Documents of the World Administrative Radio Conference for dealing with frequency allocations in certain parts of the spectrum (WARC-92) (Malaga-Torremolinos, 1992)

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INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/1-E
3 February 1992

AGENDA OF THE
MEETING OF HEADS OF DELEGATIONS
Monday, 3 February 1992, at 1030 hrs
(Room Ronda)

		Document
1.	Opening by the Secretary-General and designation of the Chairman of the meeting	-
2.	Approval of the agenda of the meeting	-
3.	Proposals for the election of the Chairman of the Conference	-
4.	Proposals for the election of the Vice-Chairmen of the Conference	-
5.	Conference Structure	DT/2
6.	Proposals for the election of the Chairmen and Vice-Chairmen of the Committees	-
7.	Draft agenda of the first Plenary Meeting	DT/3
8.	Allocation of documents to Committees	DT/4
9..	Other business	-

Pekka TARJANNE
Secretary-General

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/2-E
3 February 1992

STEERING COMMITTEE

Draft

GENERAL SCHEDULE OF THE WORK OF THE CONFERENCE

Week 1 (3-7 February)

Organisation and commencement of work in Committees and Working Parties with decisions progressively, with particular emphasis in Committee 4

Friday 7 - End of work of the Working Group of the PL

Week 2 (10 - 14 February)

Continuation of work in Committees and Working Groups

Week 3 (17 - 21 February)

Continuation of work in Committees and Working Groups

Thursday 20 - End of work of Working Groups of Committee 4

Week 4 (24 - 28 February)

Monday 24 - End of work of Working Groups of Committee 5
Tuesday 25 - End of work of Committee 4
Wednesday 26 - End of work of Committee 5
Thursday 27 - First reading by Plenary of last texts of the Final Acts
Friday 28 - Report of Committee 2
- Report of Committee 3
- Second reading by Plenary of last texts of the final Acts

Week 5 (2-3 March)

Tuesday 3 - Signing ceremony and Closing

Note 1 - Plenary meetings will be scheduled as necessary during each week of the Conference.

Note 2 - This schedule may be changed in the course of the work of the Conference

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/3-E
3 February 1992
Original: English

COMMITTEE 4

Note by the Chairman of Committee 4

ORGANIZATION OF THE WORK OF COMMITTEE 4

1. Following the adoption, by the Plenary, of the terms of reference of Committee 4, and in accordance with Provision No. 464 of the International Telecommunication Convention (Nairobi, 1982), the following organization of Committee 4 is proposed:

- Working Group 4A: Frequency allocations below 137 MHz
- Working Group 4B: Frequency allocations in the bands between 137 MHz and 3 000 MHz
- Working Group 4C: Frequency allocations in the bands above 3 000 MHz

2. The terms of reference of each Working Group are summarized in the table below:

	WG 4A	WG 4B	WG 4C
Items of the Agenda	2.2.2 2.6	2.2.3a 2.2.4 2.2.6 2.2.7 2.2.8 (RR 635) 2.6	2.2.1 2.2.3b 2.2.5 2.2.8 (RR 797B) 2.6
Resolutions		208 (Mob-87) 520 (Orb-88) 708 (Mob-87)	521 (Orb-88)
Recommendations	511 (HFBC-87)	205 (Mob-87) 408 (Mob-87) 716 (Orb-88)	

I. HUTCHINGS
Chairman

Document DL/4-E
3 February 1992
Original: English

COMMITTEE 4

Note by the Chairman of Committee 4

ALLOCATION OF DOCUMENTS

WG 4A 7, 8, 9, 12(+Add.), 13, 14, 15, 16, 17, 20, 25, 26, 27, 30, 31, 34, 37, 39, 40, 41, 44, 45, 48, 49, 52

WG 4B 6, 7, 8, 9, 12(+Add.), 13, 15, 20, 23, 25, 26, 27, 28, 29, 30, 31(+Add.), 34(+Corr.), 36, 37, 39, 40, 41, 44, 45, 48, 49, 51, 52, 53

WG 4C 7, 8, 9, 12(+Add.), 13, 15, 20, 23, 26, 27, 30, 31(+Add.), 34(+Corr.), 39, 40, 41, 44, 45, 46, 49, 51, 52, 54

Other Conference documents containing reference material relevant to all Working Groups:

- 3 (CCIR), 4 (IFRB), 10 (ICAO), 11 (IMO), 22 (VGE-RR), 24 (IFRB), 33 (IFRB), and 38 (IATA).

I. HUTCHINGS
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/5-E
4 February 1992
Original: English

WORKING GROUP 5A

PROPOSALS FOR THE WORK OF WORKING GROUP 5A

Consideration of the provisions of Articles 55(Rev.) and 56(Rev.)
Agenda Item 2.3

Introduction

This document presents a synopsis of general observations and proposals made by Administrations with respect to Articles 55 and 56 of the Radio Regulations.

Robert C. McIntyre
Chairman of Working Group 5A

GENERAL OBSERVATIONS

B/30/ **2.11** The WARC-92 will examine the procedures that establish requirements concerning "Certificates for Ship Stations Radio Operators" and "Personnel of Stations in the Maritime Mobile and the Maritime Mobile-Satellite Services".

Brazil considers that it is necessary to review these procedures because they are not aligned with the provisions established by the International Maritime Organization (IMO) in the Safety of Life at Sea Convention (SOLAS), in terms of the Global Maritime Distress and Safety System (GMDSS).

In view of these considerations, Brazil proposes suppression of the First- and Second-Class Radio Electronic Certificates from Article 55.

CLN/62/ Considering of the provisions of Articles 55 and 56: Request no change, as WARC 87 clearly defined the responsibility of the operator in relation to GMDSS.

CHN/61/ Safety of life at sea is a matter of great concern to every country in the world. In the SOLAS Convention (Rev. 1988), There are explicit requirements of the maintenance methods of equipment on-board GMDSS ships, the availability of the equipment, and the personnel in charge of distress and safety communications. It is of great significance to meet the requirements, and in doing so, proper arrangements should be made by Administrations. Since advanced communications equipment is used in GMDSS, in order to ensure maritime distress and safety communications, personnel who have been given proof of the technical and professional knowledge and qualifications are required to be carried on-board, responsible for operation and maintenance of the equipment. This is reasonable safety measure. The four categories of certificates for personnel in charge of ship stations and earth stations in the GMDSS, which were determined by WARC Mob-87 are also reasonable. Nevertheless, as conditions vary in each country, there are different methods of maintaining the equipment on-board. Therefore, it would be more practical not to have any mandatory requirements concerning the personnel carried on-borad and to leave it to Administrations to decide, on the condition that the basic requirements be preserved.

CTI/57/ **II.4** With the adoption of the regulatory provisions in Chapter N IX for implementation of the new Global Maritime Distress and Safety System (GMDSS), WARC Mob-87 amended Articles 55 and 56 of the Radio Regulations to require ships using GMDSS frequencies to carry personnel with a first-class or second-class radio electronic certificate in order to maintain the radio and electronic equipment.

In view of the large number of reservations formulated by the administrations both at the end of and after WARC Mob-87, the Plenipotentiary Conference (Nice, 1989) requested the present Conference to review the relevant provisions of Articles 55 and 56.

The Côte d' Ivoire Administration considers that safety is all important and that the technical staff on board ships equipped for the new distress and safety system must possess the highest possible level of qualifications in order to ensure the safety of crews at sea. Accordingly, it is in favour of first- and second- class radio electronic certificates and proposes that the provisions of Articles 55(Rev.) and 56(Rev.) be left unchanged.

CUB/65/

EUR/20/ The Plenipotentiary Conference, Nice, 1989, in its Resolution 7 (PLEN/8) recognized the desirability of finding a solution to the problem which arose from the revision of Articles 55 and 56 of the Radio Regulations by the WARC Mob-87, the resulting Statement 51 made by 22 Members of the Union and the consequential attempt made by several other Members to join that Statement after the Conference.

IMO/11/ 4. Currently, the ITU Radio Regulations and the SOLAS Convention are not compatible with one another on the radio equipment maintenance issue. To avoid problems related to this incompatibility, it would be desirable for appropriate changes to be made to Articles 55 and 56 so that the two treaties are aligned.

The results of the 1988 Conference of Contracting Government to the International Convention for the Safety of Life at Sea, 1974 on the Global Maritime Distress and Safety System viz., SOLAS regulations IV/1, IV/12, IV/15 and IV/16 as well as the draft Assembly Resolution on Maintenance Guidelines. (See Doc. 11)

INS/52/8 Indonesia considers that Articles 55 and 56 should be slightly amended to reflect the harmonization between WARC Mob-87 and the SOLAS Convention.

J/27/ To consider the provisions of Articles 55(Rev.) and 56(Rev.) of the Radio Regulations which concern the mandatory carriage on board ships of personnel certified for the on-board maintenance of shipborne radio and electronic equipment, as indicated in Resolution 7 (PLEN/8).

It was prescribed that the personnel of a ship station shall include at least a holder of a license qualified for at-sea electronic maintenance on board ships which sail within certain sea areas in WARC Mob-87.

