

further considering

- a)* that coordination between satellite networks is required on a bilateral basis in accordance with the Radio Regulations, and, in the bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space), coordination is partially assisted by regional multilateral meetings;
- b)* that, in these bands, geostationary satellite system operators currently use a capacity-planning approach at multilateral coordination meetings, with the guidance and support of their administrations, to periodically coordinate access to the spectrum needed to accommodate their requirements;
- c)* that the GMDSS and AMS(R)S spectrum requirements are currently satisfied through the capacity-planning approach and that, in the bands to which Nos. **5.353A** or **5.357A** apply, this approach, and other methods such as intra- and inter-system prioritization, pre-emption and interoperability, may assist in accommodating the expected increase of spectrum requirements for GMDSS and AMS(R)S;

d) that the feasibility of prioritization, real-time pre-emptive access and the mechanism to transfer spectrum between different mobile-satellite systems that may or may not provide GMDSS and/or AMS(R)S has yet to be established,

recognizing

a) that priority access and immediate availability of spectrum for distress, urgency and safety communications of the GMDSS and AMS(R)S communications is of vital importance for the safety of life;

b) that the International Civil Aviation Organization (ICAO) has adopted Standards and Recommended Practices (SARPs) addressing satellite communications with aircraft in accordance with the Convention on International Civil Aviation;

c) that all air traffic communications as defined in Annex 10 to the Convention on International Civil Aviation fall within priority categories 1 to 6 of Article 44;

d) that Table 15-2 of Appendix 15 identifies the bands 1 530-1 544 MHz (space-to-Earth) and 1 626.5-1 645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes,

resolves

1 that, in frequency coordination of MSSs in the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz, administrations shall ensure that the spectrum needed for distress, urgency and safety communications of GMDSS, as elaborated in Articles 32 and 33, in the bands where No. 5.353A applies, and for AMS(R)S communications within priority categories 1 to 6 of Article 44 in the bands where No. 5.357A applies is accommodated;

2 that administrations shall ensure the use of the latest technical advances, which may include prioritization and real-time pre-emptive access between MSS systems, when necessary and where feasible, in order to achieve the most flexible and practical use of the generic allocations;

3 that administrations shall ensure that MSS operators carrying non-safety-related traffic yield capacity, as and when necessary, to accommodate the spectrum requirements for distress, urgency and safety communication of GMDSS communications, as elaborated in Articles 32 and 33, and for AMS(R)S communications within priority categories 1 to 6 of Article 44; this could be achieved in advance through the coordination process in *resolves* 1, and, when necessary and where feasible, through prioritization and real-time pre-emptive access,

invites ITU-R

to complete studies to determine the feasibility and practicality of prioritization and real-time pre-emptive access between different networks of mobile-satellite systems as referred to in *resolves 2* above, while taking into account the latest technical advances in order to maximize spectral efficiency,

invites

ICAO, the International Maritime Organization (IMO), the International Air Transport Association (IATA), administrations and other organizations concerned to participate in the studies identified in *invites ITU-R* above.

RESOLUTION 223 (WRC-2000)

Additional frequency bands identified for IMT-2000

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that International Mobile Telecommunications-2000 (IMT-2000) is the ITU vision of global mobile access and is scheduled to start service around the year 2000, subject to market and other considerations;
- b) that IMT-2000 is an advanced mobile communication applications concept intended to provide telecommunication services on a worldwide scale regardless of location, network or terminal used;
- c) that IMT-2000 will provide access to a wide range of telecommunication services supported by fixed telecommunication networks (e.g. PSTN/ISDN), and to other services which are specific to mobile users;
- d) that the technical characteristics of IMT-2000 are specified in ITU-R and ITU-T Recommendations, including Recommendation ITU-R M.1457, which contains the detailed specifications of the radio interfaces of IMT-2000;
- e) that the evolution of IMT-2000 is being studied within ITU-R;
- f) that the review of IMT-2000 spectrum requirements at this Conference has concentrated on the bands below 3 GHz;
- g) that at WARC-92, 230 MHz of spectrum was identified for IMT-2000 in the bands 1 885-2 025 MHz and 2 110-2 200 MHz, including the bands 1 980-2 010 MHz and 2 170-2 200 MHz for the satellite component of IMT-2000, in No. **5.388** and under the provisions of Resolution **212 (Rev.WRC-97)**;
- h) that since WARC-92 there has been a tremendous growth in mobile communications including an increasing demand for wideband multimedia capability;
- i) that ITU-R studies forecasted that of the order of 160 MHz of spectrum, in addition to that already identified for IMT-2000 in No. **5.388** and in addition to the spectrum used for first- and second-generation mobile systems in all three ITU Regions, will be needed in order to meet the projected requirements of IMT-2000 in those areas where the traffic is the highest by 2010;
- j) that this Conference has identified additional frequency bands in No. **5.384A** for IMT-2000 in order to meet the additional spectrum requirement projected by ITU-R;

- k)* that the bands identified for IMT-2000 are currently used by either first- or second-generation mobile systems or applications of other radiocommunication services;
- l)* that Recommendation ITU-R M.1308 addresses the evolution of existing mobile communication systems to IMT-2000;
- m)* that harmonized worldwide bands for IMT-2000 are desirable in order to achieve global roaming and the benefits of economies of scale;
- n)* that the bands 1 710-1 885 MHz and 2 500-2 690 MHz are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations;
- o)* that, for technical reasons, the existing applications in the bands identified for IMT-2000 require spectrum below 3 GHz;
- p)* that technological advancement and market demand will promote innovation and accelerate the delivery of advanced communication applications to consumers;
- q)* that changes in technology may lead to the further development of communication applications, including IMT-2000,

emphasizing

- a)* that flexibility must be afforded to administrations:
 - to determine, at a national level, how much spectrum to make available for IMT-2000 from within the identified bands;
 - to develop their own transition plans, if necessary, tailored to meet their specific deployment of existing systems;
 - to have the ability for the identified bands to be used by all services having allocations in those bands;
 - to determine the timing of availability and use of the bands identified for IMT-2000, in order to meet particular market demand and other national considerations;
- b)* that the particular needs of developing countries must be met;
- c)* that Recommendation ITU-R M.819 describes the objectives to be met by IMT-2000 in order to meet the needs of developing countries,

noting

- a)* Resolutions **224 (WRC-2000)** and **225 (WRC-2000)***, which also relate to IMT-2000;
- b)* that the sharing implications between services sharing the bands identified for IMT-2000 in No. **5.384A** will need further study in ITU-R;

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

- c) that studies regarding the availability of the bands 1 710-1 885 MHz and 2 500-2 690 MHz for IMT-2000 are being conducted in many countries, the results of which could have implications for the use of those bands in those countries;
- d) that, due to differing requirements, not all administrations may need all of the IMT-2000 bands identified at this Conference, or, due to the usage by and investment in existing services, may not be able to implement IMT-2000 in all of those bands;
- e) that the spectrum for IMT-2000 identified by this Conference may not completely satisfy the expected requirements of some administrations;
- f) that currently operating second-generation mobile communication systems may evolve to IMT-2000 in their existing bands;
- g) that services such as fixed, mobile (second-generation systems), space operations, space research and aeronautical mobile are in operation or planned in the band 1 710-1 885 MHz, or in portions of that band;
- h) that services such as broadcasting-satellite, broadcasting-satellite (sound), mobile-satellite and fixed (including multipoint distribution/communication systems) are in operation or planned in the band 2 500-2 690 MHz, or in portions of that band;
- i) that the identification of several bands for IMT-2000 allows administrations to choose the best band or parts of bands for their circumstances;
- j) that ITU-R has identified additional work to address further developments in IMT-2000 and beyond;
- k) that the IMT-2000 radio interfaces as defined in Recommendation ITU-R M.1457 are expected to evolve within the framework of ITU-R beyond those initially specified, to provide enhanced services and services beyond those envisaged in the initial implementation;
- l) that the identification of a band for IMT-2000 does not establish priority in the Radio Regulations and does not preclude the use of the band for any application of the services to which they are allocated;
- m) that the provisions of Nos. **5.317A**, **5.384A** and **5.388** do not prevent administrations from having the choice to implement other technologies in the frequency bands identified for IMT-2000, based on national requirements,

recognizing

- a) that some administrations are planning to use the band 2 300-2 400 MHz for IMT-2000;
- b) that for some administrations the only way of implementing IMT-2000 would be spectrum refarming, requiring significant financial investment;

c) that spectrum for IMT-2000 is identified in Nos. **5.317A**, **5.384A** and **5.388**, but this identification does not preclude the use for IMT-2000 of other bands allocated to the mobile service,

resolves

1 to invite administrations implementing IMT-2000 or planning to implement IMT-2000 to make available, based on market demand and other national considerations, additional bands or portions of the bands above 1 GHz identified in No. **5.384A** for the terrestrial component of IMT-2000; due consideration should be given to the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT-2000, taking into account the use and planned use of these bands by all services to which these bands are allocated;

2 to acknowledge that the differences in the texts of Nos. **5.384A** and **5.388** do not confer differences in regulatory status,

invites ITU-R

1 to study the implications of sharing of IMT-2000 with other applications and services in the bands 1 710-1 885 MHz and 2 500-2 690 MHz and the implementation, sharing and frequency arrangements of IMT-2000 in the bands 1 710-1 885 MHz and 2 500-2 690 MHz in accordance with Annex 1;

2 to develop harmonized frequency arrangements for operation of the terrestrial component of IMT-2000 in the spectrum mentioned in this Resolution, aiming to achieve compatibility with existing frequency arrangements used by the first- and second-generation systems;

3 to continue its studies on further enhancements of IMT-2000, including the provision of Internet Protocol (IP)-based applications that may require unbalanced radio resources between the mobile and base stations;

4 to provide guidance to ensure that IMT-2000 can meet the telecommunication needs of the developing countries and rural areas in the context of the studies referred to above;

5 to include these frequency arrangements and the results of these studies in one or more ITU-R Recommendations,

invites ITU-T

1 to complete its studies of signalling and communication protocols for IMT-2000;

2 to develop a common worldwide intersystem numbering plan and associated network capabilities that will facilitate worldwide roaming,

further invites ITU-R and ITU-T

to commence these studies forthwith,

instructs the Director of the Radiocommunication Bureau

to facilitate to the greatest extent possible the completion of these studies and to report the results of the studies before the next competent conference, or within three years, whichever is the earlier,

requests administrations and Sector Members

to submit the necessary contributions and to participate actively in the ITU-R studies.

ANNEX 1 TO RESOLUTION 223 (WRC-2000)

Request for studies by ITU-R

In response to Resolution **223 (WRC-2000)**, studies that address the following should be conducted:

- 1 sharing implications and possibilities for all services having allocations in the identified frequency bands;
- 2 harmonized frequency arrangements for the implementation of IMT-2000 in the bands mentioned in this Resolution that take into account the services currently using the bands or planning to use the bands and the required compatible frequency arrangements of second-generation systems using these bands, taking into account the need to facilitate the evolution of current mobile systems to IMT-2000;
- 3 means to facilitate global roaming across different regional band usage within the bands identified for IMT-2000;
- 4 spectrum demand predictions related to traffic density and timing;
- 5 planning tools for adaptation of mobile radiocommunication technologies, including IMT-2000, for the needs of developing countries;
- 6 maintaining a database of national studies and decisions on selection of spectrum for IMT-2000;
- 7 study of the provision of a fixed wireless access interface using IMT-2000 technologies.

RESOLUTION 224 (WRC-2000)

Frequency bands for the terrestrial component of IMT-2000 below 1 GHz

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that parts of the band 806-960 MHz are extensively used in the three Regions by first- and second-generation mobile systems;
- b) that some administrations are planning to use part of the band 698-806 MHz for International Mobile Telecommunications-2000 (IMT-2000);
- c) that, in some countries, the band 698-806 MHz is allocated to the mobile service on a primary basis;
- d) that first- and second-generation mobile systems in the three Regions operate using various frequency arrangements;
- e) that where cost considerations warrant the installation of fewer base stations, such as in sparsely populated areas, bands below 1 GHz are generally suitable for implementing mobile systems including IMT-2000;
- f) Recommendation ITU-R M.819 which describes the objectives to be met by IMT-2000 to meet the needs of developing countries,

recognizing

that the evolution of first- and second-generation cellular-based mobile systems to IMT-2000 can be facilitated if they are permitted to use their current frequency bands,

emphasizing

- a) that flexibility must be afforded to administrations:
 - to determine, at a national level, how much spectrum to make available for IMT-2000 from within the identified bands;
 - to develop their own transition plans, if necessary, tailored to meet their specific deployment of existing systems;
 - to have the ability for the identified bands to be used by all services having allocations in those bands;

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- to determine the timing of availability and use of the bands identified for IMT-2000, in order to meet particular market demand and other national considerations;
- b) that the particular needs of developing countries must be met,

resolves

to request administrations which are implementing, or planning to implement IMT-2000, to consider the use of bands below 1 GHz and the possibility of evolution of first- and second-generation mobile systems to IMT-2000, in the frequency band identified in No. **5.317A**, based on market demand and other national considerations,

invites ITU-R

to study compatibility between mobile systems with different technical characteristics and provide guidance on any impact on spectrum arrangements.

RESOLUTION 225 (Rev.WRC-03)

Use of additional frequency bands for the satellite component of IMT-2000

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that the bands 1 980-2 010 MHz and 2 170-2 200 MHz are identified for use by the satellite component of International Mobile Telecommunications-2000 (IMT-2000) through No. **5.388** and Resolution **212 (Rev.WRC-97)**;

b) Resolutions **212 (Rev.WRC-97)**, **223 (WRC-2000)** and **224 (WRC-2000)** on the implementation of the terrestrial and satellite components of IMT-2000;

c) that the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 2 483.5-2 500 MHz, 2 500-2 520 MHz and 2 670-2 690 MHz are allocated on a co-primary basis to the mobile-satellite service and other services in accordance with the Radio Regulations;

cbis) that at this Conference, the bands 1 518-1 525 MHz and 1 668-1 675 MHz were allocated to the mobile-satellite service on a co-primary basis with other services, under the conditions specified in the Radio Regulations;

d) that distress, urgency and safety communications of the Global Maritime Distress and Safety System and the aeronautical mobile-satellite (R) service have priority over all other mobile-satellite service communications in accordance with Nos. **5.353A** and **5.357A**,

recognizing

a) that services such as broadcasting-satellite, broadcasting-satellite (sound), mobile-satellite, fixed (including point-to-multipoint distribution/communication systems) and mobile are in operation or planned in the band 2 500-2 690 MHz, or in portions of that band;

b) that other services such as the mobile service and radiodetermination-satellite service are in operation or planned, in accordance with the Table of Frequency Allocations, in the bands 1 525-1 559/1 626.5-1 660.5 MHz and 1 610-1 626.5/2 483.5-2 500 MHz, or in portions of those bands, and that those bands, or portions thereof, are intensively used in some countries by applications other than the IMT-2000 satellite component, and the sharing studies within ITU-R are not finished;

- c) that studies of potential sharing and coordination between the satellite component of IMT-2000 and the terrestrial component of IMT-2000, mobile-satellite service applications and other high-density applications in other services such as point-to-multipoint communication/distribution systems in the bands 2 500-2 520 MHz and 2 670-2 690 MHz bands are not finished;
- d) that the bands 2 520-2 535 MHz and 2 655-2 670 MHz are allocated to the mobile-satellite, except aeronautical mobile-satellite, service for operation limited to within national boundaries pursuant to Nos. **5.403** and **5.420**;
- e) Resolution ITU-R 47 on studies under way on satellite radio transmission technologies for IMT-2000,

resolves

- 1 that, in addition to the frequency bands indicated in *considering a)* and *resolves 2*, the frequency bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz and 2 483.5-2 500 MHz may be used by administrations wishing to implement the satellite component of IMT-2000, subject to the regulatory provisions related to the mobile-satellite service in these frequency bands;
- 2 that the bands 2 500-2 520 MHz and 2 670-2 690 MHz as identified for IMT-2000 in No. **5.384A** and allocated to the mobile-satellite service may be used by administrations wishing to implement the satellite component of IMT-2000; however, depending on market developments, it may be possible in the longer term for bands 2 500-2 520 MHz and 2 670-2 690 MHz to be used by the terrestrial component of IMT-2000;
- 3 that this identification of frequency bands for the satellite component of IMT-2000 does not preclude the use of these bands by any applications of the services to which they are allocated and does not establish priority in the Radio Regulations,
- 4 that a future competent conference may consider adding the bands 1 518-1 525 MHz and 1 668-1 675 MHz to the frequency bands indicated in *resolves 1*, taking into account the impact on other services in these frequency bands,

invites ITU-R

- 1 to study the sharing and coordination issues in the above bands related to use of the mobile-satellite service allocations for the satellite component of IMT-2000 and the use of this spectrum by the other allocated services, including the radiodetermination-satellite service;
- 2 to report the results of these studies to a future world radiocommunication conference,

instructs the Director of the Radiocommunication Bureau

to facilitate to the greatest extent possible the completion of these studies.

RESOLUTION 228 (Rev.WRC-03)

Studies on frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 as defined by ITU-R

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that International Mobile Telecommunications-2000 (IMT-2000) systems started operation in some countries from the year 2000;
- b)* that Question ITU-R 229/8 addresses the future development of IMT-2000 and systems beyond IMT-2000;
- c)* that Question ITU-R 77-4/8 addresses the needs of developing countries in the development and implementation of mobile radiocommunication technology;
- d)* that Question ITU-D 18/2 addresses the strategy for migration of mobile networks to IMT-2000 and systems beyond IMT-2000;
- e)* that the technical characteristics of IMT-2000 are specified in ITU-R and ITU-T Recommendations, including Recommendation ITU-R M.1457 which contains the detailed specifications of the radio interfaces of IMT-2000;
- f)* that the future development of IMT-2000 and systems beyond IMT-2000 is being studied by ITU-R in accordance with Recommendation ITU-R M.1645;
- g)* that the technical characteristics of the future development of IMT-2000 and systems beyond IMT-2000 remain under study within ITU-R;
- h)* that an orderly process of change and development of IMT-2000 towards the capabilities and functionalities of systems beyond IMT-2000 is needed;
- i)* that adequate spectrum availability is a prerequisite for the success of the future development of IMT-2000 and systems beyond IMT-2000;
- j)* that it was eight years before the initial deployment of IMT-2000 that WARC-92 identified the frequency bands for IMT-2000 in No. **5.388** and in Resolution **212**;
- k)* that the review of IMT-2000 spectrum requirements at WRC-2000 concentrated on bands below 3 GHz;
- l)* that many countries have not yet made available spectrum already identified in the Radio Regulations for IMT-2000, due to various reasons, including the use of this spectrum by existing services;

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- m)* that sharing and compatibility should be addressed between existing services and the future development of IMT-2000 and systems beyond IMT-2000;
- n)* that some of these existing services may have increasing spectrum demand in order to meet increasing user needs;
- o)* that information technologies and telecommunication usage evolve rapidly;
- p)* that continuing and accelerating growth is forecast in the demand for multimedia applications (such as high-speed data, IP-packet and video) by mobile communication systems, and is expected to be accommodated by IMT-2000, the future development of IMT-2000 and systems beyond IMT-2000, and other systems;
- q)* that the future development of IMT-2000 and systems beyond IMT-2000 is foreseen to address the need for higher data rates than those of currently deployed IMT-2000 systems;
- r)* that, for global operation and economy of scale, which are key requirements for the success of mobile communication systems, it is desirable to agree on a harmonized time-frame for common technical, operational and spectrum-related parameters of systems, taking account of relevant IMT-2000 and other experience;
- s)* that it is therefore timely to study demand, technical, spectrum and regulatory issues pertinent to the future development of IMT-2000 and systems beyond IMT-2000,

noting

- a)* that the IMT-2000 radio interfaces as defined in Recommendation ITU-R M.1457 are expected to evolve within the framework of ITU-R beyond those initially specified, to provide enhanced services and services beyond those envisaged in the initial implementation;
- b)* that ITU-R has envisaged that new elements of systems beyond IMT-2000 will be developed, which will closely interwork and be interoperable with currently operating IMT-2000 and its future enhancements;
- c)* that interoperability between different radio interfaces is desirable for the future development of IMT-2000 and systems beyond IMT-2000;
- d)* that ITU-R has already begun considering appropriate naming for the future development of IMT-2000 and systems beyond IMT-2000, for a decision in advance of WRC-07,

recognizing

- a) the time necessary to develop and agree on the technical, operational, spectrum and regulatory issues associated with the continuing enhancement of mobile services;
- b) that service functionalities in fixed, mobile and broadcasting networks are increasingly converging and interworking;
- c) that, in the future, mobile systems are expected to adopt more spectrum-efficient techniques;
- d) that a disparity exists between the telecommunication infrastructure available in developing and developed countries;
- e) the need, in many developing countries and countries with large areas of low-population density, for the cost-effective implementation of IMT-2000, the future development of IMT-2000 and systems beyond IMT-2000, and that the propagation characteristics of frequency bands below those identified in No. **5.317A** result in larger cells;
- f) that administrations have deployed or are planning to deploy IMT-2000 systems in the frequency bands identified in Nos. **5.317A**, **5.384A** and **5.388**, and some in frequency bands other than those identified for IMT-2000 which are allocated to the mobile service on a primary basis;
- g) that spectrum already identified for IMT-2000 should be included in spectrum estimates, and may also be used for the future development of IMT-2000 and systems beyond IMT-2000;
- h) that proximity to bands already identified for IMT-2000 may lead to reduced complexity of equipment;
- i) that some bands may not be appropriate for identification on a global basis for the future development of IMT-2000 and systems beyond IMT-2000 because of the extent of use of these bands by existing services;
- j) that frequencies below those identified for IMT-2000 in No. **5.317A** are extensively used by terrestrial services with applications other than IMT-2000 and systems beyond IMT-2000,

resolves

- 1 to invite ITU-R to further study technical and operational issues relating to the future development of IMT-2000 and systems beyond IMT-2000, and develop Recommendations as required;

2 to invite ITU-R to report, in time for WRC-07, on the results of studies on the spectrum requirements and potential frequency ranges suitable for the future development of IMT-2000 and systems beyond IMT-2000, taking into account:

- the evolving user needs, including the growth in demand for IMT-2000 services;
- the evolution of IMT-2000 and pre-IMT-2000 systems through advances in technology;
- the bands currently identified for IMT-2000;
- the time-frame in which spectrum would be needed;
- the period for migration from existing to future systems;
- the extensive use of frequencies below those identified for IMT-2000 in No. **5.317A**;

3 to invite ITU-R to conduct regulatory and technical studies on the usage of frequencies below those identified for IMT-2000 in No. **5.317A** for the future development of IMT-2000 and systems beyond IMT-2000, notably assessing their advantages and disadvantages, taking into account *recognizing e) and j)* above;

4 that the studies referred to in *resolves* 1 and 2 should take into consideration the particular needs of developing countries including use of the satellite component of IMT-2000 for suitable coverage of these countries;

5 that the studies referred to in *resolves* 1, 2 and 3 should include sharing and compatibility studies with services already having allocations in potential spectrum for the future development of IMT-2000 and systems beyond IMT-2000 taking into account the needs of other services;

6 that WRC-07 should consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000, taking due account of the results of ITU-R studies, in accordance with this Resolution,

invites the Director of the Telecommunication Development Bureau

to draw the attention of the Telecommunication Development Sector to this Resolution,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

RESOLUTION 229 (WRC-03)

**Use of the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz
by the mobile service for the implementation of wireless access systems
including radio local area networks**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference has allocated the bands 5 150-5 350 MHz and 5 470-5 725 MHz on a primary basis to the mobile service for the implementation of wireless access systems (WAS), including radio local area networks (RLANs);
- b)* that this Conference has decided to make an additional primary allocation for the Earth exploration-satellite service (EESS) (active) in the band 5 460-5 570 MHz and space research service (SRS) (active) in the band 5 350-5 570 MHz;
- c)* that this Conference has decided to upgrade the radiolocation service to a primary status in the 5 350-5 650 MHz band;
- d)* that the band 5 150-5 250 MHz is allocated worldwide on a primary basis to the fixed-satellite service (FSS) (Earth-to-space), this allocation being limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service (No. **5.447A**);
- e)* that the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, in some countries (No. **5.447**) subject to agreement obtained under No. **9.21**;
- f)* that the band 5 250-5 460 MHz is allocated to the EESS (active) and the band 5 250-5 350 MHz to the SRS (active) on a primary basis;
- g)* that the band 5 250-5 725 MHz is allocated on a primary basis to the radio-determination service;
- h)* that there is a need to protect the existing primary services in the 5 150-5 350 MHz and 5 470-5 725 MHz bands;
- i)* that results of studies in ITU-R indicate that sharing in the band 5 150-5 250 MHz between WAS, including RLANs, and the FSS is feasible under specified conditions;
- j)* that studies have shown that sharing between the radiodetermination and mobile services in the bands 5 250-5 350 MHz and 5 470-5 725 MHz is only possible with the application of mitigation techniques such as dynamic frequency selection;

k) that there is a need to specify an appropriate e.i.r.p. limit and, where necessary, operational restrictions for WAS, including RLANs, in the mobile service in the bands 5 250-5 350 MHz and 5 470-5 570 MHz in order to protect systems in the EESS (active) and SRS (active);

l) that the deployment density of WAS, including RLANs, will depend on a number of factors including intrasystem interference and the availability of other competing technologies and services,

further considering

a) that the interference from a single WAS, including RLANs, complying with the operational restrictions under *resolves* 2 will not on its own cause any unacceptable interference to FSS receivers on board satellites in the band 5 150-5 250 MHz;

b) that such FSS satellite receivers may experience an unacceptable effect due to the aggregate interference from these WAS, including RLANs, especially in the case of a prolific growth in the number of these systems;

c) that the aggregate effect on FSS satellite receivers will be due to the global deployment of WAS, including RLANs, and it may not be possible for administrations to determine the location of the source of the interference and the number of WAS, including RLANs, in operation simultaneously,

noting

that, prior to WRC-03, a number of administrations have developed regulations to permit indoor and outdoor WAS, including RLANs, to operate in the various bands under consideration in this Resolution,

recognizing

a) that in the band 5 600-5 650 MHz, ground-based meteorological radars are extensively deployed and support critical national weather services, according to footnote No. **5.452**;

b) that the means to measure or calculate the aggregate pfd level at FSS satellite receivers specified in Recommendation ITU-R S.1426 are currently under study;

c) that certain parameters contained in Recommendation ITU-R M.1454 related to the calculation of the number of RLANs tolerable by FSS satellite receivers operating in the band 5 150-5 250 MHz require further study;

d) that the performance and interference criteria of spaceborne active sensors in the EESS (active) are given in Recommendation ITU-R SA.1166;

- e) that a mitigation technique to protect radiodetermination systems is given in Recommendation ITU-R M.1652;
- f) that an aggregate pfd level has been developed in Recommendation ITU-R S.1426 for the protection of FSS satellite receivers in the 5 150-5 250 MHz band;
- g) that Recommendation ITU-R SA.1632 identifies a suitable set of constraints for WAS, including RLANs, in order to protect the EESS (active) in the 5 250-5 350 MHz band;
- h) that Recommendation ITU-R M.1653 identifies the conditions for sharing between WAS, including RLANs, and the EESS (active) in the 5 470-5 570 MHz band;
- i) that the stations in the mobile service should also be designed to provide, on average, a near-uniform spread of the loading of the spectrum used by stations across the band or bands in use to improve sharing with satellite services;
- j) that WAS, including RLANs, provide effective broadband solutions;
- k) that there is a need for administrations to ensure that WAS, including RLANs, meet the required mitigation techniques, for example, through equipment or standards compliance procedures,

resolves

- 1 that the use of these bands by the mobile service will be for the implementation of WAS, including RLANs, as described in Recommendation ITU-R M.1450;
- 2 that in the band 5 150-5 250 MHz, stations in the mobile service shall be restricted to indoor use with a maximum mean e.i.r.p.¹ of 200 mW and a maximum mean e.i.r.p. density of 10 mW/MHz in any 1 MHz band or equivalently 0.25 mW/25 kHz in any 25 kHz band;
- 3 that administrations may monitor whether the aggregate pfd levels given in Recommendation ITU-R S.1426² have been, or will be exceeded in the future, in order to enable a future competent conference to take appropriate action;

¹ In the context of this Resolution, “mean e.i.r.p.” refers to the e.i.r.p. during the transmission burst which corresponds to the highest power, if power control is implemented.

² $-124 - 20 \log_{10} (h_{SAT}/1\,414)$ dB(W/(m² · 1 MHz)), or equivalently,
 $-140 - 20 \log_{10} (h_{SAT}/1\,414)$ dB(W/(m² · 25 kHz)), at the FSS satellite orbit, where h_{SAT} is the altitude of the satellite (km).

4 that in the band 5 250-5 350 MHz, stations in the mobile service shall be limited to a maximum mean e.i.r.p. of 200 mW and a maximum mean e.i.r.p. density of 10 mW/MHz in any 1 MHz band. Administrations are requested to take appropriate measures that will result in the predominant number of stations in the mobile service being operated in an indoor environment. Furthermore, stations in the mobile service that are permitted to be used either indoors or outdoors may operate up to a maximum mean e.i.r.p. of 1 W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band, and, when operating above a mean e.i.r.p. of 200 mW, these stations shall comply with the following e.i.r.p. elevation angle mask where θ is the angle above the local horizontal plane (of the Earth):

-13 dB(W/MHz)	for $0^\circ \leq \theta < 8^\circ$
$-13 - 0.716(\theta - 8) \text{ dB(W/MHz)}$	for $8^\circ \leq \theta < 40^\circ$
$-35.9 - 1.22(\theta - 40) \text{ dB(W/MHz)}$	for $40^\circ \leq \theta \leq 45^\circ$
-42 dB(W/MHz)	for $45^\circ < \theta$;

5 that administrations may exercise some flexibility in adopting other mitigation techniques, provided that they develop national regulations to meet their obligations to achieve an equivalent level of protection to the EESS (active) and the SRS (active) based on their system characteristics and interference criteria as stated in Recommendation ITU-R SA.1632;

6 that in the band 5 470-5 725 MHz, stations in the mobile service shall be restricted to a maximum transmitter power of 250 mW³ with a maximum mean e.i.r.p. of 1 W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band;

7 that in the bands 5 250-5 350 MHz and 5 470-5 725 MHz, systems in the mobile service shall either employ transmitter power control to provide, on average, a mitigation factor of at least 3 dB on the maximum average output power of the systems, or, if transmitter power control is not in use, then the maximum mean e.i.r.p. shall be reduced by 3 dB;

8 that, in the bands 5 250-5 350 MHz and 5 470-5 725 MHz, the mitigation measures found in Annex 1 to Recommendation ITU-R M.1652 shall be implemented by systems in the mobile service to ensure compatible operation with radiodetermination systems,

invites administrations

to adopt appropriate regulation if they intend to permit the operation of stations in the mobile service using the e.i.r.p. elevation angle mask in *resolves* 4, to ensure the equipment is operated in compliance with this mask,

³ Administrations with existing regulations prior to this Conference may exercise some flexibility in determining transmitter power limits.

invites ITU-R

- 1 to continue work on regulatory mechanisms and further mitigation techniques to avoid incompatibilities which may result from aggregate interference into the FSS in the band 5 150-5 250 MHz from a possible prolific growth in the number of WAS, including RLANs;
- 2 to continue studies on mitigation techniques to provide protection of EESS from stations in the mobile service,
- 3 to continue studies on suitable test methods and procedures for the implementation of dynamic frequency selection, taking into account practical experience.

RESOLUTION 230 (WRC-03)

**Consideration of mobile allocations for
wideband aeronautical telemetry
and associated telecommand**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that there is a need to provide global spectrum to the mobile service for wideband aeronautical telemetry systems;
- b)* that there is an identified need for additional spectrum required to meet future wideband aeronautical telemetry demands;
- c)* that there is also a need to accommodate telecommand operations associated with aeronautical telemetry;
- d)* that there is a need to protect existing services,

noting

- a)* that a number of bands between 3 GHz and 30 GHz are already allocated to the mobile service, without excluding the aeronautical mobile service, on a secondary basis;
- b)* that any spectrum allocated to the mobile service above 3 GHz (to include aeronautical telemetry) is not a substitution for existing allocations used for aeronautical telemetry purposes below 3 GHz, the requirement for which will continue,

recognizing

- a)* that there are emerging telemetry systems with large data transfer requirements to support testing of commercial aircraft and other airframes;
- b)* that the future technologies and performance expectations for airborne platforms contemplate a need for real-time monitoring of large data systems with multiple video streams (including high-definition video), high-definition sensors, and integrated high-speed avionics;
- c)* that the 2000 Radiocommunication Assembly approved Question ITU-R 231/8, titled: "Operation of wideband aeronautical telemetry in bands above 3 GHz", with the target date of 2005;
- d)* that those studies will provide a basis for considering regulatory changes, including additional allocations and recommendations, designed to accommodate justified spectrum requirements of aeronautical mobile telemetry consistent with the protection of incumbent services,

RES230-2

resolves

that WRC-07 be invited to:

- 1 consider the spectrum required to satisfy justified wideband aeronautical mobile telemetry requirements and associated telecommand above 3 GHz;
- 2 review, with a view to upgrading to primary, secondary allocations to the mobile service in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand;
- 3 consider possible additional allocations to the mobile service, including aeronautical mobile, on a primary basis in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand, taking into account *considering d)* above;
- 4 designate existing mobile allocations between 16 and 30 GHz for wideband aeronautical telemetry and associated telecommand,

invites ITU-R

to conduct, as a matter of urgency, studies to facilitate sharing between aeronautical mobile telemetry and the associated telecommand, on the one hand, and existing services, on the other hand, taking into account the *resolves* above.

RESOLUTION 331 (Rev.WRC-03)

Transition to the Global Maritime Distress and Safety System (GMDSS)

The World Radiocommunication Conference (Geneva, 2003),

noting

that all ships subject to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, are required to be fitted for the Global Maritime Distress and Safety System (GMDSS),

noting further

a) that a number of administrations have taken steps to implement the GMDSS also for classes of vessels not subject to SOLAS, 1974, as amended;

b) that an increasing number of vessels not subject to SOLAS, 1974, as amended, are making use of the techniques and frequencies of the GMDSS prescribed in Chapter VII;

c) that some administrations and vessels, not subject to SOLAS, 1974, as amended, may wish to continue to use provisions of Appendix 13 for distress and safety communications for a few years after this Conference;

d) that it would be costly for administrations to maintain in parallel for an excessive period of time shore-based facilities necessary to support both the old and new distress and safety systems;

e) that there may be a need to maintain existing shore-based distress and safety services described in Appendix 13 for some years after this Conference so that vessels not subject to SOLAS, 1974, as amended and not yet using the techniques and frequencies of the GMDSS will be able to obtain assistance from these services until such time as they are able to participate in the GMDSS;

f) that the International Maritime Organization (IMO) has decided that on board SOLAS ships:

- listening watch on 2 182 kHz is no longer mandatory after 1 February 1999;
- listening watch on VHF channel 16 shall continue with a view to maintaining communication between SOLAS ships and vessels not fitted for the GMDSS;
- the required watch on VHF channel 16 will be reviewed prior to 2005;

- g) that IMO has urged administrations to require all seagoing vessels under national legislation, and encourage all vessels voluntarily carrying VHF radio equipment to be fitted with facilities for transmitting and receiving distress alerts by digital selective calling (DSC) on VHF channel 70 no later than 1 February 2005;
- h) that listening watch by coast stations on 2 182 kHz is no longer mandatory;
- i) that the Radio Regulations require GMDSS ships to keep watch on the appropriate DSC distress frequencies;
- j) that separate provisions in the existing Radio Regulations designate VHF channel 16 and the frequency 2 182 kHz as the international channels for general calling by radiotelephony;
- k) that the Radio Regulations establish that ship stations should, when practicable, keep watch on VHF channel 13;
- l) that several administrations have established Vessel Traffic Service (VTS) systems and require their vessels to keep watch on local VTS channels;
- m) that ships that are required by SOLAS to carry a radio station have been equipped with DSC, and many vessels subject to national carriage requirements are also being equipped with DSC, but the majority of vessels that carry a radio station on a voluntary basis might not yet have DSC equipment;
- n) that similarly, many administrations have established distress and safety service based on DSC watchkeeping, but the majority of port stations, pilot stations and other operational coast stations might not yet have been equipped with DSC facilities;
- o) that for the reasons in *noting further m)* and *n)* listed above, it will be necessary for some stations in the maritime mobile service to continue for some years to call each other by radiotelephony in certain situations,

considering

- a) that the operation of the GMDSS described in Chapter VII and the distress and safety system described in Appendix 13 differ in many crucial aspects, such as means and methods of alerting, communication facilities available, announcement and transmission of maritime safety information, etc.;
- b) that operation of the two systems in parallel for a long period would cause ever-increasing difficulties and incompatibilities between vessels operating in the two different systems and may thus seriously degrade safety at sea in general;
- c) that the GMDSS overcomes the deficiencies of the aural watch-keeping on maritime distress and calling frequencies on which the distress and safety system described in Appendix 13 relies, by replacing these watches by automatic watch, i.e. DSC and satellite communication systems;

d) that the listening watch on 2 182 kHz on board SOLAS ships and at some coast stations has ceased in accordance with the decisions of IMO mentioned in *noting further f)* above,

resolves

1 to retain, as an interim measure, the provisions permitting use of VHF channel 16 and the frequency 2 182 kHz for general voice-calling;

2 to urge all administrations to assist in enhancing safety at sea by:

- encouraging all vessels to make use of the GMDSS as soon as possible;
- encouraging, where appropriate, establishment of suitable shore-based facilities for GMDSS, either on an individual basis or in cooperation with other relevant parties in the area;
- encouraging all vessels carrying maritime VHF equipment to be fitted with DSC on VHF channel 70 as soon as possible, taking into account the relevant decisions of IMO;
- encouraging vessels to limit their use of VHF channel 16 and the frequency 2 182 kHz for calling to the minimum necessary, noting the provisions of No. **52.239**;

3 that administrations may release their ship stations and coast stations from the obligations described in Appendix **13** concerning listening watch on VHF channel 16 or 2 182 kHz or both, taking account of all aspects involved, such as:

- decisions by IMO and ITU on aural watch on 2 182 kHz and VHF channel 16;
- the GMDSS radio systems available in the area concerned;
- the compatibility problems mentioned in *considering a)* and *b)* above;
- the density and classes of vessels normally in the area;
- the geographical nature of the area and general navigational conditions within the area;
- other adequate measures taken to ensure safety communications for vessels sailing in the area,

when the development on transition to the GMDSS and the prevailing conditions in the area makes it reasonable to do so;

when doing so, administrations should:

- inform IMO of their decisions and submit to IMO details on the area concerned;
- inform the Secretary-General on the necessary details for inclusion in the List of Coast Stations,

RES331-4

resolves further

that the Secretary-General should ensure that such arrangements and details regarding the area concerned be indicated in relevant maritime publications,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, the International Civil Aviation Organization and the International Association of Marine Aids to Navigation and Lighthouse Authorities.

RESOLUTION 339 (Rev.WRC-03)

Coordination of NAVTEX services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that the International Maritime Organization (IMO) has established a Coordinating Panel on NAVTEX to, *inter alia*, coordinate the operational aspects of NAVTEX services, such as allocation of transmitter identification character (B1) and time schedules, in the planning stages for transmissions on the frequencies 490 kHz, 518 kHz or 4 209.5 kHz;
- b) that coordination in the frequencies 490 kHz, 518 kHz and 4 209.5 kHz is essentially operational;
- c) that the frequency band around 518 kHz is also allocated to the aeronautical radio-navigation service on a primary basis,

resolves

to invite administrations to apply the procedures established by IMO, taking into account the IMO NAVTEX Manual, for coordinating the use of the frequencies 490 kHz, 518 kHz and 4 209.5 kHz,

instructs the Secretary-General

- 1 to invite IMO to provide ITU with information on a regular basis on operational coordination for NAVTEX services on the frequencies 490 kHz, 518 kHz and 4 209.5 kHz;
- 2 to publish this information in the List of Coast Stations (see No. **20.7**).