However, 1988 amendments of the 1974 SOLAS Convention did not enforce arrangement of a person qualified for at-sea maintenance on board ship on Convention ships. A certain number of Members reserved their positions on the provisions of Article 56 of the Radio Regulations at WARC Mob-87 or the Plenipotentiary Conference 1989, and the Resolution which requests WARC-92 to review the Article concerned in order to make adjustment of the provisions between the Radio Regulations and the SOLAS Convention, was adopted at that Conference.

It is necessary to adopt the minimum modifications for the provisions of the Radio Regulations so that administrations will be able to take flexible actions, observing the requirements of both provisions of the Radio Regulations and the SOLAS Convention.

Japan proposes to modify the Articles concerned so that every ship engaged on the voyages beyond the coverage of MF coast stations can carry a person who is a holder of a general operator certificate as the radio personnel of the ship in order that the administrations concerned can take a flexible approach on the arrangements of radio personnel on board ships observing the requirements of the Radio Regulations and the SOLAS Convention and ensuring the execution of the national regulations enacted for the GMDSS.

MEX/63/ 9.

NIG/9/ 2.13 This Administration supports the proposed revision of Articles 55(Rev.) and 56(Rev.) of the Radio Regulations as amended by WARC Mob-87, with the exception of No. 3867.

NZL/26/ To consider the provisions of Articles 55(Rev.) and 56(Rev.) concerning mandatory carriage on board ships of personnel certificated for the on-board maintenance of shipboard radio and electronic equipment, as indicated in Resolution 7 (PLEN/8)

In order to more appropriately reflect the requirements of Regulation 15 of Chapter IV of the amendments to the Safety of Life at Sea Convention relating to the Global Maritime Distress and Safety System and to better reflect the purpose of the task of the Voluntary Group of Experts on Simplification of the Radio Regulations, New Zealand proposes minimal modifications to RR 3990 and RR 3992 of Article 56.

Articles 55 and 56 of the Radio Regulations, Geneva 1990, concern the mandatory carriage of suitably qualified ship radio station operators.

At the World Administrative Radio Conference for Mobile Services, Geneva 1987 (WARC Mob-87), provision was made for qualifications and operator requirements for ship radio stations operating in accordance with Chapter N IX.

It was the view of New Zealand, and 21 other administrations, that the revision of Section III of Article 55 placed rigid obligations on the maritime community with the carriage of personnel certificated for the maintenance of shipborne equipment for distress and safety radiocommunications, when other means of ensuring high standards of maintenance and operational availability of that equipment were available. These views led to a Statement (No. 51) being lodged in the Final Protocol of the Final Acts of WARC Mob-87 by those administrations.

Subsequent to that Conference, several administrations sought to associate themselves with Statement No. 51, but were unable to do so under the Rules of Procedure. At the Plenipotentiary Conference, Nice, 1989, a Resolution (No. 7) was passed instructing the Administrative Council to place consideration of Articles 55(Rev.) and 56(Rev.) on the agenda of WARC-92, with a view to finding an appropriate solution to the problem.

The revision of the Safety of Life at Sea Convention, 1974, adopted on 9 November 1988, provided for maintenance requirements to be met on board ships by a combination of two elements of three options:

a) duplication of equipment;
b) shore-based maintenance; and
c) at-sea electronic maintenance.

The approval process for the combination being in the hands of the administration.

The New Zealand proposal is to modify the provisions of Article 56, with the minimum of change, to reflect Regulation No. 15 of Chapter IV of the SOLAS Convention.

PAK/44/ This administration is of the view that there should be consistency between IMO and ITU provisions, that maintenance aboard ships would be difficult as well as expensive and therefore administrations should be free to choose either of the combination in accordance with the SOLAS Convention. Article 56 of the Radio Regulations may therefore be amended to provide flexibility to choose either of the following:

a) At sea electrical maintenance capability requiring a holder of first- or second-class radio electronic certificate.

b) Duplication of shipborne equipment and a holder of general operator's certificate with shore-based maintenance capability.

PNG/16/ XIII. Papua New Guinea considers that the provisions of these Articles should be revised so as to make them consistent with the requirements of the SOLAS Convention.

PROPOSALS BY ADMINISTRATIONS

RADIO REGULATIONS TEXTS (Edition of 1990)

ARTICLE 55

ARTICLE 55

EUR/20/63,
NZL/26/25,
CTI/57/19
NOC

EUR/20/64,
NZL/26/26,
CTI/57/19
NOC

Mob-87

Certificates for Personnel of Ship Stations and Ship Earth Stations

Mob-87

Certificates for Personnel of Ship Stations and Ship Earth Stations

CTI = Reasons: Our Administration is of the opinion that the provisions contained in Articles 55(Rev.) and 56(Rev.) are necessary in order to guarantee human safety and to safeguard human life and property at sea.

Section I. General Provisions

No proposals

3860
Mob-87
to
3866
Mob-87

NIG/9/9
MOD

3867
Mob-87

(2) When it is necessary to employ a person without a certificate but having adequate knowledge of the equipment on board the ship or an operator not holding an adequate certificate as a temporary operator, his performance as such must be limited solely to signals of distress, distress alerting, urgency and safety, messages relating thereto, messages relating directly to the safety of life and urgent messages relating to the movement of the ship. Persons employed in these cases are bound by the provisions of No. 3877 regarding the secrecy of correspondence.

Reasons: The above underlined modification arises because it is necessary for the temporary operator to be able to perform the functions for which he is temporarily employed.

3867
Mob-87

(2) When it is necessary to employ a person without a certificate or an operator not holding an adequate certificate as a temporary operator, his performance as such must be limited solely to signals of distress, distress alerting, urgency and safety, messages relating thereto, messages relating directly to the safety of life and urgent messages relating to the movement of the ship. Persons employed in these cases are bound by the provisions of No. 3877 regarding the secrecy of correspondence.

3868 (3) In all cases, such temporary operators must be replaced as soon as possible by operators holding the certificate prescribed in paragraph 1 of this Article.

3869 § 3. (1) Each administration shall take the necessary steps to prevent, to the maximum extent possible, the fraudulent use of certificates. For this purpose, such certificates shall bear the holder's signature and shall be authenticated by the issuing administration. Administrations may employ, if they wish, other means of identification such as photographs, fingerprints, etc.

CUB/65/14 3870
MOD

3870 (2) In the maritime mobile service the certificates issued after 1 January 1978 shall bear the photograph of the holder and the holder's date of birth.

CUB = Reasons: ...

USA/12/145 3870
CAN/23/143
SUP

USA = Reasons: The Certificates to be used will be held by a number of individuals aboard ship, making it no longer necessary to go to the trouble and expense to have photographs. The personnel who operate radio aboard ship will, for most administrations, not have that responsibility as a sole occupation, except in cases of distress. The radio licence in the GMDSS may be an endorsement or a supplement to a deck officer's licence so that a separate photo is not needed and in many cases would be duplicative. No. 3873 requires the date of birth.
CAN = Reasons: The photograph is an unnecessary expense and complication in the issuance of certificates. It becomes outdated and is easily falsified. Furthermore, some administrations may desire the flexibility to have the radio operator's certificate in the GMDSS as an endorsement or a supplement to a deck officer's licence. No. 3873 requires the date of birth and was duplicated in 3870.

USA/12/146 3871
(MOD)

Reasons: Renumber as a consequence of SUP 3870.

3871 (3) To facilitate verification of certificates, these may carry, if necessary, in addition to the text in the national language, a translation of this text in a working language of the Union.

USA/12/147 3872
(MOD)

Reasons: Renumber as a consequence of SUP 3870.

3872 (4) In the maritime mobile service all certificates not in one of the working languages of the Union and issued after 1 January 1978 shall carry at least the following information in one of these working languages:

3873 *a)* the name and date of birth of the holder;

3874 *b)* the title of the certificate and its date of issue;

		3875	*c)* if applicable, the number and period of validity of the certificate;
USA/12/148 MOD	3876	3876	*d)* the issuing <u>or recognizing</u> administration.

<u>USA = Reasons</u>: To eliminate the apparent conflict between Nos. 3860 Mob-87 and 3876.

		3877	§ 4. Each administration shall take the necessary steps to place operators under the obligation to preserve the secrecy of correspondence as provided for in No. **2023**.
MEX/63/85 MOD	3877A Mob-87	3877A Mob-87	§ 4A. Each administration may determine the conditions under which personnel holding certificates specified in Nos. **3879** to **3883** may be granted certificates under Nos. **3890B** to **3890E**.

<u>MEX = Reasons</u>: ....

		Mob-87	**Section II. Categories of Certificates for Operators of Ship Stations and Ship Earth Stations Using the Frequencies and Techniques Prescribed in Chapter IX and for Public Correspondence**

No proposals

		3878 to 3890	
		Mob-87	**Section IIA. Categories of Certificates for Personnel of Ship Stations and Ship Earth Stations Using the Frequencies and Techniques Prescribed in Chapter N IX and for Public Correspondence**
CUB/65/15 NOC	3890A Mob-87	3890A Mob-87	§ 7A. (1) There are four categories of certificates for personnel of ship stations and ship earth stations using the frequencies and techniques prescribed in Chapter **N IX**:

<u>CUB = Reasons</u>: ....

CHN/61/ MOD	3890A Mob-87	§ 7A. (1) Desirably there could be four categories of certificates for personnel of ship stations and ship earth stations using the frequencies and techniques prescribed in Chapter N IX:
USA/12/149, B/30/55 MEX/63/86 MOD	3890A Mob-87	§ 7A. (1) There are ~~four~~ <u>two</u> categories of certificates for personnel of ship stations and ship earth stations using the frequencies and techniques prescribed in Chapter N IX:

CHN/61/ NOC	**3890B Mob-87**	**3890B Mob-87**	*a)* First-Class Radio Electronic Certificate;
MEX/63/87 MOD	**3890B Mob-87**		
USA/12/150, B/30/56 SUP	**3890B Mob-87**		
CHN/61/ NOC	**3890C Mob-87**	**3890C Mob-87**	*b)* Second-Class Radio Electronic Certificate;
USA/12/151, B/30/57 MEX/63/88 SUP	**3890C Mob-87**	B = Reasons: The categories of First and Second Class Certificates must be deleted since these categories of certificates are not recognized or used in the IMO SOLAS Convention.	
MEX/63/89 (MOD)	**3890C Mob-87**		
CHN/61/ NOC	**3890D Mob-87**	**3890D Mob-87**	*c)* General Operator's Certificate;
USA/12/152, B/30/58 (MOD)	**3890D Mob-87**	~~*c)*~~ *a)* General Operator's Certificate;	
CHN/61/ NOC	**3890E Mob-87**	CHN = Reasons: To allow Administrations to determine categories of certificates in accordance with their own conditions, and leave room for choice by setting optional requirements.	**3890E Mob-87** *d)* Restricted Operator's Certificate.
USA/12/153, B/30/59, (MOD)	**3890E Mob-87**	~~*d)*~~ *b)* Restricted Operator's Certificate.	
MEX/63/90 (MOD)	**3890E Mob-87**	MEX = Reasons: ...	
MEX/63/91 ADD	**3890E Mob-87**	MEX = Reasons: ...	

USA/12/154, B/30/60 (MOD)	3890F Mob-87	(2) The holder of one of the certificates specified in Nos. ~~3890B, 3890C,~~ 3890D and 3890E may carry out the service of ship stations or ship earth stations using the frequencies and techniques prescribed in Chapter N IX. USA = Reasons: To delete the categories of certificates not recognized or used in the IMO Safety of Life at Sea Convention.	3890F Mob-87	(2) The holder of one of the certificates specified in Nos. **3890B, 3890C, 3890D** and **3890E** may carry out the service of ship stations or ship earth stations using the frequencies and techniques prescribed in Chapter N IX.
MEX/63/92 (MOD)	3890F Mob-87	MEX = Reasons: ...		
			Mob-87	**Section III. Conditions for the Issue of Certificates for Operators of Ship Stations and Ship Earth Stations Using the Frequencies and Techniques Prescribed in Chapter IX and for Public Correspondence**
		No proposals	3891 to 3949	*A. General*
			Mob-87	**Section IIIA. Conditions for the Issue of Certificates for Personnel of Ship Stations and Ship Earth Stations Using the Frequencies and Techniques Prescribed in Chapter N IX and for Public Correspondence**
MEX/63/93 MOD	3949A Mob-87		3949A Mob-87	*A. First-Class Radio Electronic Certificate*
USA/12/155, B/30/61 SUP	3949A Mob-87 to 3949AI Mob-87	USA = Reasons: The First-Class Radio Electronic Certificate is not an integral part of the Global Maritime Distress and Safety System (GMDSS). Electronic maintenance aboard ship is only an option that will be subject to national decision according to the 1988 SOLAS Amendments. Most (two-thirds of shipping tonnage) of the maritime countries of the world have rejected on-board maintenance as a requirement by presenting protocol statements either to the Final Acts of the World Administrative Radio Conference for the Mobile Services (Mob-87), Geneva 1987, or to the Final Acts of the Plenipotentiary Conference, Nice 1989. B = Reasons: Consequential from changes above.		
MEX/63/94 MOD	3949AA Mob-87		3949AA Mob-87	§ 18A. The First-Class Radio Electronic Certificate is issued to candidates who have given proof of the technical and professional knowledge and qualifications enumerated below:
USA/12/155, B/30/61 SUP	3949AA Mob-87			

MEX/63/95 3949AB
NOC Mob-87

USA/12/155, 3949AB
B/30/61 Mob-87
SUP

MEX/63/95 3949AC
NOC Mob-87

USA/12/155, 3949AC
B/30/61 Mob-87
SUP

MEX/63/95 3949AD
NOC Mob-87

USA/12/155, 3949AD
B/30/61 Mob-87
SUP

MEX/63/96 3949AE
MOD Mob-87

USA/12/155, 3949AE
B/30/61 Mob-87
SUP

3949AB
Mob-87

a) knowledge of the principles of electricity and the theory of radio and electronics sufficient to meet the requirements specified in Nos. **3949AC**, **3949AD** and **3949AE**;

3949AC
Mob-87

b) theoretical knowledge of GMDSS radiocommu-nication equipment, including narrow-band direct-printing telegraph and radiotelephone transmitters and receivers, digital selective calling equipment, ship earth stations, emergency position-indicating radiobeacons, marine antenna systems, radio equipment for survival craft together with all auxiliary items, including power supplies, as well as general knowledge of the principles of other equipment generally used for radionavigation, with particular reference to maintaining the equipment in service;

3949AD
Mob-87

c) practical knowledge of the operation and knowledge of the preventive maintenance of the equipment indicated in No. **3949AC**;

3949AE
Mob-87

d) practical knowledge necessary for the location and repair (using appropriate testing equipment and tools) of faults in the equipment mentioned in No. **3949AC** which may occur during a voyage;

MEX/63/97 NOC	3949AF Mob-87		3949AF Mob-87
USA/12/155, B/30/61 SUP	3949AF Mob-87		
MEX/63/97 NOC	3949AG Mob-87		3949AG Mob-87
USA/12/155, B/30/61 SUP	3949AG Mob-87		
MEX/63/97 NOC	3949AH Mob-87		3949AH Mob-87
USA/12/155, B/30/61 SUP	3949AH Mob-87		
MEX/63/97 NOC	3949AI Mob-87		3949AI Mob-87
USA/12/155, B/30/61 SUP	3949AI Mob-87		
USA/12/156, B/30/62 MEX/63/99 SUP	3949B Mob-87 to 3949BI Mob-87	USA = Reasons: The Second-Class Radio Electronics Certificate, like the First-Class, is not a required part of the GMDSS and is not included as a requirement of the 1988 SOLAS Amendments. B = Reasons: Consequential from changes above. MEX = Reasons: ...	3949B Mob-87

e) detailed practical knowledge of the operation of all GMDSS sub-systems and equipment;

f) ability to send and receive correctly by radiotelephone and direct-printing telegraphy;

g) detailed knowledge of the regulations applying to radiocommunications, knowledge of the documents relating to charges for radiocommunications and knowledge of those provisions of the International Convention for the Safety of Life at Sea which relate to radio;

h) sufficient knowledge of one of the working languages of the Union. Candidates should be able to express themselves satisfactorily in that language, both orally and in writing.

B. Second-Class Radio Electronic Certificate

USA/12/156, B/30/62 MEX/63/99 SUP 3949BA Mob-87

3949BA Mob-87 § 18B. The Second-Class Radio Electronic Certificate is issued to candidates who have given proof of the technical and professional knowledge and qualifications enumerated below:

USA/12/156, B/30/62 MEX/63/99 SUP 3949BB Mob-87

3949BB Mob-87 *a)* knowledge of the principles of electricity and the theory of radio and electronics sufficient to meet the requirements specified in Nos. **3949BC**, **3949BD** and **3949BE**;

USA/12/156, B/30/62 MEX/63/99 SUP 3949BC Mob-87

3949BC Mob-87 *b)* general theoretical knowledge of GMDSS radiocommunication equipment, including narrow-band direct-printing telegraph and radiotelephone transmitters and receivers, digital selective calling equipment, ship earth stations, emergency position-indicating radiobeacons, marine antenna systems, radio equipment for survival craft together with all auxiliary items, including power supplies, as well as general knowledge of other equipment generally used for radionavigation, with particular reference to maintaining the equipment in service;

USA/12/156, B/30/62 MEX/63/99 SUP 3949BD Mob-87

3949BD Mob-87 *c)* practical knowledge of the operation and knowledge of the preventive maintenance of the equipment indicated in No. **3949BC**;

USA/12/156, B/30/62 MEX/63/99 SUP 3949BE Mob-87

3949BE Mob-87 *d)* practical knowledge necessary for effecting repairs in the case of faults in the equipment indicated in No. **3949BC**, using the means available on board and, if necessary, replacing modular units;

USA/12/156, B/30/62 MEX/63/99 SUP 3949BF Mob-87

3949BF Mob-87 *e)* detailed practical knowledge of the operation of all GMDSS sub-systems and equipment;

USA/12/156, B/30/62 MEX/63/99 SUP 3949BG Mob-87

3949BG Mob-87 *f)* ability to send and receive correctly by radiotelephone and direct-printing telegraphy;