RESOLUTION 340 (WRC-97)

Need for additional search and rescue information in databases

The World Radiocommunication Conference (Geneva, 1997),

noting

a) that the provisions of No. **20.16** of Article **20** require administrations to notify the Radiocommunication Bureau of ship station characteristics contained in the List of Ship Stations (List V), which currently includes: name of ship, call sign, selective call number, country, auxiliary installations, class of ship, nature of service, hours of service, telegraph transmission frequency bands, telephone transmission frequency bands, accounting authority, and remarks (e.g. Inmarsat terminal number, MMSI);

b) that the provisions of No. **20.15**, however, give the Bureau authority to change the content and form of this information in consultation with administrations; and

c) that administrations and the International Maritime Organization (IMO) have expressed a need for additional information to be included in search and rescue databases, including:

- vessel identification number (IMO number or national registration number);
- name, address and telephone number and, if applicable, telefax number of emergency contact person ashore;
- alternative 24-hour emergency telephone number;
- capacity for persons on board (passengers and crew),

resolves

to instruct the Director of the Radiocommunication Bureau to begin consultations with administrations with a view to incorporating the information contained in the Annex to this Resolution in the ITU maritime services database,

invites

administrations to consider also the incorporation of that information in their national databases,

instructs the Secretary-General

to communicate this Resolution to the IMO.

ANNEX TO RESOLUTION 340 (WRC-97)

Registration database for the Global Maritime Distress and Safety System

(See Article 32)

1 All identities used by the Global Maritime Distress and Safety System (GMDSS) for identifying vessels in distress shall be registered in accordance with this Annex. Administrations or organizations responsible for assigning these identities shall make suitable arrangements for ensuring that registrations of these identities are made and maintained. Administrations shall notify this information to the Bureau in accordance with No. **20.16**.

2 Means shall be provided by the Bureau and administrations maintaining national databases to allow rescue coordination centres immediate access to this database on a 24-hour per day, 7-day per week basis.

3 Each registration database should include the following information:

- 3.1 vessel name;
- 3.2 maritime mobile service identity (MMSI);
- 3.3 call sign;
- 3.4 emergency position indicating radiobeacons (EPIRB) identification code (if applicable);
- 3.5 country (vessel flag State; may be derived from MMSI and call sign);
- 3.6 vessel identification number (IMO number or national registration number);
- 3.7 brief ship description (type);
- 3.8 name, address, telephone and (if applicable) telefax number of emergency contact person ashore;
- 3.9 alternative 24-hour emergency telephone number;
- 3.10 capacity for persons on board (passengers and crew);
- 3.11 ship's radio installation (Inmarsat A, B, C, M, VHF digital selective calling, etc.);
and
- 3.12 Inmarsat ship earth station identities (if applicable).

RESOLUTION 342 (Rev.WRC-2000)

**New technologies to provide improved efficiency in the use of the
band 156-174 MHz by stations in the maritime mobile service**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that the agenda of this Conference included the consideration of the use of new technologies for the maritime mobile service in the band 156-174 MHz and the consequential revision of Appendix 18;
- b) Recommendation 318 (Mob-87), particularly *noting* b) and c) thereof;
- c) that Appendix 18 identifies frequencies to be used for distress and safety communications on an international basis;
- d) that the introduction of new technology in the maritime mobile service shall not disrupt distress and safety communications in the VHF band including those established by the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended;
- e) that the date for full implementation of the global maritime distress and safety system (GMDSS) was 1 February 1999;
- f) that ITU-R is conducting studies on improving efficiency in the use of this band, and that these studies are still ongoing;
- g) that changes made in Appendix 18 should not prejudice the future use of these frequencies or the capabilities of systems or new applications required for use by the maritime mobile service;
- h) that the congestion on Appendix 18 frequencies calls for the implementation of efficient new technologies;
- i) that the use of new technology on maritime VHF frequencies will make it possible to better respond to the emerging demand for new services;
- j) that ITU-R has approved Recommendation ITU-R M.1312 relating to a long-term solution for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service;
- k) that ITU-R has approved Recommendation ITU-R M.1371 relating to technical characteristics for a universal shipborne automatic identification system using time-division multiple access in the VHF maritime mobile band;
- l) that there is a need to maintain some duplex channels for specific applications,

noting

- a) that the global maritime market may not be of a sufficient size to warrant the development of a new system solely for the maritime service;
- b) that digital systems have been successfully implemented in the land mobile service,

noting also

that this Conference has modified Appendix **18**, including the addition of note o), to permit the possible use on a voluntary basis of various channels or bands created by the conversion of some duplex channels to simplex channels, for the initial testing and the possible future introduction of new technologies,

resolves

- 1 that, in order to provide full worldwide interoperability of equipment on ships, there should be one technology, or more than one interoperable worldwide technology, implemented under Appendix **18**;
- 2 that, as soon as the ITU-R studies are complete, a future competent conference should consider any necessary changes to Appendix **18** to enable the use of new technologies by the maritime mobile service,

invites ITU-R

to finalize the following studies:

- a) identify the future requirements of the maritime mobile service;
- b) identify suitable technical characteristics of the system or interoperable systems to replace existing technology;
- c) identify necessary modifications to the Table of frequencies contained in Appendix **18**;
- d) recommend a transition plan for the introduction of new technologies;
- e) recommend how new technologies can be introduced while ensuring compliance with the distress and safety requirements,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization and the International Association of Lighthouse Authorities.

RESOLUTION 343 (WRC-97)

Maritime certification for personnel of ship stations and ship earth stations for which a radio installation is not compulsory

The World Radiocommunication Conference (Geneva, 1997),

considering

- a) that WRC-97 has considered the question of certification for personnel of ship stations and ship earth stations within the Global Maritime Distress and Safety System (GMDSS);
- b) that GMDSS will be fully implemented on 1 February 1999 by ships subject to an international agreement;
- c) that ships not subject to an international agreement have begun to adopt GMDSS systems and techniques;
- d) that use of GMDSS equipment should be accompanied by appropriate training and certification;
- e) that the Radio Regulations stipulate that the service of every ship radio station working on frequencies assigned for international use shall be performed by operators holding a certificate;
- f) that the present certificates described in Article 47 may be too demanding for radio operators of ship stations and ship earth stations on board ships for which a radio installation is not compulsory,

noting

that a number of administrations currently issue radio operator certificates specially designed for the non-compulsory sector,

resolves

that administrations wishing to implement special certification for the non-compulsory sector should implement the certificates contained in the Annex to this Resolution,

invites ITU-R

to develop a Recommendation describing these certificates,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization (IMO).

ANNEX TO RESOLUTION 343 (WRC-97)

Examination syllabus for radio operator's certificates appropriate to vessels using the frequencies and techniques of the Global Maritime Distress and Safety System on a non-compulsory basis

Introduction

The introduction of the Global Maritime Distress and Safety System (GMDSS) in February 1992 made it necessary to harmonize the examination requirements for certificates for professional radio operators. Harmonized examination procedures for the general operator's Certificate and restricted operator's Certificate, based on the syllabuses described in Article 47, have already been introduced for maritime radio operators performing radiocommunication duties on board vessels subject to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended. The GMDSS will be fully implemented on 1 February 1999 for vessels subject to SOLAS, 1974, as amended.

For vessels not subject to SOLAS, 1974, as amended, and which install radiocommunication equipment on a voluntary basis, there are significant advantages to also using the GMDSS. However, it was foreseen by some administrations that such vessels would use some, but not all, of the frequencies and techniques of the GMDSS and that radio personnel on board such vessels would not need the same level of certification as radio personnel on board vessels which use all of the frequencies and techniques of the GMDSS on a compulsory basis. A syllabus has been developed which provides the flexibility for a depth of study, level of knowledge, and length of course appropriate to meet the certification requirements of radio personnel on board vessels which use some of the frequencies and techniques of the GMDSS on a non-compulsory basis. The syllabus also provides for certification in the use of satellite equipment where appropriate.

This Annex describes the syllabus developed to meet the certification requirements referred to above, and which are implemented in a number of countries under the title "Long Range Certificate" and "Short Range Certificate". The Short Range Certificate should at least contain those elements of the syllabus which are relevant to sea area A1.

Examination syllabus

The examination should consist of theoretical and practical tests and should include at least:

A General knowledge of radiocommunications in the maritime mobile service

A.1 The general principles and basic features of the maritime mobile service.

B Detailed practical knowledge and ability to use radio equipment

- B.1 The VHF radio installation. Use of VHF equipment in practice.
- B.2 The MF/HF radio installation. Use of MF/HF equipment in practice.
- B.3 Purpose and use of digital selective calling facilities and techniques.

C Operational procedures of the GMDSS and detailed practical operation of GMDSS subsystems and equipment

- C.1 Basic introduction to GMDSS procedures.
- C.2 Distress, urgency and safety communication procedures in the GMDSS.
- C.3 Distress, urgency and safety communication procedures by radiotelephony in the old distress and safety system.
- C.4 Protection of distress frequencies.
- C.5 Maritime safety information (MSI) systems in the GMDSS.
- C.6 Alerting and locating signals in the GMDSS.

D Operational procedures and regulations for radiotelephone communications

- D.1 Ability to exchange communications relevant to the safety of life at sea.
- D.2 Regulations, obligatory procedures and practices.
- D.3 Practical and theoretical knowledge of radiotelephone procedures.
- D.4 Use of the international phonetic alphabet and, where appropriate, parts of the IMO Standard Marine Communication Phrases.

E Optional examination module for the maritime mobile-satellite service for vessels not subject to a compulsory fit

- E.1 The general principles and basic features of the maritime mobile-satellite service.
- E.2 Operational procedures and detailed practical operation of ship earth stations in the GMDSS.

RESOLUTION 344 (Rev.WRC-03)

**Management of the maritime mobile service identity
numbering resource**

The World Radiocommunication Conference (Geneva, 2003),

noting

- a)* that the installation of digital selective calling equipment or Inmarsat B, C or M ship earth station equipment on ships participating in the Global Maritime Distress and Safety System (GMDSS) on a mandatory or voluntary basis requires the assignment of a unique nine-digit maritime mobile service identity (MMSI);
- b)* that such equipment offers the possibility to connect with public telecommunication networks;
- c)* that only mobile-satellite systems have been able to resolve the various billing, routing, charging and signalling requirements needed to provide full two-way automatic connectivity between ships and the international public correspondence service;
- d)* that ships using the present generation of mobile-satellite ship earth stations have to be assigned an MMSI ending with three trailing zeros in order to support automatic access to public telecommunication networks through a diallable ship telephone number whose format is compliant with ITU-T Recommendation E.164 but can only accommodate the first six digits of the MMSI;
- e)* that the first three digits of a ship station MMSI form the maritime identification digits (MID), which denote the ship's administration or geographical area of origin;
- f)* that each MID only has sufficient capacity to identify 999 ships using the three-trailing-zero number format, with the result that widespread use of MMSIs with three trailing zeros will rapidly exhaust the capacity of each MID,

considering

- a)* that digital selective calling distress alerts require valid identities recognizable by search and rescue authorities in order to ensure a timely response;
- b)* that Recommendation ITU-R M.585 contains guidance for the assignment of MMSIs,

recognizing

- a)* that even domestic ships which install the present generation of ship earth stations operating to Inmarsat B, C or M standards will require the assignment of MMSI numbers from those numbers originally intended for ships communicating worldwide, further depleting the resource;

RES344-2

b) that future growth of Inmarsat B, C or M ship earth station use by non-compulsory ships may further deplete the MMSI and MID resources;

c) that future generations of mobile-satellite systems offering access to public telecommunication networks and participating in the GMDSS will employ a free-form numbering system that need not include any part of the MMSI,

noting further

a) that ITU-T has recommended that ITU-R assume sole responsibility for managing the MMSI and MID numbering resources;

b) that ITU-R can monitor the status of the MMSI resource, through regular reviews of the spare capacity available within the MIDs already in use, and the availability of spare MIDs, taking account of regional variations,

resolves to instruct the Director of the Radiocommunication Bureau

1 to manage the allotment and distribution of the MID resource within the MMSI numbering format, taking into account:

- Sections II, V and VI of Article 19;
- regional variations in MMSI use;
- spare capacity within the MID resource; and
- the guidelines on MID and MMSI management contained in the most recent version of Recommendation ITU-R M.585, in particular as regards the reuse of MMSIs;

2 to report to each world radiocommunication conference on the use and status of the MMSI resource, noting in particular the anticipated reserve capacity and any indications of rapid exhaustion of the resource,

invites ITU-R

to keep under review the Recommendations for assigning MMSIs, with a view to:

- improving the management of the MID and MMSI resources; and
- identifying alternative resources if there is an indication of rapid exhaustion of these resources,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization.

RESOLUTION 345 (WRC-97)

**Operation of Global Maritime Distress and Safety System
equipment on and assignment of maritime mobile service
identities to non-compulsory fitted vessels**

The World Radiocommunication Conference (Geneva, 1997),

noting

- a)* that ships not required by international agreement to carry Global Maritime Distress and Safety System (GMDSS) equipment could elect to do so for safety purposes;
- b)* that such vessels may only carry VHF digital selective calling (DSC) equipment;
- c)* that some administrations may not require operators on such vessels to have appropriate training, certification or licence;
- d)* that not all administrations assign and register identities to users of VHF DSC equipment on such ships,

considering

that VHF DSC false distress alerts are a problem for rescue coordination centres, particularly when incorrect identities are used, or when the radio is operated by persons untrained in its use,

recognizing

that administrations have different training requirements for users of VHF DSC equipment,

resolves

- 1 to invite ITU-R to consider DSC standards and operating procedures in order to simplify operation of this equipment;
- 2 to invite ITU-T and ITU-R to review the process for assigning maritime mobile service identities for simplifying the process, taking into account cases of new installation, sale of the vessel or transfer of the equipment to a new ship;

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3 to invite ITU-T and ITU-R to undertake studies to ensure the registration and continuous accessibility and availability of identities to rescue authorities,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization for consideration and comments.

RESOLUTION 349 (WRC-97)

Operational procedures for cancelling false distress alerts in the Global Maritime Distress and Safety System

The World Radiocommunication Conference (Geneva, 1997),

considering

- a) that the 1974 International Convention for the Safety of Life at Sea (SOLAS), as amended, prescribes that ships subject to that Convention shall be fitted with Global Maritime Distress and Safety System (GMDSS) equipment as appropriate;
- b) that non-SOLAS vessels are also being equipped with GMDSS equipment;
- c) that the transmission and relay of false distress alerts is a significant problem within the GMDSS,

noting

that the International Maritime Organization (IMO) has developed similar operational procedures to cancel false distress alerts,

resolves

- 1 to urge administrations to take all necessary measures to avoid false distress alerts and to minimize the unnecessary burden on rescue organizations which occurs;
- 2 to urge administrations to encourage the correct use of GMDSS equipment, with particular attention to appropriate training;
- 3 to urge administrations to implement the operational procedures contained in the Annex to this Resolution;
- 4 that administrations should take any consequential appropriate action in this respect,

instructs the Secretary-General

to bring this Resolution to the attention of IMO.

ANNEX TO RESOLUTION 349 (WRC-97)

Cancelling of false distress alerts

If a distress alert is inadvertently transmitted, the following steps shall be taken to cancel the distress alert.

1 VHF digital selective calling

- 1) Reset the equipment immediately;
- 2) Set to channel 16; and
- 3) Transmit a broadcast message to “All Stations” giving the ship’s name, call sign and maritime mobile service identity (MMSI), and cancel the false distress alert.

2 MF digital selective calling

- 1) Reset the equipment immediately;
- 2) Tune for radiotelephony transmission on 2 182 kHz; and
- 3) Transmit a broadcast message to “All Stations” giving the ship’s name, call sign and MMSI, and cancel the false alert.

3 HF digital selective calling

- 1) Reset the equipment immediately;
- 2) Tune for radiotelephony on the distress and safety frequency in each band in which a false distress alert was transmitted (see Appendix 15); and
- 3) Transmit a broadcast message to “All Stations” giving the ship’s name, call sign and MMSI, and cancel the false alert on the distress and safety frequency in each band in which the false distress alert was transmitted.

4 Inmarsat ship earth station

Notify the appropriate rescue coordination centre that the alert is cancelled by sending a distress priority message by way of the same coast earth station through which the false distress alert was sent. Provide ship name, call sign and Inmarsat identity with the cancelled alert message.

5 Emergency position indicating radiobeacon (EPIRB)

If for any reason an EPIRB is activated inadvertently, contact the appropriate rescue coordination centre through a coast station or land earth station and cancel the distress alert.

6 General

Notwithstanding the above, ships may use additional appropriate means available to them to inform the appropriate authorities that a false distress alert has been transmitted and should be cancelled.

RESOLUTION 351 (WRC-03)

Review of the frequency and channel arrangements in the MF and HF bands allocated to the maritime mobile service with a view to improving efficiency by considering the use of new digital technology by the maritime mobile service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the agenda of this Conference included consideration of the use of new digital technology in the maritime mobile service (MMS) in the MF and HF bands;
- b)* that the introduction of new digital technology in the MMS shall not disrupt the distress and safety communications in the MF and HF bands including those established by the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended;
- c)* that changes made in Appendix 17 should not prejudice the future use of these frequencies or the capabilities of systems or new applications required for use by the MMS;
- d)* that the need to use new digital technologies in the MMS is growing rapidly;
- e)* that the use of new digital technology on HF and MF frequencies allocated to the MMS will make it possible to better respond to the emerging demand for new services;
- f)* that the HF bands allocated to the MMS for A1A Morse telegraphy and narrow-band direct-printing are significantly under-utilized at present;
- g)* that the ITU Radiocommunication Sector is conducting ongoing studies to improve the efficient use of these bands,

noting

that different digital technologies have already been developed and are in use in the MF and HF bands in several radiocommunication services,

noting also

that this conference has modified Appendix 17 to permit, on a voluntary basis, the use of various channels or bands identified in the MF and HF bands for initial testing and future introduction of new digital technology,

resolves

1 that, in order to provide full worldwide interoperability of equipment on ships, there should be one technology, or more than one interoperable worldwide technology, implemented under Appendix 17;

2 that, as soon as the ITU-R studies are completed, a future competent conference should consider necessary changes to Appendix 17 to enable the use of new technology by the MMS,

invites ITU-R

to finalize studies currently ongoing:

- to identify future requirements of the MMS;
- to identify the technical characteristics necessary to facilitate use of digital systems in the MF and HF bands allocated to the MMS, taking into account any relevant ITU-R Recommendations;
- to identify the digital system(s) to be used in the MF/HF bands by the MMS;
- to identify any necessary modifications to the frequency table contained within Appendix 17;
- to propose a timetable for the introduction of new digital technologies and any consequential changes to Appendix 17;
- to recommend how digital technologies can be introduced while ensuring compliance with distress and safety requirements,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization, the International Civil Aviation Organization, the International Association of Marine Aids to Navigation and Lighthouse Authorities and the Comité International Radio-Maritime.

RESOLUTION 352 (WRC-03)

Use of the carrier frequencies 12 290 kHz and 16 420 kHz for safety-related calling to and from rescue coordination centres

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference modified No. **52.221A** to allow safety-related calling to and from rescue coordination centres on the carrier frequencies 12 290 kHz and 16 420 kHz;
- b)* that this limited safety-related calling function on these carrier frequencies will enhance the capability of those search and rescue organizations which maintain watch on these distress and safety frequencies to call vessels not utilizing the Global Maritime Distress and Safety System (GMDSS),

noting

- a)* that regulation IV/4.8 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, requires that SOLAS ships, while at sea, be capable of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks;
- b)* that general communications may include safety-related communications necessary for the safe operation of vessels,

further noting

that safety-related communications require adequate, effective and immediate access and protection,

recognizing

- a)* that the International Maritime Organization (IMO) notes that distress, urgency and safety radiocommunications include, but are not limited to:
 - transmissions of maritime safety information;
 - distress calls and traffic;
 - acknowledgment and relaying of distress calls;
 - search and rescue coordination communications;
 - ship movement service communications;

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- communications related to the safe operation of ships;
- communications related to navigation;
- meteorological warnings;
- meteorological observations;
- ship position reports; and
- medical emergencies (e.g. MEDICO/MEDIVAC);

b) that distress, urgency and safety communications are defined in Articles **32** and **33**,

resolves

1 that the carrier frequencies 12 290 kHz and 16 420 kHz be used only for distress, urgency and safety communications, and safety-related calling limited to that to and from rescue coordination centres;

2 that safety-related calling be initiated only after determination that other communications are not present on these frequencies;

3 that safety-related calling be minimized and not cause interference to distress, urgency and safety communications,

invites administrations

to encourage the coast and ship stations under their jurisdiction to use digital selective calling techniques,

instructs the Secretary-General

to bring this Resolution to the attention of the IMO.

RESOLUTION 353 (WRC-03)

**Maritime mobile service identities for equipment
other than shipborne mobile equipment**

The World Radiocommunication Conference (Geneva, 2003),

noting

- a)* that there is a need to assign maritime mobile service identities (MMSIs) for Automatic Identification Systems (AIS) on search and rescue (SAR) aircraft and aids to navigation in accordance with Recommendation ITU-R M.1371;
- b)* that administrations are required to notify ITU of ship and coast station MMSI assignments, in accordance with Nos. **19.99** and **20.16**;
- c)* that ITU provides data of all notified ships through the Maritime Mobile Access and Retrieval System (MARS);
- d)* that AIS equipment uses the MMSI for its identification;
- e)* that AIS equipment may be a valuable tool for use by SAR aircraft,

noting further

- a)* that Recommendation ITU-R M.585 and the Radio Regulations do not address the assignment and use of MMSIs for SAR aircraft and aids to navigation;
- b)* that MMSIs used for AIS on SAR aircraft should be entirely different from MMSIs assigned to ships or coast stations;
- c)* that a unique format for SAR aircraft is required to ensure compatibility with AIS;
- d)* that administrations assigning an MMSI to SAR aircraft should notify ITU of this assignment so that it can be considered for inclusion in the MARS system,

considering

- a)* that some administrations at present have a national requirement to operate AIS equipment on board SAR aircraft;
- b)* that, with respect to using AIS on SAR aircraft, there is a need to develop a provision for a standard format of the identification number,

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resolves to invite ITU-R

to review the MMSI operational and procedural requirements and to develop an appropriate format which cannot be confused with the format used for ship and coast stations,

further resolves

in the light of results of the studies referred to in *resolves to invite ITU-R* above, to invite WRC-07 to consider necessary changes to the Radio Regulations to allow MMSIs for use on SAR aircraft,

instructs the Director of the Radiocommunication Bureau

to consider the possibility of making provision in the MARS system for the registration of MMSIs used on SAR aircraft, preferably without changing either the database format or the content of the paper publications,

invites administrations

to notify the Radiocommunication Bureau of MMSI assignments to SAR aircraft,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization, the International Civil Aviation Organization and the International Association of Marine Aids to Navigation and Lighthouse Authorities.

RESOLUTION 405

Relating to the use of frequencies of the aeronautical mobile (R) service¹

The World Administrative Radio Conference (Geneva, 1979),

considering

- a) that WARC-Aer2 adopted and developed a new Frequency Allotment Plan for the use of HF channels for the aeronautical mobile (R) service (Appendix 27);
- b) that air operations are subject to continuous changes;
- c) that these changes require attention by the administrations concerned; but
- d) that, in seeking to satisfy new communication requirements, no decision should be taken that will prevent or handicap the coordinated utilization of those high frequency aeronautical mobile (R) band allotments as prescribed in the Plan;
- e) that the families of frequencies allotted to the major world air route areas (MWARAs), regional and domestic air route areas (RDARAs) and sub-areas and VOLMET areas have been chosen considering propagation conditions which allow for the selection of the most suitable frequencies for the distances involved;
- f) that specific steps should be taken to ensure that the correct order of frequency is used;
- g) that it is essential to distribute the communication traffic load as uniformly as possible over the frequencies available;
- h) that frequencies have been allotted for worldwide use,

resolves

that administrations, individually or in collaboration, take the necessary steps:

- 1 to make as great a use as possible of higher frequencies in order to lessen the load on the HF aeronautical mobile (R) bands;
- 2 to make as great a use as possible of antennae of appropriate directivity and efficiency in order to minimize the possibilities of mutual interference within an area or between areas;

¹ WRC-97 made editorial amendments to this Resolution.

- 3 to coordinate the use of families of frequencies necessary for a given route segment in accordance with the technical principles in Appendix 27 and in the light of the propagation data available, to ensure that the most appropriate frequencies are used with an aircraft at a given distance from the aeronautical station providing service over the route segment concerned;
- 4 to improve operating techniques and procedures and to use equipment which will make it possible to attain the highest possible efficiency in handling air-ground HF communications;
- 5 to collect precise data on the operation of their HF communication systems, particularly data having a bearing on technical and operating standards, so as to facilitate re-examination of the Plan;
- 6 to establish, through regional arrangements, the best method of providing the communications required for any new long-distance international or regional air operation which is not or cannot be accommodated within the system of MWARA and RDARA, in such a manner as not to cause harmful interference to the utilization of frequencies as prescribed in the Plan.

RESOLUTION 413 (WRC-03)

Use of the band 108-117.975 MHz by aeronautical services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* the current allocation of the frequency band 108-117.975 MHz to the aeronautical radionavigation service (ARNS);
- b)* the current requirements of FM broadcasting systems operating in the frequency band 87-108 MHz;
- c)* that digital sound broadcasting systems are capable of operating in the frequency band at about 87-108 MHz as described in Recommendation ITU-R BS.1114;
- d)* the need for the aeronautical community to provide additional services by enhancing navigation and surveillance systems through a communication data link;
- e)* the need for the broadcasting community to provide digital terrestrial sound broadcasting services,

recognizing

- a)* that precedence must be given to the ARNS operating in the frequency band 108-117.975 MHz;
- b)* that, in accordance with Annex 10 of the Convention of the International Civil Aviation Organization (ICAO) on international civil aviation, all aeronautical systems must meet standards and recommended practices (SARPs) requirements;
- c)* that within ITU-R, compatibility criteria between FM broadcasting systems operating in the frequency band 87-108 MHz and the ARNS operating in the frequency band 108-117.975 MHz already exist, as indicated in the most recent version of Recommendation ITU-R SM.1009;
- d)* that all compatibility issues between FM broadcasting systems and ICAO standard ground-based systems for the transmission of radionavigation-satellite differential correction signals have been addressed,

noting

- a)* that aeronautical systems are converging towards a communication data link environment to support aeronautical navigation and surveillance functions, which need to be accommodated in existing radio spectrum;
- b)* that some administrations are planning to introduce digital sound broadcasting systems in the frequency band at about 87-108 MHz;

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c) that no compatibility criteria currently exist between FM broadcasting systems operating in the frequency band 87-108 MHz and the planned additional aeronautical systems in the adjacent band 108-117.975 MHz using aircraft transmission;

d) that no compatibility criteria currently exist between digital sound broadcasting systems capable of operating in the frequency band at about 87-108 MHz and aeronautical services in the band 108-117.975 MHz;

e) that surveillance functions include the observation of aircraft location and velocity, and weather conditions for the purpose of air traffic control and situational awareness/collision avoidance between aircraft,

resolves

1 that the provisions of this Resolution and of No. **5.197A** shall enter into force on 5 July 2003;

2 that any additional aeronautical systems¹ planned to operate in the frequency band 108-117.975 MHz shall, as a minimum, meet the FM broadcasting immunity requirements contained in Annex 10 of the ICAO Convention on International Civil Aviation for existing aeronautical radionavigation systems operating in this frequency band;

3 that additional aeronautical systems operating in the band 108-117.975 MHz shall place no additional constraints on the broadcasting service or cause harmful interference to stations operating in the bands allocated to the broadcasting service in the frequency band 87-108 MHz and No. **5.43** does not apply to systems identified in *recognizing d)*;

4 that frequencies below 112 MHz shall not be used for these additional aeronautical systems excluding the ICAO systems identified in *recognizing d)* until all potential compatibility issues with the lower adjacent frequency band 87-108 MHz have been resolved,

invites ITU-R

to study any compatibility issues between the broadcasting and aeronautical services that may arise from the introduction of these additional aeronautical systems as referenced in *noting a)*, or appropriate digital sound broadcasting systems, as described in Recommendation ITU-R BS.1114 and to develop new or revised ITU-R Recommendations as appropriate,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

¹ In the context of this Resolution, the term “additional aeronautical systems” refers to systems that transmit navigational information in support of air navigation and surveillance functions in accordance with recognized international aviation standards.

RESOLUTION 414 (WRC-03)

**Consideration of the frequency range between 108 MHz and 6 GHz
for new aeronautical applications**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that new technologies are needed to support communications and air navigation, including airborne and ground surveillance applications;
- b)* that the new technologies to support air navigation in *considering a)* may not conform to the definition of aeronautical radionavigation in the Radio Regulations;
- c)* that the current aeronautical mobile band from 117.975-137 MHz will become saturated in some areas of the world and will no longer be able to support the increasing and new requirements;
- d)* that new aviation security requirements are currently being defined internationally;
- e)* that new applications and concepts in air traffic management which are data intensive are envisioned;
- f)* that proposals to meet two current aviation safety objectives, i.e. to provide more information to the pilot and cockpit, and to reduce runway incursions, are being considered in the band 5 091-5 150 MHz;
- g)* that there are requirements to support data links that carry critical aeronautical data from systems such as air traffic control radars, wind shear radars, remote maintenance monitoring systems, runway lighting, low-level wind shear alert systems, automated weather surface observing systems, or automatic weather observation systems,

recognizing

that it may not be feasible to introduce some of these new aviation applications in certain bands used by aeronautical safety communications, radionavigation and surveillance due to the possible incompatibility problems or possible spectrum congestion,

noting

- a) that past experience has shown that the range 108 MHz to 6 GHz is suitable for aviation requirements;
- b) that Resolutions **114 (Rev.WRC-03)** and **413 (WRC-03)** call for compatibility studies in the relevant aeronautical bands,

resolves

that WRC-07 considers additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, taking into account *considering c) to g)* above,

further resolves to invite ITU-R

- 1 to investigate, as a first step, the bands currently available for use by aeronautical systems in the frequency range between 108 MHz and 6 GHz in order to determine whether additional allocations to the aeronautical mobile (R) service are required and can be accommodated in these bands without placing undue constraints to services to which the frequency bands are currently allocated;
- 2 to further investigate, in case the first step above would not lead to satisfactory results, also the frequency bands currently not available for use by aeronautical systems, subject to not constraining the existing and planned use of such bands, taking account of existing use and future requirements in these bands;
- 3 to investigate how to accommodate the requirements for aeronautical systems in the band 5 091-5 150 MHz,

further invites

all members of the Radiocommunications Sector and especially the International Civil Aviation Organization (ICAO) to contribute to these studies,

requests the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 415 (WRC-03)

Study of current satellite frequency allocations that will support the modernization of civil aviation telecommunication systems

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that some developing countries still lack an appropriate communication infrastructure that meets the evolving requirements of modern civil aviation;
- b) that the cost of providing and maintaining such an infrastructure, in particular a terrestrial infrastructure, is increasingly expensive, particularly in remote regions;
- c) that satellite communication systems provide a real possibility to meet the demands of the International Civil Aviation Organization (ICAO) communication, navigation, surveillance and air traffic management (CNS/ATM), especially in the areas where a terrestrial communication infrastructure is not available,

further considering

- a) that allocations to aeronautical services and for applications exist over a broad range of frequency bands;
- b) that technologies now exist where different services can be accommodated by efficient use of a single spacecraft or satellite network;
- c) that the benefits of establishing and utilizing satellite communication systems for civil aviation would also bring additional benefits for developing and sparsely populated countries by enabling the development of telecommunication systems in conjunction with the civil aviation systems,

noting

- 1 that Recommendation **34 (WRC-95)** states that future world radiocommunication conferences, whenever possible, should allocate frequency bands to the most broadly defined services with a view to providing maximum flexibility in spectrum use;
- 2 that Resolution **20 (Rev.WRC-2000)** resolves to instruct the Secretary-General “to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications”;
- 3 that there is a need to provide long-term spectrum availability for aeronautical satellite communications for safety purposes,

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resolves to invite WRC-07

1 to examine the possibility of broadening the services and applications of the use of current satellite frequency allocations in order to allow the expansion of ICAO CNS/ATM systems that can also support other non-aeronautical telecommunication services;

2 to take appropriate actions, based on the results of the examination specified under *resolves 1*,

invites ITU-R

1 to study, as a matter of urgency, the current satellite frequency allocations that could meet aeronautical requirements to support the modernization of civil aviation telecommunication systems, especially those in developing countries, and to study in particular those radio frequencies that could be used to support both ICAO CNS/ATM systems and other non-aeronautical telecommunication services,

further invites

1 the Telecommunication Development Bureau to also examine this issue and provide assistance, as appropriate, that would facilitate developing countries to participate in the work of the ITU-R on this matter;

2 ICAO, the International Air Transport Association (IATA), administrations and other organizations concerned to participate in the studies identified in *invites ITU-R* above,

requests the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 506 (Rev.WRC-97)

Use by space stations in the broadcasting-satellite service operating in the 12 GHz frequency bands allocated to the broadcasting-satellite service of the geostationary-satellite orbit and no other

The World Radiocommunication Conference (Geneva, 1997),

considering

- a)* that a Plan designating frequency assignments in the above-mentioned frequency bands and positions in the geostationary-satellite orbit was adopted by WARC SAT-77 for Regions 1 and 3;
- b)* that a similar Plan for Region 2 was adopted by the Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2 (Geneva, 1983);
- c)* that the Plans referred to in *considering a)* and *b)* above were consolidated in Appendix 30 at WARC Orb-85;
- d)* that the Plans in Appendices 30 and 30A for Regions 1 and 3 have been modified by this Conference,
- e)* that the operation of the broadcasting-satellite service in the frequency bands concerned in orbits other than the geostationary-satellite orbit might be incompatible with the Plans referred to in *considering a)*, *b)* and *d)* above,

resolves

that administrations shall ensure that their space stations in the broadcasting-satellite service in these frequency bands are operated in the geostationary-satellite orbit and no other.

RESOLUTION 507 (Rev.WRC-03)

**Establishment of agreements and associated plans
for the broadcasting-satellite service**

The World Radiocommunication Conference (Geneva, 2003),

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 antennas as could be set up for a broadcasting-satellite service may be an obstacle to changing the location of space stations in that service on the geostationary-satellite orbit, as of the date of their being brought into use;
- c)* that satellite broadcasts may create harmful interference over a large area of the Earth's surface;
- d)* that the other services with allocations in the same band need to use the band before the broadcasting-satellite service is set up,

resolves

- 1 that stations in the broadcasting-satellite service shall be established and operated in accordance with agreements and associated plans adopted by world or regional administrative conferences, and/or world or regional radiocommunication 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 during the period before the entry into force of such agreements and associated plans the administrations and the Radiocommunication Bureau shall apply the procedure contained in Resolution **33 (Rev.WRC-03)**,

invites the Council

to keep under review the question of world radiocommunication conferences, and/or regional radiocommunication conferences, as required, with a view to fixing suitable dates, places and agenda.

RESOLUTION 517 (Rev.WRC-03)

**Introduction of digitally modulated and single-sideband emissions in the
high-frequency bands between 5 900 kHz and 26 100 kHz
allocated to the broadcasting service**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that digital techniques are being introduced into many existing services;
- b) that digital and single-sideband (SSB) techniques allow more effective utilization of the frequency spectrum than double-sideband (DSB) techniques;
- c) that digital and SSB techniques enable reception quality to be improved;
- d) the relevant parts of Appendix 11 concerning the digital and SSB system specifications in the HF broadcasting services;
- e) that ITU-R, in its Recommendation ITU-R BS.1514, has recommended system characteristics for digital sound broadcasts in the broadcast bands below 30 MHz;
- f) that digital modulation techniques are expected to provide the means to achieve the optimum balance between sound quality, circuit reliability and bandwidth;
- g) that digitally modulated emissions can, in general, provide more efficient coverage than amplitude-modulated transmissions by using fewer simultaneous frequencies and less power;
- h) that it may be economically attractive, using current technology, to convert modern conventional DSB broadcasting systems to digital operation in accordance with *considering d*);
- i) that some DSB transmitters have been used with digital modulation techniques without transmitter modifications;
- j) that ITU-R is carrying out further studies on the development of broadcasting using digitally modulated emissions in the bands allocated to the broadcasting service below 30 MHz;
- k) that a long period could be needed for the introduction of digital broadcasting, taking into account the cost impact of replacement of transmitters and receivers,

resolves

1 that the early introduction of digitally modulated emissions as recommended by ITU-R in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service is to be encouraged;

2 that digitally modulated and SSB emissions shall comply with the characteristics specified in relevant parts of Appendix 11;

3 that whenever an administration replaces a DSB emission by an emission using digital or SSB modulation techniques, it shall ensure that the level of interference is not greater than that caused by the original DSB emission, and shall use the RF protection values specified in Resolution 543 (WRC-03) and Recommendation 517 (Rev.WRC-03);

4 that the continued use of DSB emissions may be reviewed by a future competent world radiocommunication conference based on administrations' experience with the introduction of digital HF broadcasting services,

instructs the Director of the Radiocommunication Bureau

to compile and provide to the future competent world radiocommunication conference referred to in *resolves* 4 the latest available complete statistics on the worldwide distribution of digital HF broadcasting receivers and transmitters,

invites ITU-R

to continue its studies on digital techniques in HF broadcasting with a view to assisting in the development of this technology for future use,

invites administrations

to encourage the inclusion in all new HF broadcasting transmitters put into service after 1 January 2004 of the capability to offer digital modulation,

further invites administrations

1 to assist the Director of the Radiocommunication Bureau by providing the relevant statistical data and to participate in ITU-R studies on matters relating to the development and introduction of digitally modulated emissions in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service;

2 to bring to the notice of transmitter and receiver manufacturers the recent results of relevant ITU-R studies on spectrum-efficient modulation techniques suitable for use at HF as well as the information referred to in *considering d)* and *e)*, and encourage the availability of affordable low-cost digital receivers.

RESOLUTION 525 (Rev.WRC-03)

**Introduction of high-definition television systems
of the broadcasting-satellite service in the
band 21.4-22.0 GHz in Regions 1 and 3**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-92 has reallocated the band 21.4-22.0 GHz in Regions 1 and 3 to the broadcasting-satellite service (BSS) to be implemented after 1 April 2007;
- b)* that until 1 April 2007 the existing services operating in the band 21.4-22.0 GHz in Regions 1 and 3 in accordance with the Table of Frequency Allocations are therefore entitled to continue operating without harmful interference from other services;
- c)* that it is nevertheless desirable to facilitate the introduction of experimental high-definition television (HDTV) systems in this band before 1 April 2007 without affecting the continued operation of existing services;
- d)* that it also may be possible to introduce operational HDTV systems in this band before 1 April 2007 without affecting the continued operation of existing services;
- e)* that after 1 April 2007 the introduction of HDTV systems in this band must be regulated in a flexible and equitable manner until such time as a future competent world radiocommunication conference has adopted definitive provisions for this purpose in accordance with Resolution **507 (Rev.WRC-03)**;
- f)* that procedures are required for the three sets of circumstances envisaged in *considerings c), d) and e)* above,

resolves

to adopt the interim procedures contained in the Annex hereto with effect from 1 April 1992,

invites all administrations

to comply with the above procedures,

instructs the Radiocommunication Bureau

to apply the above procedures.