USA/12/156, B/30/62 MEX/63/99 SUP	3949BH Mob-87		3949BH Mob-87 *g)* detailed knowledge of the regulations applying to radiocommunications, knowledge of the documents relating to charges for radiocommunications and knowledge of those provisions of the International Convention for the Safety of Life at Sea which relate to radio;
USA/12/156, B/30/62 MEX/63/99 SUP	3949BI Mob-87		3949BI Mob-87 *h)* sufficient knowledge of one of the working languages of the Union. Candidates should be able to express themselves satisfactorily in that language, both orally and in writing.
MEX/63/100 (MOD)	3949C Mob-87		3949C Mob-87 *C. General Operator's Certificate*
USA/12/157 (MOD)	3949C Mob-87	~~C.~~ A. *General Operator's Certificate*	
MEX/63/101 (MOD)	3949CA Mob-87		3949CA Mob-87 § 18C. The General Operator's Certificate is issued to candidates who have given proof of the knowledge and qualifications enumerated below:
USA/12/158 (MOD)	3949CA Mob-87	§ ~~18C.~~ 18A. The General Operator's Certificate is issued to candidates who have given proof of the knowledge and qualifications enumerated below:	
USA/12/ MEX/63/102 NOC	3949CB Mob-87		3949CB Mob-87 *a)* detailed practical knowledge of the operation of all GMDSS sub-systems and equipment;
USA/12/ MEX/63/102 NOC	3949CC Mob-87		3949CC Mob-87 *b)* ability to send and receive correctly by radiotelephone and direct-printing telegraphy;
USA/12/ MEX/63/102 NOC	3949CD Mob-87		3949CD Mob-87 *c)* detailed knowledge of the regulations applying to radiocommunications, knowledge of the documents relating to charges for radiocommunications and knowledge of those provisions of the International Convention for the Safety of Life at Sea which relate to radio;
USA/12/ MEX/63/102 NOC	3949CE Mob-87		3949CE Mob-87 *d)* sufficient knowledge of one of the working languages of the Union. Candidates should be able to express themselves satisfactorily in that language, both orally and in writing.

MEX/63/103 (MOD) 3949D Mob-87

USA/12/159 (MOD) 3949D Mob-87

~~D.~~ *B. Restricted Operator's Certificate*

MEX/63/104 (MOD) 3949DA Mob-87

USA/12/160 (MOD) 3949DA Mob-87

§ ~~18D.~~ 18B. The Restricted Operator's Certificate is issued to candidates who have given proof of the knowledge and qualifications enumerated below:

USA/12/ MEX/63/105 NOC 3949DB Mob-87

USA/12/ MEX/63/105 NOC 3949DC Mob-87

USA/12/ MEX/63/105 NOC 3949DD Mob-87

USA/12/ MEX/63/105 NOC 3949DE Mob-87

No proposals

3949D Mob-87 *D. Restricted Operator's Certificate*

3949DA Mob-87 § 18D. The Restricted Operator's Certificate is issued to candidates who have given proof of the knowledge and qualifications enumerated below:

3949DB Mob-87 *a)* practical knowledge of the operation of the GMDSS sub-systems and equipment which is required while the ship is sailing within the range of VHF coast stations;

3949DC Mob-87 *b)* ability to send and receive correctly by radiotelephone;

3949DD Mob-87 *c)* knowledge of the regulations applying to radiotelephony communications and specifically of that part of those regulations relating to the safety of life;

3949DE Mob-87 *d)* an elementary knowledge of one of the working languages of the Union. Candidates should be able to express themselves satisfactorily in that language, both orally and in writing. Administrations may waive the above language requirements for holders of a restricted operator's certificate when the ship station is confined to a limited area specified by the administration concerned. In such cases the certificate shall be suitably endorsed.

Section IV. Qualifying Service

3950 to 3953

3954 to NOT allocated

EUR/20/65, NZL/26/27, CTI/57/20
NOC

ARTICLE 56

EUR/20/66, NZL/26/28, CTI/57/20
NOC

Mob-87

Personnel of Stations in the Maritime Mobile and the Maritime Mobile-Satellite Service

CTI = Reasons: Our Administration is of the opinion that the provisions contained in Articles 55(Rev.) and 56(Rev.) are necessary in order to guarantee human safety and to safeguard human life and property at sea.

EUR/20/67, NZL/26/29
NOC

Mob-87

Section I. Personnel of Coast Stations and Coast Earth Stations

EUR/20/68, NZL/26/30, USA/12/161
NOC

3979 Mob-87

USA = Reasons: To ensure adequate safety is provided.

ARTICLE 56

Mob-87

Personnel of Stations in the Maritime Mobile and the Maritime Mobile-Satellite Service

Mob-87

Section I. Personnel of Coast Stations and Coast Earth Stations

3979 Mob-87

§ 1. Administrations shall ensure that the staff on duty in coast stations and in coast earth stations are adequately qualified to operate the stations efficiently.

EUR/20/69, NZL/26/31 Mob-87
NOC

Mob-87

Section II. Class and Minimum Number of Operators of Ship Stations and Ship Earth Stations Using the Frequencies and Techniques Prescribed in Chapter IX and for Public Correspondence

EUR/20/70, NZL/26/32 3980
NOC

3980 § 2. In the public correspondence service, each government shall take the necessary steps to ensure that stations on board ships of its own nationality have personnel adequate to perform efficient service.

EUR/20/70, NZL/26/32 3981
NOC

3981 § 3. The personnel of ship stations in the public correspondence service shall, having regard to the provisions of Article **55**, include at least:

EUR/20/70, NZL/26/32 3982
NOC

3982 *a)* ship stations of the first category, except in the case provided for in No. **3986**: a chief operator holding a radiocommunication operator's general certificate or a first-class radiotelegraph operator's certificate;

EUR/20/70, NZL/26/32 3983
NOC

3983 *b)* ship stations of the second and third categories, except in the case provided for in No. **3986**: a chief operator holding a radiocommunication operator's general certificate or a first- or second-class radiotelegraph operator's certificate;

EUR/20/70, NZL/26/32 3984
NOC

3984 *c)* ship stations of the fourth category, except in the cases provided for in Nos. **3985** and **3986**: one operator holding a radiocommunication operator's general certificate or a first- or second-class radiotelegraph operator's certificate;

EUR/20/70, NZL/26/32 3985
NOC

3985 *d)* ship stations in which a radiotelegraph installation is provided but not prescribed by international agreements: one operator holding a radiocommu-nication operator's general certificate or a first- or second-class radiotelegraph operator's certificate, or a radiotelegraph operator's special certificate;

EUR/20/70, NZL/26/32 3986
NOC

3986 *e)* ship stations equipped with a radiotelephone installation only: one operator holding either a radiotelephone operator's certificate or a radiotelegraph operator's certificate.

EUR/20/71, NZL/26/33 Mob-87
NOC

Mob-87

Section III. Class and Minimum Number of Personnel for Ship Stations and Ship Earth Stations Using the Frequencies and Techniques Prescribed in Chapter N IX and for Public Correspondence

EUR/20/72, NZL/26/34, USA/12/162 MEX/63/106 3987 Mob-87
NOC

3987 Mob-87

§ 4. Administrations shall ensure that the personnel of ship stations and ship earth stations are adequately qualified to enable efficient operation of the station, and shall take steps to ensure the operational availability and maintenance of equipment for distress and safety communications in accordance with the relevant international agreements.

EUR/20/72, NZL/26/34, USA/12/163 MEX/63/106 3988 Mob-87
NOC

USA = Reasons: To ensure adequate safety is provided by qualified individuals.

3988 Mob-87

§ 5. An adequately qualified person shall be available to act as a dedicated communications operator in cases of distress.

EUR/20/73, CAN/23/144, NZL/26/34, USA/12/164 CHN/61/ MEX/63/106 3989 Mob-87
NOC

USA = Reasons: To ensure the Radio Regulations comport with the Convention on the Safety of Life at Sea.

3989 Mob-87

§ 6. The personnel of ship stations for which a radio installation is compulsory under international agreements and which use the frequencies and techniques prescribed in Chapter N IX shall, with respect to the provisions of Article 55, include at least:

USA/12/165 **SUP**	**3990** **Mob-87**		**3990** **Mob-87**
MEX/63/107 **MOD**	**3990** **Mob-87**		
EUR/20/74 **MOD**	**3990** **Mob-87**	*a)* for stations on board ships which sail within or beyond the range of MF coast stations: taking into account the provisions of the Convention for the Safety of Life at Sea and other applicable conventions: a holder of a first- or second-class radio electronic certificate or a general operator's certificate;	*a)* for stations on board ships which sail beyond the range of MF coast stations: a holder of a first- or second-class radio electronic certificate;
CHN/61/ **MOD**	**3990** **Mob-87**	*a)* for stations on board ships which sail beyond the range of ~~MF~~VHF coast stations: a holder of a first- or second-class radio electronic certificate or a general operator's certificate;	
J/27/75 **MOD**	**3990** **Mob-87**	*a)* for stations on board ships which sail within the range or beyond the range of MF coast stations: a holder of a first- or second-class radio electronic certificate or a general operator's certificate;	
CAN/23/145 **MOD**	**3990** **Mob-87**	*a)* for stations on board ships which sail beyond the range of MF coast stations: a holder of a first- or second-class radio electronic certificate or a general operator's certificate;	
NZL/26/35 **MOD**	**3990** **Mob-87**	*a)* for stations on board ships which sail within or beyond the range of MF coast stations, noting the provisions of No. N 2932: a holder of a first- or second-class radio electronic certificate or a general operator's certificate;	

EUR/20/75, CAN/23/146, NZL/26/36, J/27/76
SUP

3991 Mob-87

3991 Mob-87

b) for stations on board ships which sail within the range of MF coast stations: a holder of a first- or second-class radio electronic certificate or a general operator's certificate;

MEX63/108
MOD

3991 Mob-87

b) for stations on board ships which sail within the range of ~~MF~~VHF coast stations: a holder of a first- or second-class radio electronic certificate or a general operator's certificate or a restricted operator's certificate.;

CHN/61/
MOD

3991 Mob-87

~~b)~~ a) for stations on board ships which sail ~~within~~beyond the range of ~~MF~~VHF coast stations: a holder of a ~~first-or second-class radio electronic certificate or a~~general operator's certificate;

USA/12/166
MOD

3991 Mob-87

EUR/20/76, CAN/23/147, J/27/77, NZL/26/37 (MOD)

3992 Mob-87

~~c)~~ *b)* for ship stations on board ships which sail within the range of VHF coast stations: a holder of a first- or second-class radio electronic certificate or a general operator's certificate or a restricted operator's certificate.

3992 Mob-87

c) for ship stations on board ships which sail within the range of VHF coast stations: a holder of a first- or second-class radio electronic certificate or a general operator's certificate or a restricted operator's certificate.

USA/12/167 MOD

3992 Mob-87

~~c)~~ *b)* for ~~ship~~stations on board ships which sail within the range of VHF coast stations: a holder of a ~~first-or-second-class-radio-electronic certificate or a~~general operator's certificate or a restricted operator's certificate.

CHN/61/ MEX/63/109 SUP

3992 Mob-87

CHN/61/ MOD

3992 Mob-87

CHN = Reasons: Renumbering.

USA = Reasons: To align the Radio Regulations with the Convention on the Safety of Life at Sea and decisions of the International Maritime Organization.

CAN = Reasons: The SOLAS Convention, which adopted the Global Maritime Distress and Safety System on 8 November 1988, now permits administrations the flexibility to choose a combination of at least two of three methods such as duplication of equipment, shore based maintenance or at-sea maintenance. The above noted change will provide consistency between the SOLAS and ITU Regulations by requiring personnel of ship stations to hold a general operator's certificate when the ship station employs duplication of equipment and shore based maintenance and sails beyond the range of VHF coast stations.

J = Reasons: 1. The requirements defined in Article 56 of the Radio Regulations and Regulation IV/15.7 of the 1974 SOLAS Convention amended in 1988, which administrations responsible for ship radio personnel shall satisfy, should be harmonized.
2. It is de facto not clear that Articles 55 and 56 are recognized as the international rules which should be observed. Because many administrations made reservations on Articles 55 and 56 of the Radio Regulations amended by the results of WARC Mob-87.
3. Considering many administrations have provided or are providing necessary domestic laws and orders for the Articles of the Radio Regulations amended by the results of WARC Mob-87 which entered into force on 3 October 1989 and for GMDSS which will be implemented on 1 February 1992, it is appropriate to modify Articles 55 and 56 in the manner that will affect such domestic laws and/or orders to the minimum extent possible

EUR/20/77, USA/12/168 MEX/63/110
NOC

3993 Mob-87

EUR = Reasons: 1. According to Regulation IV/15.7 of the revised SOLAS Convention, on ships engaged on voyages in sea areas A3 and A4, the availability of equipment shall be ensured by using a combination of at least two methods such as duplication of equipment, shore-based maintenance, or at-sea maintenance capability. If a combination of duplication of equipment and shore-based maintenance is chosen then - according to the revised SOLAS Convention - the at-sea electronic maintenance capability would not be required. According to the present Article 56 (WARC Mob-87) of the Radio Regulations (RR), however, for stations on board ships which sail beyond the range of MF coast stations a holder of a first- or second-class radio electronic certificate is required.

2. CEPT is of the opinion that there is a conflict between Regulation IV/15 of the revised SOLAS Convention and Article 56 of the RR as revised by Mob-87. Since this involves a maritime safety-related matter where the main responsibility lies with IMO, it is proposed to align Article 56 (Mob-87) with Regulation IV/15 (SOLAS) in order to overcome the problem of the 22 countries which made the reservation contained in Statement 51 in the Final Protocol to the Final Acts of Mob-87 and of those countries which wished to join that reservation at a later stage.

3. If the RR are modified in accordance with the proposals made above administrations would - in accordance with the revised SOLAS Convention - be free to choose:

- either at-sea electronic maintenance together with one of the other options mentioned above; then the person designated to perform at-sea electronic maintenance should EITHER hold an appropriate certificate as specified by the RR OR have adequate at-sea electronic maintenance qualifications as may be approved by the Administration, taking into account the recommendations of IMO on the training of such personnel;
- or duplication of equipment and shore-based maintenance; then the holder of at least a general operator's certificate would be required.

USA = Reasons: To ensure adequate safety is provided by qualified individuals.

MEX = Reasons: ....

3993
Mob-87

§ 7. The personnel of ship stations for which a radio installation is not compulsory under international agreements and which use the frequencies and techniques prescribed in Chapter N IX shall be adequately qualified and certificated in accordance with the administration's requirements.

3994
to
4011

NOT allocated.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/6-E
3 February 1992
Original: English

COMMITTEE 5

Draft terms of reference for Working Groups of Committee 5

WORKING GROUP 5A

Terms of reference

On the basis of proposals by administrations and taking into account the relevant conclusions of the Frequency Allocation Committee and Working Group to the Plenary, as well as the Reports by the IFRB and CCIR:

1) to consider the provisions of Articles 55(Rev.) and 56(Rev.) of the Radio Regulations as indicated in Resolution No. 7[1] (item 2.3);

2) to consider Recommendations and Resolutions associated with item 1 above.

[1] Plenipotentiary Conference of Nice, 1989.

WORKING GROUP 5B

Terms of reference

On the basis of proposals by administrations and taking into account the relevant conclusions of the Frequency Allocation Committee and Working Group to the Plenary, as well as the Reports by the IFRB and CCIR:

1 to review and revise, as necessary, the regulatory procedures pertaining to various radio services and associated frequency bands in accordance with Agenda items 2.2 (2.2.1-2.2.8) and 2.6;

2) to consider minimum modifications to Article 12 of the Radio Regulations as a result of actions taken with regard to Appendix 26 as indicated in Resolution No. 9[1] (item 2.4);

3) to consider Recommendations and Resolutions associated with items 1 and 2 above.

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[1] Plenipotentiary Conference of Nice, 1989.

WORKING GROUP 5C

Terms of reference

On the basis of proposals by administrations and taking into account the relevant conclusions of the Frequency Allocation Committee and Working Group to the Plenary, as well as the Reports by the IFRB and CCIR:

1) to review the relevant provisions of Article 1 of the Radio Regulations and consider definitions for certain new space applications (item 2.1);

2) to consider appropriate action, in light of the decisions of the Conference relating to definitions in accordance with Resolution No. 11[1] (item 2.5);

3) to consider Recommendations and Resolutions associated with items 1 and 2 above and those not associated with Working Groups 5A and 5B but within the terms of reference of Committee 5.

E. GEORGE
Chairman

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1 Plenipotentiary Conference of Nice, 1989.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/7-E
3 February 1992
Original: English

COMMITTEE 5

Note by the Chairman of Committee 5

ALLOCATION OF DOCUMENTS

WG 5A	9, 12, 20, 23, 26, 30, 31, 52
WG 5B	5, 8, 12, 20, 27, 30, 34, 44, 46
WG 5C	6, 7, 12, 14, 20, 21, 23, 25, 26, 27, 30, 31, 32, 34, 39, 41, 45, 46, 52

E. GEORGE
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/8-E
4 February 1992
Original: English

WORKING GROUP 4A

Note from the Chairman of Working Group 4A

SUBJECTS TO BE CONSIDERED BY WORKING GROUP 4A
BASED ON PROPOSALS TO THE CONFERENCE

1. Principles for extension of the allocations to the HF broadcasting service:
   - frequency bands shall be made available on a worldwide basis;
   - whenever possible, bands adjacent to existing HF BC bands shall be chosen;
   - bands internationally planned for non-broadcasting services in accordance with the Radio Regulations shall be avoided, e.g., Maritime Mobile (Appendix 31 or Appendix 25), Aeronautical mobile (R), Aeronautical mobile (OR) bands, etc.;
   - bands allocated to the amateur service, standard frequency and time signal service shall be avoided.
2. Tropical Zone bands
3. Proposals for changes in the allocations of the bands

   6 MHz
   9 MHz
   10 MHz
   11 MHz
   13 MHz
   15 MHz
   17 MHz
   19 MHz

   including proposed new footnotes.
4. The amateur and broadcasting service around 7 MHz
5. SSB
   - new bands reserved for SSB;
   - change of implementation date for SSB.
6. Extension of RR 530 to other bands
7. Implementation of the new allocations
   - development of appropriate procedures.