ANNEX TO RESOLUTION 525 (Rev.WRC-03)

Interim procedures for the introduction of BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3

Section I – General provisions

1 It shall be understood that prior to 1 April 2007 all existing services in the band 21.4-22.0 GHz in Regions 1 and 3 operating in accordance with the Table of Frequency Allocations shall be entitled to continue to operate. After that date they may continue to operate, but they shall neither cause harmful interference to BSS (HDTV) systems nor be entitled to claim protection from such systems. It shall be understood that the introduction of an operational BSS (HDTV) system in the band 21.4-22.0 GHz in Regions 1 and 3 should be regulated by an interim procedure in a flexible and equitable manner until the date to be decided by a future competent conference.

Section II – Interim procedure relating to experimental BSS (HDTV) systems introduced before 1 April 2007

2 For the purpose of introducing experimental BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3 before 1 April 2007 under the provisions of Article 27, the procedures contained in Sections A to C of Resolution 33 (Rev.WRC-03) or in Articles 9 to 14, as appropriate (see *resolves* 1 and 2 of Resolution 33 (Rev.WRC-03)), shall be applied.

Section III – Interim procedure relating to operational BSS (HDTV) systems introduced before 1 April 2007

3 For the purpose of introducing operational BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3 before 1 April 2007, the procedure contained in Resolution 33 (Rev.WRC-03) shall be applied, if the power flux-density at the Earth's surface produced by emissions from a space station, on the territory of any other country, exceeds:

- $-115 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band for angles of arrival between 0° and 5° above the horizontal plane; or
- $-105 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band for angles of arrival between 25° and 90° above the horizontal plane; or
- values to be derived by linear interpolation between these limits for angles of arrival between 5° and 25° above the horizontal plane.

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

4 If the power flux-density at the Earth's surface produced by emissions from a space station does not exceed these limits, the procedure in Section A of Resolution 33 (Rev.WRC-03) or No. 9.11, as appropriate (see *resolves* 1 and 2 of Resolution 33 (Rev.WRC-03)) shall not be applied.

**Section IV – Interim procedure relating to BSS (HDTV) systems
introduced after 1 April 2007**

5 For the purpose of introducing and operating BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3 after 1 April 2007, and before a future conference has taken decisions on definitive procedures, all relevant provisions of Articles **9** to **14** except No. **9.11** shall be applied.

6 For the purpose of this Section, BSS (HDTV) systems introduced under provisions of Sections II and III of this Resolution shall be taken into account.

7 Administrations shall, to the maximum extent possible, seek to ensure that operational BSS (HDTV) systems introduced in the band 21.4-22.0 GHz in Regions 1 and 3 under Sections III or IV of this Resolution have characteristics which take into account the studies of the ITU-R for the preparation of a future competent world radiocommunication conference.

RESOLUTION 526 (WARC-92)

Future adoption of procedures to ensure flexibility in the use of the frequency band allocated to the broadcasting-satellite service (BSS) for wide RF-band high-definition television (HDTV) and to the associated feeder links¹

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

- a) that WARC-92 has added an allocation to the BSS in the bands 21.4-22.0 GHz in Regions 1 and 3 and 17.3-17.8 GHz in Region 2 for use by wide RF-band HDTV;
- b) that considerable further technological development of wide RF-band HDTV is expected before it can be introduced for general operational use;
- c) that this Conference has adopted interim provisions to be applied during the period before 1 April 2007 to regulate the introduction of experimental or operational BSS (HDTV) systems (see Resolution **525 (WARC-92)***);
- d) that in the longer term regulatory provisions designed to ensure flexible and equitable use of the BSS (HDTV) and associated feeder-link allocations will be necessary to replace these interim provisions,

resolves to urge all administrations

to study the development of future regulatory provisions for BSS (HDTV) to ensure flexibility in the use of the bands 21.4-22.0 GHz in Regions 1 and 3 and 17.3-17.8 GHz in Region 2, having regard to the interests of all countries and the state of technical development of this new service,

instructs the Secretary-General

to bring this Resolution to the attention of the Council with a view to placing an appropriate item on the agenda of a future world radiocommunication conference.

¹ WRC-97 made editorial amendments to this Resolution.

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

RESOLUTION 527 (WARC-92)

Terrestrial VHF digital sound broadcasting¹

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

- a)* that advances in technology have made available digital sound broadcasting systems of high quality;
- b)* that such digital sound broadcasting systems will offer a considerably higher sound quality as well as additional system characteristics which the present FM broadcasting system does not possess;
- c)* that digital sound broadcasting can, in addition to possessing the properties mentioned above, permit greater spectrum efficiency than conventional FM sound broadcasting;
- d)* that digital sound broadcasting systems require less effective radiated power;
- e)* that the bands 87.5-108 MHz in Region 1, 88-108 MHz in Region 2 and 87-108 MHz in Region 3 are generally widely used for high-powered FM sound broadcasting service, except in some countries;
- f)* that several European countries are considering the implementation of digital sound broadcasting on an interim basis in the VHF bands allocated to the broadcasting service, while ensuring the protection of assignments in the relevant broadcasting Plans in force,

resolves to invite the ITU-R

in order to harmonize the implementation of terrestrial digital sound broadcasting:

- 1 to undertake, as a matter of urgency, the relevant technical studies associated with the introduction of terrestrial digital sound broadcasting, focusing primarily on the VHF broadcasting bands;
- 2 in particular, to consider the system characteristics and propagation phenomena in relation to developing compatibility criteria in the same and adjacent bands, including protection of the safety services,

¹ WRC-97 made editorial amendments to this Resolution.

RES527-2

invites the Telecommunication Development Bureau

to include among its priorities the definition of a project relating to the study by the ITU-R of exceptional severe propagation phenomena in the regions of concern to developing countries,

instructs the Secretary-General

to bring this Resolution to the attention of the Council with a view to placing on the agenda of a competent radiocommunication conference the subject of terrestrial VHF digital sound broadcasting for Region 1 countries and interested countries in Region 3,

invites administrations

to contribute actively to the relevant ITU-R studies.

RESOLUTION 528 (Rev.WRC-03)

Introduction of the broadcasting-satellite service (sound) systems and complementary terrestrial broadcasting in the bands allocated to these services within the range 1-3 GHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WARC-92 has made frequency allocations to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting;
- b)* that it is necessary to ensure that the introduction of the broadcasting-satellite service (sound) and complementary terrestrial broadcasting proceeds in a flexible and equitable manner;
- c)* that efficient use of the spectrum will be enhanced by a worldwide allocation;
- d)* that a worldwide allocation may cause difficulties to some countries in relation to their existing services;
- e)* that future planning may limit the effect on other services,

resolves

- 1 that a competent conference should be convened, preferably not later than 1998, for the planning of the broadcasting-satellite service (sound) in the bands allocated to this service in the range 1-3 GHz; and the development of procedures for the coordinated use of complementary terrestrial broadcasting;
- 2 that this conference should review criteria for sharing with other services;
- 3 that in the interim period, broadcasting-satellite systems may only be introduced within the upper 25 MHz of the appropriate band in accordance with the procedures contained in Sections A to C of Resolution **33 (Rev.WRC-03)**, or in Articles **9** to **14**, as appropriate (see *resolves* 1 and 2 of Resolution **33 (Rev.WRC-03)**). The complementary terrestrial service may be introduced during this interim period subject to coordination with administrations whose services may be affected;
- 4 that the calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant ITU-R Recommendations agreed by the administrations concerned as a result of Resolution **703 (Rev.WARC-92)*** or otherwise,

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

RES528-2

invites the ITU-R

to conduct the necessary studies prior to the conference,

instructs the Secretary-General

to bring this Resolution to the attention of the Council to consider including in the agenda of a radiocommunication conference to be held preferably not later than the year 1998 the matters addressed above.

RESOLUTION 533 (Rev.WRC-2000)

**Implementation of the decisions of WRC-2000 relating to processing
of proposed networks submitted under Articles 4, 6 and 7 of
Appendices 30 and 30A to the Radio Regulations**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that this Conference revised the Appendix **30** Regions 1 and 3 Plan which, through decisions of WRC-2000, has been structured into a Regions 1 and 3 Plan and a Regions 1 and 3 List;¹
- b)* that similarly, this Conference revised the 14.5-14.8 GHz and 17.3-18.1 GHz Appendix **30A** Regions 1 and 3 feeder-link Plans and structured it into Regions 1 and 3 feeder-link Plans and Regions 1 and 3 feeder-link Lists¹;
- c)* that the R1/R3 downlink Plan and the initial R1/R3 downlink List (and the associated R1/R3 feeder-link Plans and initial R1/R3 feeder-link Lists) were analysed and were confirmed to be compatible with each other;
- d)* that compatibility must be ensured between the R1/R3 downlink Plan (and the associated R1/R3 feeder-link Plans) and:
 - the other services in all three Regions having primary allocations in the bands used by the R1/R3 downlink and feeder-link Plans;
 - the Region 2 Plan;
- e)* that this Conference has adopted new sharing criteria and associated calculation methods which are included in, or referenced in, the Annexes to Appendices **30** and **30A**;

¹ Hereinafter within this Resolution the Appendix **30** Regions 1 and 3 Plan is referred to as the “R1/R3 downlink Plan” and the Appendix **30** Regions 1 and 3 List is referred to as the “R1/R3 downlink List”. Similarly, the Appendix **30A** Regions 1 and 3 feeder-link Plans are referred to as the “R1/R3 feeder-link Plans” and the Appendix **30A** Regions 1 and 3 feeder-link Lists are referred to as the “R1/R3 feeder-link Lists”.

- f)* that “existing”² systems and “Part B”³ systems included in the R1/R3 downlink and feeder-link Plans and Lists as established by WRC-2000 have been determined to be compatible with the other services in the three Regions having primary allocations in the bands used by the R1/R3 downlink and feeder-link Plans, and with the Region 2 Plan;
- g)* that during WRC-2000 the R1/R3 downlink Plan (and the associated R1/R3 feeder-link Plans) were not analysed in order to identify any incompatibility with the other services in the three Regions having primary allocations in the bands used by the R1/R3 downlink and feeder-link Plans, and with the Region 2 Plan;
- h)* that since assignments in the initial R1/R3 downlink List (and the associated R1/R3 feeder-link Lists) have completed coordination with the other services in the three Regions having primary allocations in the bands used by the R1/R3 downlink and feeder-link Plans, and with the Region 2 Plan, using the compatibility criteria in force at the time of WRC-2000, there will be no additional compatibility requirements associated with entries in the initial R1/R3 downlink List or the R1/R3 feeder-link Lists;
- i)* that proposed additional assignments would only enter the evolving R1/R3 downlink List after they have satisfied all compatibility requirements with the R1/R3 downlink Plan, with the existing R1/R3 downlink List, with other Appendix 30 Article 4 submissions with prior dates of receipt, with the other services in the three Regions having primary allocations in the bands used by the R1/R3 downlink and feeder-link Plans, and with the Region 2 Plan;
- j)* that proposed additional assignments would only enter the evolving R1/R3 feeder-link Lists after they have satisfied all compatibility requirements with the R1/R3 feeder-link Plans, with the existing R1/R3 feeder-link Lists, with other Appendix 30A Article 4 submissions with prior dates of receipt, with the other services in the three Regions with primary allocations in the same band, and with the Region 2 Plan,

recognizing

that the Radiocommunication Bureau needs clear instructions from this Conference on how to deal with the large number of Appendices 30 and 30A Article 4 submissions that have either been processed or are currently being processed which might affect the R1/R3 downlink and feeder-link Plans and Lists, other Appendices 30 and 30A Article 4 submissions with

² Whenever the term “existing” is used in this Resolution, it refers to the notified assignments that are in conformity with Appendices 30 and 30A, which have been brought into use and for which the date of bringing into use has been confirmed to the Bureau before 1700 h (Istanbul time) on 12 May 2000.

³ Whenever the term “Part B” is used in this Resolution, it refers to the assignments for which the procedures of Article 4 of Appendices 30 and 30A have been successfully completed and for which due diligence information has been provided (when required) before 1700 h (Istanbul time) on 12 May 2000, but which have not been brought into use and/or the date of bringing into use has not been confirmed to the Bureau.

prior dates of receipt, the other services in the three Regions having primary allocations in the bands used by the R1/R3 downlink and feeder-link Plans, and the Region 2 Plan,

resolves

1 that following WRC-2000 the Bureau shall compute the reference situations of the R1/R3 downlink Plan and the R1/R3 downlink List and the R1/R3 feeder-link Plans and R1/R3 feeder-link Lists as at 3 June 2000 and publish this information in a circular letter;

2 that as from 3 June 2000 the Bureau shall use the revised Appendices **30** and **30A** as adopted at this Conference in its examination of submissions received after the Conference;

3 that the Bureau shall review, in date of receipt order, all Special Sections already published⁴ in order to determine the requirement for coordination with respect to the R1/R3 downlink Plan, the R1/R3 feeder-link Plans, the R1/R3 downlink List and the R1/R3 feeder-link Lists and with other Article 4 submissions which have dates of receipt prior to the date of the Special Section in question (AP30/E or AP30A/E), using the revised Appendices **30** and **30A** as adopted by this Conference;

3.1 within four months from the date of publication of the above-mentioned corrigenda, possibly affected administrations should provide comments to the Bureau and to the notifying administration and shall indicate any still valid coordination agreements;

3.2 the existing time period for bringing the modifications into use, i.e. five years plus a possible extension of three years, will continue to be counted as from the date of receipt of the modification by the Bureau of the complete Annex 2 information pertaining to the request for modification, but shall be extended by a period equal to the time between 3 June 2000 and the date of publication of the relevant corrigenda to the Special Section;

4 that as from the end of this Conference the Bureau shall process all as yet unpublished requests for modifications under Article 4 which were received prior to 3 June 2000, in the same date order of receipt by the Bureau of the complete information on the request for modification and, using the revised Appendices **30** and **30A** as adopted at this Conference, identify for each as yet unpublished request for modification the list of administrations whose agreement is required and publish this list of affected administrations;

4.1 within four months from the date of the above publication, possibly affected administrations should provide comments to the Bureau and to the notifying administration and shall indicate any still valid coordination agreements;

⁴ See also Notes 5a) and 6 in § 11.2 of Article 11 of Appendix **30** and Notes 5 and 6 in § 9A.2 of Article 9A of Appendix **30A** with respect to assignments in the Region 2 Plan.

4.2 the existing time period for bringing the modifications into use, i.e. five years plus a possible extension of three years, will continue to be counted as from the date of receipt of the modification by the Bureau of the complete Annex 2 information pertaining to the request for modification, but shall be extended by a period equal to the time between 3 June 2000 and the date of publication of the last relevant corrigenda to the Special Sections described in *resolves* 3;

5 that in examining the requirement for coordination of other services in all three Regions with the WRC-2000 R1/R3 downlink and feeder-link Plans and Lists in the cases described in *resolves* 3, the following methodology shall be applied in accordance with Resolution **53 (Rev.WRC-2000)***, Article 11 of Appendix **30** and Article 9A of Appendix **30A** for:

- protection from fixed-satellite service assignments already published. The Bureau shall review all relevant Special Sections of the series (for example, AP30/C) previously published, and publish corrigenda where required;
- protection from fixed-satellite service assignments not yet processed. The Bureau shall determine the requirement for coordination and publish the request in its International Frequency Information Circular (BR IFIC). The administrations responsible for the fixed-satellite service assignments shall then initiate coordination with the affected assignments in the WRC-2000 R1/R3 downlink and feeder-link Plans and Lists;
- protection from terrestrial assignments already in process. The Bureau shall determine the requirement for coordination and publish the request in its BR IFIC. The administration responsible for the terrestrial assignments shall then initiate coordination with the affected assignments in the WRC-2000 R1/R3 downlink and feeder-link Plans and Lists.

* *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

RESOLUTION 535 (Rev.WRC-03)

**Information needed for the application of Article 12
of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

that WRC-97 adopted Article **12** as a simple and flexible seasonal planning procedure for high-frequency broadcasting (HFBC) based on coordination,

considering further

that appropriate Rules of Procedure are to be developed by the Radiocommunication Bureau and adopted by the Radio Regulations Board,

instructs the Director of the Radiocommunication Bureau

1 to consider the information contained in the Annex to this Resolution in developing the Rules of Procedure;

2 to consider improvements to the established arrangements for the preparation, publication and dissemination of the information relating to the application of Article **12**, in consultation with administrations and regional coordination groups,

invites administrations

1 to support the Director of the Radiocommunication Bureau in the preparation of these Rules of Procedure and in the development and testing of any accompanying computer software;

2 to submit their schedules in a common electronic format to be defined in the Rules of Procedure,

instructs the Secretary-General

to consider provision of the necessary funding to enable developing countries to participate fully in the application of Article **12** and relevant radiocommunications seminars.

ANNEX TO RESOLUTION 535 (Rev.WRC-03)

This Annex responds to the need for information in the application of Article 12; the flowchart in Description 2 provides an overview of the Procedure.

1 Software development

The Procedure will require a number of user-friendly software modules to be developed, tested and supplied to administrations by the Bureau. This will ensure that the same software modules are used by administrations and the Bureau for the analysis of the schedules.

The Bureau should:

- develop the aforementioned software with assistance from administrations;
- distribute the software, together with user instructions and relevant documentation;
- organize training in the use of the software;
- monitor the functional performance of the software and, if required, make necessary modifications.

2 Software modules

Data capture of requirements

A new module will be required that permits the capture of all data elements detailed in Description 3. This module should also contain validation routines that prevent inconsistent data being captured and sent to the Bureau for processing.

Propagation calculation

This new module should calculate the field strength and other necessary data at all relevant test points as described in Descriptions 1 and 4.

It should also include an option that allows administrations to select the optimum frequency bands for their requirements.

The output format of the data and the medium should be such as to allow easy publication and distribution of the results to all administrations.

The results of these calculations should be displayable in a graphical format.

Compatibility analysis

This module should use the output of the propagation calculation to provide a technical analysis of a requirement both alone and in the presence of other requirements as in Description 4. This analysis would be used in the coordination process.

The values for the parameters given in Description 4 should be user selectable, but in the absence of other values the recommended default values should be used.

The results of this analysis should be capable of being displayed in a graphical format for a defined service area as in Description 4.

Data query

This module should enable the user to perform typical data query functions.

DESCRIPTION 1

Selection of suitable frequency band(s)

General

In order to assist broadcasters and administrations in the preparation of their HF broadcasting requirements, the Bureau will prepare and distribute suitable computer software. This should be easy to use and the output should be easy to understand.

User input data

The user should be able to enter:

- the name of the transmitting station (for reference purposes);
- the geographic coordinates of the transmitting station;
- the transmitter power;
- the bands which are available for use;
- hours of transmission;
- sunspot number;
- months during which a service is required;
- the available antenna types, together with the relevant directions of maximum radiation;
- the required coverage area specified as a set of CIRAF zones and quadrants (or by means of relevant geographic information).

It is desirable that the software should be able to store the above information, once it has been entered correctly, and provide the user with an easy means of recalling any previously entered information.

Methodology and data

The software should use:

- Recommendation ITU-R BS.705 for the calculation of antenna patterns;
- Recommendation ITU-R P.533 for the prediction of wanted field-strength values;
- Recommendation ITU-R P.842 for the calculation of reliability values.

The set of 911 test points (agreed at WARC HFBC-87) should be used, supplemented where necessary with test points based on a geographic grid.

The software should calculate the field strength values and the fading margins at each test point inside the required service area for each of the frequency bands declared to be available, taking account of the relevant transmitting antenna characteristics for each frequency band. The desired RF signal-to-noise ratio should be user selectable with a default value of 34 dB in the case of double sideband (DSB) or as provided in the most recent version of Recommendation ITU-R BS.1615, as appropriate, in the case of digital emissions.

The dates for which calculations are made should be user selectable, the default values being:

- 0.5 month after the start of the season;
- mid-point of the season;
- 0.5 month before the end of the season.

The times for which calculations are made should be user selectable, the default values being:

- 30 min past the hour in which the requirement starts;
- 30 min past each successive hour until the hour in which the requirement stops.

Software output data

For rapid assessment of suitable bands, the software should calculate:

- the basic service reliability for each available band and for the relevant test points from the set of 911 test points;
- the basic area reliability for each available band and for the relevant test points from the set of 911 test points.

In order to provide information about the geographic distribution of wanted signal values within the required service area, additional results should be available from the software:

- a listing should be available giving, for each of the available bands, the basic circuit reliability (BCR) for each of the test points (from the set of 911 test points) inside the required service area.

In some cases, a graphical display of the BCR values throughout the required service area may be desirable. These values should be calculated at test points at 2° intervals of latitude and longitude throughout the required service area.

The BCR values should be displayed graphically as a set of coloured or hatched “pixels” scaled in steps of 10%. It should be noted that:

- reliability values relate to the use of a single frequency band;
- reliability values are a function of the desired RF signal-to-noise ratio (user selectable);
- the field-strength values should be calculated by the supplied software on the user’s own computer hardware. The software supplied should calculate the relevant reliability values based on these field-strength values and the user-supplied desired RF signal-to-noise values.

DESCRIPTION 2

Time sequence for the Procedure

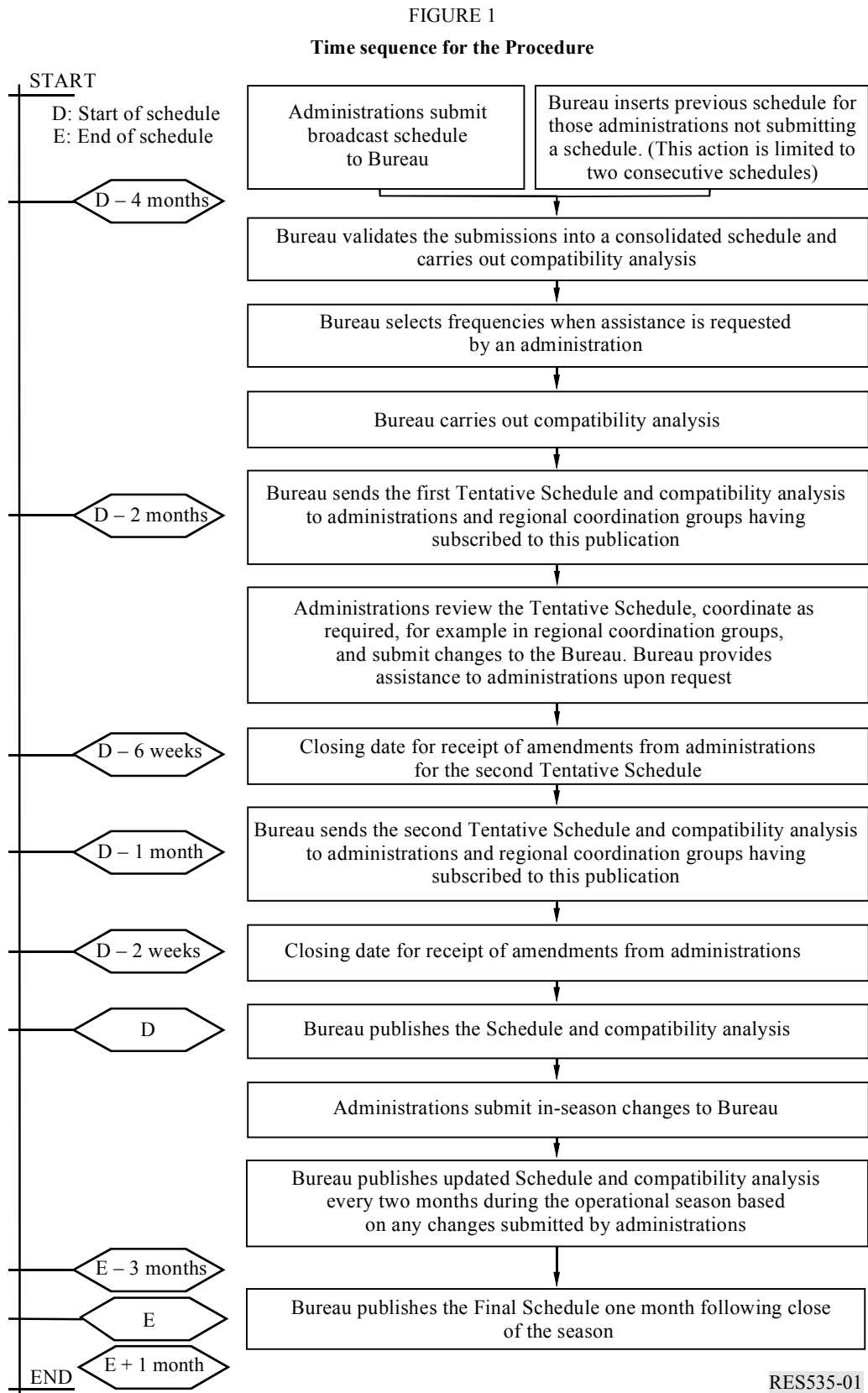
In the sequence outlined below, the start date for a given schedule period is defined as D and the end date for the same schedule period is defined as E.

Date	Action
D – 4 months	Closing date for administrations to send their schedules ¹ to the Radiocommunication Bureau (Bureau), preferably by electronic mail or on 3.5" diskette (720 kbytes or 1.44 Mbytes). Schedule data will be made available via TIES as soon as it has been processed.
D – 2 months	Bureau to send to administrations a consolidated schedule (the first Tentative Schedule) together with a complete compatibility analysis ² .
D – 6 weeks	Closing date for receipt of amendments from administrations to correct errors and other changes resulting from the coordination process to ensure that this information appears in the second Tentative Schedule for D – 1 month.
D – 1 month	Bureau to send to administrations a consolidated schedule (the second Tentative Schedule) together with a complete compatibility analysis ² .
D – 2 weeks	Closing date for receipt of amendments from administrations to correct errors and other changes resulting from the coordination process to ensure that this information appears in the Schedule for date D.
D	Bureau to issue the High Frequency Broadcasting Schedule and compatibility analysis.
D to E – 3 months	Administrations to correct errors and coordinate in-season changes of requirements, sending information to the Bureau as it becomes available. Bureau to issue updates of the Schedule and compatibility analysis at intervals of two months.
E	Closing date for receipt of final operational schedules from administrations to Bureau. No input is needed if there have been no changes to the information previously sent.
E + 1 month	Bureau to send to administrations the final consolidated schedule (the Final Schedule) together with a compatibility analysis.

¹ See Description 3.

² See Description 4. The schedules and the results of the analyses should be available on CD-ROM and in TIES.

Figure 1 shows, in flow chart form, the time sequence for the Procedure.



DESCRIPTION 3

Specification of input data for a requirement

The fields needed for a given requirement and their specifications are:

- frequency in kHz, up to 5-digit integer;
- start time, as 4-digit integer;
- stop time, as 4-digit integer;
- target service area, as a set of up to 12 CIRAF zones and quadrants up to a maximum of 30 characters;
- site code, a 3-character code from a list of codes, or a site name and its geographic coordinates;
- power in kW, up to 4-digit integer;
- azimuth of maximum radiation;
- slew angle, up to 2-digit integer representing the difference between the azimuth of maximum radiation and the direction of unslewed radiation;
- antenna code, up to 3-digit integer from a list of values, or a full antenna description, as given in Recommendation ITU-R BS.705;
- days of operation;
- start date, in the case that the requirement starts after the start of the schedule;
- stop date, in the case that the requirement stops before the end of the schedule;
- modulation choice, to specify if the requirement is to use DSB, single-side band (SSB) (see Recommendation ITU-R BS.640) or digital emission (see Recommendation ITU-R BS.1514). This field may be used to identify any other type of modulation when this has been defined for use by HFBC in an ITU-R Recommendation;
- administration code;
- broadcasting organization code;
- identification number;
- identification of synchronization with other requirements.

DESCRIPTION 4

Compatibility analysis**General**

In order to assess the performance of each requirement in the presence of noise and of the potential interference from other requirements using the same or adjacent channels, it is necessary to calculate the relevant reliability values. To this end, the Bureau will prepare suitable software, taking account of user requirements in terms of desired signal-to-noise and signal-to-interference ratios.

Input data

The schedule for a given season – this may be either an initial consolidated schedule (to permit assessment of those requirements which need coordination) or the High Frequency Broadcasting Schedule (to permit assessment of the likely performance of requirements during the relevant season).

Methodology and data

The software should use:

- Recommendation ITU-R BS.705 for the calculation of antenna patterns;
- Recommendation ITU-R P.533 for the prediction of the wanted field strength values at each test point for each wanted requirement;
- Recommendation ITU-R P.533 for the prediction of the potentially interfering field-strength values from all other co-channel or adjacent channel requirements at each test point for each wanted requirement;
- Recommendations **517 (Rev.WRC-03)** and ITU-R BS.560 for adjacent channel RF protection ratios;
- Recommendation ITU-R P.842 for the calculation of reliability values.

The set of 911 test points (agreed at WARC HFBC-87) should be used, supplemented where necessary with test points based on a geographic grid.

The software should calculate the wanted and unwanted field-strength values and the fading margins at each test point inside the required service area.

The desired RF signal-to-noise and RF protection ratios should be user selectable, the default values being 34 dB and 17 dB (DSB-to-DSB co-channel case), respectively. In the case of digital emissions, the desired RF signal-to-noise ratios are as provided in the most recent version of Recommendation ITU-R BS.1615. The default values of RF protection ratio to be used by the Bureau for its compatibility analyses are given in Section I of the Annex to Resolution **543 (WRC-03)**.

The dates for which a compatibility analysis is made should be user selectable, the default values being:

- 0.5 month after the start of the season;
- mid-point of the season;
- 0.5 month before the end of the season.

These default values should be used by the Bureau for its compatibility analyses.

The times for which a compatibility analysis is made should be user selectable, the default values being:

- 30 min past the hour in which the requirement starts;
- 30 min past each successive hour until the hour in which the requirement ends.

These default values should be used by the Bureau for its compatibility analyses.

Software output data

For rapid assessment of the performance of a requirement, the software should calculate:

- the overall service reliability for the relevant test points from the set of 911 test points;
- the overall area reliability for the relevant test points from the set of 911 test points.

In order to provide information about the geographic distribution of wanted and unwanted signal values for a given requirement, additional results should be available from the software:

- a listing should be available giving the overall circuit reliability for each of the relevant test points from the set of 911 test points.

In some cases, a graphical display of the coverage achieved throughout a required service area may be desirable. These values will need to be calculated by the user (with the supplied software and on the user's own computer hardware) at test points at 2° intervals of latitude and longitude throughout the required service area. The values should be displayed graphically as a set of coloured or hatched pixels in steps of 10%. It should be noted that:

- reliability values relate to the use of a single frequency;
- reliability values are a function of the desired RF signal-to-noise and RF protection ratios (both user selectable);
- the field-strength values for the test points (from the set of 911 test points) inside the required service area should be calculated by the Bureau. The software supplied should calculate the relevant reliability values based on these pre-calculated field strength values and the user-supplied desired signal-to-noise and signal-to-interference values;
- the field-strength values for the test points at 2° intervals should be calculated using the supplied software on the user's own computer hardware. The software supplied should calculate the relevant reliability values based on these field strength values and the user-supplied desired signal-to-noise and signal-to-interference values.

RESOLUTION 536 (WRC-97)

Operation of broadcasting satellites serving other countries

The World Radiocommunication Conference (Geneva, 1997),

considering

- a) the institutional nature of the ITU which is founded on an agreement between its Member States;
- b) the treaty status of the Plans in Appendices **30** and **30A**;
- c) that these Plans were established on the basis of planning principles which included, *inter alia*, that the Plans should be based mainly on national coverage;
- d) the increasing number of applications under Article 4 of Appendices **30** and **30A** for modifications to the Plans, leading to many multinational systems;
- e) that No. **23.13** requires that “In devising the characteristics of a space station in the broadcasting-satellite service, all technical means available shall be used to reduce, to the maximum, the radiation over the territory of other countries unless an agreement has been previously reached with such countries”;

recognizing

- a) that current technology provides opportunities to implement broadcasting-satellite systems with service areas that exceed national coverage;
- b) that several such systems have been implemented and others are being planned;
- c) that successful Appendices **30** and **30A** Article 4 coordination of such systems does not in any way imply licensing authorization to provide a service within the territory of a Member States,

resolves

that, in addition to observing No. **23.13**, and before providing satellite broadcasting services to other administrations, administrations originating the services should obtain the agreement of those other administrations.

RESOLUTION 539 (Rev.WRC-03)

**Use of the band 2 605-2 655 MHz in certain Region 3 countries
by non-geostationary satellite systems in the
broadcasting-satellite service (sound)**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the band 2 535-2 655 MHz is allocated under No. **5.418** to the broadcasting-satellite service (BSS) (sound) in certain Region 3 countries;
- b)* that the provisions of Resolution **528 (WARC-92)** currently limit the use of this band by systems in the BSS (sound) to the upper 25 MHz of the band;
- c)* that, prior to WRC-2000, there were no coordination procedures applicable to non-geostationary (non-GSO) BSS (sound) systems in this band in relation to other non-GSO or GSO satellite networks;
- d)* that satellite technology has now advanced to the stage where non-GSO systems in the BSS (sound) are technically and economically feasible when operated with high elevation angles and that there are practical designs available to ensure that the radiation of the non-GSO satellite in the BSS (sound) outside the main beam is kept at low levels;
- e)* that satellite systems in the BSS as described in *considering d)* can be used for the delivery of high-quality, spectrally efficient BSS (sound) to portable and mobile terminals;
- f)* that non-GSO systems in the BSS (sound) in the band 2 630-2 655 MHz in Region 3 have been notified to ITU and are expected to be brought into use in the near future;
- g)* that, prior to WRC-2000, the protection of existing terrestrial services was addressed through the coordination procedures of No. **9.11**;
- h)* that the provision cited in *considering g)* may be inadequate to ensure the future deployment of terrestrial services in this band;
- i)* that a regulatory procedure is required in order to meet the dual objectives of providing adequate long-term protection to existing and planned terrestrial services while not placing undue constraints on the development and implementation of the non-GSO BSS (sound) system;
- j)* that there are non-GSO systems being planned for operation in the BSS (sound) in the band 2 605-2 655 MHz in Region 3 that have highly elliptical orbits;

k) that ITU-R has undertaken studies of the likely aggregate interference from a number of co-frequency broadcasting-satellite systems sharing with the terrestrial services on a co-primary basis;

l) that ITU-R has undertaken studies that assumed there is only one satellite active at any time in a non-GSO system operating in a highly elliptical orbit,

invites

a) administrations planning to operate non-GSO BSS (sound) systems in accordance with this Resolution, to take measures to design the system to minimize interference to terrestrial services outside the non-GSO BSS (sound) service area, for example as in *considering d)* above;

b) administrations, whose territory is geographically close to the territory of an administration planning to operate a non-GSO BSS (sound) system in accordance with this Resolution, and for which there is a correspondingly high elevation angle to the active satellite, to take measures to facilitate the operation of non-GSO BSS (sound) systems,

resolves

1 that any BSS (sound) system using non-geostationary orbits brought into operation in the band 2 605-2 655 MHz in Region 3 shall be operated such that the minimum elevation angle over the service area is not less than 55°, for the purposes of sharing with terrestrial services;

2 that, before an administration notifies to the Radiocommunication Bureau or brings into use a frequency assignment for a BSS (sound) system using non-GSO satellites in the band 2 630-2 655 MHz, for which complete Appendix 4 coordination information or notification information has been received after 2 June 2000, and in the band 2 605-2 630 MHz for which complete Appendix 4 coordination information or notification information has been received after 4 July 2003, the following regulatory arrangements shall apply.

The following mask of power flux-density values at the Earth's surface produced by emissions from a space station for all conditions and for all methods of modulation shall be used as the basis of the regulatory procedures of this Resolution:

-130	dB(W/(m ² · MHz))	for 0° ≤ θ ≤ 5°
-130 + 0.4 (θ - 5)	dB(W/(m ² · MHz))	for 5° < θ ≤ 25°
-122	dB(W/(m ² · MHz))	for 25° < θ ≤ 45°
-122 + 0.2 (θ - 45)	dB(W/(m ² · MHz))	for 45° < θ ≤ 65°
-118 + 0.09 (θ - 65)	dB(W/(m ² · MHz))	for 65° < θ ≤ 76°
-117	dB(W/(m ² · MHz))	for 76° < θ ≤ 90°

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees.

These values relate to the power flux-density and angles of arrival which would be obtained under free-space propagation conditions.

Furthermore:

- for angles of arrival less than 76° in the power flux-density mask above, if the limits are exceeded, the notifying administration shall obtain the explicit agreement from any administration identified by the Bureau in its examination below;
- for angles of arrival from 76° to 90° in the power flux-density mask above, the coordination procedure with respect to those administrations identified by the Bureau in its examination below will be that of No. **9.11**;

3 that systems in the BSS (sound) using non-GSO satellites shall be limited to national services unless agreement has been reached to include the territories of other administrations in the service area;

4 that, within the context of this Resolution, an administration listed in No. **5.417A** or **5.418** shall not have simultaneously two overlapping frequency assignments, one under that provision, and the other one under provision No. **5.416**;

5 that, as from 5 July 2003, the Bureau and administrations shall apply the provisions of Articles **9** and **11** taking into account Nos. **5.417A**, **5.417B**, **5.417C**, **5.417D**, **5.418**, **5.418A**, **5.418B**, **5.418C** and this Resolution, as revised by this Conference,

instructs the Radiocommunication Bureau

1 when applying *resolves* 2, to use the power flux-density mask in *resolves* 2; and

- for angles of arrival less than 76°, identify the affected administrations which have a primary allocation to terrestrial services in the same frequency band and on whose territory the power flux-density is exceeded and inform both the notifying and the affected administrations. At the notification stage the lack of any necessary agreement is considered as non-conformity with No. **11.31**;
- for angles of arrival from 76° to 90°, identify the affected administrations which have a primary allocation to terrestrial services in the same frequency band and on whose territory the power flux-density is exceeded and inform both the notifying and the affected administrations. At the notification stage each notice shall be examined in the application of No. **11.32** and, if appropriate, under No. **11.32A** with respect to the probability of harmful interference that may be caused to assignments for which coordination could not be successfully completed;

2 as from 5 July 2003, to apply *resolves* 5 in its examination of requests for coordination and notifications for any BSS (sound) systems using non-GSO satellites in the 2 630-2 655 MHz band for which complete Appendix 4 coordination information or notification information has been received after 2 June 2000.

RESOLUTION 543 (WRC-03)

Provisional RF protection ratio values for analogue and digitally modulated emissions in the HF broadcasting service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference has resolved to encourage the introduction of digitally modulated emissions in the high frequency broadcast bands allocated to the broadcasting service and has revised Resolution **517** accordingly;
- b)* that the current use of the spectrum is based on the use of double-sideband (DSB) emissions;
- c)* that Appendix **11** gives details of the system parameters and the emission characteristics of the digitally modulated emissions;
- d)* that ITU-R is carrying out further studies on the development of HF broadcasting using digitally modulated emissions in the bands allocated to the broadcasting service below 30 MHz;
- e)* that RF co-channel and adjacent channel protection ratios are among the fundamental parameters when determining compatibility;
- f)* that the currently available values of RF protection ratios may need to be updated in the light of future ITU-R studies;
- g)* that Annex 1 to Recommendation ITU-R BS.1514 describes a digital system suitable for broadcasting in the bands below 30 MHz;
- h)* that there is a need to compile and maintain statistics on administrations' capability to introduce digital modulation systems for their HF broadcasting services,

resolves

- 1 that digital modulation in accordance with Resolution **517 (Rev.WRC-03)** may be used in any of the HF bands allocated to the broadcasting service; this accommodation has to be made with the appropriate amounts of protection given to both analogue and digital emissions as described in the Annex to this Resolution;
- 2 that the protection ratio values described in the Annex be used in the coordination process under Article **12** on a provisional basis;

3 to invite a future competent conference to revise these provisional protection ratio values, as appropriate,

invites ITU-R

1 to continue studies on digital techniques in HF broadcasting with the purpose to revise the RF protection ratio values for analogue and digitally modulated emissions in the HF broadcasting service as described in the Annex to this Resolution;

2 to report the results of these studies to the World Radiocommunication Conference 2007.