S. HESS
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/9-E
4 February 1992
English only

Note by the Chairman of Working Group 5A

The attached IMO Resolution A.703 (17) is presented for your information concerning the training of radio personnel for the GMDSS.

Robert C. McINTYRE
Chairman of Working Group 5A

TRAINING OF RADIO PERSONNEL IN THE GMDSS

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

CONSIDERING the 1987 amendments to the Radio Regulations, the 1988 amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974 and the 1991 amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, (STCW), 1978 for introduction of the global maritime distress and safety system (GMDSS),

NOTING that the 1991 amendments to regulation IV/2 of the STCW Convention require that in determining the appropriate level of knowledge and training for certification of GMDSS radio personnel, the Administration shall also take into account the relevant recommendations of the Organization,

NOTING ALSO that resolutions 14 and 15 of the International Conference on Training and Certification of Seafarers, 1978 concerning the training and certification of radio officers and radiotelephone operators do not apply to radio personnel on ships operating in the GMDSS,

NOTING FURTHER that resolution A.702(17)* on radio maintenance guidelines for the GMDSS related to sea areas A3 and A4 includes provisions permitting Administrations to approve at-sea electronic maintenance qualifications which are equivalent to those recommended for holders of certificates specified by the Radio Regulations,

RECOGNIZING the need for developing recommendations on training for radio personnel in ships operating in the GMDSS,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its fifty-ninth session,

1. ADOPTS:

(a) the recommendation on Training of Radio Operators related to the First-Class Radioelectronic Certificate, set out in Annex 1;

(b) the recommendation on Training of Radio Operators related to the Second-Class Radioelectronic Certificate, set out in Annex 2;

(c) the recommendation on Training of Radio Operators related to the General Operator's Certificate, set out in Annex 3;

(d) the recommendation on Training of Radio Operators related to the Restricted Operator's Certificate, set out in Annex 4; and

(e) the recommendation on Training of personnel performing maintenance of the GMDSS installations aboard ships, set out in Annex 5;

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* See Annex 2-10.

2. **RECOMMENDS** Governments to take account of the appropriate recommendation set out in the Annexes to the present resolution on the training of radio personnel for ships operating in the GMDSS;

3. **INVITES** the Maritime Safety Committee to keep the present resolution under review in consultation or association with other international organizations, as appropriate, particularly with the International Labour Organisation and the International Telecommunication Union, and to bring any future amendments to the attention of all Governments concerned;

4. **AUTHORIZES** the Maritime Safety Committee to keep the annexed recommendations under review and to adopt, when appropriate, amendments thereto.

ANNEX 1

RECOMMENDATION ON TRAINING OF RADIO OPERATORS RELATED TO THE FIRST-CLASS RADIOELECTRONIC CERTIFICATE

1 General

1.1 Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech, should be met by the candidate.

1.2 The training should be relevant to the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), the provisions of the Radio Regulations annexed to the International Telecommunication Convention (Radio Regulations) and the provisions of the International Convention for the Safety of Life at Sea (SOLAS) then in force, with particular attention to provisions for the global maritime distress and safety system (GMDSS). In developing training requirements, account should be taken of knowledge of the following items, which is not an exhaustive list.

2 Theory

2.1 Knowledge of the general principles and basic factors necessary for safe and efficient use of all the subsystems and equipment required in the GMDSS sufficient to support the training requirements listed in the practical section of this Annex.

2.2 Knowledge of the use, operation and service areas of the GMDSS subsystems, including satellite system characteristics, navigational and meteorological warning systems and selection of appropriate communication circuits.

2.3 Knowledge of the principles of electricity and the theory of radio and electronics sufficient to meet the requirements specified in paragraphs 2.4, 2.5, 2.6, 2.7 and 2.8 below.

2.4 Theoretical knowledge of GMDSS radiocommunication equipment, including narrow-band direct-printing telegraphy and radiotelephone transmitters and receivers, digital selective calling equipment, ship earth stations, emergency position-indicating radiobeacons, marine antenna systems, radio equipment for survival craft together with all auxiliary items, including power supplies, as well as general knowledge of the principles of other equipment generally used for radionavigation, with particular reference to maintaining the equipment in service.

2.5 Knowledge of factors that affect system reliability, availability, maintenance procedures and proper use of test equipment.

2.6 Knowledge of microprocessors and fault diagnosis in systems using microprocessors.

2.7 Knowledge of control systems in the GMDSS radio equipment including testing and analysis.

2.8 Knowledge of the use of computer software for the GMDSS radio equipment and methods for correcting faults caused by loss of software control of the equipment.

3 Regulations and documentation

The operator should have knowledge of:

.1 the SOLAS Convention and the Radio Regulations with particular emphasis on:

.1.1 distress, urgency and safety radiocommunications;

.1.2 avoiding harmful interference, particularly with distress and safety traffic;

.1.3 prevention of unauthorized transmissions;

.2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings, and weather broadcasts in the Maritime Mobile Service and the Maritime Mobile Satellite Service;

.3 use of the International Code of Signals and the IMO Standard Marine Navigational Vocabulary.

4 Watchkeeping and procedures

Training should be given in:

.1 communication procedures and discipline to prevent harmful interference in the GMDSS subsystems;

.2 procedures for using propagation prediction information to establish optimum frequencies for communications;

.3 radiocommunications watchkeeping relevant to all GMDSS subsystems, exchange of radiocommunications traffic, particularly concerning distress, urgency and safety procedures and radio records;

.4 use of the international phonetic alphabet;

.5 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency;

.6 ship position-reporting systems and procedures;

.7 communication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR), using radiocommunications;

.8 radio medical systems and procedures.

5 Practical

Practical training, supported by appropriate laboratory work, should be given in:

.1 correct and efficient operation of all GMDSS subsystems and equipment under normal propagation conditions and under typical interference conditions;

.2 safe operation of all the GMDSS communication equipment and ancillary devices, including safety precautions;

.3 adequate and accurate keyboard skill for the satisfactory exchange of communications;

.4 operational techniques for:

.4.1 receiver and transmitter adjustment for the appropriate mode of operation, including digital selective calling and direct-printing telegraphy;

.4.2 antenna adjustment and re-alignment, as appropriate;

.4.3 use of radio life-saving appliances;

.4.4 use of emergency position-indicating radio beacons (EPIRBs);

.5 antenna rigging, repair and maintenance, as appropriate;

.6 reading and understanding of pictorial, logic and circuit diagrams;

.7 use and care of those tools and test instruments necessary to carry out at-sea electronic maintenance;

.8 manual soldering and desoldering techniques, including those involving semiconductor devices and modern circuits and the ability to distinguish whether the circuit is suitable to be manually soldered or desoldered;

.9 tracing and repair of faults to component level where practicable, and to board/module level in other cases;

.10 recognition and correction of conditions contributing to the fault occurring;

.11 maintenance procedures, both preventive and corrective for all the GMDSS communication equipment and radionavigation equipment;

.12 methods of alleviating electrical and electromagnetic interference such as bonding, shielding and bypassing.

6 Miscellaneous

The operator should have knowledge of, and/or receive training in:

.1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;

.2 world geography, especially the principal shipping routes, services of Rescue Co-ordination Centres (RCCs) and related communication routes;

.3 survival at sea, the operation of lifeboats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio life-saving appliances;

.4 fire prevention and fire-fighting with particular reference to the radio installation;

.5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;

.6 first aid, including heart-respiration revival technique;

.7 Co-ordinated Universal Time (UTC), global time zones and International Dateline.

ANNEX 2

RECOMMENDATION ON TRAINING OF RADIO OPERATORS RELATED TO THE SECOND-CLASS RADIOELECTRONIC CERTIFICATE

1 General

1.1 Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech, should be met by the candidate.

1.2 The training should be relevant to the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), the provisions of the Radio Regulations annexed to the International Telecommunication Convention (Radio Regulations) and the provisions of the International Convention for the Safety of Life at Sea (SOLAS) then in force, with particular attention to provisions for the global maritime distress and safety system (GMDSS). In developing training requirements, account should be taken of knowledge of the following items, which is not an exhaustive list.

2 Theory

2.1 Knowledge of the general principles and basic factors necessary for safe and efficient use of all the subsystems and equipment required in the GMDSS sufficient to support the training requirements listed in the practical section of this Annex.

2.2 Knowledge of the use, operation and service areas of the GMDSS subsystems, including satellite system characteristics, navigational and meteorological warning systems and selection of appropriate communication circuits.

2.3 Knowledge of the principles of electricity and the theory of radio and electronics sufficient to meet the requirements specified in paragraphs 2.4, 2.5, 2.6, 2.7 and 2.8 below.

2.4 General theoretical knowledge of GMDSS radiocommunication equipment, including narrow-band direct-printing telegraph and radiotelephone transmitters and receivers, digital selective calling equipment, ship earth stations, emergency position-indicating radiobeacons, marine antenna systems, radio equipment for survival craft together with all auxiliary items, including power supplies, as well as general knowledge of other equipment generally used for radionavigation, with particular reference to maintaining the equipment in service.

2.5 General knowledge of factors that affect system reliability, availability, maintenance procedures and proper use of test equipment.

2.6 General knowledge of microprocessors and fault diagnosis in systems using microprocessors.

2.7 General knowledge of control systems in the GMDSS radio equipment including testing and analysis.

2.8 Knowledge of the use of computer software for the GMDSS radio equipment and methods for correcting faults caused by loss of software control of the equipment.

3 Regulations and documentation

The operator should have knowledge of:

.1 the SOLAS Convention and the Radio Regulations with particular emphasis on:

.1.1 distress, urgency and safety radiocommunications;

.1.2 avoiding harmful interference, particularly with distress and safety traffic;

.1.3 prevention of unauthorized transmissions;

.2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings, and weather broadcasts in the Maritime Mobile Service and the Maritime Mobile Satellite Service;

.3 use of the International Code of Signals and the IMO Standard Marine Navigational Vocabulary.

4 Watchkeeping and procedures

Training should be given in:

.1 communication procedures and discipline to prevent harmful interference in the GMDSS subsystems;

.2 procedures for using propagation prediction information to establish optimum frequencies for communications;

.3 radiocommunications watchkeeping relevant to all GMDSS subsystems, exchange of radiocommunications traffic, particularly concerning distress, urgency and safety procedures and radio records;

.4 use of the international phonetic alphabet;

.5 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency;

.6 ship position-reporting systems and procedures;

.7 communication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR), using radiocommunications;

.8 radio medical systems and procedures.

5 Practical

Practical training, supported by appropriate laboratory work, should be given in:

.1 correct and efficient operation of all GMDSS subsystems and equipment under normal propagation conditions and under typical interference conditions;

.2 safe operation of all the GMDSS communication equipment and ancillary devices, including safety precautions;

.3 adequate and accurate keyboard skill for the satisfactory exchange of communications;

.4 operational techniques for:

.4.1 receiver and transmitter adjustment for the appropriate mode of operation, including digital selective calling and direct-printing telegraphy;

.4.2 antenna adjustment and re-alignment, as appropriate;

.4.3 use of radio life-saving appliances;

.4.4 use of emergency position-indicating radio beacons (EPIRBs);

.5 antenna rigging, repair and maintenance, as appropriate;

.6 reading and understanding of pictorial, logic and module interconnection diagrams;

.7 use and care of those tools and test instruments necessary to carry out at-sea electronic maintenance at the level of unit or module replacement;

.8 basic manual soldering and desoldering techniques and their limitations;

.9 tracing and repair of faults to board/module level;

.10 recognition and correction of conditions contributing to the fault occurring;

.11 basic maintenance procedures, both preventive and corrective for all the GMDSS communication equipment and radionavigation equipment;

.12 methods of alleviating electrical and electromagnetic interference such as bonding, shielding and bypassing.

6 Miscellaneous

The operator should have knowledge of, and/or receive training in:

.1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;

.2 world geography, especially the principal shipping routes, services of Rescue Co-ordination Centres (RCCs) and related communication routes;

.3 survival at sea, the operation of lifeboats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio life-saving appliances;

.4 fire prevention and fire-fighting with particular reference to the radio installation;

.5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;

.6 first aid, including heart-respiration revival technique;

.7 Co-ordinated Universal Time (UTC), global time zones and International Dateline.

ANNEX 3

RECOMMENDATION ON TRAINING OF RADIO OPERATORS RELATED TO THE GENERAL OPERATOR'S CERTIFICATE

1 General

1.1 Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech, should be met by the candidate.

1.2 The training should be relevant to the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), the provisions of the Radio Regulations annexed to the International Telecommunication Convention (Radio Regulations) and the provisions of the International Convention for the Safety of Life at Sea (SOLAS) then in force, with particular attention to provisions for the global maritime distress and safety system (GMDSS). In developing training requirements, account should be taken of knowledge of the following items, which is not an exhaustive list.

2 Theory

2.1 Knowledge of the general principles and basic factors necessary for safe and efficient use of all the subsystems and equipment required in the GMDSS sufficient to support the training requirements listed in the practical section of this Annex.

2.2 Knowledge of the use, operation and service areas of the GMDSS subsystems, including satellite system characteristics, navigational and meteorological warning systems and selection of appropriate communication circuits.

3 Regulations and documentation

The operator should have knowledge of:

.1 the SOLAS Convention and the Radio Regulations with particular emphasis on:

.1.1 distress, urgency and safety radiocommunications;

.1.2 avoiding harmful interference, particularly with distress and safety traffic;

.1.3 prevention of unauthorized transmissions;

.2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings, and weather broadcasts in the Maritime Mobile Service and the Maritime Mobile Satellite Service;

.3 use of the International Code of Signals and the IMO Standard Marine Navigational Vocabulary.

4 Watchkeeping and procedures

Training should be given in:

.1 communication procedures and discipline to prevent harmful interference in the GMDSS subsystems;

.2 procedures for using propagation prediction information to establish optimum frequencies for communications;

.3 radiocommunications watchkeeping relevant to all GMDSS subsystems, exchange of radiocommunications traffic, particularly concerning distress, urgency and safety procedures and radio records;

.4 use of the international phonetic alphabet;

.5 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency;

.6 ship position-reporting systems and procedures;

.7 communication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR), using radiocommunications;

.8 radio medical systems and procedures.

5 Practical

Practical training should be given in:

.1 correct and efficient operation of all GMDSS subsystems and equipment under normal propagation conditions and under typical interference conditions;

.2 safe operation of all the GMDSS communications equipment and ancillary devices, including safety precautions;

.3 accurate and adequate keyboard skills for the satisfactory exchange of communications;

.4 operational techniques for:

.4.1 receiver and transmitter adjustment for the appropriate mode of operation, including digital selective calling and direct-printing telegraphy;

.4.2 antenna adjustment and re-alignment as appropriate;

.4.3 use of radio life-saving appliances;

.4.4 use of emergency position indicating radio beacons (EPIRBs).

6 Miscellaneous

The operator should have knowledge of, and/or receive training in:

.1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;

.2 world geography, especially the principal shipping routes, services of Rescue Co-ordination Centres (RCCs) and related communication routes;

.3 survival at sea, the operation of lifeboats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio life-saving appliances;

.4 fire prevention and fire-fighting with particular reference to the radio installation;

.5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;

.6 first aid, including heart-respiration revival technique;

.7 Co-ordinated Universal Time (UTC), global time zones and International Dateline.

ANNEX 4

RECOMMENDATION ON TRAINING OF RADIO OPERATORS RELATED TO THE RESTRICTED OPERATOR'S CERTIFICATE

1 General

1.1 Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech, should be met by the candidate.

1.2 The training should be relevant to the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), the provisions of the Radio Regulations annexed to the International Telecommunication Convention (Radio Regulations) and the provisions of the International Convention for the Safety of Life at Sea (SOLAS) then in force, with particular attention to provisions for the global maritime distress and safety system (GMDSS). In developing training requirements, account should be taken of knowledge of the following items, which is not an exhaustive list.

2 Theory

2.1 Knowledge of the general principles and basic factors, including VHF range limitation and antenna height effect necessary for safe and efficient use of all the subsystems and equipment required in the GMDSS in sea area A1, sufficient to support the training requirements listed in the practical section of this Annex.

2.2 Knowledge of the use, operation and service areas of the GMDSS sea area A1 subsystems, e.g. navigational and meteorological warning systems and the appropriate communication circuits.

3 Regulations and documentation

The operator should have knowledge of:

.1 those parts of the SOLAS Convention and the Radio Regulations relevant to sea area A1, with particular emphasis on:

.1.1 distress, urgency and safety radiocommunications;

.1.2 avoiding harmful interference, particularly with distress and safety traffic;

.1.3 prevention of unauthorized transmissions.

.2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings and weather broadcasts in the Maritime Mobile Services in sea area A1;

.3 use of the International Code of Signals and the IMO Standard Marine Navigational Vocabulary.

4 Watchkeeping and procedures

Training should be given in:

.1 communication procedures and discipline to prevent harmful interference in the GMDSS subsystems used in sea area A1;

.2 VHF communication procedures for:

.2.1 radiocommunications watchkeeping, exchange of radiocommunications traffic, particularly concerning distress, urgency and safety procedures and radio records;

.2.2 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency;

.2.3 digital selective calling system;

.3 use of the international phonetic alphabet;

.4 ship position-reporting systems and procedures;

.5 communication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR) using VHF radiocommunications;

.6 radio medical systems and procedures.

5 Practical

Practical training should be given in:

.1 correct and efficient operation of the GMDSS subsystems and equipment prescribed for ships operating in sea area A1 under normal propagation conditions and under typical interference conditions;

.2 safe operation of the relevant GMDSS communication equipment and ancillary devices, including safety precautions;

.3 operational techniques for:

.3.1 use of VHF, including channel, squelch, and mode adjustment, as appropriate;

.3.2 use of radio life-saving appliances;

.3.3 use of emergency position-indicating radio beacons (EPIRBs);

.3.4 use of NAVTEX receiver.

6 Miscellaneous

The operator should have knowledge of, and/or receive training in:

.1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;

.2 services of Rescue Co-ordination Centres (RCCs) and related communication routes;

.3 survival at sea, the operation of life boats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio lifesaving appliances;

.4 fire prevention and fire-fighting with particular reference to the radio installation;

.5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;

.6 first aid including heart-respiration revival technique.