ANNEX TO RESOLUTION 543 (WRC-03)

Section 1 – Standard RF protection ratio values

RF protection ratio values to be used for seasonal planning under the provisions of Article 12 are contained in Table 1 in this Section.

The values are consistent with those in Recommendation ITU-R BS.1615.

The characteristics of the digital emission are based on the 64-QAM modulation system, protection level No. 1, robustness mode B, spectrum occupancy type 3 (as contained in Recommendation ITU-R BS.1514), which will be used extensively for HF skywave broadcasting in 10 kHz channels.

The characteristics of the analogue emission are based on double-sideband modulation as summarized in Part A of Appendix 11, with 53% modulation depth.

TABLE 1

Relative RF protection ratios (dB) associated with digitally modulated emissions in the HF bands allocated to the broadcasting service

Wanted signal	Unwanted signal	Frequency separation $f_{\text{unwanted}} - f_{\text{wanted}}$ (kHz)								
		-20	-15	-10	-5	0	5	10	15	20
Amplitude modulation	Digital	-47	-42	-32	3	6	3	-32	-42	-47
Digital	Amplitude modulation	-54	-48	-40	-3	0	-3	-40	-48	-54
Digital	Digital	-53	-47	-38	-3	0	-3	-38	-47	-53

In the case of an amplitude modulation (AM) signal interfered with by a digital signal, the protection ratios are determined by adding 17 dB (audio-frequency protection ratio) to the relative RF protection ratios in Table 1.

In the case of a digital signal interfered with by an AM signal, the protection ratios are determined by adding 7 dB (signal-to-interference ratio for a bit error ratio (BER) of 10^{-4}) to the relative RF protection ratios in Table 1.

In the case of a digital signal interfered with by a digital signal, the protection ratios are determined by adding 16 dB (signal-to-interference ratio for a BER of 10^{-4}) to the RF relative protection ratios in Table 1.

Section 2 – Correction values of RF protection ratios

Correction values of RF protection ratios for different wanted signal conditions such as AM modulation depths, AM quality grades and digital modulation modes are provided in this Section.

1 AM modulation depth

RF protection ratios for a wanted AM signal interfered with by a digital signal depend on the AM modulation depth. A modulation depth of 53% is used as a default value in this Annex. If a different modulation depth is used, a correction value for RF protection ratio is required. Table 2 provides correction values for typical modulation depths.

TABLE 2

Correction values (dB) to be used for other AM modulation depths in respect of wanted AM signal

Modulation depth (%)	30	38	53	<i>m</i>
Correction value (dB)	5	3	0	$20 \log (53/m)$

2 AM audio quality

RF protection ratios for a wanted AM signal interfered with by a digital signal depend on the required audio quality grade. If another quality grade is used, correction values of RF protection ratios as in Table 3 shall be added.

TABLE 3

Correction values (dB) to be used for other audio quality grades in respect of wanted AM signal

Audio quality grade	3	3.5	4
Correction value (dB)	0	7	12

3 Digital modulation scheme, protection level number and robustness mode

RF protection ratios for a wanted digital signal interfered with by an analogue or digital signal depend on the digital modulation scheme and mode. If any combination different from the default value in Section 1 is used, correction values of RF protection ratios as in Table 4 shall be added.

TABLE 4

Correction values (dB) to be used for other combinations of digital modulation scheme, protection level number and robustness mode in respect of wanted digital signal

Modulation scheme	Protection level number	Robustness mode		
		B	C	D
16-QAM	0	-7	-6	-6
	1	-5	-4	-4
64-QAM	0	-1	-1	0
	1	0	0	1

NOTE – 10 kHz nominal bandwidth.

Protection levels Nos. 2 and 3 and robustness mode A are not recommended for use in HF and are therefore not described here.

Section 3 – Explanatory examples

- a) In Table 1, first row <AM interfered with by Digital>: with the AF protection ratio = 17 dB, all values of relative protection ratios entered in that row of the Table must be increased by 17 dB in order to determine the absolute value of the RF protection ratio (RF PR). As examples:
- For co-channel interference (0 kHz separation) the RF PR would be $6 + 17 = 23$ dB.
 - For adjacent channel interference (± 10 kHz separation) the RF PR would be $-32 + 17 = -15$ dB.
 - For the case of modulation depth = 38% and audio quality grade = 4, a correction factor of 15 dB ($= 3 + 12$) is added to the RF PR values described above.
- b) In Table 1, second row <Digital interfered with by AM>: all values of relative protection ratios entered in that row of the Table must be increased by 7 dB in order to determine the absolute value of the RF PR. As examples:
- For co-channel interference (0 kHz separation) the RF PR would be $0 + 7 = 7$ dB.
 - For adjacent channel interference (± 10 kHz separation) the RF PR would be $-40 + 7 = -33$ dB.

- c) In Table 1, third row <Digital interfered with by Digital>: all values of relative protection ratios entered in that row of the Table must be increased by 16 dB in order to determine the absolute value of the RF protection ratio. As examples:
- For co-channel interference (0 kHz separation) the RF PR would be $0 + 16 = 16$ dB.
 - For adjacent channel interference (± 10 kHz separation) the RF PR would be $-38 + 16 = -22$ dB.

RESOLUTION 544 (WRC-03)

**Identification of additional spectrum for the
broadcasting service in the HF bands**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the spectrum allocated to the broadcasting service from 4 MHz to 10 MHz is about 25 per cent of all the spectrum allocated to HF broadcasting;
- b)* that WARC-79 allocated an additional 125 kHz of spectrum to the broadcasting service below 10 MHz (9 775-9 900 kHz);
- c)* that WARC-92 allocated an additional 200 kHz to the broadcasting service, consisting of 100 kHz near 9 MHz, 50 kHz near 7 MHz and 50 kHz near 6 MHz, and that this additional spectrum will become available to the broadcasting service as from 1 April 2007;
- d)* that the agenda for WRC-07 includes the revision of allocations to the services in HF bands;
- e)* that the results of coordination under Article 12 demonstrate that the broadcasting bands below 10 MHz are congested, even when there are high levels of sunspot activity, with little more than half of the broadcasting requirements being satisfied;
- f)* that in recent schedule periods, the statistics made by ITU-R for analogue emissions show that in the bands below 10 MHz, around 250 kHz of additional spectrum is needed to clear the co-channel collisions and up to 800 kHz to clear both the co-channel and adjacent channel collisions;
- g)* that the introduction and promotion of the new digital technology that improves spectrum utilization and efficiency cannot completely solve current congestion problems;
- h)* that many administrations continue to use the HF bands for other services, including for fixed and mobile communications;
- i)* that this Conference has made decisions on the use of some parts of the band 7 100-7 450 kHz for use in HF broadcasting,

recognizing

that the specific bands for broadcasting in the Tropical Zone as referred to in No. 23.6 are to be used in accordance with No. 5.113,

noting

that ITU-R studies identified preferred bands, from which sufficient allocations could be made to the broadcasting service:

4 500-4 650 kHz
5 060-5 250 kHz
5 840-5 900 kHz
7 350-7 650 kHz
9 290-9 400 kHz
9 900-9 940 kHz,

noting further

that further studies are required on the potential allocation of the bands identified in *noting* above and of any other bands between 4 and 10 MHz that may be considered for allocation to the broadcasting service,

resolves to invite ITU-R

1 to carry out studies on this matter, particularly in respect of the bands identified in *noting* above, taking into account technical, operational, economic and other relevant factors, including the appropriate transitional arrangements, and how the introduction of digital emissions will affect the HF broadcasting requirements and how such reallocations will affect other services using these bands;

2 to bring the results of these studies to the attention of WRC-07,

further resolves

to recommend a future competent conference to conclude, where appropriate, on additional spectrum requirements for the broadcasting service, taking into account the interest of all affected services,

invites administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R.

RESOLUTION 545 (WRC-03)

Technical and regulatory procedures relating to the broadcasting-satellite service networks operating in the 620-790 MHz band

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that No. **5.311** provides the conditions under which the band 620-790 MHz may be used for assignments to television stations using frequency modulation in the broadcasting-satellite service (BSS);
- b)* that it is necessary to adequately protect terrestrial services including the terrestrial television broadcasting systems in this band;
- c)* that the sharing and associated provisions for satellite networks are under study in ITU-R with respect to the impact of such systems on the terrestrial services;
- d)* that geostationary-satellite (GSO) BSS networks and non-geostationary (non-GSO) BSS satellite networks or systems are at the stage of advance publication or coordination, or have been notified in the 620-790 MHz frequency band;
- e)* that studies are being undertaken to determine, *inter alia*, the planning criteria to be used for the Regional Radiocommunication Conference (RRC-04/05) for Region 1 and one country in Region 3;
- f)* that the impact of these GSO BSS networks and non-GSO BSS satellite networks or systems on terrestrial services including digital and analogue television broadcasting systems has yet to be examined;
- g)* that there are at present few GSO networks operating in accordance with No. **5.311**;
- h)* that it would be inappropriate to draw any conclusions regarding the form and levels of the protection criteria and their application to GSO BSS networks and non-GSO BSS satellite networks or systems until the completion of relevant studies and the approval of corresponding ITU-R Recommendations;
- i)* that many administrations have extensive infrastructure for the transmission and reception of analogue and digital television services between 620 MHz and 790 MHz,

noting

- a) that the protection of terrestrial television services in the band 620-790 MHz requires more study before any conclusion can be made about the appropriate pfd values;
- b) that studies called for in Recommendation **705** have been recently initiated but not completed;
- c) that the reference bandwidth of the pfd limit in No. **5.311** is undefined and guidance is urgently needed and has been requested by the Radiocommunication Bureau;
- d) that the existing provisions related to the band 620-790 MHz are ambiguous and have been difficult to apply by administrations and the Bureau,

resolves

- 1 that the processing of submissions of GSO BSS networks and non-GSO BSS satellite networks or systems in the frequency band 620-790 MHz received by the Bureau and not brought into use prior to 5 July 2003, irrespective of their date of receipt, shall be suspended pending WRC-07 decisions on the sharing criteria, including the pfd required to protect the terrestrial services in this frequency band;
- 2 to suspend the application of No. **5.311** and Recommendation **705** until the end of WRC-07 with respect to the GSO BSS networks and non-GSO BSS satellite networks or systems in the frequency band 620-790 MHz and for which notification is received between 5 July 2003 and the end of WRC-07;
- 3 that GSO BSS networks and non-GSO BSS satellite networks or systems in the frequency band 620-790 MHz other than those notified, brought into use and the date of bringing into use confirmed before the end of WRC-03, shall not be brought into use before the end of WRC-07;
- 4 that the notified date of bringing into use referred in Nos. **11.44** and **11.48** for GSO BSS networks and non-GSO BSS satellite networks or systems in this frequency band for which the Bureau receives notification prior to 5 July 2003 shall be extended by the length of the period from the date of receipt by the Bureau of the complete advanced publication information to the end of WRC-07;
- 5 that the BSS systems referred to in *resolves* 1 above shall not be taken into account in the application of *resolves* 3.1C and 3.4 of Council Resolution 1185;

6 that in the band 620-790 MHz, No. **22.2** shall continue to apply to assignments to non-GSO satellite systems in the BSS for which complete notification information is considered to have been received by the Bureau prior to 5 July 2003 in respect of assignments to GSO satellite networks in the BSS for which complete coordination information is considered to have been received by the Bureau prior to 5 July 2003. The relationship between GSO networks and non-GSO satellite networks or systems for which complete Appendix 4 information has been received by the Bureau after 4 July 2003 in the band 620-790 MHz is subject to the procedures to be decided at WRC-07,

invites ITU-R

to conduct studies as a matter of urgency, and develop sharing criteria and regulatory provisions, prior to WRC-07, for the protection of terrestrial services, in particular terrestrial television broadcasting services, in the 620-790 MHz band from GSO BSS networks and non-GSO BSS satellite networks or systems which it is planned to operate in this band,

instructs the Director of the Radiocommunication Bureau

subject to the decisions taken by WRC-07, to resume, as appropriate, the application of Nos. **5.311**, **9.34** and **11.30** and other relevant associated provisions of the Radio Regulations,

instructs the Secretary-General

to bring this Resolution to the attention of the Regional Radiocommunication Conference, 2004/2005 (RRC-04/05).

RESOLUTION 546 (WRC-03)

**Implementation of the decisions of WRC-03 relating to processing
of networks under Appendices 30 and 30A
of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

that this Conference has adopted new sharing criteria and associated calculation methods which are included in, or referenced in, the Annexes to Appendices **30** and **30A**,

recognizing

that the Radiocommunication Bureau needs clear instructions from this Conference on the sharing criteria and associated calculation methods to process the Appendices **30** and **30A** submissions, which are in various stages of treatment,

further recognizing

that it will take six months for the Radiocommunication Bureau to develop and test the software to implement the new sharing criteria and associated calculation methods adopted by this Conference,

resolves

1 that the revised Appendices **30** and **30A** as adopted at this Conference shall enter into force on 5 July 2003¹ with the exception of the revised Annexes referred to in *resolves* 2 and footnotes to § 4.1.5, 4.1.15, 4.2.8 and 4.2.19;

2 that the revised Annexes of these Appendices as adopted by this Conference shall enter into force on 1 January 2004¹;

3 that as from 1 January 2004², for requests for modifications or additional uses under Article 4 and submissions under Article 2A of Appendices **30** and **30A**, for which complete information was received prior to 1 January 2004 by the Bureau but which have not yet been published in a Special Section of the International Frequency Information Circular (BR IFIC), the Bureau shall apply the revised Appendices **30** and **30A** as adopted at this Conference;

¹ The use of the new criteria applied to networks published prior to 1 January 2004 shall not result in additional coordination requirements for those networks.

² Pending the completion of the relevant software referred to in *further recognizing*, the Bureau will continue to use the current software for processing of notices received prior to 5 July 2003.

4 that, as from 1 January 2004^{1,2},

4.1 when applying § 4.1.11 or 4.2.15 of Appendix **30** or **30A**, the administrations and the Bureau shall apply the new criteria and associated calculation methods adopted by this Conference;

4.2 when applying § 4.1.12 or 4.2.16 of Appendix **30** or **30A**, an agreement shall be necessary with an administration having previously made a valid objection, when, using the new criteria and associated calculation methods adopted by this Conference, that administration is still considered as affected;

4.3 for notification under Article 5 of Appendices **30** and **30A** for which complete information was received prior to that date by the Bureau but not yet published in Part II or III of the BR IFIC, the Bureau shall apply the revised Appendices **30** and **30A** as adopted at this Conference;

5 that, as from 1 January 2004^{1,2},

5.1 for requests for coordination under Article 7 of Appendices **30** and **30A** for which complete information was received prior to this date by the Bureau but not yet published in a Special Section of the BR IFIC, the Bureau shall apply the revised Appendices **30** and **30A** as adopted at this Conference;

5.2 in application of No. **11.32** with respect to Article 7 of Appendices **30** and **30A**, the Bureau shall apply the new criteria and associated calculation methods adopted by this Conference if changes to the characteristics published under No. **9.38** increase the probability of interference or if coordination agreements previously required are missing;

5.3 in application of No. **11.32** with respect to Article 6 of Appendices **30** and **30A**, the Bureau shall apply the new criteria and associated calculation methods adopted by this Conference.

¹ The use of the new criteria applied to networks published prior to 1 January 2004 shall not result in additional coordination requirements for those networks.

² Pending the completion of the relevant software referred to in *further recognizing*, the Bureau will continue to use the current software for processing of notices received prior to 5 July 2003.

RESOLUTION 547 (WRC-03)

**Updating of the “Remarks” columns in the Tables of Article 9A of
Appendix 30A and Article 11 of Appendix 30
of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference updated the “Remarks” columns in the Tables of Article 9A of Appendix 30A and Article 11 of Appendix 30 based on the results of studies by the Radiocommunication Bureau;
- b)* that this Conference adopted new Tables in Article 9A of Appendix 30A and Article 11 of Appendix 30 that specify affected or affecting networks or beams of administrations based on the results of studies by the Radiocommunication Bureau;
- c)* that this Conference adopted new sharing criteria in Appendices 30 and 30A;
- d)* that it would be appropriate to update the Tables adopted at this Conference taking into account the sharing criteria adopted at this Conference;
- e)* that it would also be appropriate to update the results to reflect the changes in status of the fixed-satellite service networks and modifications to the characteristics, contained in these Tables,

recognizing

- a)* that the integrity of the Region 2 Plan and its associated provisions must be preserved;
- b)* that the compatibility between the broadcasting-satellite service (BSS) in Regions 1 and 3 and the other services in all three Regions must be ensured;
- c)* that the Bureau requires clear instructions from this Conference on how to update the results of compatibility analyses with a view to reducing the number of affected and affecting administrations or networks,

resolves

- 1 that the Bureau, using the revised criteria adopted at this Conference, shall carry out the required analyses based on the following Notes explaining the nature of the “Remarks” columns entries in order to reduce the number of affected and affecting administrations or networks taking into account modifications to satellite networks: Notes 5 to 7 in § 9A.2 of Article 9A of Appendix 30A and Notes 5 to 8 in § 11.2 of Article 11 of Appendix 30;

2 that, in addition to the use of the new criteria, the Bureau shall also take into account any changes in the characteristics and any suppression of assignments in the application of the Radio Regulations;

3 that the Bureau shall publish, not later than 1 January 2005, the updated results of its analyses, as indicated in *resolves* 1 and 2 above, together with its related conclusions, in a circular letter;

4 that, once the circular letter referred to in *resolves* 3 has been sent, administrations will have until one year before WRC-07 to decide whether they do or do not wish to continue appearing as “affected or affecting administrations”. In the case of a request by an administration whose name appears in the “Remarks” column as an affecting or affected BSS administration in Regions 1 and 3, its deletion from the “Remarks” column is subject to the agreement of the affected or affecting administration. The Bureau shall send a reminder to all administrations 45 days before the expiry of the above-mentioned deadline in the form of a circular telefax requesting comment or reply. If no reply is received from administrations within that period, it will be taken that there is no need to make any change,

instructs the Director of the Radiocommunication Bureau

to include the results of an up-to-date analysis based on this Resolution in his Report to WRC-07, under agenda item 7.1, for consideration by the Conference, with a view to its taking necessary action as appropriate.

RESOLUTION 548 (WRC-03)

**Application of the grouping concept in Appendices 30 and 30A
in Regions 1 and 3¹**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the grouping concept as it is applied in Appendices **30** and **30A** with respect to Regions 1 and 3 was considered by this Conference;
- b)* that the protection of assignments in the Plan and the List in Appendices **30** and **30A** is based upon an equivalent protection margin criterion;
- c)* that concerns have been raised that the use of the grouping concept by one administration may reduce access to spectrum resources by others;
- d)* that coordination of one network² in a group shall not lead to a reduction of coordination requirements for other networks in the same group;
- e)* that WRC-2000 accepted grouping in the Regions 1 and 3 List for some networks which are separated by up to 0.2° in the geostationary arc according to their respective nominal orbital locations,

noting

- a)* that the 2002 Conference Preparatory Meeting considered a proposed solution in which there is a limit to the number of assignments in a group or number of groups in one orbital location;
- b)* that the Radio Regulations Board has developed Rules of Procedure with respect to the application of the grouping concept,

¹ It is noted that the application of the grouping concept in Region 2 does not require any change. Therefore, the Radiocommunication Bureau shall continue to apply the grouping concept in Region 2 as it has applied it prior to this Conference.

² In the application of this Resolution, a network is understood as being a submission by one administration, or one administration acting on behalf of a group of administrations, to the Bureau of a set of assignments, received on the same date (except for merged networks referred to in *resolves* 4 *f*), with the same name for the satellite network and at the same orbital location.

resolves

1 that a grouping of networks with an overall separation of not more than 0.4° in the geostationary arc, in accordance with their respective nominal orbital locations, is regarded as a grouping at the same orbital location;

2 that the limitations referred to in *resolves* 4 do not apply to grouping of networks before the inclusion of the assignments in the List;

3 that the limitations in *resolves* 4 do not apply to grouping within one network;

4 that under Appendices **30** and **30A** in Regions 1 and 3 the following principles with respect to the application of the grouping concept between networks at the same orbital location shall apply:

a) these limitations apply for networks with overlapping frequency bands;

b) for networks for which a submission is received by the Bureau under § 4.1.3 of Appendix **30** or **30A** after 4 July 2003, not more than three networks within the same overlapping frequency bandwidth can be in a group in the List except under the provisions of *d)* or *e)* below;

c) for networks for which a submission was received by the Bureau under § 4.1.3 of Appendix **30** or **30A** but not yet processed under § 4.1.5 before 5 July 2003, not more than five networks within the same overlapping frequency bandwidth can be in a group in the List except under the provisions of *d)* or *e)* below;

d) for networks for which a submission was received by the Bureau under § 4.1.3 of Appendix **30** or **30A** and processed under § 4.1.5 before 5 July 2003, the number of networks that can be in a group in the List within the same overlapping frequency bandwidth cannot be further expanded by new networks beyond five;

e) for a group of networks in the List established prior to 5 July 2003, the number of networks within the same overlapping frequency bandwidth in the group cannot be further expanded by new networks beyond five;

ebis) if the number of networks in a group in the List reaches the maximum limit specified above, no new networks can be entered into the List in this group without removal of another overlapping part of a network from the List;

f) as a provisional measure, networks in the List may be optimized or merged to reduce the number of networks in accordance with the following principles:

- no optimization or merging of networks in a group shall lead to an increased probability of harmful interference or require more protection than was the case for those networks prior to optimization/merging;

- the associated priority date and date of bringing into use for each assignment shall be maintained;
- networks in the List can be optimized or merged as described above, before 1 January 2004;
- upon entering into the List of networks submitted to the Bureau in accordance with § 4.1.3 before 5 July 2003, the List may be optimized or merged as described above;

5 that, as from 5 July 2003, in the processing and publication by the Bureau of submissions relating to Regions 1 and 3 under Article 4 of Appendices **30** or **30A** received after 2 June 2000 and the identification of affected administrations in accordance with § 4.1.5, each network in a group is examined separately, without taking into account the other networks in the group³,

instructs the Director of the Radiocommunication Bureau

1 to implement *resolves* 1 to 5 above as from 5 July 2003;

2 by 1 September 2003, to send a notice to administrations having networks in the Regions 1 and 3 List as of 5 July 2003 to bring *resolves* 4 *f*) to their attention;

3 upon processing and publication of a network for which a submission has been received by the Bureau under § 4.1.3 prior to 5 July 2003, send a notice to the notifying administration, bringing the provisions of *resolves* 4 *f*) to its attention and allowing the administration, within 30 days from the date of the notice, to optimize or merge its networks in the List in accordance with the principles in *resolves* 4 *f*),

instructs the Radio Regulations Board

to review and revise, as appropriate, the Rules of Procedure relating to the application of the grouping concept in Regions 1 and 3.

³ In applying § 4.1.11, the application of the new methodology in this *resolves* to networks received before 3 June 2000 shall not result in additional coordination requirements for those networks.

RESOLUTION 608 (WRC-03)

Use of the frequency band 1 215-1 300 MHz by systems of the radionavigation-satellite service (space-to-Earth)

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 introduced a new allocation for the radionavigation-satellite service (RNSS) in the frequency band 1 260-1 300 MHz;
- b)* that the frequency bands 1 215-1 240 MHz and 1 240-1 260 MHz were already allocated to the RNSS;
- c)* that, in the band 1 215-1 260 MHz, RNSS (space-to-Earth) systems have been successfully operating for more than 20 years without any reports of interference to the radars which operate in this frequency band;
- d)* the importance of the continuing need for protection for the radiodetermination systems operating in the frequency band 1 215-1 300 MHz,

noting

that the provisions of No. **5.329** as adopted by this Conference, will provide for the operation of the RNSS (space-to-Earth) in the frequency band 1 215-1 300 MHz and will protect the radiolocation systems operating in that frequency band, in addition to the protection already provided to radionavigation service systems operating in the countries listed in No. **5.331**,

recognizing

1 that ITU-R carried out studies related to the protection of the radiodetermination systems operating in the frequency band 1 215-1 300 MHz and that these studies should continue pursuant to relevant ITU-R Questions, such as Questions ITU-R 62/8 and ITU-R 217/8, so as to prepare, as appropriate, ITU-R Recommendations;

2 that up to the end of WRC-2000, use of the RNSS in the band 1 215-1 260 MHz was subject only to the constraint that no harmful interference was caused to the radionavigation service in Algeria, Germany, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Burundi, Cameroon, China, Croatia, Denmark, United Arab Emirates, France, Greece, India, Iran (Islamic Republic of), Iraq, Kenya, The Former Yugoslav Rep. of Macedonia, Liechtenstein, Luxembourg, Mali, Mauritania, Norway, Oman, Pakistan, Netherlands, Portugal, Qatar, Serbia and Montenegro, Senegal, Slovenia, Somalia, Sudan, Sri Lanka, Sweden, Switzerland and Turkey, furthermore, that No. **5.43** was applied,

RES608-2

resolves

that no constraints in addition to those in place prior to WRC-2000 (see *recognizing* 2) shall be placed on the use of RNSS (space-to-Earth) frequency assignments in the band 1 215-1 260 MHz brought into use until 2 June 2000,

instructs the Secretary-General

to communicate the contents of this Resolution to the International Civil Aviation Organization (ICAO) for such actions as it may consider appropriate, and to invite ICAO to participate actively in the study activity identified under *recognizing* 1.

RESOLUTION 609 (WRC-03)

**Protection of aeronautical radionavigation service systems from the
equivalent power flux-density produced by radionavigation-
satellite service networks and systems in the
1 164-1 215 MHz frequency band**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the band 960-1 215 MHz is allocated on a primary basis to the aeronautical radionavigation service (ARNS) in all Regions;
- b)* that the band 1 164-1 215 MHz is also allocated on a primary basis to the radionavigation-satellite service (RNSS), subject to the condition in No. **5.328A** that operation of RNSS systems shall be in accordance with this Resolution;
- c)* that WRC-2000 provided for implementation of a provisional aggregate power flux-density (pfd) limit during the period between WRC-2000 and WRC-03, and requested ITU-R studies on the need for an aggregate pfd limit, and revision, if necessary, of the provisional pfd limit given in No. **5.328A**;
- d)* that this Conference has determined that protection of the ARNS from harmful interference can be achieved if the value of the equivalent pfd (epfd) produced by all the space stations of all RNSS (space-to-Earth) systems in the 1 164-1 215 MHz band does not exceed the level of $-121.5 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band;
- e)* that only a limited number of RNSS systems are expected to be deployed in the 1 164-1 215 MHz band, and only a few of these systems at most would have overlapping frequencies;
- f)* that ARNS systems can be protected without placing undue constraints on the development and operation of RNSS systems in this band;
- g)* that to achieve the objectives in *considering f)*, administrations operating or planning to operate RNSS systems will need to agree cooperatively through consultation meetings to equitably share the aggregate epfd in a manner to achieve the level of protection for ARNS systems that is stated in *considering d)*;
- h)* that it may be appropriate for representatives of administrations operating or planning to operate ARNS systems to be involved in determinations made pursuant to *considering g)*;

i) that this Conference has decided to apply the coordination provisions of Nos. **9.12**, **9.12A** and **9.13** to RNSS systems and networks for which complete coordination or notification information, as appropriate, is received by the Bureau after 1 January 2005,

noting

a) that WRC-2000 invited ITU-R to conduct the appropriate technical, operational and regulatory studies on the overall compatibility between the RNSS and the ARNS in the band 960-1 215 MHz;

b) that WRC-2000 resolved to recommend that WRC-03 review the results of the studies,

recognizing

that under No. **7.5**, interested administrations have the ability, at any time, to request the assistance of the Bureau with respect to Articles **9** and **11** and associated procedures,

resolves

1 that in order to protect ARNS systems, administrations shall ensure, pursuant to this Resolution, that the epfd level produced by all space stations of all RNSS systems does not exceed the level $-121.5 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band;

2 that administrations operating or planning to operate in the 1 164-1 215 MHz frequency band RNSS systems or networks shall, in collaboration, take all necessary steps, including, if necessary, by means of appropriate modifications to their systems or networks, to ensure that the aggregate interference into ARNS systems caused by such RNSS systems or networks operating co-frequency in these frequency bands is shared equitably among the systems identified in *resolves* 3 and does not exceed the level of the aggregate protection criterion given in *resolves* 1 above;

3 that administrations, in carrying out their obligations under *resolves* 1 and 2 above, shall take into account only those RNSS systems with frequency assignments in the band 1 164-1 215 MHz that have met the criteria listed in the Annex to this Resolution through appropriate information provided to the consultation meetings referred to in *considering g*);

4 that administrations, in developing agreements to carry out their obligations under *resolves* 1 and 2 above, shall establish mechanisms to ensure that all potential RNSS system operators and administrations are given full visibility of the process;

5 that in order to allow multiple RNSS systems to operate in the frequency band 1 164-1 215 MHz, no single RNSS system shall be permitted to use up the entire interference allowance specified in *resolves* 1 above in any 1 MHz of the 1 164-1 215 MHz band (see Recommendation **608 (WRC-03)**);

6 that to achieve the objectives in *resolves* 1 and 2 above, administrations operating or planning to operate RNSS systems will need to agree cooperatively through consultation meetings to achieve the level of protection for ARNS systems that is stated in *resolves* 1;

7 that administrations participating in this process of epfd calculation should hold consultation meetings on a regular basis (e.g. yearly);

8 the administrations participating in the consultation meeting shall designate one administration that shall communicate to the Bureau the results of any aggregate sharing determinations made in application of *resolves* 2 above, without regard to whether such determinations result in any modifications to the published characteristics of their respective systems or networks (see Recommendation **608 (WRC-03)**);

9 that administrations operating or planning to operate ARNS systems in the 1 164-1 215 MHz band should participate, as appropriate, in discussions and determinations relating to the *resolves* above;

10 that the methodology and the reference worst-case ARNS system antenna contained in Recommendation ITU-R M.1642 shall be used by administrations for calculating the aggregate epfd produced by all the space stations within all RNSS systems in the band 1 164-1 215 MHz,

instructs the Radiocommunication Bureau

1 to participate in consultation meetings mentioned under *resolves* 6 and to observe carefully results of the epfd calculation mentioned in *resolves* 1;

2 to determine whether the pfd level in *recommends* 1 of Recommendation **608 (WRC-03)** is exceeded by any subject space station, and to report the findings of this determination to the participants in the consultation meeting;

3 to publish in the International Frequency Information Circular (BR IFIC), the information referred to in *resolves* 8 and *instructs the Radiocommunication Bureau* 2,

invites the Radiocommunication Bureau

to examine the possibility, if needed, of developing software that can be used to calculate the epfd level mentioned under *resolves* 1,

invites administrations

1 to deal with RNSS intersystem matters, as required, as early as possible;

2 to provide the Bureau and all participants in the consultation meeting with access to appropriate software used to calculate the epfd level mentioned under *resolves* 1.

ANNEX TO RESOLUTION 609 (WRC-03)

Criteria for application of Resolution 609 (WRC-03)

1 Submission of appropriate Advance Publication information.

2 Entry into satellite manufacturing or procurement agreement, and entry into satellite launch agreement.

The RNSS system or network operator should possess:

- i) clear evidence of a binding agreement for the manufacture or procurement of its satellites; and
- ii) clear evidence of a binding agreement to launch its satellites.

The manufacturing or procurement agreement should identify the contract milestones leading to the completion of manufacture or procurement of satellites required for the service provision, and the launch agreement should identify the launch date, launch site and launch service provider. The notifying administration is responsible for authenticating the evidence of agreement.

The information required under this criterion may be submitted in the form of a written commitment by the responsible administration.

3 As an alternative to satellite manufacturing or procurement and launch agreements, clear evidence of guaranteed funding arrangements for the implementation of the project would be accepted. The notifying administration is responsible for authenticating the evidence of these arrangements and for providing such evidence to other interested administrations in furtherance of its obligations under this Resolution.

RESOLUTION 610 (WRC-03)

**Coordination and bilateral resolution of technical compatibility
issues for radionavigation-satellite service networks
and systems in the bands 1 164-1 300 MHz,
1 559-1 610 MHz and 5 010-5 030 MHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 decided to allocate the bands 1 164-1 215 MHz, 1 260-1 300 MHz and 5 010-5 030 MHz to the radionavigation-satellite service (RNSS) (space-to-Earth) (space-to-space) in addition to the bands 1 215-1 260 MHz and 1 559-1 610 MHz that have already been allocated to the RNSS;
- b)* that this Conference established conditions for the protection of the aeronautical radionavigation service from RNSS systems in the 1 164-1 215 MHz band, for the protection of radiodetermination services from RNSS systems in the 1 215-1 300 MHz band, and for the protection of the radio astronomy service in the band 4 990-5 000 MHz from RNSS systems in the 5 010-5 030 MHz band;
- c)* that to date, RNSS systems have been able to resolve intersystem technical compatibility issues on a bilateral basis under Section I of Article 9, without the need for imposition of the coordination procedures of Section II of Article 9, however, in recent years, there has been an increase in the number of RNSS systems and networks filed with the Radiocommunication Bureau;
- d)* that this Conference has decided to apply, in the bands mentioned in *considering a)*, the coordination provisions of Nos. 9.12, 9.12A and 9.13 to RNSS systems and networks for which complete coordination or notification information, as appropriate, is received by the Radiocommunication Bureau after 1 January 2005, and the provisions of No. 9.7 already apply to geostationary-satellite networks in the RNSS;
- e)* that it is necessary to have a basis for administrations with RNSS systems that are not subject to Nos. 9.12, 9.12A and 9.13 to engage in bilateral coordinations to resolve intersystem technical compatibility issues within the RNSS;
- f)* that it is desirable, in order to reduce burdens on administrations operating or planning RNSS systems or networks, to conduct bilateral coordinations between RNSS systems and networks that are either in operation or that are actually in the process of being implemented,

resolves

1 that for administrations planning to operate RNSS systems subject to coordination under Nos. **9.7**, **9.12**, **9.12A** and/or **9.13** in the bands mentioned in *considering a)*, if an administration with which coordination is requested responds to the request under No. **9.52**, the requesting administration shall, during the process of coordination and upon request by the responding administration, inform the responding administration (with a copy to the Bureau) whether it has met the criteria listed in the Annex to this Resolution with respect to the subject network or system;

2 that administrations responding under No. **9.52** to a request for coordination under Nos. **9.7**, **9.12**, **9.12A** and/or **9.13** in the bands mentioned in *considering a)*, shall, during the process of coordination mentioned in *resolves 1* and upon request by the requesting administration, inform the requesting administration (with a copy to the Bureau) whether it has met the criteria listed in the Annex to this Resolution with respect to the subject network or system;

3 that administrations operating or planning to operate RNSS systems in the bands mentioned in *considering a)*, which systems are not subject to coordination under Section II of Article **9**, shall take all practicable steps to resolve issues of intersystem compatibility on a bilateral basis;

4 that in undertaking the obligations under *resolves 3* above, administrations operating or planning to operate RNSS systems or networks should first address intersystem compatibility between RNSS systems or networks that are actually in operation or are in the process of being implemented;

5 that for application of *resolves 4* above, an RNSS system or network that has satisfied the criteria listed in the Annex to this Resolution with respect to the subject network or system would be considered to be actually in the process of being implemented;

6 that when notifying the Bureau under No. **11.47** that a frequency assignment to station(s) in the RNSS in the bands mentioned in *considering a)* has been brought into use, the notifying administration, if it has not already done so, shall inform the Bureau whether it has met the criteria listed in the Annex to this Resolution;

7 that implementation of this Resolution shall be conducted in such a way as to promote the principle of equality and fairness in ensuring access for RNSS operators and planned RNSS systems in the above-referenced bands,

instructs the Radiocommunication Bureau

to provide, on request, assistance to administrations operating or planning to operate RNSS systems in the bands mentioned in *considering a)* above, which systems are not subject to coordination under Section II of Article **9**, in securing bilateral agreements with other RNSS systems as early as possible.

ANNEX TO RESOLUTION 610 (WRC-03)

Criteria for application of Resolution 610 (WRC-03)

- 1 Submission of appropriate Advance Publication information.
- 2 Entry into satellite manufacturing or procurement agreement, and entry into satellite launch agreement.

The RNSS system or network operator should possess:

- i) clear evidence of a binding agreement for the manufacture or procurement of its satellites; and
- ii) clear evidence of a binding agreement to launch its satellites.

The manufacturing or procurement agreement should identify the contract milestones leading to the completion of manufacture or procurement of satellites required for the service provision, and the launch agreement should identify the launch date, launch site and launch service provider. The notifying administration is responsible for authenticating the evidence of agreement.

The information required under this criterion may be submitted in the form of a written commitment by the responsible administration.

- 3 As an alternative to satellite manufacturing or procurement and launch agreements, clear evidence of guaranteed funding arrangements for the implementation of the project would be accepted. The notifying administration is responsible for authenticating the evidence of these arrangements.

RESOLUTION 641 (Rev.HFBC-87)

Use of the frequency band 7 000-7 100 kHz

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

considering

- a)* that the sharing of frequency bands by the amateur and broadcasting services is undesirable and should be avoided;
- b)* that it is desirable to have world-wide exclusive allocations for these services in band 7;
- c)* that the band 7 000-7 100 kHz is allocated on a world-wide basis exclusively to the amateur service,

resolves

that the broadcasting service shall be prohibited in the band 7 000-7 100 kHz and that the broadcasting stations operating on frequencies in this band shall cease such operation,

urges

the administrations responsible for the broadcasting stations operating on frequencies in the band 7 000-7 100 kHz to take the necessary steps to ensure that such operation ceases immediately,

instructs the Secretary-General

to bring this Resolution to the attention of administrations.

RESOLUTION 642

**Relating to the bringing into use of earth stations in
the amateur-satellite service**

The World Administrative Radio Conference (Geneva, 1979),

recognizing

that the procedures of Articles **9** and **11** are applicable to the amateur-satellite service,

recognizing further

- a)* that the characteristics of earth stations in the amateur-satellite service vary widely;
- b)* that space stations in the amateur-satellite service are intended for multiple access by amateur earth stations in all countries;
- c)* that coordination among stations in the amateur and amateur-satellite services is accomplished without the need for formal procedures;
- d)* that the burden of terminating any harmful interference is placed upon the administration authorizing a space station in the amateur-satellite service pursuant to the provisions of No. **25.11**,

notes

that certain information specified in Appendix **4** cannot reasonably be provided for earth stations in the amateur-satellite service,

resolves

- 1 that when an administration (or one acting on behalf of a group of named administrations) intends to establish a satellite system in the amateur-satellite service and wishes to publish information with respect to earth stations in that system it may:
 - 1.1 communicate to the Radiocommunication Bureau all or part of the information listed in Appendix **4**; the Bureau shall publish such information in a Special Section of its BR IFIC requesting comments to be communicated within a period of four months after the date of publication;
 - 1.2 notify under Nos. **11.2** to **11.8** all or part of the information listed in Appendix **4**; the Bureau shall record it in a special list;
- 2 that this information shall include at least the characteristics of a typical amateur earth station in the amateur-satellite service having the facility to transmit signals to the space station to initiate, modify, or terminate the functions of the space station.

RESOLUTION 644 (Rev.WRC-2000)

Telecommunication resources for disaster mitigation and relief operations

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that ITU, in the same spirit as reflected in Articles 40 and 46 of its Constitution has specifically recognized the importance of the international use of radiocommunications in the event of natural disasters, epidemics, famines and similar emergencies;
- b)* that the Plenipotentiary Conference (Minneapolis, 1998), in endorsing Resolution 19 of the World Telecommunication Development Conference (Valetta, 1998), adopted Resolution 36 (Rev. Minneapolis, 1998) on telecommunications in the service of humanitarian assistance;
- c)* that administrations have been urged to take all practical steps to facilitate the rapid deployment and effective use of telecommunication resources for disaster mitigation and disaster relief operations by reducing and, where possible, removing regulatory barriers and strengthening transborder cooperation between States,

recognizing

- a)* the potential of modern telecommunication technologies as an essential tool for disaster mitigation and relief operations and the vital role of telecommunications for the safety and security of relief workers in the field;
- b)* the particular needs of developing countries and the special requirements of the inhabitants of remote areas,

noting

that the Intergovernmental Conference on Emergency Telecommunications (ICET-98), held from 16 to 18 June 1998 in Tampere, Finland, adopted the Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations (Tampere Convention),

RES644-2

resolves

to invite the ITU Radiocommunication Sector to continue to study, as a matter of urgency, those aspects of radiocommunications that are relevant to disaster mitigation and relief operations, such as decentralized means of communications that are appropriate and generally available, including amateur radio facilities and mobile and portable satellite terminals,

instructs the Director of the Radiocommunication Bureau

to support administrations in their work towards the implementation of Resolution 36 (Rev. Minneapolis, 1998) and the Tampere Convention.

RESOLUTION 646 (WRC-03)

Public protection and disaster relief

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the term “public protection radiocommunication” refers to radiocommunications used by responsible agencies and organizations dealing with maintenance of law and order, protection of life and property and emergency situations;
- b)* that the term “disaster relief radiocommunication” refers to radiocommunications used by agencies and organizations dealing with a serious disruption of the functioning of society, posing a significant widespread threat to human life, health, property or the environment, whether caused by accident, natural phenomena or human activity, and whether developing suddenly or as a result of complex, long-term processes;
- c)* the growing telecommunication and radiocommunication needs of public protection agencies and organizations, including those dealing with emergency situations and disaster relief, that are vital to the maintenance of law and order, protection of life and property, disaster relief and emergency response;
- d)* that many administrations wish to promote interoperability and interworking between systems used for public protection and disaster relief, both nationally and for cross-border operations in emergency situations and for disaster relief;
- e)* that current public protection and disaster relief applications are mostly narrow-band supporting voice and low data-rate applications, typically in channel bandwidths of 25 kHz or less;
- f)* that, although there will continue to be narrow-band requirements, many future applications will be wideband (indicative data rates in the order of 384-500 kbit/s) and/or broadband (indicative data rates in the order of 1-100 Mbit/s) with channel bandwidths dependent on the use of spectrally efficient technologies;

- g) that new technologies for wideband and broadband public protection and disaster relief applications are being developed in various standards organizations¹;
- h) that continuing development of new technologies such as IMT-2000 and systems beyond IMT-2000 and Intelligent Transportation Systems (ITS) may be able to support or supplement advanced public protection and disaster relief applications;
- i) that some commercial terrestrial and satellite systems are complementing the dedicated systems in support of public protection and disaster relief, that the use of commercial solutions will be in response to technology development and market demands and that this may affect the spectrum required for those applications and for commercial networks;
- j) that Resolution 36 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference urges Member States to facilitate use of telecommunications for the safety and security of the personnel of humanitarian organizations;
- k) that Recommendation ITU-R M.1637 offers guidance to facilitate the global circulation of radiocommunication equipment in emergency and disaster relief situations;
- l) that some administrations may have different operational needs and spectrum requirements for public protection and disaster relief applications depending on the circumstances;
- m) that the Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations (Tampere, 1998), an international treaty deposited with the United Nations Secretary-General and related United Nations General Assembly Resolutions and Reports are also relevant in this regard,

¹ For example, a joint standardization programme between the European Telecommunications Standards Institute (ETSI) and the Telecommunications Industry Association (TIA), known as Project MESA (Mobility for Emergency and Safety Applications) has commenced for broadband public protection and disaster relief. Also, the Working Group on Emergency Telecommunications (WGET), convened by the United Nations Office for Humanitarian Affairs (OCHA), is an open forum to facilitate the use of telecommunications in the service of humanitarian assistance comprising United Nations entities, major non-governmental organizations, the International Committee of the Red Cross (ICRC), ITU and experts from the private sector and academia. Another platform for coordination and to foster harmonized global Telecommunication for Disaster Relief (TDR) standards is the TDR Partnership Coordination Panel, which has just been established under the coordination of ITU with participation of international telecommunication service providers, related government departments, standards development organizations, and disaster relief organizations.

recognizing

- a) the benefits of spectrum harmonization such as:
 - increased potential for interoperability;
 - a broader manufacturing base and increased volume of equipment resulting in economies of scale and expanded equipment availability;
 - improved spectrum management and planning; and
 - enhanced cross-border coordination and circulation of equipment;
- b) that the organizational distinction between public protection activities and disaster relief activities are matters for administrations to determine at the national level;
- c) that national spectrum planning for public protection and disaster relief needs to have regard to cooperation and bilateral consultation with other concerned administrations, which should be facilitated by greater levels of spectrum harmonization;
- d) the benefits of cooperation between countries for the provision of effective and appropriate humanitarian assistance in case of disasters, particularly in view of the special operational requirements of such activities involving multinational response;
- e) the needs of countries, particularly the developing countries², for low-cost communication equipment;
- f) that the trend is to increase the use of technologies based on Internet Protocols;
- g) that currently some bands or parts thereof have been designated for existing public protection and disaster relief operations, as documented in Report ITU-R M.2033³;
- h) that for solving future bandwidth requirements, there are several emerging technology developments such as software-defined radio, advanced compression and networking techniques that may reduce the amount of new spectrum required to support some public protection and disaster relief applications;
- i) that in times of disasters, if most terrestrial-based networks are destroyed or impaired, amateur, satellite and other non-ground-based networks may be available to provide communication services to assist in public protection and disaster relief efforts;

² Taking into account, for example, the ITU-D Handbook on disaster relief.

³ 3-30, 68-88, 138-144, 148-174, 380-400 MHz (including CEPT designation of 380-385/390-395 MHz), 400-430, 440-470, 764-776, 794-806 and 806-869 MHz (including CITEL designation of 821-824/866-869 MHz).

- j) that the amount of spectrum needed for public protection on a daily basis can differ significantly between countries, that certain amounts of spectrum are already in use in various countries for narrow-band applications, and that in response to a disaster, access to additional spectrum on a temporary basis may be required;
- k) that in order to achieve spectrum harmonization, a solution based on regional frequency ranges⁴ may enable administrations to benefit from harmonization while continuing to meet national planning requirements;
- l) that not all frequencies within an identified common frequency range will be available within each country;
- m) that the identification of a common frequency range within which equipment could operate may ease the interoperability and/or inter-working, with mutual cooperation and consultation, especially in national, regional and cross-border emergency situations and disaster relief activities;
- n) that when a disaster occurs, the public protection and disaster relief agencies are usually the first on the scene using their day-to-day communication systems, but that in most cases other agencies and organizations may also be involved in disaster relief operations,

noting

- a) that many administrations use frequency bands below 1 GHz for narrow-band public protection and disaster relief applications;
- b) that applications requiring large coverage areas and providing good signal availability would generally be accommodated in lower frequency bands and that applications requiring wider bandwidths would generally be accommodated in progressively higher bands;
- c) that public protection and disaster relief agencies and organizations have an initial set of requirements, including but not limited to interoperability, secure and reliable communications, sufficient capacity to respond to emergencies, priority access in the use of non-dedicated systems, fast response times, ability to handle multiple group calls and the ability to cover large areas as described in Report ITU-R M.2033;
- d) that, while harmonization may be one method of realizing the desired benefits, in some countries, the use of multiple frequency bands can contribute to meeting the communication needs in disaster situations;

⁴ In the context of this Resolution, the term “frequency range” means a range of frequencies over which a radio equipment is envisaged to be capable of operating but limited to specific frequency band(s) according to national conditions and requirements.

e) that many administrations have made significant investments in public protection and disaster relief systems;

f) that flexibility must be afforded to disaster relief agencies and organizations to use current and future radiocommunications, so as to facilitate their humanitarian operations,

emphasizing

a) that the frequency bands identified in this Resolution are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations and are currently used intensively by the fixed, mobile, mobile satellite and broadcasting services;

b) that flexibility must be afforded to administrations:

- to determine, at national level, how much spectrum to make available for public protection and disaster relief from the bands identified in this Resolution in order to meet their particular national requirements;
- to have the ability for bands identified in this Resolution to be used by all services having allocations within those bands according to the provisions of the Radio Regulations, taking into account the existing applications and their evolution;
- to determine the need and timing of availability as well as the conditions of usage of the bands identified in this Resolution for public protection and disaster relief in order to meet specific national situations,

resolves

1 to strongly recommend administrations to use regionally harmonized bands for public protection and disaster relief to the maximum extent possible, taking into account the national and regional requirements and also having regard to any needed consultation and cooperation with other concerned countries;

2 to encourage administrations, for the purposes of achieving regionally harmonized frequency bands/ranges for advanced public protection and disaster relief solutions, to consider the following identified frequency bands/ranges or parts thereof when undertaking their national planning:

- in Region 1: 380-470 MHz as the frequency range within which the band 380-385/390-395 MHz is a preferred core harmonized band for permanent public protection activities within certain countries of Region 1 which have given their agreement;

- in Region 2 ⁵: 746-806 MHz, 806-869 MHz, 4 940-4 990 MHz;
- in Region 3 ⁶: 406.1-430 MHz, 440-470 MHz, 806-824/851-869 MHz, 4 940-4 990 MHz and 5 850-5 925 MHz;

3 that the identification of the above frequency bands/ranges for public protection and disaster relief does not preclude the use of these bands/frequencies by any application within the services to which these bands/frequencies are allocated and does not preclude the use of nor establish priority over any other frequencies for public protection and disaster relief in accordance with the Radio Regulations;

4 to encourage administrations, in emergency and disaster relief situations, to satisfy temporary needs for frequencies in addition to what may be normally provided for in agreements with the concerned administrations;

5 that administrations encourage public protection and disaster relief agencies and organizations to utilize both existing and new technologies and solutions (satellite and terrestrial), to the extent practicable, to satisfy interoperability requirements and to further the goals of public protection and disaster relief;

6 that administrations may encourage agencies and organizations to use advanced wireless solutions taking into account *considering h) and i)* for providing complementary support to public protection and disaster relief;

7 to encourage administrations to facilitate cross-border circulation of radiocommunication equipment intended for use in emergency and disaster relief situations through mutual cooperation and consultation without hindering national legislation;

8 that administrations encourage public protection and disaster relief agencies and organizations to utilize relevant ITU-R Recommendations in planning spectrum use and implementing technology and systems supporting public protection and disaster relief;

9 to encourage administrations to continue to work closely with their public protection and disaster relief community to further refine the operational requirements for public protection and disaster relief activities;

10 that manufacturers should be encouraged to take this Resolution into account in future equipment designs, including the need for administrations to operate within different parts of the identified bands,

⁵ Venezuela has identified the band 380-400 MHz for public protection and disaster relief applications.

⁶ Some countries in Region 3 have also identified the bands 380-400 MHz and 746-806 MHz for public protection and disaster relief applications.

invites ITU-R

1 to continue its technical studies and to make recommendations concerning technical and operational implementation, as necessary, for advanced solutions to meet the needs of public protection and disaster relief radiocommunication applications, taking into account the capabilities, evolution and any resulting transition requirements of the existing systems, particularly those of many developing countries, for national and international operations;

2 to conduct further appropriate technical studies in support of possible additional identification of other frequency ranges to meet the particular needs of certain countries in Region 1 which have given their agreement, especially in order to meet the radiocommunication needs of public protection and disaster relief agencies.

RESOLUTION 670 (WRC-03)

Notification and protection of earth stations in the meteorological-satellite service in the band 1 670-1 675 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that this Conference has made an allocation to the mobile-satellite service (MSS) (Earth-to-space) in the band 1 668-1 675 MHz;
- b) that there are existing earth stations operating in the meteorological-satellite service (space-to-Earth) in the band 1 670-1 710 MHz;
- c) that the existing earth stations of the meteorological-satellite service operating in the band 1 670-1 675 MHz are used for reception of unprocessed active and passive sensor data;
- d) that this Conference has added No. **5.380A** to ensure protection of existing earth stations in the meteorological-satellite service from mobile earth stations in the band 1 670-1 675 MHz;
- e) that, previously, some earth stations in the meteorological-satellite service have not needed to be registered,

considering further

that Recommendation ITU-R SA.1158 provides guidelines about the sharing between the MSS and the meteorological-satellite service,

invites administrations

to notify before 1 January 2004 assignments to any earth stations in the meteorological-satellite service which were operating in the band 1 670-1 675 MHz on 4 July 2003,

resolves

that if an administration operating an earth station in the meteorological-satellite service for which assignments have been notified in the band 1 670-1 675 MHz before 1 January 2004 subsequently notifies a new assignment to the same earth station in the same band, then this new assignment shall also be protected from harmful interference from the MSS,

instructs the Director of the Radiocommunication Bureau

to publish the list of meteorological-satellite service earth stations operating in the band 1 670-1 675 MHz notified before 1 January 2004,

instructs the Secretary-General

to bring this Resolution to the attention of the World Meteorological Organization.

RESOLUTION 703 (Rev.WRC-03)

**Calculation methods and interference criteria recommended by ITU-R
for sharing frequency bands between space radiocommunication and
terrestrial radiocommunication services or between space
radiocommunication services**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in frequency bands shared with equal rights by space radiocommunication and terrestrial radiocommunication services, it is necessary to impose certain technical limitations and coordination procedures on each of the sharing services for the purpose of limiting mutual interference;
- b)* that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose coordination procedures for the purpose of limiting mutual interference;
- c)* that the calculation methods and interference criteria relating to coordination procedures referred to in *considering a)* and *b)* are based upon ITU-R Recommendations;
- d)* that, in recognition of the successful sharing of the frequency bands by space radiocommunication and terrestrial radiocommunication services, and the continuing improvements in space technology and that of the Earth segment, each Radiocommunication Assembly has improved upon some of the technical criteria recommended by the preceding Assembly;
- e)* that the ITU Radiocommunication Assembly has approved a procedure for approving Recommendations between Radiocommunication Assemblies;
- f)* that the Constitution recognizes the right of Member States to make special arrangements on telecommunication matters; however, such arrangements shall not be in conflict with the terms of the Constitution, Convention or of the Regulations annexed thereto as far as harmful interference to the radio services of other countries is concerned;
- g)* that the use of this Resolution may reduce the need for incorporation by reference of some ITU-R Recommendations,

is of the opinion

- a)* that future decisions of the ITU-R are likely to make further changes in the recommended calculation methods and interference criteria;

b) that the administrations should whenever possible apply the current ITU-R Recommendations on sharing criteria when planning systems for use in frequency bands shared with equal rights between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services,

invites administrations

to submit contributions to the Radiocommunication Study Groups, providing information on practical results and experience of sharing between terrestrial and space radiocommunication services or between space services, which help to bring about significant improvements in coordination procedures, calculation methods and harmful interference thresholds, and thereby to optimize the available orbit/spectrum resources,

resolves

1 that the Director of the Radiocommunication Bureau, in consultation with Study Group Chairmen, shall prepare a list identifying the relevant parts of new or revised Recommendations approved by the ITU-R affecting the calculation methods and the interference criteria and also those specific sections of the Radio Regulations to which they are applicable, relating to sharing between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services. This list shall be prepared without delay following the approval of these Recommendations;

2 that the Director of the Radiocommunication Bureau shall forward this list to all administrations for information once every year.

RESOLUTION 705 (Mob-87)

Mutual protection of radio services operating in the band 70-130 kHz

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

considering

- a) that various radio services, including radionavigation systems used by maritime and aeronautical services, operate in frequency bands between 70 and 130 kHz;
- b) that, radionavigation being a safety service, all practical steps consistent with the Radio Regulations should be taken to prevent harmful interference to any radionavigation system;
- c) that the ITU-R has noted that users of phased pulse radionavigation systems in the band 90-110 kHz receive no protection outside the band, yet may receive benefit from their signals outside the occupied bandwidth,

noting

that ITU-R studies show:

- that for continuous wave radionavigation systems in the frequency bands 70-90 kHz and 110-130 kHz, the protection ratio should be 15 dB within the receiver passband of ± 7 Hz at 3 dB;
- that phased pulse radionavigation systems require a 15 dB protection ratio within the band 90-110 kHz;
- that these pulse radionavigation systems would be aided by protection ratios of 5 dB and 0 dB for frequency separations between wanted and interfering signal of 10-15 kHz and 15-20 kHz, respectively,

further noting

that the ITU-R has recommended the exchange of information between authorities operating radionavigation systems in the band 90-110 kHz and those operating other systems in the band 70-130 kHz employing emissions of very high stability,

recognizing

- a) that radio services other than radionavigation operating in the bands 70-90 kHz and 110-130 kHz fulfil essential functions that may be affected;
- b) the provisions of Nos. **4.5**, **4.10**, **5.60** and **5.62**,

resolves that administrations

1 in assigning frequencies to services in the bands 70-90 kHz, 90-110 kHz and 110-130 kHz, consider the potential mutual impairment to other stations operating in accordance with the Table of Frequency Allocations and apply protective measures;

2 use the relevant ITU-R Recommendations and encourage the exchange of information between authorities operating radionavigation systems in the band 90-110 kHz and those operating other systems in the band 70-130 kHz employing emissions of very high stability, to assist in preventing potential interference problems;

3 encourage consultation, both nationally and internationally, between operators of radionavigation systems using the band 90-110 kHz and of other systems using the band 70-130 kHz,

requests the ITU-R

to continue studies in this matter, particularly the development of technical criteria and standards to permit compatible operations within the allocated bands and to assist in developing the list of contacts of system operators,

invites

1 the Council to place this matter on the agenda of the next competent world radio-communication conference, in order to establish technical criteria for the harmonious operation of the services in the bands between 70-130 kHz;

2 the International Maritime Organization (IMO), the International Civil Aviation Organization (ICAO), the International Association of Lighthouse Authorities (IALA), the Bureau international de l'heure (BIH)* and national authorities to provide the Union with information pertaining to the potential impairment of systems operating in the bands 70-90 kHz, 90-110 kHz and 110-130 kHz, together with their views and proposals resulting therefrom.

* *Note by the General Secretariat:* The 18th General Conference of the “Bureau international des poids et des mesures (BIPM)”, 12-15 October 1987, adopted a Resolution transferring the responsibility of establishing the International Atomic Time (TAI) from the BIH to the BIPM.

RESOLUTION 716 (Rev.WRC-2000)

Use of the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the fixed and mobile-satellite services and associated transition arrangements

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that WARC-92 allocated the bands 1 980-2 010 MHz and 2 170-2 200 MHz for the mobile-satellite service (MSS) with a date of entry into force of 1 January 2005, these allocations being co-primary with fixed and mobile service allocations;
- b) that the use of the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the MSS, in accordance with the provisions of Nos. **5.389A**, **5.389C** and **5.389D** of the Radio Regulations, as adopted by WRC-95 and WRC-97, is subject to a date of entry into force of 1 January 2000, 1 January 2002 (for Region 2) or 1 January 2005;
- c) that these bands are shared with the fixed and mobile¹ services on a primary basis and that they are widely used by the fixed service in many countries;
- d) that the studies made have shown that, while sharing of the MSS with the fixed service in the short to medium term would be generally feasible, in the long term sharing will be complex and difficult in both bands, so that it would be advisable to transfer the fixed service stations operating in the bands in question to other segments of the spectrum;
- e) that for many developing countries, the use of the 2 GHz band offers a substantial advantage for their radiocommunication networks and that it is not attractive to transfer these systems to higher frequency bands because of the economic consequences that this would entail;
- f) that ITU-R has developed a new frequency plan for the fixed service in the 2 GHz band, set out in Recommendation ITU-R F.1098 which will facilitate the introduction of new fixed service systems in band segments that do not overlap with the above-mentioned MSS allocations at 2 GHz;
- g) that sharing between fixed service systems using tropospheric scatter and Earth-to-space links in the MSS in the same frequency band segments is generally not feasible;
- h) that some countries utilize these bands in application of Article 48 of the Constitution (Geneva, 1992),

¹ This Resolution does not apply to the mobile service. In this respect, the use of these bands by the MSS is subject to coordination with the mobile service under the provisions of Resolution **46 (Rev.WRC-97)*** or No. **9.11A**, as applicable.

* *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

recognizing

a) that WARC-92 identified the bands 1 885-2 025 MHz and 2 110-2 200 MHz for worldwide use by International Mobile Telecommunications-2000 (IMT-2000), the satellite component being limited to the bands 1 980-2 010 MHz and 2 170-2 200 MHz, and that the development of IMT-2000 can offer great potential in helping the developing countries develop more rapidly their telecommunication infrastructure;

b) that WARC-92 resolved to request the Telecommunication Development Bureau, when formulating its immediate plans for assistance to the developing countries, to consider the introduction of specific modifications in the radiocommunication networks of the developing countries and that a future world development conference should examine the needs of developing countries and should assist them with the resources needed to implement the required modifications to their radiocommunication networks,

resolves

1 to request administrations to notify to the Radiocommunication Bureau the basic characteristics of frequency assignments to existing or planned fixed stations requiring protection, or those typical² of existing and planned fixed stations brought into use before 1 January 2000 in the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2;

2 that administrations proposing to bring an MSS system into service must take account of the fact that, when coordinating their system with administrations having terrestrial services, such administrations may have existing or planned installations covered by Article 48 of the Constitution;

3 that in respect of stations of the fixed service taken into account in the application of Resolution **46 (Rev.WRC-97)***/No. **9.11A**, administrations responsible for MSS networks operating in the bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 shall ensure that unacceptable interference is not caused to fixed service stations notified and brought into use before 1 January 2000;

4 that to facilitate the introduction and future use of the 2 GHz bands by the MSS:

4.1 administrations are urged to ensure that frequency assignments to new fixed service systems, to be brought into operation after 1 January 2000, do not overlap with the 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 MSS allocations, for example by using the channel plans of Recommendation ITU-R F.1098;

² With respect to the notification of frequency assignments to stations in the fixed and mobile services, it was possible to notify the characteristics of typical stations in the fixed service in accordance with No. **11.17** without restriction up until 1 January 2000.

* *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

4.2 administrations are urged to take all practicable steps to phase out troposcatter systems operating in the band 1980-2010 MHz in all three Regions and 2010-2025 MHz in Region 2 by 1 January 2000. New troposcatter systems shall not be brought into operation in these bands;

4.3 administrations are encouraged, where practicable, to draw up plans for the gradual transfer of the frequency assignments to their fixed service stations in the bands 1980-2010 MHz and 2170-2200 MHz in all three Regions and 2010-2025 MHz and 2160-2170 MHz in Region 2 to non-overlapping bands, giving priority to the transfer of their frequency assignments in the band 1980-2010 MHz in all three Regions and 2010-2025 MHz in Region 2, considering the technical, operational and economical aspects;

5 that administrations responsible for the introduction of mobile-satellite systems should take into account and address the concerns of affected countries, especially developing countries, to minimize the possible economic impact of transition measures in respect to existing systems;

6 to invite the Bureau to provide assistance to developing countries requesting it for the introduction of specific modifications to their radiocommunication networks that will facilitate their access to the new technologies being developed in the 2 GHz band as well as in all coordination activities;

7 that administrations responsible for the introduction of mobile-satellite systems urge their mobile-satellite system operators to participate in the protection of terrestrial fixed services especially in the least developed countries,

invites ITU-R

to conduct, as a matter of urgency, further studies, in conjunction with the Bureau, to:

- develop and provide to administrations the necessary tools in a timely manner and not later than WRC-03 to assess the impact of interference in the detailed coordination of mobile-satellite systems;
- develop the necessary planning tools as soon as possible to assist those administrations considering a replanning of their terrestrial fixed networks in the 2 GHz range not later than WRC-03,

invites ITU-D

to evaluate, as a matter of urgency, the financial and economic impact on the developing countries of the transfer of fixed services, and to present its results to a future competent world radiocommunication conference and/or world telecommunication development conference,

RES716-4

invites the Director of the Telecommunication Development Bureau

to implement *invites ITU-D* by encouraging joint activities between the relevant study groups of both ITU-D and ITU-R,

instructs the Director of the Radiocommunication Bureau

to submit a report on the implementation of this Resolution to world radiocommunication conferences.

RESOLUTION 728 (Rev.WRC-2000)

Studies relating to consideration of allocations in the broadcasting band 470-862 MHz to non-geostationary mobile-satellite services

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a) that the agenda of this Conference included consideration of the adoption of additional allocations for non-geostationary mobile-satellite services (non-GSO MSSs);
- b) that the CPM-99 Report stated that the Radiocommunication Bureau has identified at least 22 non-GSO MSS networks as at 28 April 1999 at frequencies below 1 GHz, at some stage of coordination under Resolution **46 (Rev.WRC-97)*** and that many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum;
- c) that CPM-97 considered the protection requirements for analogue television in the band 470-862 MHz against a narrow-band MSS signal in the most sensitive and least sensitive portions of an analogue television channel and the protection requirements for a digital television channel, based on existing Recommendations ITU-R BT.655-4, ITU-R BT.417-4 and ITU-R IS.851-1**;
- d) that CPM-97 stated that the protection ratios for a narrow-band interfering signal in the least sensitive parts of an analogue television channel are to be verified by further studies;
- e) that CPM-97 stated the region of lower protection requirements and commensurately higher permissible interfering power flux-density levels as being 100 kHz from the band edges of an analogue television channel, at least in some countries;
- f) that CPM-97 stated that the interfering effects of a non-GSO MSS transmission will depend on its specific characteristics (e.g. duty-cycle, duration, periodicity, etc.), that interference contributions from sources other than MSS (even those from other broadcasting stations) have to be taken into account, that slightly lower values of field strength to be protected may need to be assumed in countries where television networks are relatively sparse, and that studies on sharing are necessary;
- g) that the permissible aggregate interfering power flux-density resulting from these protection requirements, in some portions of an analogue television channel, may be useful in determining the feasibility of sharing with non-GSO MSS transmitter space-to-Earth links;

* *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

** *Note by the Secretariat:* Radiocommunication Study Group 1 has transferred Recommendation ITU-R IS.851-1 from the IS Series to the SM Series, its new denomination is ITU-R SM.851-1.

h) that these bands are also allocated in part to fixed and mobile terrestrial systems and radionavigation systems;

i) that, in many countries, the channels assigned for analogue television may also be used for digital television, and that during the transition period of parallel operation of analogue and digital television networks the usage of this band for television will increase;

j) that ITU-R studies are currently under way to determine television broadcasting requirements under Question ITU-R 268/11 and sound broadcasting requirements under Question ITU-R 224/10,

noting

a) that on completion of studies, parts of the bands now allocated to the broadcasting service between 470 MHz and 862 MHz might be considered suitable for worldwide allocation to non-GSO MSS (space-to-Earth) transmissions;

b) that the bandwidth required in these television channels may be 1-2% of the total band 470-862 MHz to be shared with the above systems;

c) the need to protect the radio astronomy service in the band 608-614 MHz against interference from MSS transmissions, including unwanted emissions,

resolves

1 to invite ITU-R to carry out additional studies to determine operational and technical means that may facilitate co-frequency sharing between narrow-band non-GSO MSS (space-to-Earth) transmissions and the services to which the band 470-862 MHz is allocated, including the bands where the broadcasting service is also allocated, and including consideration of digital television systems and parallel transmissions during the transition period;

2 to recommend that WRC-05/06 consider, on the basis of the results of the studies referred to in *resolves* 1, the possibility of making additional allocations on a worldwide basis for the non-GSO MSS,

urges administrations

to participate actively in such studies, with the involvement of interested parties.

RESOLUTION 729 (WRC-97)

Use of frequency adaptive systems in the MF and HF bands

The World Radiocommunication Conference (Geneva, 1997),

considering

- a)* that the efficiency of spectrum use will be improved by the use of frequency adaptive systems in the MF and HF bands shared by the fixed and the mobile services;
- b)* that trials of frequency adaptive systems which have been undertaken during the past 20 years have demonstrated the feasibility of such systems and their improved spectrum efficiency;
- c)* that such improved efficiency is attained through:
 - shorter call set-up and improved transmission quality by selection of the most suitable assigned channels;
 - reduced channel occupancy, permitting the same channels to be used by different networks, yet decreasing the probability of harmful interference;
 - minimization of the transmitter power required for each transmission;
 - continued optimization of the emissions owing to the sophistication of the systems;
 - simple operation by the use of intelligent peripheral equipment;
 - reduced need for skilled radio operators;
- d)* that following Resolution **23 (WRC-95)***, the Radiocommunication Bureau no longer undertakes examination with respect to the probability of harmful interference caused by new assignments recorded in the Master International Frequency Register (MIFR) in the non-planned bands below 28 MHz;
- e)* that frequency adaptive systems will actively contribute to the avoidance of interference since, when other signals are observed on the channel, the frequency adaptive system will move to another frequency,

resolves

1 that, in authorizing the operation of frequency adaptive systems in the MF and HF bands, administrations shall:

1.1 make assignments in the bands allocated to the fixed and mobile services;

* *Note by the Secretariat:* This Resolution was abrogated by WRC-2000.

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1.2 not make assignments in the bands:

- allocated exclusively to the maritime or aeronautical mobile (R) services;
- shared on a co-primary basis with the broadcasting service, radiodetermination service or the amateur services;
- allocated to radio astronomy;

1.3 avoid use which may affect frequency assignments involving safety services made in accordance with Nos. **5.155**, **5.155A** and **5.155B**;

1.4 take into account any footnotes applicable to the proposed bands and the implications regarding compatibility;

2 that frequency adaptive systems shall automatically limit simultaneous use of frequencies to the minimum necessary for communication requirements;

3 that, with a view to avoiding harmful interference, the system should evaluate the channel occupancy prior to and during operation;

4 that frequency adaptive systems shall be notified to the Bureau in accordance with the provisions of Article **11**,

invites ITU-R

1 to pursue its studies on the subject (see, for example, Questions ITU-R 204-1/1, ITU-R 147-1/9, ITU-R 205/9 or ITU-R 214/9) with a view to achieving optimum operational performance and compatibility;

2 to report on the results of these studies to a future world radiocommunication conference,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements, as soon as practicable, for the notification of frequency assignments to adaptive systems and for their recording in the MIFR, taking into account the studies already undertaken.

RESOLUTION 731 (WRC-2000)

**Consideration by a future competent world radiocommunication conference
of issues dealing with sharing and adjacent-band compatibility between
passive and active services above 71 GHz**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that the changes made to the Table of Frequency Allocations by this Conference in bands above 71 GHz were based on the requirements known at the time of the Conference;
- b)* that the passive service spectrum requirements above 71 GHz are based on physical phenomena and therefore are well known, and are reflected in the changes made to the Table of Frequency Allocations by this Conference;
- c)* that several bands above 71 GHz are already used by Earth exploration-satellite service (passive) and space research service (passive) because they are unique bands for the measurement of specific atmospheric parameters;
- d)* that there is currently only limited knowledge of requirements and implementation plans for the active services that will operate in bands above 71 GHz;
- e)* that, in the past, technological developments have led to viable communication systems operating at increasingly higher frequencies, and that this can be expected to continue so as to make communication technology available in the future in the frequency bands above 71 GHz;
- f)* that, in the future, alternative spectrum needs for the active and passive services should be accommodated when the new technologies become available;
- g)* that, following the revisions to the Table of Frequency Allocations by this Conference, sharing studies may be required for services in some bands above 71 GHz;
- h)* that interference criteria for passive sensors have been developed and are given in Recommendation ITU-R SA.1029;
- i)* that protection criteria for radio astronomy have been developed and are given in Recommendation ITU-R RA.769;
- j)* that several satellite downlink allocations have been made in bands adjacent to those allocated to the radio astronomy service;

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k) that, sharing criteria for active and passive services in bands above 71 GHz have not yet been fully developed within ITU-R;

l) that, in order to ensure protection of passive services above 71 GHz, this Conference avoided making allocations to both active and passive services in some bands such as 100-102 GHz, 148.5-151.5 GHz and 226-231.5 GHz, so as to prevent potential sharing problems,

recognizing

that, to the extent practicable, the burden of sharing among active and passive services should be equitably distributed among the services to which allocations are made,

resolves

that a future competent conference should consider the results of ITU-R studies with a view to revising the Radio Regulations, as appropriate, in order to accommodate the emerging requirements of active services, taking into account the requirements of the passive services, in bands above 71 GHz,

urges administrations

to note the possibility of changes to Article 5 to accommodate emerging requirements for active services, as indicated in this Resolution, and to take this into account in the development of national policies and regulations,

invites ITU-R

1 to continue its studies to determine if and under what conditions sharing is possible between active and passive services in the bands above 71 GHz, such as, but not limited to, 100-102 GHz, 116-122.25 GHz, 148.5-151.5 GHz, 174.8-191.8 GHz, 226-231.5 GHz and 235-238 GHz;

2 to study means of avoiding adjacent-band interference from space services (down-links) into radio astronomy bands above 71 GHz;

3 to take into account the principles of burden-sharing to the extent practicable in their studies;

4 to complete the necessary studies when the technical characteristics of the active services in these bands are known;

5 to develop Recommendations specifying sharing criteria for those bands where sharing is feasible,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 732 (WRC-2000)

**Consideration by a future competent world radiocommunication
conference of issues dealing with sharing between
active services above 71 GHz**

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that this Conference has made changes to the Table of Frequency Allocations above 71 GHz, following consideration of science service issues;
- b)* that there are several co-primary active services in some bands above 71 GHz in the Table of Frequency Allocations as revised by this Conference;
- c)* that there is limited knowledge of characteristics of active services that may be developed to operate in bands above 71 GHz;
- d)* that sharing criteria for sharing between active services in bands above 71 GHz have not yet been fully developed within ITU-R;
- e)* that sharing between multiple co-primary active services may hinder the development of each active service in bands above 71 GHz;
- f)* that the technology for some active services may be commercially available earlier than for some other active services;
- g)* that adequate spectrum should be available for the active services for which the technology is available at a later time,

noting

that sharing criteria need to be developed, to be used by a future competent conference, for determining to what extent sharing between multiple co-primary active services is possible in each of the bands,

resolves

- 1 that appropriate measures should be taken to meet the spectrum requirements for active services for which the technology will be commercially available at a later time;

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2 that sharing criteria be developed for co-primary active services in bands above 71 GHz;

3 that the sharing criteria developed should form the basis for a review of active service allocations above 71 GHz at a future competent conference, if necessary,

urges administrations

to note the possibility of changes to Article 5 to accommodate emerging requirements for active services, as indicated in this Resolution, and to take this into account in the development of national policies and regulations,

invites ITU-R

to complete the necessary studies with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of a future competent conference,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 734 (Rev.WRC-03)

Feasibility of use of high altitude platform stations in the fixed and mobile services in the frequency bands above 3 GHz allocated exclusively for terrestrial radiocommunication

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that ITU has among its purposes “to promote the extension of the benefit of the new telecommunication technologies to all the world’s inhabitants” (No. 6 of the Constitution);
- b)* that systems based on new technologies using high altitude platform stations (HAPS) can potentially be used for various applications such as the provision of high-capacity services to urban and rural areas;
- c)* that WRC-97 made provision for the use of HAPS within the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz (see also Resolution **122 (Rev.WRC-03)**);
- d)* that in view of the altitude at which HAPS are placed, the area visible from a HAPS may be within a country or also include neighbouring countries;
- e)* that some administrations intend to operate systems using HAPS in the bands allocated exclusively by the Table of Frequency Allocations or by footnotes for terrestrial radiocommunication such as the fixed and mobile services,

recognizing

ITU-R studies relating to geometrical coordination distance from HAPS, as described in Recommendation ITU-R F.1501,

resolves

to recommend to a future competent WRC to review the feasibility of facilitating the implementation of systems using HAPS in the fixed and mobile services in bands above 3 GHz allocated exclusively by the Table of Frequency Allocations or by footnotes for terrestrial radiocommunication, taking into consideration studies already carried out,

RES734-2

invites ITU-R

to carry out regulatory and technical studies to determine the feasibility of facilitating systems using HAPS in the fixed and mobile services in bands above 3 GHz allocated exclusively by the Table of Frequency Allocations or by footnotes for terrestrial radiocommunication, recognizing the results of the studies already completed and taking account of existing use and future requirements in these bands, and any impact on allocations in adjacent bands,

encourages administrations

to contribute actively to the sharing studies in accordance with this Resolution.

RESOLUTION 738 (WRC-03)

**Compatibility analyses between the Earth exploration-satellite
service (passive) and active services**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that primary allocations have been made to various space services in the Earth-to-space direction such as the fixed-satellite service (FSS), mobile-satellite service and broadcasting-satellite service and/or to terrestrial services such as the fixed service, mobile service and broadcasting service, hereafter referred to as “active services”, in bands adjacent or nearby to bands allocated to the Earth exploration-satellite service (EESS) (passive);
- b)* that unwanted emissions from active services may cause unacceptable interference to the EESS (passive);
- c)* that for technical or operational reasons, the general limits in Appendix 3 may be insufficient in protecting the EESS (passive) in specific bands;
- d)* that, in many cases, the frequencies used by the EESS (passive) sensors are chosen to study natural phenomena producing radio emissions at frequencies fixed by the laws of nature, and therefore shifting frequency to avoid or mitigate interference problems may not be possible;
- e)* that Recommendation ITU-R SM.1633 provides a list of band-pairs and a methodology for conducting, and a framework for documenting the results of, the compatibility studies between active and passive services operating in adjacent and nearby bands;
- f)* that according to Recommendation ITU-R SM.1633, the EESS (passive) in the band 31.3-31.5 GHz can be protected if the unwanted emissions of fixed-service systems (except high-altitude platform stations (HAPS)) operating in the band 31.0-31.3 GHz do not exceed –38 dBW in a 100 MHz reference bandwidth in the band 31.3-31.5 GHz;
- g)* that according to Recommendation ITU-R SM.1633, the EESS (passive) in the band 52.6-54.25 GHz can be protected if the unwanted emissions of fixed-service systems operating in the band 51.4-52.6 GHz do not exceed –33 dBW in a 100 MHz reference bandwidth in the band 52.6-54.25 GHz;
- h)* that it is necessary to ensure an equitable burden sharing for achieving compatibility between active and passive services,

recognizing

- a)* that Recommendation ITU-R SM.1633 addresses the compatibility between the EESS (passive) and active services operating in adjacent or nearby bands;
- b)* that the relevant annexes in Recommendation ITU-R SM.1633 need further refinement;
- c)* that Recommendation ITU-R SM.1633 does not address all band-pairs in the Table below where compatibility analyses need to be conducted;
- d)* that additional measures may be required to protect the EESS (passive) from unwanted emissions of active services for the band-pairs listed in the Table,

resolves

1 to invite ITU-R to continue or to initiate studies on the compatibility analyses between EESS (passive) and the corresponding active services as listed in the Table with a view to updating Recommendation ITU-R SM.1633 or developing additional Recommendations;

TABLE

EESS (passive) band	Active service band	Active service
1 400-1 427 MHz	1 350-1 400 MHz	Fixed service (FS) Mobile service (MS) Radiolocation service (RLS)
1 400-1 427 MHz	1 427-1 429 MHz	FS, MS (except aeronautical mobile service (AMS)) and space research service (SRS) (Earth-to-space)
1 400-1 427 MHz	1 429-1 452 MHz	FS and MS
23.6-24 GHz	22.55-23.55 GHz	Inter-satellite service (ISS)
31.3-31.5 GHz	30-31 GHz	FSS (Earth-to-space)
50.2-50.4 GHz ¹	50.4-51.4 GHz ¹	FSS (Earth-to-space) ¹
50.2-50.4 GHz ¹	47.2-50.2 GHz (Regions 2 and 3) 49.44-50.2 GHz ¹ (Region 1)	FSS ¹

¹ Studies in this band must take into account No. 5.340.1.

2 to invite ITU-R to further study the impact of implementing the values provided in *considering f)* and *g)* for unwanted emissions of fixed-service systems operating in Regions 2 and 3, taking into account that the impact on fixed-service systems in Region 1 has already been investigated;

3 to recommend that WRC-07 review the results of the studies identified in *resolves* 1 and 2 in order to consider regulatory measures, if appropriate, to ensure the protection of the EESS (passive) operating in the bands listed in the Table from unwanted emissions of active services operating in the corresponding bands while taking into account the impact on all concerned services of implementing or not implementing such measures,

invites administrations

1 to provide the relevant characteristics of active and passive service systems operating in the bands identified in the Table;

2 to actively participate in the studies identified in *resolves* 1 and 2.

RESOLUTION 739 (WRC-03)

Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that adjacent or nearby primary service allocations have been made to the radio astronomy service, and to various space services, such as the fixed-satellite service (FSS), radionavigation-satellite service (RNSS), mobile-satellite service (MSS) and broadcasting-satellite service (BSS), hereafter referred to as “active space services”;
- b)* that, in many cases, the frequencies used by the radio astronomy service (RAS) are chosen to study natural phenomena producing radio emissions at frequencies fixed by the laws of nature, so shifting frequency to avoid or mitigate interference problems may not be possible;
- c)* that Recommendation ITU-R SM.1633 provides a methodology for conducting, and a framework for documenting the results of, compatibility studies between active space service and passive service band-pairs;
- d)* that Recommendation ITU-R SM.1633 also provides the results of compatibility studies between a passive service and an active space service in certain adjacent and nearby bands;
- e)* that appropriate consultation between administrations has the potential to lead to the development of innovative solutions and to the rapid deployment of systems;
- f)* that, for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix 3 may be required to protect the RAS from active services in specific bands,

noting

- a)* that the additional burden of undertaking any technical examination should not be placed on the Radiocommunication Bureau;
- b)* that a consultation procedure, as contained in this Resolution, would not place an additional burden on the Bureau;
- c)* that Recommendation ITU-R M.1583 provides a methodology based on the equivalent power flux-density (epfd) concept for calculation of interference resulting from unwanted emissions from non-geostationary (non-GSO) satellite systems of the MSS or RNSS into radio astronomy stations;

- d)* that Recommendation ITU-R S.1586 provides a methodology based on the epfd concept for calculation of interference resulting from unwanted emissions from non-GSO systems of the FSS into radio astronomy stations;
- e)* that Recommendation ITU-R RA.1631 provides antenna patterns to be used for compatibility analyses between non-GSO systems and RAS stations, based on the epfd concept;
- f)* that Recommendation ITU-R RA.1513 provides acceptable levels of data loss to radio astronomy observations, stating in particular that the percentage of data loss caused by any system should be lower than 2%;
- g)* that some of the results documented in Recommendation ITU-R SM.1633 may be used as threshold levels to initiate the consultation procedure;
- h)* that the results of successful consultation between concerned administrations would ensure that the interests of both the active and passive services are considered;
- i)* that measures taken by active space services to protect radio astronomy stations from interference may result in increased costs and/or reduced capabilities for those services;
- j)* that conversely, not taking such measures may result in additional operating costs and reduced operational effectiveness for the radio astronomy stations concerned;
- k)* that the implementation of additional interference mitigation measures at the radio astronomy station may increase operating costs and reduce observational effectiveness;
- l)* that conversely, not implementing such measures may impose upon the active space services an additional cost burden and reduction in service capability;
- m)* that studies for some of the band-pairs listed in Recommendation ITU-R SM.1633 are still in progress,

recognizing

- a)* that unwanted emissions produced by stations of the active space services may cause unacceptable interference to stations of the RAS;
- b)* that, although some unwanted emissions from transmitters on space stations can be controlled through careful design methods and appropriate testing procedures, other unwanted emissions, such as narrowband spurious emissions, generated by uncontrollable and/or unpredictable physical mechanisms, may only be detected after the spacecraft is launched;
- c)* that there is an uncertainty in the pre-launch assessment of the levels of unwanted emissions;

d) that it is necessary to ensure an equitable sharing of burden for achieving compatibility between the active space services and the RAS;

e) that for those cases where difficulties are encountered in meeting the values in the Annex, a consultation procedure could be used to resolve the difficulties,

resolves

1 that an administration takes all reasonable steps to ensure that space stations being designed and constructed to operate in the bands in the Annex 1 meet the values given therein at any radio astronomy station operating in the corresponding bands identified in this Annex;

2 that in the event that during construction and prior to launch it is determined that, after having considered all reasonable means, the unwanted emissions from the space station cannot meet the values given in the Annex 1, the administration that notified the space station contacts, as soon as possible, the administration operating the radio astronomy station to confirm that *resolves* 1 has been fulfilled, and the concerned administrations enter into a consultation process in order to identify all practicable steps with a view to achieving a mutually acceptable solution;

3 that in the event, following the space station launch, an administration operating a radio astronomy station determines that, due to unexpected circumstances, a space station does not meet the values for unwanted emissions given in the Annex 1 at that radio astronomy station, it contacts the administration that notified the space station so that the administration that notified the space station confirms that *resolves* 1 has been fulfilled, and the concerned administrations enter into a consultation process in order to identify further steps with a view to achieving a mutually acceptable solution;

4 that the radio astronomy stations to be taken into account in applying *resolves* 1, 2 and 3 are those which are operating in the frequency band(s) identified in the Annex 1 and which are notified before the date of reception of the advance publication information of the space station to which this Resolution applies;

5 that the space stations to be considered in the application of the above *resolves* are those designed to operate in the space service frequency bands listed in the Annex 1 for which advance publication information is received by the Bureau following the entry into force of the Final Acts of this conference;

6 that the objective of the consultation process in *resolves* 1, 2 and 3 is to achieve a mutually acceptable solution, using as guidance Recommendation ITU-R SM.1633 and any other ITU-R Recommendations deemed relevant by the concerned administrations;

7 that the Bureau shall make no examination or finding with respect to this Resolution under either Article 9 or 11,

invites administrations

1 to take all appropriate and practicable steps, from the design phase onward, to ensure that unwanted emissions are minimized from space stations that are planned to operate in one or more space service allocations, in order to avoid exceeding the threshold levels of unwanted emissions identified in the Annex 1 at any radio astronomy station;

2 to take all practicable steps, from the design phase onward, to minimize the sensitivity of radio astronomy stations to interference and to take into account the need to implement interference mitigation measures.

ANNEX 1 TO RESOLUTION 739 (WRC-03)

Unwanted emission threshold levels

The unwanted emission threshold levels applicable to geostationary space stations are given in Table 1-1 in terms of power flux-density (pfd) in a reference bandwidth produced at a radio astronomy station.

In Table 1-1 the unwanted emission threshold levels given in the fourth, sixth and eighth columns (associated with the reference bandwidth contained in the adjacent columns) should be met by space stations operating in the bands indicated in the second column at the radio astronomy station operating in the band mentioned in the third column.

The unwanted emission threshold levels applicable to space stations of non-geostationary systems are given in Table 1-2 in terms of the equivalent power flux-density (epfd), produced at a radio astronomy station in a reference bandwidth, not to be exceeded during a given percentage of time, over the whole sky.

In Table 1-2 the epfd value given in the fourth, sixth and eighth columns (associated with the reference bandwidths contained in the adjacent column) should be met by space stations operating in the bands indicated in the second column at the radio astronomy station operating in the band mentioned in the third column. The epfd value at a given radio astronomy station shall be evaluated by using the antenna pattern and the RAS maximum antenna gain given in Recommendation ITU-R RA.1631. Guidance on the calculation of epfd can be found in Recommendations ITU-R S.1586 and ITU-R M.1583. The elevation angles of the radio astronomy stations to be taken into account in the epfd calculation are those higher than the minimum elevation angle θ_{min} of the radio telescope. In the absence of such information a value of 5° shall be taken. The percentage of time during which the epfd level shall not be exceeded is mentioned in Note ⁽¹⁾ of Table 1-2.

TABLE 1-1
pfd thresholds for unwanted emissions from geostationary space stations
at a radio astronomy station

Space service	Space service band	Radio astronomy band	Single dish, continuum observations		Single dish, spectral line observations		VLBI ⁽¹⁾
			pfd ⁽²⁾	Reference bandwidth	pfd ⁽²⁾	Reference bandwidth	
	(MHz)	(MHz)	(dB(W/m ²))	(MHz)	(dB(W/m ²))	(kHz)	(dB(W/m ²))
BSS (space-to-Earth)	1 452-1 492	1 400-1 427	-180	27	-196	20	-166
MSS (space-to-Earth)	1 525-1 559						
MSS (space-to-Earth)	1 525-1 559	1 610.6-1 613.8	NA	NA	-194	20	-166
MSS (space-to-Earth)	1 613.8-1 626.5						
BSS (space-to-Earth)	2 655-2 670	2 690-2 700	-177	10	NR	25	-161
FSS (space-to-Earth)	2 670-2 690	2 690-2 700 (in Regions 1 and 3)	-177	10	NR	20	-161
	(GHz)	(GHz)	-	-	-	-	-
BSS (space-to-Earth)	21.4-22.0	22.21-22.5	NR	NR	NR	250	-128

NA: Not applicable, measurements of this type are not made in this band.

NR: No result available.

⁽¹⁾ The reference bandwidth used for spectral line observations has also been used as reference bandwidth for very long baseline interferometry (VLBI) observations. In VLBI bands, where no spectral line observations are conducted, the reference bandwidth for VLBI observations has been determined using the assumption of Recommendation ITU-R RA.769 for a typical spectrometer channel (3 km/s).

⁽²⁾ Integrated over the reference bandwidth with an integration time of 2 000 s.

TABLE 1-2
epfd thresholds* for unwanted emissions from non-GSO satellite systems
at a radio astronomy station

Space service	Space service band (MHz)	Radio astronomy band (MHz)	Single dish, continuum observations		Single dish, spectral line observations		VLBI ⁽¹⁾
			epfd ⁽²⁾ (dB(W/m ²))	Reference bandwidth (MHz)	epfd ⁽²⁾ (dB(W/m ²))	Reference bandwidth (kHz)	
MSS (space-to-Earth)	1 613.8-1 626.5	1 610.6-1 613.8	NA	NA	-258	20	epfd ⁽²⁾ (dB(W/m ²)) -230

NA: Not applicable, measurements of this type are not made in this band.

* These epfd thresholds should not be exceeded for more than 2% of time.

⁽¹⁾ The reference bandwidth used for spectral line observations has also been used as reference bandwidth for VLBI observations. In VLBI bands, where no spectral line observations are conducted, the reference bandwidth for VLBI observations has been determined using the assumption of Recommendation ITU-R RA.769 for a typical spectrometer channel (3 km/s).

⁽²⁾ Integrated over the reference bandwidth with an integration time of 2 000 s.

RESOLUTION 740 (WRC-03)

Future compatibility analyses between the radio astronomy service and active space services in certain adjacent and nearby frequency bands

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that adjacent or nearby primary service allocations have been made to the radio astronomy service (RAS), and to various space services, such as the fixed-satellite service (FSS), mobile-satellite service (MSS), broadcasting-satellite service (BSS) and radionavigation satellite service (RNSS), hereafter referred to as “active space services”;
- b)* that unwanted emissions from active space services may cause unacceptable interference to the RAS;
- c)* that, for technical or operational reasons, the general limits in Appendix 3 may be insufficient in protecting the RAS in specific bands;
- d)* that, in many cases, the frequencies used by the RAS are chosen to study natural phenomena producing radio emissions at frequencies fixed by the laws of nature, and therefore shifting frequency to avoid or mitigate interference problems may not be possible;
- e)* that Recommendation ITU-R SM.1633 provides a list of band-pairs and a methodology for conducting, and a framework for documenting the results of, the compatibility studies between certain active and passive services operating in specific adjacent and nearby band-pairs;
- f)* that it is necessary to ensure an equitable burden sharing for achieving compatibility between active and passive services,

recognizing

- a)* that Recommendation ITU-R SM.1633 addresses the compatibility between the RAS and the active space services in specific band-pairs;
- b)* that the relevant Annexes in Recommendation ITU-R SM.1633 need further refinement;
- c)* that measures beyond the general unwanted emission limits in Appendix 3 may be required to protect the RAS from unwanted emissions of active space services for the band-pairs listed in the Table,

TABLE

Band-pairs to be considered for further studies

Space service band	Space service	Radio astronomy service band
(MHz)		(MHz)
137-138	MSS (space-to-Earth)	150.05-153.0 (No. 5.208A)
387-390	MSS (space-to-Earth)	322-328.6 (No. 5.208A)
400.15-401	MSS (space-to-Earth)	406.1-410 (No. 5.208A)
620-790 (No. 5.311) see Resolution 545 (WRC-03)	BSS (space-to-Earth)	608-614
1 452-1 492	BSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 610.6-1 613.8
1 559-1 610	RNSS (space-to-Earth)	1 610.6-1 613.8
2 655-2 670	BSS (space-to-Earth)	2 690-2 700
2 655-2 670	FSS (space-to-Earth) (Region 2)	2 690-2 700
2 670-2 690	FSS (space-to-Earth) (Region 2)	2 690-2 700
(GHz)		(GHz)
10.7-10.95	FSS (space-to-Earth)	10.6-10.7
21.4-22.0	BSS (space-to-Earth)	22.21-22.5

resolves

1 to invite ITU-R to study the compatibility between the RAS and the corresponding active space services as listed in the Table only, with a view to updating or developing ITU-R Recommendations, if appropriate;

2 that WRC-07 should consider the results of the studies as identified in *resolves* 1, in order to review and update, if appropriate, the tables of threshold levels for consultation in the Annex 1 to Resolution **739 (WRC-03)**,

invites administrations

to actively participate in the ITU-R studies identified in *resolves* 1 and to provide, where practicable, the relevant characteristics of active and passive service systems operating in the bands identified in the Table to this Resolution, as well as to indicate the impact on all concerned services of implementing or not implementing the compatibility solutions.

RESOLUTION 741 (WRC-03)

Protection of the radio astronomy service in the band 4 990-5 000 MHz from unwanted emissions of the radionavigation-satellite service (space-to-Earth) operating in the frequency band 5 010-5 030 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that unwanted emissions from space stations of the radionavigation-satellite service (RNSS) operating in the frequency band 5 010-5 030 MHz may cause interference to the radio astronomy service (RAS) in the band 4 990-5 000 MHz;
- b)* that WRC-2000 decided to introduce a provisional power flux-density (pfd) limit in the band 4 990-5 000 MHz to protect the RAS, and invited ITU-R to conduct studies to review this limit;
- c)* that protection requirements for the RAS are given in Recommendations ITU-R RA.769 and ITU-R RA.1513, and are different for geostationary (GSO) and non-GSO satellite systems,

noting

- a)* that Recommendation ITU-R M.1583 provides a methodology based on the equivalent pfd (epfd) concept for calculation of interference resulting from unwanted emissions from non-GSO systems of the mobile-satellite service or RNSS into radio astronomy stations;
- b)* that Recommendation ITU-R RA.1631 provides antenna patterns and maximum antenna gain to be used for compatibility analyses between non-GSO systems and RAS stations based on the epfd concept;
- c)* that Recommendation ITU-R RA.1513 recommends acceptable levels of data loss to radio astronomy observations, stating in particular that the percentage of data loss caused by any system should be lower than 2%,

resolves

- 1 that in order not to cause harmful interference to the RAS in the band 4 990-5 000 MHz, the pfd produced in this band by any GSO RNSS network operating in the 5 010-5 030 MHz band shall not exceed $-171 \text{ dB(W/m}^2\text{)}$ in a 10 MHz band at any radio astronomy station;

2 that in order not to cause harmful interference to the RAS in the band 4990-5000 MHz, over the whole sky, for elevations higher than the minimum operating elevation angle θ_{min} ¹ specified for the radio telescope, the epfd produced in this band by all space stations within any non-GSO RNSS system operating in the 5010-5030 MHz band shall not exceed -245 dB(W/m²) in a 10 MHz band at any radio astronomy station for more than 2% of the time, using the methodology in Recommendation ITU-R M.1583 and a reference antenna with a radiation pattern and maximum antenna gain given in Recommendation ITU-R RA.1631;

3 that the limits referred to in *resolves* 1 and 2 shall apply to RNSS systems as from 3 June 2000;

4 that administrations planning to operate a GSO or a non-GSO RNSS system in the band 5010-5030 MHz, for which complete coordination or notification information, as appropriate, has been received by the Bureau after 2 June 2000, shall send to the Bureau the value of the maximum level of pfd as referred to in *resolves* 1 or the value of the maximum level of epfd as referred to in *resolves* 2, as appropriate,

instructs the Radiocommunication Bureau

as from the end of this Conference, to review all RNSS systems for which complete coordination or notification information, as appropriate, has been received by the Bureau before the end of this Conference for the band 5010-5030 MHz, and, if appropriate, to revise its findings regarding compliance with No. **5.443B**, taking into account additional information received under *resolves* 4.

¹ Until adoption of a definition of θ_{min} by ITU-R, and publication of notified radio astronomy observatory data, a value of 5° should be assumed in appropriate calculations.

RESOLUTION 742 (WRC-03)

Use of the frequency band 36-37 GHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the frequency band 36-37 GHz is allocated to the Earth exploration-satellite service (EESS) (passive) and to the space research service (passive) on a primary basis;
- b)* that the frequency band 36-37 GHz is allocated to the fixed service and to the mobile service on a primary basis;
- c)* that the EESS (passive) protection criteria are contained in Recommendation ITU-R SA.1029;
- d)* that Recommendation ITU-R F.758-2 provides characteristics of fixed service point-to-multipoint systems operating in the band 36-37 GHz, but does not provide information on characteristics of fixed service point-to-point systems operating in this band;
- e)* that the band 36-37 GHz is not available for high-density applications in the fixed service (see No. **5.547**);
- f)* that the EESS (passive) operating in the band 36-37 GHz could receive interference from the emissions of systems of active services,

recognizing

- a)* that EESS (passive) systems may experience harmful interference if a high density of fixed-service stations is deployed in the band 36-37 GHz;
- b)* that sharing criteria between EESS (passive) and fixed-service systems need to be defined for the band 36-37 GHz,

resolves

- 1 to invite ITU-R to conduct sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria;
- 2 to recommend that a future competent conference review the results of the studies and consider the possible inclusion of the sharing criteria within the Radio Regulations,

invites administrations

1 to provide ITU-R with characteristics of active systems (fixed and mobile services) operating in the band 36-37 GHz;

2 to take into account that EESS (passive) systems may experience harmful interference if the band 36-37 GHz becomes heavily used by stations in the fixed or mobile-service prior to the establishment of the sharing criteria.

RESOLUTION 743 (WRC-03)

**Protection of single-dish radio astronomy stations in Region 2
in the 42.5-43.5 GHz band**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the band 42.5-43.5 GHz is allocated to the radio astronomy service (RAS) on a primary basis, and that both continuum and spectral line observations are conducted in this band;
- b)* that there are primary allocations to the fixed-satellite service (FSS) (space-to-Earth) and to the broadcasting-satellite service (BSS) in the 42-42.5 GHz band;
- c)* that a geostationary (GSO) FSS or BSS satellite operating in the 42-42.5 GHz band could encounter great difficulty in meeting the values given in No. **5.551I** for single-dish radio telescope observations in the 42.5-43.5 GHz band for 100% of the time;
- d)* that an FSS or BSS satellite or system operating in the 42-42.5 GHz band would encounter great difficulty in meeting the power flux-density (pfd) level of $-153 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for GSO satellites or the equivalent pfd (epfd) level of $-246 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for any non-GSO system for single-dish radio telescope spectral-line observations near the 42.5 GHz band edge of the 42.5-43.5 GHz band, even when all practicable technical or operational measures to reduce the potential for interference detrimental to the RAS stations are employed;
- e)* that because there are relatively few RAS stations operating single-dish telescopes in the band 42.5-43.5 GHz, and because there are expected to be relatively few FSS or BSS earth stations operating in the 42-42.5 GHz band, it may be feasible for both services to employ technical or operational measures, including but not limited to such interference mitigation techniques as geographical isolation, time sharing, etc., in order to reduce the potential for interference detrimental to the RAS stations operating in this band;
- f)* that, taking into account the above *considerings*, it should be feasible to rely on arrangements between concerned RAS and FSS/BSS administrations to ensure that the unwanted emissions from FSS or BSS satellites and systems in the 42-42.5 GHz band do not cause interference detrimental to RAS stations in Region 2 conducting spectral-line observations in the 42.5-42.77 GHz band,

resolves

1 that a GSO FSS or BSS satellite in the band 42-42.5 GHz shall not exceed the values given in No. **5.551I** for more than 2% of the time at any radio astronomy station in Region 2 registered as a single-dish radio telescope in the 42.5-43.5 GHz band;

2 that an administration that plans to operate a GSO FSS or BSS satellite or a non-GSO FSS or BSS system in the 42-42.5 GHz band shall take all practicable steps to avoid exceeding the pfd value of $-153 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for a GSO satellite, and the epfd value of $-246 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for any non-GSO system in the 42.5-42.77 GHz band, for more than 2% of the time, at the site of a radio astronomy station registered as a single-dish radio telescope in Region 2;

3 that in the event that an administration planning to operate a GSO FSS or BSS satellite or a non-GSO FSS or BSS system in the band 42-42.5 GHz has taken all practicable steps to avoid exceeding the values and percentage of time criterion in *resolves* 2 in the 42.5-42.77 GHz band, but that nevertheless would not meet them, the administration planning to operate such a satellite or systems shall enter into discussions with the administration operating the affected radio astronomy station in Region 2 to arrive at a mutually satisfactory arrangement with respect to the unwanted emissions produced into the band 42.5-42.77 GHz;

4 that *resolves* 1, 2 and 3 shall apply with respect to any radio astronomy station in Region 2 registered as a single-dish radio telescope in the band 42.5-43.5 GHz that was in operation prior to 5 July 2003 and that has been notified to the Radiocommunication Bureau before 4 January 2004, or that was notified before the date of receipt of the complete Appendix 4 information for coordination or notification, as appropriate, for an FSS or BSS satellite or system to which this Resolution applies (see Note 1);

5 that an administration notifying a radio astronomy station in Region 2 as a single-dish radio telescope after the dates provided in *resolves* 4 may seek an agreement with administrations that have authorized FSS or BSS satellites or systems to which this Resolution applies,

invites ITU-R

to conduct studies and develop Recommendations to establish the appropriate balance between the percentage of time that GSO satellites operating in the 42-42.5 GHz band exceed the single-dish values in No. **5.551I** at the site of a radio astronomy station and the associated impact on radio astronomy observations.

NOTE 1 – For purposes of No. **5.551H**, No. **5.551I** and *resolves* 4 of this Resolution, the radio astronomy stations currently under construction in Sierra Negra, Mexico, 18° 59' N/97° 18' W (station Volcan Sierra Negra) and San Pedro de Atacama, Chile, 23° 20' S/67° 44' W (station Atacama Large Millimeter Array) to conduct observations in the 42.5-43.5 GHz band, shall be considered to have been in operation prior to 5 July 2003 if they are notified to the Radiocommunication Bureau before 1 January 2005.

RESOLUTION 744 (WRC-03)

Sharing between the mobile-satellite service (Earth-to-space) and the space research (passive) service in the band 1 668-1 668.4 MHz and between the mobile-satellite service (Earth-to-space) and the fixed and mobile services in the band 1 668.4-1 675 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference has made a global allocation to the mobile-satellite service (MSS) (Earth-to-space) in the band 1 668-1 675 MHz and a global allocation to the MSS (space-to-Earth) in the band 1 518-1 525 MHz;
- b)* that due to sharing conditions between MSS (space-to-Earth) and the aeronautical mobile service for telemetry in the band 1 518-1 525 MHz (see No. **5.348B**), MSS operation in the United States of America is unlikely to be feasible;
- c)* that the above constraints on the MSS in the band 1 518-1 525 MHz therefore limit the possible use of the band 1 668-1 675 MHz by the MSS in the United States of America;
- d)* that the band 1 660.5-1 668.4 MHz is allocated to the space research (passive) service;
- e)* that in the band 1 668-1 668.4 MHz, mobile earth stations and space research (passive) stations are subject to coordination under No. **9.11A**;
- f)* that the band 1 670-1 675 MHz is currently planned for use in the United States of America for the fixed and mobile services,

considering further

- a)* that the band 1 668.4-1 675 MHz is allocated to the fixed and mobile services;
- b)* that No. **5.380** identifies the band 1 670-1 675 MHz for aeronautical public correspondence systems but that no such systems exist;
- c)* that sharing between mobile systems other than those referred to in No. **5.380** and the MSS in the band 1 670-1 675 MHz has not been studied, since mobile service system characteristics were not available;
- d)* that MSS systems in the band 1 668-1 675 MHz are not expected to become operational prior to 2007,

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resolves

that, in the band 1 670-1 675 MHz, stations in the MSS shall not claim protection from fixed and mobile stations operating within the United States of America,

invites ITU-R

1 to complete, as a matter of urgency and in time for WRC-07, studies relating to provisions to protect space research (passive) space stations from harmful interference from mobile earth stations in the band 1 668-1 668.4 MHz, taking care to avoid undue constraints on either service;

2 to study, as a matter of urgency and in time for WRC-07, the use of the band 1 668.4-1 675 MHz by the mobile service, and to complete any relevant sharing studies between the mobile service and the MSS in this band, taking care to avoid undue constraints on either service;

3 to bring the results of these studies to the attention of WRC-07,

invites administrations and interested parties

to participate actively in these studies,

recommends

that WRC-07 take appropriate action based on the results of those studies, excluding modification of the above *resolves*.

RESOLUTION 745 (WRC-03)

Protection of existing services in all Regions from non-geostationary-satellite networks in the fixed-satellite service using the frequency bands around 1.4 GHz on a secondary basis

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the agenda of this Conference included consideration of the adoption of allocations for feeder links for the non-geostationary (non-GSO) systems in the mobile-satellite service (MSS) around 1.4 GHz;
- b)* that the band 1 350-1 400 MHz is allocated on a primary basis to the radiolocation, fixed and mobile services in Region 1 and to the radiolocation service in Regions 2 and 3;
- c)* that Nos. **5.149**, **5.338** and **5.339** also apply to the band 1 350-1 400 MHz;
- d)* that the band 1 400-1 427 MHz is allocated to the Earth exploration-satellite service (EESS) (passive), radio astronomy and space research (passive) services on a primary basis in all Regions;
- e)* that No. **5.340** also applies to the band 1 400-1 427 MHz;
- f)* that the band 1 427-1 429 MHz is allocated in all Regions to the space operation (Earth-to-space), fixed and mobile (except aeronautical mobile) services on a primary basis;
- g)* that No. **5.341** also applies to the band 1 400-1 452 MHz;
- h)* that the band 1 429-1 452 MHz is allocated on a primary basis to the fixed service in all Regions, to the mobile service (except aeronautical mobile) in Region 1 and to the mobile service in Regions 2 and 3;
- i)* that No. **5.342** also applies to the band 1 429-1 452 MHz in Region 1;
- j)* that the Report of the 2002 Conference Preparatory Meeting (CPM) indicated that there were significant technical challenges to be overcome in some areas if existing services, particularly passive services, were to be protected from harmful interference from the operation of feeder links around 1.4 GHz;
- k)* that the Report of 2002 CPM also indicated that studies in ITU-R were incomplete for the radio astronomy, EESS (passive), space research, aeronautical mobile (aeronautical mobile telemetry (AMT)) and radiolocation services,

recognizing

that secondary allocations around 1.4 GHz to the fixed-satellite service (FSS) for feeder links for non-GSO satellite systems in the MSS with service links below 1 GHz may support the development of new services on a global basis,

resolves

1 that the additional allocations for the FSS on a secondary basis in the bands 1 390-1 392 MHz and 1 430-1 432 MHz for feeder links in the (Earth-to space) and (space-to-Earth) directions, respectively, for non-GSO satellite systems in the MSS with service links operating below 1 GHz, shall not be used until the completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 to this Resolution and the results of these studies shall be reported to WRC-07 and the decisions should be taken by WRC-07 accordingly;

2 to recommend that decisions taken by WRC-07, including any provisions for the protection of other services to which the bands in *resolves* 1 are allocated, and of passive services in the adjacent band, apply to all non-GSO FSS systems in these bands filed to the Bureau after 5 July 2003,

further resolves to invite ITU-R, as a matter of urgency

1 to continue studies, and to carry out tests and demonstrations to validate the studies on operational and technical means to facilitate sharing around 1.4 GHz, including the frequency band 1 390-1 392 MHz, between existing and currently planned services and FSS feeder links (Earth-to-space) for use by non-GSO satellite systems in the MSS with service links operating below 1 GHz;

2 to conduct studies and carry out tests and demonstrations to validate the studies on operational and technical means to facilitate sharing around 1.4 GHz, including the frequency band 1 430-1 432 MHz, between existing and currently planned services and FSS feeder links (space-to-Earth) for use by non-GSO satellite systems in the MSS with service links operating below 1 GHz;

3 to carry out studies, including the measurement of emissions from equipment that would be employed in operational systems, to validate that the systems meet all requirements for the protection of passive services in the band 1 400-1 427 MHz from unwanted emissions from FSS feeder links around 1.4 GHz for non-GSO satellite systems in the MSS with service links operating below 1 GHz;

4 to study the power flux-density (pfd) values required to protect sensors of the EESS (passive) operating in the band 1 400-1 427 MHz.

ANNEX 1 TO RESOLUTION 745 (WRC-03)

Compatibility issues**Earth-to-space**

Service	Parameter of concern	1 350-1 400 MHz	1 400-1 427 MHz
Fixed service		Note 1	Note 2
Mobile service		Note 1	Note 2
Radiolocation	pfd limits	Note 1	Note 2
EESS (passive) (secondary) (No. 5.339)	e.i.r.p. limits	Note 1	Note 2
Radio astronomy	pfd limits, separation distances	Note 1	Note 1
EESS (passive)	Unwanted emission limits; limited filter rejection	Note 2	Note 1
Space research (passive)	pfd limits	Note 2	No issue

Space-to-Earth

Service	Parameter of concern	1 350-1 400 MHz	1 400-1 427 MHz	1 429-1 452 MHz
Fixed service	pfd limits	Note 1	Note 2	Note 1
Mobile service	pfd limits; FSS shall not cause harmful interference	Note 1	Note 2	Note 1
Aeronautical mobile (AMT)	pfd limits	Note 2	Note 2	Note 1
Radio astronomy	epfd limits; issue % of time	Notes 1 and 2	Note 1	Note 2
EESS (passive)	Unwanted emission limits; limited filter rejection	Note 2	Note 1	Note 2
Space research (passive)	pfd limits	Note 2	Note 1	Note 2

NOTE 1 – Study considered in this Resolution.

NOTE 2 – No allocation (for radio astronomy: No. **5.149** applies to the band 1 350-1 400 MHz).

RESOLUTION 746 (WRC-03)

Issues dealing with allocations to science services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference recognized the importance of proper consideration of science service issues based on technical and operational criteria developed in Radiocommunication Study Groups;
- b)* that the bandwidth requirements for transmission of data from high resolution sensors on the next generation geostationary meteorological satellites to be launched in the time-frame 2015-2020 are in excess of 200 MHz;
- c)* that a primary allocation to the geostationary meteorological satellite (space-to-Earth) exists in the band 18.1-18.3 GHz in No. **5.519**;
- d)* that the number of earth stations deployed to support these meteorological satellites will be low (on the order of five per Region);
- e)* that the band 18-18.4 GHz is allocated to the fixed, fixed-satellite and mobile services;
- f)* that the frequency band 10.6-10.68 GHz is allocated to the Earth exploration-satellite service (EESS) (passive), radio astronomy and space research (passive) services on a primary basis;
- g)* that the frequency band 10.6-10.68 GHz is also allocated to the mobile, except aeronautical mobile, and the fixed services on a primary basis, taking into account No. **5.482**;
- h)* that the EESS (passive) operating in the band 10.6-10.68 GHz may experience harmful interference from the emissions of systems of active services;
- i)* that the band 10.6-10.68 GHz is of primary interest for the measurement of rain, snow, sea state, ocean wind and soil moisture,

recognizing

- 1 that the bandwidth of the existing allocation for geostationary meteorological satellites in the band 18.1-18.3 GHz is insufficient to support the required data rates;
- 2 that sharing between geostationary meteorological satellites and the fixed, fixed-satellite and mobile services may be feasible in the band 18-18.4 GHz;
- 3 that the provisions given in No. **5.482** may not be sufficient to ensure the protection of the EESS (passive) in the band 10.6-10.68 GHz;

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4 that sharing criteria between the EESS (passive) and the space research (passive) service on one hand and other primary services on the other hand need to be reviewed in the band 10.6-10.68 GHz,

resolves

1 to invite ITU-R to conduct sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum;

2 to invite ITU-R to conduct sharing analyses between the EESS (passive) and the space research service (passive) on one hand and the fixed and mobile services on the other hand in the band 10.6-10.68 GHz to determine appropriate sharing criteria;

3 to recommend that WRC-07 review the results of the studies under *resolves* 1 and 2 and consider the inclusion of the sharing criteria within the Radio Regulations;

4 to make appropriate modifications to the Table of Frequency Allocations with respect to *resolves* 1, based on proposals from administrations,

invites administrations

1 to contribute to the sharing studies between the meteorological satellite service and the fixed, fixed-satellite and mobile services in the 18-18.4 GHz band;

2 to provide the relevant characteristics of active systems (fixed and mobile services) operating in the band 10.6-10.68 GHz;

3 to contribute to the sharing studies between the EESS (passive) and the space research service (passive) on one hand and the other primary services on the other hand in the band 10.6-10.68 GHz,

invites ITU-R

to complete the necessary studies, as a matter of urgency, taking into account the present use of allocated bands, with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of the Conference,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 747 (WRC-03)

Possible upgrade of the radiolocation service to primary allocation status in the frequency bands 9 000-9 200 MHz and 9 300-9 500 MHz, and possible extension of the existing primary allocations to the Earth exploration-satellite service (active) and the space research service (active) in the band 9 500-9 800 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that there is a need to provide contiguous spectrum in the bands around 9 GHz for the radiolocation service allocated on a primary basis worldwide, in order to provide adequate spectrum for new radar systems to function;
- b)* that emerging requirements for increased image resolution and increased range accuracy necessitate wider contiguous emission bandwidths;
- c)* that there is a need to upgrade the status of frequency allocations to the radiolocation service in the frequency range 9 000-9 200 MHz and 9 300-9 500 MHz in order for existing and planned radar systems to satisfy their required missions;
- d)* that, while radionavigation is recognized as a safety service as delineated in No. **4.10**, radiolocation services have demonstrated compatible operations with radionavigation services in the bands 9 000-9 200 MHz and 9 300-9 500 MHz over many years because of using similar system characteristics of low-duty cycle emissions, scanning beams and interference reduction techniques;
- e)* that previous and ongoing studies in ITU-R addressing other bands indicate that compatibility in the bands 9 000-9 200 MHz and 9 300-9 500 MHz between the radionavigation and radiolocation services is feasible;
- f)* that radars in the radiolocation service operate on a primary basis worldwide in the 9 200-9 300 MHz and 9 800-10 000 MHz bands, and operate on a secondary basis with respect to the radionavigation service in the 9 000-9 200 MHz and 9 300-9 500 MHz;
- g)* that the Earth exploration-satellite (EESS) (active), space research (active), radiolocation and radionavigation services have an allocation on a primary basis in the frequency range 9 500-9 800 MHz, taking into account the constraints of footnote **5.476A**;
- h)* that it may be necessary to increase by up to 200 MHz the bandwidth available to the EESS (active) and the SRS (active) to satisfy global environmental monitoring requirements for improved resolution;

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- i) that Recommendation ITU-R M.1313 contains the technical characteristics and protection criteria for maritime radars in the band 9 300-9 500 MHz;
- j) that Recommendation ITU-R M.1372 identifies interference reduction techniques which enhance compatibility among radar systems;
- k) that Recommendation ITU-R SA.1166 contains the technical characteristics and protection criteria for Earth sensors operating near 9 500 MHz,

recognizing

- a) that the 2003 Radiocommunication Assembly approved Question ITU-R 234/8 on the compatibility of radionavigation and radiolocation services operating in the bands 9 000-9 200 MHz and 9 300-9 500 MHz;
- b) that ITU-R and administrations have already started work on this issue by developing a preliminary draft new Recommendation on radar characteristics and protection criteria, and have conducted initial compatibility measurements;
- c) that it is important to protect the existing primary services having allocations in the frequency bands 9 000-9 200 MHz and 9 300-9 500 MHz;
- d) that an upgrade to a primary allocation worldwide may be required to give radar system developers, manufacturers and investors confidence that their systems will have the regulatory assurance to operate globally;
- e) that new EESS (active) systems are being considered for operation in the 9 300-9 800 MHz frequency range,

resolves to invite ITU-R

- 1 to continue to study, as a matter of urgency, the technical characteristics, protection criteria, and other factors of radiolocation and radionavigation systems that ensure compatible operations in the bands 9 000-9 200 MHz and 9 300-9 500 MHz;
- 2 to continue to study, as a matter of urgency, the technical characteristics, protection criteria, and other factors of radiolocation, radionavigation, EESS (active) and space research service (active) systems that ensure compatible operations in the band 9 300-9 500 MHz;
- 3 as a matter of urgency, with due regard to services to which these bands are allocated:
 - to study the compatibility between radars of the radiolocation and radionavigation services in the bands 9 000-9 200 MHz and 9 300-9 500 MHz through testing and measurements;
 - to continue to study and conduct test measurements to determine the protection criteria for radionavigation and radiolocation systems in the bands 9 000-9 200 MHz and 9 300-9 500 MHz;

- to study the compatibility between terrestrial radars of the radiolocation and radionavigation services, and spaceborne radars of the Earth exploration-satellite and space research services in the band 9 300-9 500 MHz;

4 in the event that sharing studies in the 9 300-9 500 MHz band lead to unsatisfactory conclusions which do not fully satisfy the requirement for an increase by up to 200 MHz of contiguous spectrum for EESS (active) and space research service (active), to carry out additional sharing studies in the alternative frequency range 9 800-10 000 MHz;

5 to include the results of the above studies in one or more Recommendation,

further resolves

that, taking into account the results of ITU-R studies, WRC-07 consider:

1 the upgrading of the radiolocation service to a primary allocation in the bands 9 000-9 200 MHz and 9 300-9 500 MHz; and

2 the possible extension by up to 200 MHz of the allocation in the band 9 500-9 800 MHz to the EESS (active) and the space research service (active),

invites ITU-R

to conduct, and complete in time for WRC-07, the appropriate studies leading to technical and operational recommendations to facilitate sharing between the radionavigation, radiolocation, EESS (active) and space research (active) services.

RESOLUTION 802 (WRC-03)

Agenda for the 2007 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in accordance with No. 118 of the Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and a final agenda shall be established by the Council two years before the conference;
- b)* Article 13 of the Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;
- c)* the relevant Resolutions and Recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

recognizing

- a)* that this Conference has identified a number of urgent issues requiring further examination by WRC-07;
- b)* that, in preparing this agenda, many items proposed by administrations could not be included and have had to be deferred to future conference agendas,

resolves

to recommend to the Council that a world radiocommunication conference be held in 2007 for a period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC-03 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action with respect to the following items:

1.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev.WRC-97)**;

1.2 to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions **746 (WRC-03)** and **742 (WRC-03)**;

1.3 in accordance with Resolution **747 (WRC-03)**, consider upgrading the radiolocation service to primary allocation status in the bands 9 000-9 200 MHz and 9 300-9 500 MHz and extending by up to 200 MHz the existing primary allocations to the Earth exploration-satellite service (EESS) (active) and the space research service (SRS) (active) in the band 9 500-9 800 MHz without placing undue constraint on the services to which the bands are allocated;

1.4 to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 taking into account the results of ITU-R studies in accordance with Resolution **228 (Rev.WRC-03)**;

1.5 to consider spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit-rate aeronautical telemetry, in accordance with Resolution **230 (WRC-03)**;

1.6 to consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution **414 (WRC-03)** and, to study current satellite frequency allocations, that will support the modernization of civil aviation telecommunication systems, taking into account Resolution **415 (WRC-03)**;

1.7 to consider the results of ITU-R studies regarding sharing between the mobile-satellite service and the SRS (passive) in the band 1 668-1 668.4 MHz, and between the mobile-satellite service and the mobile service in the band 1 668.4-1 675 MHz in accordance with Resolution **744 (WRC-03)**;

1.8 to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution **145 (WRC-03)**, and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution **122 (Rev.WRC-03)**;

1.9 to review the technical, operational and regulatory provisions applicable to the use of the band 2 500-2 690 MHz by space services in order to facilitate sharing with current and future terrestrial services without placing undue constraint on the services to which the band is allocated;

1.10 to review the regulatory procedures and associated technical criteria of Appendix **30B** without any action on the allotments, the existing systems or the assignments in the List of Appendix **30B**;

1.11 to review sharing criteria and regulatory provisions for protection of terrestrial services, in particular the terrestrial television broadcasting service, in the band 620-790 MHz from broadcasting-satellite service networks and systems, in accordance with Resolution **545 (WRC-03)**;

1.12 to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: "Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks" in accordance with Resolution **86 (WRC-03)**;

1.13 taking into account Resolutions **729 (WRC-97)**, **351 (WRC-03)** and **544 (WRC-03)**, to review the allocations to all services in the HF bands between 4 MHz and 10 MHz, excluding those allocations to services in the frequency range 7000-7200 kHz and those bands whose allotment plans are in Appendices **25**, **26** and **27** and whose channelling arrangements are in Appendix **17**, taking account of the impact of new modulation techniques, adaptive control techniques and the spectrum requirements for HF broadcasting;

1.14 to review the operational procedures and requirements of the Global Maritime Distress and Safety System (GMDSS) and other related provisions of the Radio Regulations, taking into account Resolutions **331 (Rev.WRC-03)** and **342 (Rev.WRC-2000)** and the continued transition to the GMDSS, the experience since its introduction, and the needs of all classes of ships;

1.15 to consider a secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz;

1.16 to consider the regulatory and operational provisions for Maritime Mobile Service Identities (MMSIs) for equipment other than shipborne mobile equipment, taking into account Resolutions **344 (Rev.WRC-03)** and **353 (WRC-03)**;

1.17 to consider the results of ITU-R studies on compatibility between the fixed-satellite service and other services around 1.4 GHz, in accordance with Resolution **745 (WRC-03)**;

1.18 to review pfd limits in the band 17.7-19.7 GHz for satellite systems using highly inclined orbits, in accordance with Resolution **141 (WRC-03)**;

1.19 to consider the results of the ITU-R studies regarding spectrum requirement for global broadband satellite systems in order to identify possible global harmonized fixed-satellite service frequency bands for the use of Internet applications, and consider the appropriate regulatory/technical provisions, taking also into account No. **5.516B**;

1.20 to consider the results of studies, and proposals for regulatory measures if appropriate regarding the protection of the EESS (passive) from unwanted emissions of active services in accordance with Resolution **738 (WRC-03)**;

1.21 to consider the results of studies regarding the compatibility between the radio astronomy service and the active space services in accordance with Resolution **740 (Rev.WRC-03)**, in order to review and update, if appropriate, the tables of threshold levels used for consultation that appear in the Annex to Resolution **739 (WRC-03)**;

2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex to Resolution **27 (Rev.WRC-03)**;

3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

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4 in accordance with Resolution **95 (Rev.WRC-03)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6 to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;

7 in accordance with Article 7 of the Convention:

7.1 to consider and approve the Report of the Director of the Radiocommunication Bureau:

- on the activities of the Radiocommunication Sector since WRC-03;
- on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and
- on action in response to Resolution **80 (Rev.WRC-2000)**;

7.2 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution **803 (WRC-03)**,

further resolves

to activate the Conference Preparatory Meeting and the Special Committee on Regulatory/Procedural Matters,

invites the Council

to finalize the agenda and arrange for the convening of WRC-07, and to initiate as soon as possible the necessary consultations with Member States,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-07,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 803 (WRC-03)

**Preliminary agenda for the 2010 World
Radiocommunication Conference**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for WRC-10 should be established four to six years in advance;
- b)* Article 13 of the Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;
- c)* the relevant Resolutions and Recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

resolves to give the view

that the following items should be included in the preliminary agenda for WRC-10:

- 1 to take appropriate action in respect of those urgent issues that were specifically requested by WRC-07;
- 2 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-07, to consider and take appropriate action in respect of the following items:
 - 2.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-97)**;
 - 2.2 to consider frequency allocations between 275 GHz and 3 000 GHz taking into account the result of ITU-R studies in accordance with Resolution **950 (WRC-03)**;
 - 2.3 to consider results of ITU-R studies in accordance with Resolution **222 (WRC-2000)** to ensure spectrum availability and protection for the aeronautical mobile-satellite (R) service, and to take appropriate action on this subject, while retaining the generic allocation for the mobile-satellite service;
 - 2.4 to consider allocations to the mobile service in the band 806-862 MHz in Region 1, following the transition of analogue to digital TV;
 - 2.5 to consider the results of studies related to Resolution **136 (Rev.WRC-03)** dealing with sharing between non-GSO and GSO systems;

2.6 to consider the need to modify the provisional protection ratio values in the Annex to Resolution **543 (WRC-03)**, taking into account the experience of the coordination of seasonal scheduling of the HF bands allocated to the broadcasting service and relevant studies conducted by ITU-R since WRC-03;

2.7 to consider the progress of ITU-R studies concerning the technical and regulatory issues relative to the fixed service in the 81-86 and 92-100 GHz frequency bands, taking into account Resolutions **731 (WRC-2000)** and **732 (WRC-2000)**;

2.8 to consider the progress of the ITU-R studies concerning the development and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Recommendation **722 (WRC-03)** and to take any appropriate action on this subject;

3 to consider the results of the studies related to the following, with a view to considering them for inclusion in the agendas of future conferences:

3.1 to review the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-GSO mobile-satellite service) in accordance with Resolution **114 (Rev.WRC-03)**;

4 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC-03)**;

5 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

6 in accordance with Resolution **95 (Rev.WRC-03)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

7 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

8 to identify those items requiring urgent action by the Radiocommunication Study Groups;

9 in accordance with Article 7 of the Convention:

9.1 to consider and approve the Report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since WRC-07;

9.2 to recommend to the Council items for inclusion in the agenda for the following WRC,

invites the Council

to consider the views given in this Resolution,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-10,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 900 (WRC-03)

**Review of the Rule of Procedure for No. 9.35
of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the existence of the backlog of satellite filings is a significant problem that has the potential of adversely affecting the rights of all administrations;
- b)* that the Board, at its 25th meeting, adopted a provisional Rule of Procedure partially suspending the examination of satellite network filings under No. **9.35**,

recognizing

- a)* that there was no agreement regarding this provisional Rule of Procedure on its conformity with the Radio Regulations;
- b)* that the Radiocommunication Bureau is facing severe financial restraints,

resolves

- 1 that the Bureau shall henceforth resume full examination of satellite network filings under No. **9.35** for those filings considered as received from 1 May 2002;
- 2 that, for those satellite coordination filings having been subjected to the provisional Rule of Procedure mentioned in *considering b)* above, the Bureau shall carry out the process described in the Annex and inform administrations of the results;
- 3 that, when the Bureau examines the assignments under Article **11** (No. **11.31**) for satellite networks covered by *resolves* 2, for which the full examination under No. **9.35** was not carried out and which were identified in step *c)* of the Annex referred to in *resolves* 2, if the Bureau determines that assignments in the coordination request submitted under No. **9.30** exceed the limits in force at the date of receipt of this coordination information as contained in Articles **21** and **22** and relevant Resolutions, these assignments will receive an unfavourable finding;
- 4 that those assignments for which the findings are favourable under *resolves* 3 shall also be examined under Article **11** (No. **11.31**) with respect to their notification information submitted in accordance with No. **11.15**,

invites administrations

1 to take into account, in their bilateral and multilateral negotiations with the concerned administrations, the results of the Bureau's actions referred to under *resolves* 2 above;

2 to inform the Bureau, if they so wish, of their comments on the published information referred to in the Annex,

instructs the Radiocommunication Bureau

to provide the necessary assistance to requesting administrations,

instructs the Radio Regulations Board

to suppress the current Rule of Procedure on No. **9.35**.

ANNEX TO RESOLUTION 900 (WRC-03)

Procedure to be used by the Radiocommunication Bureau for networks examined under the Rule of Procedure on No. 9.35

The Bureau shall calculate the power flux-density (pfd)/e.i.r.p. for those networks that were subject to the Rule of Procedure on No. **9.35** and make these results available to administrations without re-establishment of findings, with no publication of modifications to CR/C Special Sections, and no update of the satellite network system database.

The procedure to be used by the Bureau for those networks that were subject to the Rule of Procedure on No. **9.35** shall be as follows:

- a) Identify networks that were examined at the coordination stage under the Rule of Procedure and which were given qualified favourable (B) findings.
- b) Run the pfd calculation program for each frequency assignment in the network to generate pfd/e.i.r.p. results. These results may be further refined by the Bureau, to the extent practicable, using a process applicable to all networks. This process will be developed and adopted by the Bureau prior to undertaking this procedure.
- c) Format the results of the pfd calculation program for readability to identify those assignments that may not be in conformity with the appropriate limits.
- d) Convert these results to an appropriate format.
- e) Place these results on the ITU website and publish them all on CD-ROM to be sent to all administrations.

RESOLUTION 901 (WRC-03)

Determination of the orbital arc separation for which coordination would be required between two satellite networks operating in a space service not subject to a Plan

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 adopted a coordination arc concept in Appendix 5 to simplify the coordination between fixed-satellite service (FSS) networks in certain frequency bands between 3.4 GHz and 30 GHz;
- b)* that in frequency bands below 3.4 GHz, mobile-satellite service (MSS) satellite networks normally have to coordinate with other networks with overlapping service areas operating anywhere in the visible arc;
- c)* that the application of such a concept was limited to the frequency ranges where very large numbers of FSS satellite filings had been received by ITU-R;
- d)* that many satellite networks and systems are now proposing to use higher frequency bands for which the coordination arc does not yet apply;
- e)* that the Radio Regulations Board (RRB) adopted a Rule of Procedure on No. 9.36 that extended the coordination arc concept to the FSS and broadcasting-satellite service (BSS), not subject to a Plan, and in all bands above 3.4 GHz until a review by WRC-03;
- f)* that the use of the coordination arc considerably reduces the volume of data that needs to be supplied to the Radiocommunication Bureau under Section D of Annex 2 to Appendix 4;
- g)* that application of the coordination arc concept has the potential to reduce the workload of the Bureau in identifying affected administrations;
- h)* that the coordination arc concept may be valid for all geostationary space stations operating in any space radiocommunication service above 3.4 GHz that is not subject to a Plan, but may require different values for different services and frequency bands;
- i)* that the ITU-R studies for other services and for frequency bands above 17.3 GHz, except for the 17.7-20.2 GHz and 29.5-30 GHz ranges for the FSS, have not been completed;
- j)* that application of the coordination arc concept could facilitate the introduction of satellite services above 17.3 GHz after the studies conclude on the appropriate value(s) of the coordination arc,

recognizing

that there have been no difficulties resulting from the application of the coordination arc concept in the bands where it applies,

noting

that this Conference has incorporated part of the Rule of Procedure referred to in *considering e)* and extended the coordination arc of $\pm 8^\circ$ for the FSS in bands above 17.3 GHz on a provisional basis, and has adopted an alternative value of $\pm 16^\circ$ on a provisional basis for the coordination arc applicable for the BSS in these bands in Table 5-1 of Appendix 5,

resolves

to recommend that a future competent conference review the results of ITU-R studies on the application of the coordination arc value(s) to other frequency bands and other services, as applicable, and consider their inclusion in Appendix 5,

invites ITU-R

1 to conduct studies on the applicability of the coordination arc concept for space radiocommunication services not yet covered by these Regulations;

2 to recommend, as appropriate, the orbital separation required for triggering inter-service and intra-service coordination concerning the satellite services in frequency bands above 3.4 GHz for geostationary-satellite (GSO) networks not subject to a Plan and not already covered by the coordination arc concept specified in No. 9.7 (GSO/GSO) of Table 5-1 (Appendix 5), under items 1), 2) and 3) of the frequency band column, and subject to Section II of Article 9,

instructs the Director of the Radiocommunication Bureau

to report the results of these studies to the RRB once Recommendations are approved, and to the next competent conference,

instructs the Radio Regulations Board

1 to suppress the Rules of Procedure adopted at its 25th meeting relating to the application of the coordination arc;

2 to consider the results of the studies included in ITU-R Recommendations and, as appropriate, develop a provisional Rule of Procedure, until a decision by the next world radiocommunication conference, to apply the coordination arc value(s) to those services and frequency bands identified in *invites ITU-R 2*.

RESOLUTION 902 (WRC-03)

**Provisions relating to earth stations located on board vessels
which operate in fixed-satellite service networks in the
uplink bands 5 925-6 425 MHz and 14-14.5 GHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that there is a demand for global wideband satellite communication services on vessels;
- b)* that the technology exists that enables earth stations on board vessels (ESVs) to use fixed-satellite service (FSS) networks operating in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz;
- c)* that ESVs are currently operating through FSS networks in the bands 3 700-4 200 MHz, 5 925-6 425 MHz, 10.7-12.75 GHz and 14-14.5 GHz under No. 4.4;
- d)* that ESVs have the potential to cause unacceptable interference to other services in the bands 5 925-6 425 MHz and 14-14.5 GHz;
- e)* that, with respect to the bands considered in this Resolution, global coverage is only available in the band 5 925-6 425 MHz and that only a limited number of geostationary FSS systems can provide such global coverage;
- f)* that, without special regulatory provisions, ESVs could place a heavy coordination burden on some administrations, especially those in developing countries;
- g)* that, in order to ensure the protection and future growth of other services, ESVs need to operate under certain technical and operational limitations;
- h)* that, within ITU-R studies, based on agreed technical assumptions, minimum distances from the low-water mark as officially recognized by the coastal State have been calculated, beyond which an ESV will not have the potential to cause unacceptable interference to other services in the bands 5 925-6 425 MHz and 14-14.5 GHz;
- i)* that, in order to limit the interference into other networks in the FSS, it is necessary to establish maximum off-axis e.i.r.p. density limits on ESV emissions;
- j)* that establishing a minimum antenna diameter for ESVs has an impact on the number of ESVs that will ultimately be deployed, hence it will reduce interference into the fixed service,

noting

a) that ESVs may be assigned frequencies to operate in FSS networks in the bands 3 700-4 200 MHz, 5 925-6 425 MHz, 10.7-12.75 GHz and 14-14.5 GHz pursuant to No. 4.4 and shall not claim protection from, nor cause interference to, other services having allocations in these bands;

b) that the regulatory procedures of Article 9 apply for ESVs operating at specified fixed points,

resolves

that ESVs transmitting in the 5 925-6 425 MHz and 14-14.5 GHz bands shall operate under the regulatory and operational provisions contained in Annex 1 and the technical limitations in Annex 2 of this Resolution,

encourages concerned administrations

to cooperate with administrations which license ESVs while seeking agreement under the above-mentioned provisions, taking into consideration the provisions of Recommendation 37 (WRC-03),

instructs the Secretary-General

to bring this Resolution to the attention of the Secretary-General of the International Maritime Organization (IMO).

ANNEX 1 TO RESOLUTION 902 (WRC-03)

Regulatory and operational provisions for ESVs transmitting in the 5 925-6 425 MHz and 14-14.5 GHz bands

1 The administration that issues the licence for the use of ESVs in these bands (licensing administration) shall ensure that such stations follow the provisions of this Annex and thus do not present any potential to cause unacceptable interference to the services of other concerned administrations.

2 ESV service providers shall comply with the technical limitations listed in Annex 2 and, when operating within the minimum distances as identified in item 4 below, with the additional limitations agreed by the licensing and other concerned administrations.

3 In the 3 700-4 200 MHz band and 10.7-12.75 GHz range, ESVs in motion shall not claim protection from transmissions of terrestrial services operating in accordance with the Radio Regulations.

4 The minimum distances from the low-water mark as officially recognized by the coastal State beyond which ESVs can operate without the prior agreement of any administration are 300 km in the 5 925-6 425 MHz band and 125 km in the 14-14.5 GHz band, taking into account the technical limitations in Annex 2. Any transmissions from ESVs within the minimum distances shall be subject to the prior agreement of the concerned administration(s).

5 The potentially concerned administrations referred to in the previous item 4 are those where fixed or mobile services are allocated on a primary basis in the Table of Frequency Allocations of the Radio Regulations:

Frequency bands	Potentially concerned administrations
5 925-6 425 MHz	All three Regions
14-14.25 GHz	Countries listed in No. 5.505 , except those listed in No. 5.506B
14.25-14.3 GHz	Countries listed in Nos. 5.505 , 5.508 and 5.509 , except those listed in No. 5.506B
14.3-14.4 GHz	Regions 1 and 3, except countries listed in No. 5.506B
14.4-14.5 GHz	All three Regions, except countries listed in No. 5.506B

6 The ESV system shall include means of identification and mechanisms to immediately cease emissions, whenever the station does not operate in compliance with the provisions of items 2 and 4 above.

7 Cessation of emissions as referred to in item 6 above shall be implemented in such a way that the corresponding mechanisms cannot be bypassed on board the vessel, except under the provisions of No. **4.9**.

8 ESVs shall be equipped so as to:

- enable the licensing administration under the provisions of Article **18** to verify earth station performance; and
- enable the cessation of ESV emissions immediately upon request by an administration whose services may be affected.

9 Each licence-holder shall provide a point of contact to the administration with which agreements have been reached for the purpose of reporting unacceptable interference caused by the ESV.

10 When ESVs operating beyond the territorial sea but within the minimum distance (as referred to in item 4 above) fail to comply with the terms required by the concerned administration pursuant to items 2 and 4, then that administration may:

- request the ESV to comply with such terms or cease operation immediately; or
- request the licensing administration to require such compliance or immediate cessation of the operation.

ANNEX 2 TO RESOLUTION 902 (WRC-03)

**Technical limitations applicable to ESVs transmitting in the bands
5925-6425 MHz and 14-14.5 GHz**

	5 925-6 425 MHz	14-14.5 GHz
Minimum diameter of ESV antenna	2.4 m	1.2 m ¹
Tracking accuracy of ESV antenna	±0.2° (peak)	±0.2° (peak)
Maximum ESV e.i.r.p. spectral density toward the horizon	17 dB(W/MHz)	12.5 dB(W/MHz)
Maximum ESV e.i.r.p. towards the horizon	20.8 dBW	16.3 dBW
Maximum off-axis e.i.r.p. density ²	See below	See below

¹ While operations within the minimum distances are subject to specific agreement with concerned administrations, licensing administrations may authorize the deployment of smaller antenna sizes down to 0.6 m at 14 GHz provided that the interference to the terrestrial services is no greater than that which would be caused with an antenna size of 1.2 m, taking into account Recommendation ITU-R SF.1650. In any case, the use of smaller antenna size shall be in compliance with the tracking accuracy of ESV antenna, maximum ESV e.i.r.p. spectral density toward the horizon, maximum ESV e.i.r.p. towards the horizon and maximum off-axis e.i.r.p. density limits in the Table above and the protection requirements of the FSS intersystem coordination agreements.

² In any case, the e.i.r.p. off-axis limits shall be compliant with the FSS intersystem coordination agreements that may agree to more stringent off-axis e.i.r.p. levels.

Off-axis limits

For earth stations on board vessels operating in the 5925-6425 MHz band, at any angle ϕ specified below, off the main-lobe axis of an earth-station antenna, the maximum e.i.r.p. in any direction within 3° of the GSO shall not exceed the following values:

5 925-6 425 MHz

<i>Angle off-axis</i>	<i>Maximum e.i.r.p. per 4 kHz band</i>
$2.5^\circ \leq \phi \leq 7^\circ$	$(32 - 25 \log \phi)$ dB(W/4 kHz)
$7^\circ < \phi \leq 9.2^\circ$	11 dB(W/4 kHz)
$9.2^\circ < \phi \leq 48^\circ$	$(35 - 25 \log \phi)$ dB(W/4 kHz)
$48^\circ < \phi \leq 180^\circ$	-7 dB(W/4 kHz)

For ESV operating in the 14-14.5 GHz band, at any angle ϕ specified below, off the main-lobe axis of an earth station antenna, the maximum e.i.r.p. in any direction within 3° of the GSO shall not exceed the following values:

14.0-14.5 GHz

<i>Angle off-axis</i>	<i>Maximum e.i.r.p. in any 40 kHz band</i>
$2^\circ \leq \phi \leq 7^\circ$	$(33 - 25 \log \phi) \text{ dB(W/40 kHz)}$
$7^\circ < \phi \leq 9.2^\circ$	12 dB(W/40 kHz)
$9.2^\circ < \phi \leq 48^\circ$	$(36 - 25 \log \phi) \text{ dB(W/40 kHz)}$
$48^\circ < \phi \leq 180^\circ$	-6 dB(W/40 kHz)

RESOLUTION 950 (WRC-03)

**Consideration of the use of the frequencies
between 275 and 3 000 GHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that, in the Table of Frequency Allocations, frequency bands above 275 GHz are not allocated;
- b) that, notwithstanding *considering a)*, No. **5.565** makes provision for the use of the frequency band 275-1 000 GHz for the development of various passive services and all other services and recognizes the need to conduct further experimentation and research;
- c) that No. **5.565** also makes provision for the protection of passive services until such time as the Table of Frequency Allocations may be extended;
- d) that, in addition to the spectral lines identified by No. **5.565**, research activities in the bands above 275 GHz may yield other spectral lines of interest, such as those listed in Recommendation ITU-R RA.314;
- e) that within various Radiocommunication Study Groups, studies on systems between 275 and 3 000 GHz, including system characteristics of suitable applications, are being considered;
- f) that the present use of the bands between 275 and 3 000 GHz is mainly related to the passive services, however, with anticipated technology development, the bands may become increasingly important for suitable active service applications;
- g) that sharing studies in ITU-R among passive services and all other services operating in frequencies between 275 and 3 000 GHz have not been completed,

recognizing

- a) that propagation characteristics at frequencies above 275 GHz, such as atmospheric absorption and scattering, have a significant impact on the performance of both active and passive systems and need to be studied;
- b) that it is necessary to investigate further the potential uses of the bands between 275 and 3 000 GHz by suitable applications,

noting

- a) that significant infrastructure investments are being made under international collaboration for the use of these bands between 275 and 3 000 GHz, for example, the Atacama Large Millimetre Array (ALMA), a facility under construction that will provide new insights on the structure of the universe;
- b) that Radiocommunication Bureau Circular Letter CR/137 identified additional information for the Bureau to record characteristics of active and passive sensors for Earth exploration-satellite service and space research service satellites, in frequency bands below 275 GHz,

further noting

- a) that a process and format similar to that provided in *noting b)* could be used to record systems operating in the 275 to 3 000 GHz band;
- b) that recording active and passive systems operating in the 275 to 3 000 GHz band will provide information until the date when it is determined that changes to the Radio Regulations are needed,

resolves

- 1 to consider at WRC-10 frequency allocations between 275 GHz and 3 000 GHz taking into account the result of the ITU-R studies;
- 2 that administrations may submit for inclusion in the Master International Frequency Register details on systems which operate between 275 and 3 000 GHz and which may be recorded by the Radiocommunication Bureau under Nos. **8.4**, **11.8** and **11.12**,

invites ITU-R

to conduct the necessary studies in time for consideration by WRC-10 with a view to the modification of No. **5.565** or the possible extension of the Table of Frequency Allocations above 275 GHz, including advice on the applications suitable for such bands,

instructs the Director of the Radiocommunication Bureau

to accept submissions referred to in *resolves 2*, and to record them in the Master International Frequency Register.

RESOLUTION 951 (WRC-03)

**Options to improve the international spectrum
regulatory framework**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that spectrum is a finite resource and there is a continued increase in demand for radiocommunications;
- b)* that there is also an increasing number and diversity of applications that need to be accommodated in the radio spectrum;
- c)* that there is a keen interest in the rational, efficient and economic use of spectrum;
- d)* that by segregating bands for different radiocommunication services the best outcome in terms of spectrum efficiency may not be achieved;
- e)* that applications are emerging in which elements of different radiocommunication services (as defined in the Radio Regulations) are combined;
- f)* that there is a convergence of radio technologies, inasmuch as the same radio technology can be used in systems that operate in different radiocommunication services or with different allocation status (primary or secondary);
- g)* that similar data rates and quality of service attributes are available with different radiocommunication systems operating in different radiocommunication services;
- h)* that the use of modern underlying communication architectures and protocols, such as those used in packet radio systems, enables the concurrent provision of different applications from the same platform operating in the same frequency bands;
- i)* that evolving and emerging radiocommunication technologies may enable sharing with different existing technologies across different allocations over the traditional band segmentations;
- j)* that these evolving and emerging technologies may not require band segmentation within the traditional spectrum allocation framework;
- k)* that these or other evolving and emerging technologies may lead to more frequency-agile and interference-tolerant equipment and consequently to more flexible use of spectrum;
- l)* that some administrations are considering a flexible allocation framework with the aim of more efficient utilization of the spectrum on a national basis,

noting

that the purpose of the Radio Regulations is to ensure a framework for the effective management and use of spectrum and not to constrain the development of existing or new applications and technologies,

resolves

that studies be carried out by ITU-R to examine the effectiveness, appropriateness and impact of the Radio Regulations, with respect to the evolution of existing, emerging and future applications, systems and technologies, and to identify options for improvements in the Radio Regulations that address the *considering* and *noting* above,

instructs the Director of the Radiocommunication Bureau

to include the results of these studies in his Report to WRC-07 for the purposes of considering whether to place this subject on a future conference agenda,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

RESOLUTION 952 (WRC-03)

**Studies regarding devices using
ultra-wideband technology**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that studies on devices using ultra-wideband technology (UWB) are ongoing in ITU-R;
- b)* that UWB devices could produce unacceptable degradation in frequency bands allocated to radiocommunication services, according to the performance and availability requirements of those services;
- c)* that UWB devices are radio transmitters or receivers or both and hence are not considered as Industrial, Scientific and Medical (ISM) applications under No. **1.15**,

recognizing

that UWB technology holds promise for an array of new applications that may provide benefits for users,

resolves to invite ITU-R

to continue its studies relating to devices using UWB technology in order to ensure adequate protection of radiocommunication services,

instructs the Director of the Radiocommunication Bureau

- to draw the attention of the Comité International Spécial des Perturbations Radioélectriques (CISPR) to the definition of ISM applications under No. **1.15**;
- to invite CISPR to use this definition in CISPR Publication 11 until a new definition is developed in ITU-R in collaboration with CISPR;
- to inform CISPR that UWB devices which are radio transmitters or receivers or both and hence not considered as ISM applications by the ITU-R, are currently under study in ITU-R.

RECOMMENDATIONS

RECOMMENDATION 7 (Rev.WRC-97)

Adoption of standard forms for ship station and ship earth station licences and aircraft station and aircraft earth station licences¹

The World Radiocommunication Conference (Geneva, 1997),

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. **18.8**,

considering further

that the Administrative Radio Conference (Geneva, 1959), formulated:

- a)* a set of principles for the draft of a standard licence form (see Annex 1);
- b)* specimens of a ship station licence and of an aircraft station licence (see Annexes 2 and 3),

considering also

changes in radio systems and shipborne radiocommunication equipment introduced in connection with the implementation of the Global Maritime Distress and Safety System (GMDSS),

¹ Throughout this Recommendation, references to ship stations may include references to ship earth stations and references to aircraft stations may include references to aircraft earth stations.

recommends

- 1 that administrations which find these forms practicable and acceptable should adopt them for international use;
- 2 that administrations should, as far as possible, endeavour to bring their national licence forms into line with these standard forms.

ANNEX 1 TO RECOMMENDATION 7 (Rev.WRC-97)

Principles for the formulation of standard ship and aircraft station licences

The Administrative Radio Conference (Geneva, 1959), considered that, in formulating standard ship and aircraft station licences, the following set of principles should be applied:

- 1 The licence should, as far as possible, be prepared in tabular form, and each line and column of the table clearly numbered or lettered.
- 2 The licence for ship stations and the licences for aircraft stations should be as similar as possible.
- 3 The size of the licence should be international standard A4.
- 4 The licence should be designed in a form which facilitates its display 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, English, Spanish or French.
- 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 English, Spanish and French.

These principles were used in formulating the two standard forms which are given in Annexes 2 and 3.

ANNEX 2 TO RECOMMENDATION 7 (Rev.WRC-97)

(Full name of the authority issuing the licence, in the national language)

.....*

SHIP STATION LICENCE
LICENCE DE STATION DE NAVIRE
LICENCIA DE ESTACIÓN DE BARCO

No.

Period of validity

In accordance with (*Title of the National Regulation*) and with the Radio Regulations which complement the Constitution and the Convention of the International Telecommunication Union 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	Identification of the ship station			Holder of licence	Accounting authority identification code, or additional information including accounting information if required
	Call sign	MMSI	Other identification (<i>optional</i>)		

	Equipment	Type or description of equipment	Frequencies
5	Transmitters		**
6	Other equipment (<i>optional</i>)		

For the Issuing Authority:

.....

Place Date Authentication

* The words "Ship Station Licence" written in the national language, if this is not English, Spanish or French.

** Specifically or by reference to List V, columns 8 and 9.

ANNEX 3 TO RECOMMENDATION 7 (Rev.WRC-97)

(Full name of the authority issuing the licence, in the national language)

.....*

AIRCRAFT STATION LICENCE
LICENCE DE STATION D'AÉRONEF
LICENCIA DE ESTACIÓN DE AERONAVE

No.

Period of validity

In accordance with (*Title of the National Regulation*) and with the Radio Regulations which complement the Constitution and the Convention of the International Telecommunication Union 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 (W)	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 English, Spanish or French.

** Specifically or by reference.

RECOMMENDATION 8

Relating to automatic identification of stations

The World Administrative Radio Conference (Geneva, 1979),

considering

- a)* Article **19** which allows, where practicable, automatic identification of stations in appropriate services, and under certain circumstances;
- b)* that it is not always feasible or convenient to give manual identification;
- c)* that sources of harmful interference often remain unidentified for long periods, with consequential delay in measures that might be taken to minimize the interference;
- d)* that automatic identification procedures, where appropriate, may help overcome some of the disadvantages of manual identification;
- e)* that automatic transmission of a call sign or other signals may provide a means of identifying some stations for which identification is not always possible, e.g. radio relay and space systems;
- f)* the desirability of fostering a common automatic identification method to facilitate effective implementation of the provisions of Article **19**, as an alternative to the proliferation of many different systems and modulation techniques that might be used for this purpose,

recommends

that the ITU-R study the matter of automatic identification of stations with a view to recommending technical characteristics and methods of implementing a common universal system, including standard modulation techniques, for application in accordance with Article **19**, with due consideration to the needs of the different services and types of stations.

RECOMMENDATION 9

**Relating to the measures to be taken to prevent the operation of
broadcasting stations on board ships or aircraft
outside national territories¹**

The World Administrative Radio Conference (Geneva, 1979),

considering

- a)* that the operation of broadcasting stations on board ships or aircraft outside national territories is in conflict with the provisions of Nos. **23.2** and **42.4**;
- 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 States, 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 Member States accordingly.

¹ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION 14 (Mob-87)

**Identification and location of special vessels, such as
medical transports, by means of standard
maritime radar transponders**

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

considering

- a)* the desirability of implementing modern techniques in standard maritime radar transponders for the identification and location of vessels at sea;
- b)* Provision No. **33.28** and Appendix **13** (Part A4, § 11A), which provide that the identification and location of medical transports at sea may be effected by means of appropriate standard maritime radar transponders;
- c)* that transponders designed to be compatible with radiolocation radars are not necessarily compatible with radars used by the maritime and aeronautical radionavigation services; nor is their coding for identification technically defined;
- d)* that if maritime radar transponders of the type described in ex-CCIR Report 775-2* and Recommendations ITU-R M.628-3 and ITU-R M.630, or using the technology described in Recommendation ITU-R M.824-2, were to be encoded for the identification of special vessels such as medical transports, they would probably be incompatible with most radiolocation radars,

invites the ITU-R

to study the question of the identification and location of special vessels such as medical transports by means of standard maritime radar transponders, taking into account also the technical and economic impact of their introduction,

invites administrations

to provide the ITU-R with information on this question,

requests the Council

to include this Recommendation in the agenda of the next competent world radiocommunication conference for review and, if appropriate, to amend the Radio Regulations.

* This Report is no longer in force.

RECOMMENDATION 34 (WRC-95)

Principles for the allocation of frequency bands

The World Radiocommunication Conference (Geneva, 1995),

considering

- a)* that ITU should maintain an international Table of Frequency Allocations covering the usable radio-frequency spectrum;
- b)* that it may be desirable, in certain cases, to allocate frequency bands to the most broadly defined services in order to improve flexibility of use but without detriment to other services;
- c)* that the development of common worldwide allocations is desirable in order to improve and harmonize utilization of the radio-frequency spectrum;
- d)* that adherence to these principles for the allocation of spectrum will allow the Table of Frequency Allocations to focus on matters of regulatory significance while enabling greater flexibility in national spectrum use,

recommends that future world radiocommunication conferences

- 1 should, wherever possible, allocate frequency bands to the most broadly defined services with a view to providing the maximum flexibility to administrations in spectrum use, taking into account safety, technical, operational, economic and other relevant factors;
- 2 should, wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits) taking into account safety, technical, operational, economic and other relevant factors;
- 3 should take into account relevant studies by the Radiocommunication Sector and the reports of the relevant Conference Preparatory Meetings (CPM),

recommends administrations

in making proposals to world radiocommunication conferences, to take account of *recommends* 1 to 3,

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instructs the Director of the Radiocommunication Bureau and requests the ITU-R study groups

- 1 when carrying out technical studies relating to a frequency band, to examine the compatibility of a broad definition of services with the existing utilizations and the possibility of aligning allocations on a worldwide basis, having regard to *considerings a), b), c) and d)* and *recommends* 1, 2 and 3 above;
- 2 to conduct these studies, where appropriate in cooperation with the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO);
- 3 to submit a report to future world radiocommunication conferences containing the results of these studies,

invites

the relevant CPM and Radiocommunication Study Groups to identify areas for study and to undertake the studies necessary to determine the impact on existing services of those agenda items of future world radiocommunication conferences which involve broadening the scope of existing service allocations,

instructs the Secretary-General

to communicate this Recommendation to ICAO and IMO.

RECOMMENDATION 36 (WRC-97)

Role of international monitoring in reducing apparent congestion in the use of orbit and spectrum resources

The World Radiocommunication Conference (Geneva, 1997),

considering

- a)* that the geostationary-satellite orbit and the radio-frequency spectrum are limited natural resources and are being increasingly utilized by space services;
- b)* the desirability of achieving a more effective use of the geostationary-satellite orbit and radio-frequency spectrum in order to assist administrations in satisfying their 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 these resources;
- c)* that monitoring information should assist ITU-R in discharging this function;
- d)* that facilities for monitoring of emissions originating from space stations are expensive,

recognizing

that an international monitoring system cannot be fully effective unless it covers all areas of the world,

invites ITU-R

to study and make recommendations concerning the facilities required to provide adequate coverage of the world with a view to ensuring efficient use of resources,

invites administrations

- 1 to make every effort to provide monitoring facilities as envisaged in Article 16;
- 2 to inform ITU-R of the extent to which they are prepared to cooperate in such monitoring programmes as may be requested by ITU-R;
- 3 to consider the various aspects of monitoring emissions originating from space stations to enable the provisions of Articles 21 and 22 to be applied.

RECOMMENDATION 37 (WRC-03)

**Operational procedures for earth stations
on board vessels (ESVs) use**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that under the provisions of Resolution **902 (WRC-03)** transmissions from ESVs within the distances defined in item 4 of Annex 1 of Resolution **902 (WRC-03)** should be based upon prior agreement of concerned administrations;
- b)* that it is desirable to provide guidance on activities to achieve such prior agreement with concerned administrations;
- c)* that such guidance should include the operational procedures for ESV use,

recommends

that operation of ESVs follow the procedures set forth in the Annex.

ANNEX 1 TO RECOMMENDATION 37 (WRC-03)

Operational procedures for ESV use**A Initiation of contact**

The ESV licensing administration or the licence-holder should contact, in advance of ESV operations within the minimum distances, the concerned administration(s) to obtain agreements that will establish the technical bases for avoiding unacceptable interference to the terrestrial facilities of the concerned administration or administrations.

The minimum distances and concerned administrations are defined in items 4 and 5 of Annex 1 of Resolution **902 (WRC-03)**, respectively.

B Recommended actions of licensing administrations, licence-holders and concerned administrations

- The licensing administration or the licence-holder should provide the technical and operational parameters required by the concerned administration, among them, if required, information on the movement of the ship(s) equipped with ESVs within the minimum distances.
- Concerned administrations that wish to permit the operation of ESVs should determine if they have terrestrial stations that could be affected by ESV operations with a view to identifying possible frequencies for ESV use that would avoid potential interference.

C Frequency use arrangements

National practices, as well as applicable Recommendations of ITU-R (such as ITU-R S.1587, ITU-R SF.1585, ITU-R SF.1648, ITU-R SF.1649, ITU-R SF.1650), may be used in reaching frequency usage arrangements.

D Avoidance of unacceptable interference

According to Annex 1 of Resolution **902 (WRC-03)** the ESV licensing administration shall ensure that such stations do not cause unacceptable interference to the services of other concerned administrations. In the event that unacceptable interference occurs, the licence-holder must eliminate the source of any interference from its station immediately upon being advised of such interference. Additionally, the licence-holder shall immediately terminate transmissions at the request of either the concerned administration or the ESV licensing administration if either administration determines that the ESV is causing unacceptable interference or is otherwise not being operated in compliance with the operating agreement.

RECOMMENDATION 63

Relating to the provision of formulae and examples for the calculation of necessary bandwidths¹

The World Administrative Radio Conference (Geneva, 1979),

considering

- a)* that Appendix 1, Section I requires that the necessary bandwidth be part of the full designation of emissions;
- b)* that Recommendation ITU-R SM.1138, gives a partial list of examples and formulae for the calculation of the necessary bandwidth of some typical emissions;
- c)* that sufficient information is not available for the determination of the K-factors used throughout the table of examples of the necessary bandwidth in Recommendation ITU-R SM.1138;
- d)* that, especially with regard to the efficient utilization of the radio frequency spectrum, monitoring and the notification of emissions, it is required that necessary bandwidths for the individual classes of emission be known;
- e)* that for reasons of simplification and international uniformity it is desirable that measurements for determining the necessary bandwidth be made as seldom as possible,

recommends that ITU-R

- 1 provide, from time to time, additional formulae for the determination of necessary bandwidth for common classes of emission, as well as examples to supplement those given in Recommendation ITU-R SM.1138;
- 2 study and provide values of supplementary K-factors required for the calculation of the necessary bandwidth for common classes of emission,

invites the Radiocommunication Bureau

to publish examples of such calculations in the Preface to the International Frequency List.

¹ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION 71

Relating to the standardization of the technical and operational characteristics of radio equipment¹

The World Administrative Radio Conference (Geneva, 1979),

considering

- a)* that administrations are confronted with the necessity of allocating increasing resources to the regulation of radio equipment performance;
- b)* that administrations, and in particular those in developing countries, often have difficulty in providing such resources;
- c)* that it would be of advantage to apply, as far as practicable, any mutually agreed standards and associated type approvals;
- d)* that a number of international bodies including the ITU-R, International Civil Aviation Organization (ICAO), International Maritime Organization (IMO), International Special Committee on Radio Interference (CISPR) and the International Electrotechnical Commission (IEC) already provide recommendations and standards for technical and operating characteristics applicable to equipment performance and its measurement;
- e)* that in this context the specific requirements of developing countries have not always been taken fully into account,

recommends

- 1 that administrations endeavour to cooperate with a view to establishing international performance specifications and associated measuring methods that could be used as models for domestic standards for radio equipment;
- 2 that such international performance specifications and associated measuring methods respond to widely representative conditions including specific requirements of developing countries;
- 3 that, when such international performance specifications for radio equipment exist, administrations, as far as practicable, adopt these specifications as a basis for their national standards;
- 4 that administrations consider as far as practicable mutual acceptance for the type approval of equipment which conforms to such performance specifications.

¹ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION 75 (WRC-03)

**Study of the boundary between the out-of-band and spurious domains
of primary radars using magnetrons**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the principal objective of Appendix 3 is to specify the maximum permitted level of unwanted emissions in the spurious domain;
- b)* that the out-of-band and spurious domains of an emission are defined in Article 1;
- c)* that Recommendation ITU-R SM.1541 specifies the boundary between the out-of-band and spurious domains for primary radars, and that the boundary is related to the emission mask based on the –40 dB bandwidth;
- d)* that Appendix 3 refers to Recommendation ITU-R SM.1541;
- e)* that the measurement method for unwanted emissions of radars is described in Recommendation ITU-R M.1177,

recognizing

- a)* that § 3.3 of Annex 1 in Recommendation ITU-R SM.1539-1 mentions that the specification of the boundary between the out-of-band and spurious domains of primary radars is subject to ongoing studies in ITU-R and that there would be benefit in having these completed by the next Radiocommunication Assembly;
- b)* that there is a possibility that calculated values for the –40 dB bandwidth related to unwanted emissions of primary radars using magnetrons underestimate the actual bandwidth,

recommends

- 1 that ITU-R study calculation methods for the –40 dB bandwidth necessary for the determination of the boundary between the spurious and out-of-band domains of primary radars using magnetrons;
- 2 that ITU-R establish improved measurement methods for unwanted emissions of primary radars using magnetrons,

invites administrations

to participate actively in the above studies by submitting contributions to ITU-R.

RECOMMENDATION 100 (Rev.WRC-03)

**Preferred frequency bands for systems
using tropospheric scatter**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* the technical and operational difficulties pointed out by Recommendation ITU-R F.698 in the frequency bands shared by tropospheric scatter systems, space systems and other terrestrial systems;
- b)* the additional allocation of frequency bands made by WARC-79 and WARC-92 for the space services in view of their increasing development;
- c)* that the Radiocommunication Bureau requires administrations to supply specific information on systems using tropospheric scatter in order to verify compliance with certain provisions of the Radio Regulations (such as Nos. **5.410** and **21.16.3**),

recognizing nevertheless

that, to meet certain telecommunication requirements, administrations will wish to continue using tropospheric scatter systems,

noting

that the proliferation of such systems in all frequency bands and particularly in those shared with space systems is bound to aggravate an already difficult situation,

recommends that administrations

- 1 for the assignment of frequencies to new stations in systems using tropospheric scatter, take into account the latest information prepared by ITU-R to ensure that systems established in the future use a limited number of certain frequency bands;
- 2 in frequency assignment notifications to the Bureau, indicate expressly whether they relate to stations of tropospheric scatter systems.

RECOMMENDATION 104 (WRC-95)

Development of power flux-density and equivalent isotropically radiated power limits to be met by feeder links of non-geostationary satellite networks in the mobile-satellite service for the protection of geostationary-satellite networks in the fixed-satellite service in bands where No. 22.2 of the Radio Regulations applies

The World Radiocommunication Conference (Geneva, 1995),

considering

- a)* that, for operators both of geostationary fixed-satellite service (GSO FSS) networks and of feeder links of non-geostationary mobile-satellite service (non-GSO MSS) networks, it would be beneficial to have a precise definition of the level of protection implied by No. 22.2 in order to reduce regulatory uncertainties;
- b)* that, in particular, for GSO FSS operators, knowledge of the level of protection to be expected from existing and future non-GSO MSS feeder links is essential for the design of future systems and for ensuring the protection of existing GSO FSS systems;
- c)* that, in particular, for non-GSO MSS feeder link operators, knowledge of the level of protection to be granted to existing and future GSO FSS networks is essential in order to guarantee that the capability of providing this protection be fully considered during the design of the feeder-link network;
- d)* that the benefits of precisely defining the level of protection to be granted, as referred to in *considering c)*, would be better achieved by specifying the maximum levels of interfering emissions rather than the maximum levels of their effect;
- e)* that the several aspects addressed in *considering b), c)* and *d)* could be satisfied by limiting the equivalent isotropically radiated power (e.i.r.p.) that a feeder-link station in a non-GSO MSS system can radiate towards the geostationary-satellite orbit and by limiting the power flux-density that a non-GSO MSS space station transmitting to any of its feeder-link stations can produce at any given point on the Earth's surface,

recommends that ITU-R

1 continue to study, as a matter of urgency, the possibility of developing e.i.r.p. and power flux-density limits to be met by non-GSO MSS feeder links in order to protect GSO FSS networks in accordance with No. **22.2** in bands where Resolution **46 (Rev.WRC-97)**^{*,**} does not apply;

2 develop an appropriate Recommendation (or Recommendations) reflecting the results of those studies within the next two years.

* *Note by the Secretariat:* As of 1 January 1999, the relevant procedures are those of No. **9.11A**.

** *Note by the Secretariat:* This Resolution was abrogated by WRC-03.

RECOMMENDATION 316 (Rev.Mob-87)

**Use of ship earth stations within harbours and other waters
under national jurisdiction¹**

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

recognizing

that permitting the use of ship earth stations within harbours and other waters under national jurisdiction belongs to the sovereign right of countries concerned,

recalling

that WARC-79, allocated the bands 1 530-1 535 MHz (with effect from 1 January 1990), 1 535-1 544 MHz and 1 626.5-1 645.5 MHz to the maritime mobile-satellite service and the bands 1 544-1 545 MHz and 1 645.5-1 646.5 MHz to the mobile-satellite service,

noting

that the international agreement on the use of INMARSAT ship earth stations within the territorial sea and ports has been adopted and this Agreement is open to accession, ratification, approval or acceptance, as appropriate,

considering

a) that the maritime mobile-satellite service, which is at present in operation worldwide, has improved maritime communications greatly and has contributed much to the safety and efficiency of ship navigation, and that fostering and developing the use of that service in future will contribute further to their improvement;

b) that the maritime mobile-satellite service will play an important role in the Global Maritime Distress and Safety System (GMDSS);

c) that the use of the maritime mobile-satellite service will be beneficial not only to the countries having ship earth stations at present but also to those considering the introduction of that service,

is of the opinion

that all administrations should be invited to consider permitting, to the extent possible, ship earth stations to operate within harbours and other waters under national jurisdiction in the bands 1 530-1 535 MHz (with effect from 1 January 1990), 1 535-1 545 MHz and 1 626.5-1 646.5 MHz,

¹ WRC-97 made editorial amendments to this Recommendation.

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recommends

1 that all administrations should consider permitting, to the extent possible, ship earth stations to operate within harbours and other waters under national jurisdiction, in the above-mentioned frequency bands;

2 that administrations should consider the adoption, where required, of international agreements on this matter.

RECOMMENDATION 318 (Mob-87)

Improved efficiency in the use of the Appendix 18 VHF frequency spectrum for maritime mobile communications

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

considering

- a)* that growth in the use of Appendix **18** VHF maritime mobile channels is expected to continue;
- b)* that in many parts of the world significant congestion already exists;
- c)* that increases in congestion could be harmful to the safe movement and operation of vessels and port operations and are a matter of concern to the International Association of Lighthouse Authorities (IALA), the International Maritime Organization (IMO) and many administrations,

noting

- a)* that it may be possible to make more efficient use of the VHF maritime mobile spectrum with the development of existing or new technologies such as narrow-band FM, single sideband, compandored single sideband, use of interleaved channels separated by 12.5 kHz, reduced channel spacing, etc.;
- b)* that a great number of mariners using low-cost transceivers rely on this band and the safety services that are thereby provided;
- c)* that any modification to Appendix **18** shall take account of the distress and safety utilization,

invites the ITU-R

urgently to undertake studies to determine the most appropriate means of promoting a more efficient use of the frequency spectrum in the VHF maritime mobile band and to develop Recommendations covering the technical and operational characteristics of systems using this band,

invites administrations

to participate in these studies actively,

REC318-2

recommends

that a future competent radiocommunication conference review and revise, if appropriate, the provisions of Appendix **18**, taking into account the relevant ITU-R Recommendations,

instructs the Secretary-General

to communicate this Recommendation to the IALA and IMO.

RECOMMENDATION 401

**Relating to the efficient use of aeronautical mobile (R)
worldwide frequencies**

The World Administrative Radio Conference (Geneva, 1979),

considering

that WARC-Aer2 allotted a limited number of worldwide frequencies for exercising control over regularity of flight and for safety of aircraft,

recommends to administrations

1 that the number of HF aeronautical stations on the worldwide channels should be kept to a minimum consistent with the economic and efficient use of frequencies;

2 that, if possible and practicable, one such station should serve aircraft operating agencies in adjacent countries and there should not normally be more than one station per country.

RECOMMENDATION 503 (Rev.WRC-2000)

High-frequency broadcasting

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* the congestion in the HF broadcasting bands;
- b)* the extent of co-channel and adjacent-channel interference;
- c)* that AM reception quality is relatively poor compared with FM broadcast or CD quality;
- d)* that new digital techniques have enabled significant improvements in reception quality to be obtained in other broadcasting bands;
- e)* that the introduction of digital modulation systems in the broadcasting bands below 30 MHz has been shown to be feasible using low bit-rate coding;
- f)* that Resolution **517 (Rev.WRC-97)*** invites ITU-R to continue its studies on digital techniques in HF broadcasting, as a matter of urgency;
- g)* that urgent studies on this subject are currently being carried out by ITU-R under former Question ITU-R 217/10, with a view to issuing a relevant Recommendation in a very short time period,

recognizing

- a)* that the implementation of an ITU-recommended worldwide system for digital sound in the HF bands would be extremely beneficial, particularly for developing countries, since it allows for:
 - mass-scale production resulting in receivers as economical as possible;
 - more economical analogue-to-digital conversion of existing transmitting infrastructures;

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

b) that the above system would result in digital receivers having a number of advanced features such as assisted tuning, improved audio quality and robustness to co-channel and adjacent-channel interference, which would greatly contribute to a better spectrum utilization,

recommends administrations

1 to draw the attention of manufacturers to this matter, in order to ensure that future digital receivers take full advantage of the advanced technology while maintaining low cost;

2 to encourage manufacturers to monitor closely the development of the studies carried out by ITU-R, with a view to starting mass production of new low-cost digital receivers as soon as possible after the approval of relevant ITU-R Recommendation(s).

RECOMMENDATION 506

**Relating to the harmonics of the fundamental frequency
of broadcasting-satellite stations¹**

The World Administrative Radio Conference (Geneva, 1979),

considering

a) that the frequency band 23.6-24 GHz is allocated to the radio astronomy service on a primary basis;

b) that the second harmonic of the fundamental frequency of broadcasting-satellite stations operating within the band 11.8-12 GHz may seriously disturb radio astronomy observations in the band 23.6-24 GHz if effective steps are not taken to reduce the level of this harmonic,

in view of

the provisions of No. **3.8**,

recommends

that, when defining the characteristics of their space stations operating in the broadcasting-satellite service, particularly within the band 11.8-12 GHz, administrations take all necessary steps to reduce the level of the second harmonic below the values indicated in the relevant ITU-R Recommendations.

¹ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION 517 (Rev.WRC-03)

**Relative RF protection ratio values for single-sideband
emissions in the HF bands allocated
to the broadcasting service**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-97 adopted Article **12** as the seasonal planning procedure for the HF bands allocated to the broadcasting service;
- b)* that this procedure is based principally on the use of double-sideband (DSB) emissions;
- c)* that the RF co-channel protection ratio is one of the fundamental planning parameters;
- d)* that this Conference has adopted Resolution **517 (Rev.WRC-03)** relating to the introduction of digitally modulated and single-sideband (SSB) emissions in the HF bands allocated to the broadcasting service;
- e)* that the SSB system characteristics for HF broadcasting are contained in Appendix **11**;
- f)* that studies have shown that SSB emissions may require a lower RF co-channel protection ratio for the same reception quality,

recommends

that, in the preparation of the relevant Rules of Procedure for the application of Article **12**, the Bureau should use the values of relative RF protection ratio given in the Annex to this Recommendation relating to SSB and DSB emissions in the HF bands allocated to the broadcasting service.

ANNEX TO RECOMMENDATION 517 (Rev.WRC-03)

Relative RF protection ratio values

1 The values of relative RF protection ratio given in the Table should be used whenever SSB emissions in conformity with the specification in Appendix **11** are involved in the use of the HF bands allocated to the broadcasting service.

2 For the reception of DSB and SSB (6 dB carrier reduction relative to peak envelope power) wanted signals, a conventional DSB receiver with envelope detection designed for a channel spacing of 10 kHz is assumed.

3 SSB signals with 6 dB carrier reduction relative to peak envelope power assume equivalent sideband power as specified in Appendix 11, Part B, § 1.2.

4 The figures for case 2 in the following Table relate to a situation where the centre frequency of the intermediate frequency pass-band of the DSB receiver is tuned to the carrier frequency of the wanted SSB signal. If this is not the case, the value for a difference of +5 kHz may increase to –1 dB.

Relative RF protection ratio values with reference to the co-channel RF protection ratio for DSB wanted and unwanted signals (dB)¹ for use in the HF bands allocated to the broadcasting service

	Wanted signal	Unwanted signal	Carrier frequency separation $f_{\text{unwanted}} - f_{\text{wanted}}, \Delta f$ (kHz)								
			–20	–15	–10	–5	0	+5	+10	+15	+20
1	DSB	SSB (6 dB carrier reduction relative to p.e.p.)	–51	–46	–32	+1	3	–2	–32	–46	–51
2	SSB (6 dB carrier reduction relative to p.e.p.)	DSB	–54	–49	–35	–3	0	–3	–35	–49	–54
3	SSB (6 dB carrier reduction relative to p.e.p.)	SSB (6 dB carrier reduction relative to p.e.p.)	–51	–46	–32	+1	0	–2	–32	–46	–51

¹ Frequency separation Δf less than –20 kHz, as well as Δf greater than 20 kHz, need not be considered.

RECOMMENDATION 520 (WARC-92)

Elimination of HF broadcasting on frequencies outside the HF bands allocated to the broadcasting service

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

- a)* that there is an increasing number of HF broadcasting stations operating on frequencies outside the bands allocated to the broadcasting service;
- b)* that the common use of the HF bands by the broadcasting and other services, without the relevant allocations or detailed regulations, results in inefficient use of the frequency spectrum;
- c)* that such use has led to harmful interference;
- d)* that this Conference has allocated additional spectrum to the broadcasting service in the HF bands,

recommends

that administrations shall take practicable steps to eliminate HF broadcasting outside the HF bands allocated to the broadcasting service.

RECOMMENDATION 522 (WRC-97)

Coordination of high-frequency broadcasting schedules in the bands allocated to the broadcasting service between 5 900 kHz and 26 100 kHz

The World Radiocommunication Conference (Geneva, 1997),

considering

- a)* that Article 12 establishes the principles and the procedure for use of the frequency bands allocated to the HF broadcasting service between 5 900 kHz and 26 100 kHz;
- b)* that the aforementioned principles stipulate, *inter alia*, that the procedure should promote the development of a voluntary coordination process among administrations to resolve incompatibilities;
- c)* that the procedure itself encourages administrations to coordinate their schedules with other administrations as far as possible prior to submission;
- d)* that the development of coordination among administrations with the assistance of the Radiocommunication Bureau, when requested, would result in better use of the spectrum allocated to the HF broadcasting service between 5 900 kHz and 26 100 kHz,

recognizing

- a)* that the participation of broadcasting organizations in this coordination process would make the task of resolving incompatibilities easier;
- b)* that multilateral coordination of the use of the HF broadcasting bands is already practised on an informal basis in various regional coordination groups¹,

recommends administrations

to promote, as far as possible, regular coordination of their broadcasting schedules within appropriate regional coordination groups of administrations or broadcasting organizations in order to resolve or reduce incompatibilities, through bilateral or multilateral meetings or by correspondence (telephone, facsimile, e-mail, etc.).

¹ Not related to the ITU Regions.

RECOMMENDATION 604 (Rev.Mob-87)

Future use and characteristics of emergency position-indicating radiobeacons (EPIRBs)^{1, 2}

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

considering

- a) that the essential purpose of EPIRB signals is to help locate survivors in search and rescue operations;
- b) that requirements for carriage of EPIRBs operating on the frequencies 121.5 and 243 MHz have been included in the 1983 Amendments to the International Convention for the Safety of Life at Sea, 1974;
- c) that the International Maritime Organization (IMO) has been considering various types of EPIRBs;
- d) that the IMO has stressed in its Resolution A.279 (VIII) the urgent need for unification of the characteristics of EPIRBs,

recognizing

- a) that there are provisions in the Radio Regulations for EPIRBs on the frequencies 2 182 kHz, 121.5 MHz, 156.525 MHz, 243 MHz, and in the bands 406-406.1 MHz and 1 645.5-1 646.5 MHz;
- b) that Recommendation ITU-R M.690-1 was approved in order to facilitate the application of a universal standard for EPIRBs operating on the frequencies 121.5 MHz and 243 MHz;
- c) that for EPIRBs operating on 121.5 MHz and 243 MHz, there is a need to improve their function of being detected and located by satellite systems,

recommends

- 1 that, in view of their mutual interest in this matter, IMO and the International Civil Aviation Organization (ICAO) be invited, as a matter of urgency, to review and align their concepts for EPIRBs in regard to search and rescue operations and the safety of life at sea;

¹ For the purpose of this Recommendation, references to EPIRBs include references to satellite EPIRBs as appropriate.

² WRC-97 made editorial amendments to this Recommendation.

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2 that the ITU-R continue to study technical and operating questions for EPIRBs, in consideration of concepts stated by the IMO and ICAO;

3 that the ITU-R and ICAO study, as a matter of urgency, the technical and operational questions arising from § *d*) of Annex 1 to Recommendation ITU-R M.690-1,

instructs the Secretary-General

to communicate this Recommendation to the IMO and ICAO.

RECOMMENDATION 605 (Rev.Mob-87)

**Technical characteristics and frequencies for
shipborne transponders^{1, 2}**

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

considering

- a)* that merchant ships of the world are increasing in size and speed;
- b)* that every year a significant number of collisions occur involving merchant vessels with resultant loss of life and property and that collisions have a high potential for endangering the natural environment;
- c)* that there is a need to correlate radar targets with vessels making VHF radio-telephone 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 technical characteristics for these transponders should be coordinated with other users of the radio frequency spectrum whose operations might be affected,

requests the ITU-R

to recommend, after consultation with appropriate international organizations, the most suitable order of magnitude of frequencies and bandwidth required for this purpose, and the technical parameters to be met by such devices, taking into account both electromagnetic compatibility with other services having allocations in the same frequency band and the need to ensure that the response of a transponder of the system studied should not be capable of interpretation as being from a radar beacon of whatever type,

¹ A receiver-transmitter which emits a signal automatically when it receives the proper interrogation.

² WRC-97 made editorial amendments to this Recommendation.

invites administrations and the International Maritime Organization (IMO)

to continue to evaluate the operational benefits which could result from the widespread use of transponders on ships and to consider whether there would be advantage in adopting an internationally approved system for future implementation,

recommends

that, pending further technical and operational developments and evaluation, administrations be prepared at the next competent world radiocommunication conference to make the necessary provisions for the use of such devices.

RECOMMENDATION 606 (Mob-87)

The possibility of reducing the band 4 200-4 400 MHz used by radio altimeters in the aeronautical radionavigation service¹

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

considering

- a)* that there is a demand for additional frequency allocations for the mobile service, particularly the land mobile service;
- b)* that all systems utilizing the radio-frequency spectrum should be efficient in their use of that scarce resource;
- c)* that the allocation of the band 4 200-4 400 MHz to the aeronautical radionavigation service appeared in the Radio Regulations (Atlantic City, 1947) and has not been changed despite technological advances;
- d)* that it has decided not to change the frequency allocations in that band;
- e)* that studies carried out by the International Civil Aviation Organization (ICAO) on this question indicate that the operation of the existing radio altimeter equipment necessitates the whole band;
- f)* that it might be possible to operate radio altimeters in this band with sufficient accuracy with a necessary bandwidth of less than 200 MHz;
- g)* that the frequency tolerance of such devices might be improved,

recommends

- 1 that the next competent world conference should consider, if appropriate, a reduction of the band 4 200-4 400 MHz allocated to the aeronautical radionavigation service;
- 2 that any reduction should be based on a detailed technical evaluation of the systems in question, taking into account ICAO reports on the evaluation of future world traffic of aircraft using this band;
- 3 that the conference mentioned in *recommends* 1 above should consider reallocating to the land mobile service any portion of the band currently available for the aeronautical radionavigation service which is identified as being suitable on the basis of technical considerations,

¹ WRC-97 made editorial amendments to this Recommendation.

REC606-2

invites the ITU-R

to study the necessary bandwidth and frequency tolerance requirements for systems operating in the aeronautical radionavigation service in the frequency band 4 200-4 400 MHz,

invites the Council

to place this Recommendation on the agenda of the next competent world radiocommunication conference,

instructs the Secretary-General

to refer this Recommendation to ICAO, inviting it to consider the possibility of reducing the band 4 200-4 400 MHz for the aeronautical radionavigation service and to make appropriate recommendations to assist administrations in this matter.

RECOMMENDATION 608 (WRC-03)

**Guidelines for consultation meetings established in
Resolution 609 (WRC-03)**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that in accordance with the Radio Regulations (RR), the band 960-1215 MHz is allocated on a primary basis to the aeronautical radionavigation service (ARNS) in all the ITU Regions;
- b)* that WRC-2000 introduced a co-primary allocation for the radionavigation-satellite service (RNSS) in the frequency band 1164-1215 MHz (subject to the conditions specified under No. **5.328A**), with a provisional limit on the aggregate power flux-density (pfd) produced by all the space stations within all radionavigation-satellite systems at the Earth's surface of $-115 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band for all angles of arrival;
- c)* that this Conference revised this provisional limit and decided that the level of $-121.5 \text{ dB(W/m}^2\text{)}$ in any 1 MHz for the aggregate equivalent pfd (epfd) applying for all the space stations within all RNSS systems, taking into account the reference worst-case ARNS system antenna characteristics described in Annex 2 of Recommendation ITU-R M.1642, is adequate to ensure the protection of the ARNS in the band 1164-1215 MHz;
- d)* that this Conference decided that to achieve the objectives in *resolves* 1 and 2 of Resolution **609 (WRC-03)**, administrations operating or planning to operate RNSS systems will need to agree cooperatively through consultation meetings to achieve the level of protection for ARNS systems, and shall establish mechanisms to ensure that all potential RNSS system operators are given full visibility of the process but that only real systems are taken into account in the calculation of the aggregate epfd,

recommends

- 1 that in the implementation of *resolves* 5 of Resolution **609 (WRC-03)**, in the frequency band 1164-1215 MHz, the maximum pfd produced at the surface of the Earth by emissions from a space station in the RNSS, for all angles of arrival, should not exceed $-129 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band under free space propagation conditions;
- 2 that the RNSS characteristics listed in the Annex 1, used when applying the methodology contained in Recommendation ITU-R M.1642, as well as the calculated aggregate epfd in $\text{dB(W/m}^2\text{)}$ in each 1 MHz in the range 1164-1215 MHz, should be made available in electronic format by the consultation meetings.

ANNEX 1 TO RECOMMENDATION 608 (WRC-03)

**List of RNSS system characteristics and format of the result of the aggregate
epfd calculation to be provided to the Radiocommunication
Bureau for publication for information**

I RNSS systems characteristics**I-1 RNSS ITU publication reference**

RNSS network name	Network ID	ITU Publication reference	IFIC
		AR11/A/....	
		API/A/....	
		AR11/C/....	
		CR/C/....	

I-2 Non-GSO satellite system constellation parameters

For each non-GSO satellite system, the following constellation parameters should be provided to the Bureau for publication for information:

- N : number of space stations of the non-GSO system
- K : number of orbital planes
- h : satellite altitude above the Earth (km)
- I : inclination angle of the orbital plane above the Equator (degrees).

Satellite index I	RAAN $\Omega_{i,0}$ (degrees)	Argument of latitude $E_{i,0}$ (degrees)
1
2
...
N

I-3 GSO satellite system longitude

For each GSO satellite network, the satellite longitude should be provided to the Bureau for publication for information, as follows:

- LonGSO_i : longitude of each of the GSO satellites (degrees).

I-4 Maximum non-GSO space station pfd versus the elevation angle at the Earth's surface (worst 1 MHz)

For the non-GSO satellite system space stations, the maximum pfd in the worst 1 MHz versus elevation angle should be provided to the Bureau for publication for information in a table format as follows:

Elevation angle (each 1°)	pfd (dB(W/(m ² · MHz)))
−4	pfd (−4°)
−3	pfd (−3°)
...	...
...	...
90	pfd (−90°)

I-5 Maximum GSO space station pfd versus latitude and longitude at the Earth's surface (worst 1 MHz)

For each GSO satellite network space station, the maximum pfd in the worst 1 MHz, defined as the 1 MHz in which the pfd of the signal is maximum versus latitude and longitude should be provided to the Bureau for publication for information in a table format as follows:

Longitude (each 1°)	0	1	...	360
Latitude (each 1°)	Maximum pfd dB(W/m ²) in worst 1 MHz			
−90	pfd (0, −90)
−89
...
...
90	pfd (360, 90)

I-6 Spectrum for GSO satellite networks or non-GSO satellite systems

For each GSO satellite network or non-GSO satellite system, the level of spectrum emission in each 1 MHz relative to the spectrum value at the worst 1 MHz of the whole band (1164-1215 MHz) should also be provided to the Bureau for publication for information.

II Results of the aggregate epfd calculation in the worst 1 MHz of the 1164-1215 MHz band

Maximum aggregate epfd in dB(W/m²) in the worst-case megahertz in the range 1164-1215 MHz.

RECOMMENDATION 622 (WRC-97)

**Use of the frequency bands 2 025-2 110 MHz and 2 200-2 290 MHz by
the space research, space operation, Earth exploration-satellite,
fixed and mobile services**

The World Radiocommunication Conference (Geneva, 1997),

considering

- a)* that the bands 2 025-2 110 MHz and 2 200-2 290 MHz are allocated on a primary basis to the space research, space operation, Earth exploration-satellite, fixed and mobile services;
- b)* that, in response to Resolutions from the 1992 Conference (WARC-92), studies have resulted in a number of ITU-R Recommendations, which, when adhered to by the services, will result in a stable, long-term sharing environment (Recommendations ITU-R SA.364, ITU-R SA.1019, ITU-R F.1098, ITU-R SA.1154, ITU-R F.1247, ITU-R F.1248, ITU-R SA.1273, ITU-R SA.1274 and ITU-R SA.1275);
- c)* that this Conference adopted No. **5.391** which states that high-density mobile systems shall not be introduced in these frequency bands,

considering further

that enhancements in technology may enable the services mentioned in *considering a)* to minimize the total bandwidth requirement in these frequency bands,

noting

that WARC-92 considered that it is desirable to review the present and planned use of the frequency bands 2 025-2 110 MHz and 2 200-2 290 MHz, with the intent, where practicable, of satisfying some space mission requirements in bands above 20 GHz,

recognizing

that there are increasing requirements for emerging communication systems which need to be satisfied in the frequency range below 3 GHz,

recommends

that administrations planning to introduce new systems in the space research, space operation, earth exploration-satellite, fixed or mobile services in the bands 2 025-2 110 MHz and 2 200-2 290 MHz take into account the ITU-R Recommendations referred to in *considering b)* above when making assignments to these services, and implement enhancements in technology as early as practicable with a view to minimizing the total bandwidth required by systems of each service.

RECOMMENDATION 705

**Criteria to be applied for frequency sharing between the
broadcasting-satellite service and the terrestrial broadcasting
service in the band 620-790 MHz¹**

The World Administrative Radio Conference (Geneva, 1979),

considering

a) that, within the band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service;

b) that it is necessary to have a power flux-density limit which will provide adequate protection to the terrestrial broadcasting service,

taking into account

a) that the conclusions of the Special Joint Meeting of the ex-CCIR (Geneva, 1971), indicated that the following power flux-density limits are necessary to protect the terrestrial broadcasting service:

-121 dB(W/m ²)	for	$\delta \leq 20^\circ$
-121 + 0.4 ($\delta - 20$) dB(W/m ²)	for	$20^\circ < \delta \leq 60^\circ$
-105 dB(W/m ²)	for	$60^\circ < \delta \leq 90^\circ$

where δ is the angle of arrival above the horizontal plane (degrees);

b) that additional tests carried out by one administration after the Special Joint Meeting of the ex-CCIR indicated that the following more conservative power flux-density limits may be necessary:

-130 dB(W/m ²)	for	$\delta \leq 20^\circ$
-130 + 0.4 ($\delta - 20$) dB(W/m ²)	for	$20^\circ < \delta \leq 60^\circ$
-114 dB(W/m ²)	for	$60^\circ < \delta \leq 90^\circ$

where δ is the angle of arrival above the horizontal plane (degrees);

c) that Report 631-1 of the ex-CCIR gives the results of studies carried out up to 1978;

d) that additional information is required on the protection ratio for interference from an FM television signal into a vestigial sideband (VSB) television signal for both the 625- and 525-line systems;

¹ WRC-97 made editorial amendments to this Recommendation.

e) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in Recommendation ITU-R BT.417;

f) that account may have to be taken of ground reflections;

g) that energy dispersal techniques may reduce the required protection ratio and should be used if shown to be effective,

recommends

1 that in view of the absence of sufficient information on tests under operational conditions and in order to provide sharing criteria, on a provisional basis, the maximum power flux-density produced at the surface of the Earth within the service area of a terrestrial broadcasting station (see Recommendation ITU-R BT.417) by a space station in the broadcasting-satellite service in the band 620-790 MHz should not exceed:

$-129 \text{ dB(W/m}^2\text{)}$	for	$\delta \leq 20^\circ$
$-129 + 0.4 (\delta - 20) \text{ dB(W/m}^2\text{)}$	for	$20^\circ < \delta \leq 60^\circ$
$-113 \text{ dB(W/m}^2\text{)}$	for	$60^\circ < \delta \leq 90^\circ$

where δ is the angle of arrival above the horizontal plane (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 ITU-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 ITU-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 ITU-R should consider the advantages of energy dispersal techniques in the broadcasting-satellite service (television).

RECOMMENDATION 707

Relating to the use of the frequency band 32-33 GHz shared between the inter-satellite service and the radionavigation service¹

The World Administrative Radio Conference (Geneva, 1979),

considering

- a)* that the band 32-33 GHz is allocated to the inter-satellite service and the radio-navigation service;
- b)* that there are safety aspects associated with the radionavigation service;
- c)* that No. **5.548** has been incorporated into Article **5**,

recommends

that, as a matter of urgency, studies should be made of the sharing criteria for these two services in the frequency band listed above,

requests the ITU-R

to carry out these studies,

recommends further

that a future competent world radiocommunication conference review the ITU-R Recommendations with a view to the inclusion of such sharing criteria in Article **21**.

¹ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION 722 (WRC-03)

**Review of technical, operational and frequency issues
for terrestrial wireless interactive multimedia
applications on a global basis**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* the technical evolution taking place in several areas of telecommunications;
- b)* the ongoing convergence between some applications of the fixed, mobile and broadcasting services;
- c)* the emergence of interactive multimedia applications to be delivered by wireless;
- d)* the desirability of finding global solutions for terrestrial wireless interactive multimedia applications,

noting

- a)* the historical practice of frequency segmentation, particularly the differences between Regions, but also segmentation between services, in the Table of Frequency Allocations (Article 5);
- b)* Recommendation 34 (WRC-95), derived from the recommendations of the Voluntary Group of Experts (VGE) for the study of alternative allocation methods, merging of services, etc., which sets the objectives of allocating frequency bands on a worldwide basis and to the most broadly defined services, wherever possible;
- c)* Resolution 9 (Rev.Istanbul, 2002) of the World Telecommunication Development Conference, calling for active participation by the developing countries in the review of global spectrum requirements for new technologies;
- d)* that terrestrial wireless interactive multimedia applications are capable of supporting the bidirectional exchange of information between users or between users and servers and may be implemented within one or more of the mobile, fixed and broadcasting services;
- e)* that Radiocommunication Study Groups are currently addressing the relevant issues, including, *inter alia*, the digitization of broadcasting services and studies on spectrum requirements,

recognizing

- a)* the time necessary to develop and agree on the technical, operational and spectrum issues, and to resolve any regulatory impediments that may exist, associated with the introduction of multimedia wireless applications on a global basis;

- b)* the need to further define and develop the terrestrial wireless interactive multimedia concept, and applications that may be delivered by fixed, mobile and broadcasting networks;
- c)* that, for international operation and economies of scale, it is desirable to agree on the technical, operational and spectrum-related parameters of systems;
- d)* that spectrum studies are a prerequisite for the technological and economic success of multimedia wireless applications,

recommends that ITU-R

- 1 continue its studies on the technical, operational and frequency issues and identify any regulatory impediments that may arise in relation to the introduction of terrestrial wireless interactive multimedia applications on a global basis;
- 2 prepare Reports and Recommendations as necessary,

invites administrations

to participate in these studies by submitting contributions to ITU-R.

RECOMMENDATION 723 (WRC-03)

**Spectrum usage and operational characteristics
of electronic news gathering systems**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the use of portable and nomadic microwave radio equipment operating in appropriate fixed and mobile service bands commonly described as electronic news gathering (ENG) is now an important element in comprehensive news coverage by broadcasters;
- b)* that the growth of the use of the frequency bands between 500 MHz and 10 GHz for mobile, satellite and other radiocommunication applications has significantly reduced the flexibility of some administrations in providing adequate and appropriate spectrum to meet the needs of broadcasters including the temporary needs of visiting broadcasters of other administrations;
- c)* that digitization may provide an opportunity for more efficient spectrum usage for ENG that could assist with meeting a growing demand for spectrum by these systems;
- d)* that availability of relevant ITU publications on ENG can assist administrations in addressing ENG operations in their spectrum planning;
- e)* that it is desirable that administrations have available appropriate ITU-R Reports and Recommendations addressing the different technical and operational characteristics of applications using the fixed and mobile bands when developing proposals to WRCs addressing those bands,

recommends that ITU-R

- 1 continue the study, as a matter of urgency, of the technical, operational and frequency issues of ENG on a global basis;
- 2 prepare Reports and/or Recommendations as appropriate,

invites the Director of the Radiocommunication Bureau

to include the status of this study in his Report to WRC-07 for information,

invites administrations

to participate in this study by submitting contributions.

RECOMMENDATION 800 (WRC-03)

Principles for establishing agendas for world radiocommunication conferences

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in accordance with No. 118 of the ITU Convention, the general scope of the agendas for world radiocommunication conferences (WRCs) should be established four to six years in advance;
- b)* Article **13** of the ITU Constitution relating to the competence and scheduling of WRCs and Article 7 of the Convention relating to their agendas;
- c)* that No. 92 of the Constitution and Nos. 488 and 489 of the Convention require conferences to be fiscally responsible;
- d)* that in Resolution 71 (Rev. Marrakesh, 2002), concerning the strategic plan of the Union, the Plenipotentiary Conference noted the increasingly complex and lengthy agendas for world radiocommunication conferences;
- e)* that Resolution 80 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference and Resolution **72 (WRC-2000)** recognize the positive contribution of regional and informal groups and the need for improved efficiency and fiscal prudence;
- f)* the relevant Resolutions of previous WRCs,

noting

- a)* that the number of issues addressed in agendas for WRCs has been growing, and that some issues could not be resolved adequately in the time allotted to the Conference, including conference preparations;
- b)* that some agenda items may have a greater impact on the future of radio-communications than others;
- c)* that the human and financial resources of ITU are limited;
- d)* that there is a need to limit the agenda of conferences, taking account of the needs of developing countries, in a manner that allows the major issues to be dealt with equitably and efficiently,

recommends

- 1 that the principles in Annex 1 should be used when developing future WRC agendas;

2 that the template in Annex 2 should be used in proposing agenda items for WRCs,

invites administrations

to participate in regional activities for the preparation of future WRC agendas.

ANNEX 1 TO RECOMMENDATION 800 (WRC-03)

Principles for establishing agendas for WRCs

A conference agenda shall include:

- 1) items assigned to it by the ITU Plenipotentiary Conference;
- 2) items on which the Director of the Radiocommunication Bureau has been requested to report;
- 3) items concerning instructions to the Radio Regulations Board and the Radiocommunication Bureau regarding their activities, and concerning the review of those activities.

In general, a conference may include on a future conference agenda an item proposed by a group of administrations or an administration, if all the following conditions are met:

- 1) it addresses issues of a worldwide or regional character;
- 2) it is expected that changes in the Radio Regulations, including WRC Resolutions and Recommendations, may be necessary;
- 3) it is expected that required studies can be completed (e.g. that appropriate ITU-R Recommendations will be approved) prior to that conference;
- 4) resources associated with the subject are kept within a range which is manageable for Member States and Sector Members, the Radiocommunication Bureau and ITU-R Study Groups, Conference Preparatory Meeting (CPM) and the Special Committee.

To the extent possible, agenda items arising from previous conferences, normally reflected in Resolutions, and which have been considered by two successive conferences, should not be considered, unless justified.

In developing the conference agenda, efforts should be made to:

- a) encourage regional and interregional coordination on the subjects to be considered in the preparatory process for the WRC, in accordance with Resolution **72 (Rev.WRC-2000)** and Resolution 80 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;
- b) include, to the extent possible, agenda items that are proposed through regional groups, taking into account the equal right of individual administrations to submit proposals for agenda items;
- c) ensure that proposals are submitted with an indication of priority;

- d) include in proposals an assessment of their financial and other resource implications (with the assistance of the Radiocommunication Bureau) to ensure that they are within the agreed budgetary limits for ITU-R;
- e) ensure that the objectives and scope of proposed agenda items are complete and unambiguous;
- f) take into account the status of the ITU-R studies related to the potential agenda items before considering them as possible candidates for future agendas;
- g) distinguish between items intended to result in changes to the Radio Regulations and those dealing solely with the progress of studies.

ANNEX 2 TO RECOMMENDATION 800 (WRC-03)

Template for the submission of proposals for agenda items

Subject:

Origin:

Proposal:

Background/reason:

Radiocommunication services concerned:

Indication of possible difficulties:

Previous/ongoing studies on the issue:

<i>Studies to be carried out by:</i>	<i>with the participation of:</i>
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ITU-R Study Groups concerned:

ITU resource implications, including financial implications (refer to CV126):

Common regional proposal: Yes/No

Multicountry proposal: Yes/No

Number of countries:

Remarks