ANNEX 5

RECOMMENDATION ON TRAINING OF PERSONNEL PERFORMING MAINTENANCE OF THE GMDSS INSTALLATIONS ABOARD SHIPS

1 General

1.1 Reference is made to regulation IV/15 - maintenance requirements, as contained in the 1988 amendments to the 1974 SOLAS Convention concerning radiocommunication for the GMDSS and to the Assembly resolution on Radio Maintenance Guidelines for the GMDSS related to sea areas A3 and A4 * which includes in its Annex the following provision:

> "4.2 The person designated to perform functions for at-sea electronic maintenance should either hold an appropriate certificate as specified by the Radio Regulations, as appropriate, or have adequate at-sea electronic maintenance qualifications, as may be approved by the Administration, taking into account the recommendations of the Organization on the training of such personnel."

1.2 The following guidance on equivalent electronic maintenance qualifications is provided for use by Administrations as appropriate.

1.3 Training as recommended below, does not qualify the person to be an operator of GMDSS radio equipment, unless he holds an appropriate radio operator's certificate.

2 Maintenance training equivalent to the first-class radioelectronic certificate

2.1 In determining training equivalent to the maintenance elements of the first-class radioelectronic certificate, knowledge of the items referred to in the following paragraphs contained in annex 1 to the present resolution should be taken into account, but the list should not be considered exhaustive.

2.2 Theory

Paragraphs 2.1, 2.3, 2.4, 2.5, 2.6, 2.7 and 2.8.

2.3 Practical

Paragraphs 5.2, 5.4.1, 5.4.2, 5.4.3, 5.4.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11 and 5.12.

2.4 Miscellaneous

Paragraphs 6.4, 6.5 and 6.6.

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* Resolution A.702 (17). See Annex 2-10.

3 Maintenance training equivalent to the second-class radioelectronic certificate

3.1 In determining training equivalent to the maintenance elements of the second-class radioelectronic certificate, knowledge of the items referred to in the following paragraphs contained in annex 2 to the present resolution, should be taken into account, but the list should not be considered exhaustive.

3.2 Theory

Paragraphs 2.1, 2.3, 2.4, 2.5, 2.6, 2.7 and 2.8.

3.3 Practical

Paragraphs 5.2, 5.4.1, 5.4.2, 5.4.3, 5.4.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11 and 5.12.

3.4 Miscellaneous

Paragraphs 6.4, 6.5 and 6.6.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/10-E
4 February 1992
Original: English

WORKING GROUP 4B

Note by the Chairman of Working Group 4 B

TASKS FOR WORKING GROUP 4B

Agenda Item	Topic
2.2.3a (Res. 520)	Broadcasting-satellite service (sound) and complementary terrestrial use (excluding feeder links)
2.2.4a (Res. 208)	Mobile -satellite (and mobile) services (excluding feeder links)
2.2.4b (Rec.. 408)	Public correspondence with aircraft
2.2.24c (Rec.205)	F.P.L.M.T.S
2.2.4d	Low-orbit satellites below 1 GHz
2.2.1 (Note 1)	Manned space vehicles -around 400 MHz
2.2.6 (Rec. 716)	Space research and space operations around 2 GHz
2.2.7 (Rec. 708)	Radiodetermination-satellite service footnotes
2.2.8	RR635 (bands 223-238 MHz and 246-254 MHz)
2.6	Consequential changes

G.F. JENKINSON
Chairman

INTERNATIONAL TELECOMMUNICATION UNION
WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/11-Rev.2
10 February 1992
English only

Working Group 4B

Note by the Chairman of Working Group 4B

PROPOSED INITIAL METHOD OF ADDRESSING TOPICS

1. 137 MHz to 1.0 GHz

   Agenda items 2.2.4d, 2.2.8 and space applications (Note 1), [meteorological-satellite]
   Docs. 6, 7+Corr.2, 12, 15 , 20, 23, 25, 26, 27, 30, 31, 34, 36, 41, 44, 45, 51, 52, 55, 56, 63, 65, 74, 97, 111

2. 2 025-2 110 MHz and 2 200-2 290 MHz

   Agenda item 2.2.6
   Docs. 4, 7, 12, 13, 20, 23, 26, 27, 30, 31, 34, 40, 44, 53, 61

3. Proposals concerning BSS (Sound) and Complementary terrestrail

   Agenda item 2.2.3a
   Docs. 7, 12, 13, 16, 20, 23, 26, 27, 28, 30, 31, 34, 37, 39, 40, 41, 44, 45, 48, 49, 52, 56, 63, 64, 65, 74, 75, 101, 111
   For information: 73

4. Proposals concerning mobile-satellite service and radiodetermination-satellite service

   Agenda items 2.2.4a and 2.2.7
   Docs. 7, 9, 12, 16, 20, 23, 26, 27, 30, 31, 34, 39, 40, 44, 45, 48, 49, 51, 52, 56, 57, 61, 62, 63, 65, 72, 74, 75, 94, 111
   For information: 4, 11, 83, 84, 88

5. Proposals concerning F.P.L.M.T.S. and other mobile services

   Agenda items 2.2.4a and 2.2.4c
   Docs. 8, 12, 16, 20, 23, 26, 27, 29, 30, 31, 39, 44, 48, 52, 56, 57, 61, 63, 74, 75

6. Proposals concerning public correspondence with aircraft

   Agenda item 2.2.4b
   Docs. 9, 12, 16, 20, 26, 31, 44, 49, 51, 63, 74, 75

G.F. JENKINSON
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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Working Group 4B

Note by the Chairman of Working Group 4B

PROPOSED INITIAL METHOD OF ADDRESSING TOPICS

1. 137 MHz to 1.0 GHz

   Agenda items 2.2.4d, 2.2.8 and manned space vehicles, [meteorological-satellite]

   Docs. 6, 7, 12, 15, 16, 20, 23, 25, 26, 27, 30, 31, 34, 36, 41, 44, 45, 46, 51, 52, 55, 56, 63, 65

2. 2 025 - 2 110 MHz and 2 200 - 2 290 MHz

   Agenda item 2.2.6

   Docs. 4, 7, 12, 13, 20, 23, 26, 27, 30, 31, 34, 44, 53

3. Proposals concerning BSS(Sound) and Complementary terrestrial

   Agenda item 2.2.3a

   Docs. 7, 12, 13, 16, 20, 23, 26, 27, 28, 30, 31, 34, 37, 39, 44, 45, 48, 52, 56, 61, 64, 65

4. Proposals concerning mobile-satellite service and radiodetermination-satellite service

   Agenda items 2.2.4a and 2.2.7

   Docs. 4, 7, 9, 12, 16, 23, 26, 27, 28, 30, 31, 34, 39, 40, 44, 45, 48, 49, 51, 52, 56, 57, 61, 62, 65, 72

5. Proposals concerning F.P.L.M.T.S and other mobile services

   Agenda items 2.2.4a and 2.2.4c

   Docs. 8, 12, 16, 20, 23, 26, 29, 30, 31, 44, 48, 52, 56

6. Proposals concerning public correspondence with aircraft

   Agenda item 2.2.4b

   Docs. 9, 12, 16, 20, 26, 31, 44, 49, 51

G.F. JENKINSON
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

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WORKING GROUP 4B

Note by the Chairman of Working Group 4 B

PROPOSED INITIAL METHOD OF ADDRESSING TOPICS

1. 137 MHz to 1.0 GHz

   Agenda items 2.2.4d, 2.2.8, and manned space vehicles, [meteorological-satellite]

   Docs. 7, 12, 15, 20, 23, 25, 26, 27, 30, 34, 36, 41, 45.

2. 2025-2110 MHz and 2200-2290 MHz

   Agenda item 2.2.6

   Docs. 7, 12, 20, 23, 27, 30, 31, 34, 53.

3. Proposals concerning BSS (sound) and Complementary terrestrial

   Agenda item 2.2.3a

   Docs. DT1/41 + Addendum 1 to DT1/41)
   (List to follow)

4. Proposals concerning mobile-satellite service and radiodetermination-satellite service

   Agenda items 2.2.4a and 2.2.7

   Docs. * (ditto as per 3)

5. Proposals concerning F.P.L.M.T.S.

   Agenda item 2.2.4c

   Docs. * (ditto as per 3)

6. Proposals concerning public correspondence with aircraft

   Agenda item 2.2.4b

   Docs. * (ditto as per 3)

G. F. JENKINSON
Chairman

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

CAMR-92 **CAMR CHARGÉE D'ÉTUDIER LES ATTRIBUTIONS DE FRÉQUENCES DANS CERTAINES PARTIES DU SPECTRE**

MÁLAGA-TORREMOLINOS, FÉVRIER/MARS 1992

Document DL/12-E
5 February 1992
Original: English

WORKING GROUP 5A

Note by the Chairman of Working Group 5A

The attached Resolution No. 5 of the IMO GMDSS Conference (London, 1988) is presented for your information.

Robert C. McIntyre
Chairman, Working Group 5A

Attachment: 1

ATTACHMENT

Resolution 5

Reviews of the requirements of SOLAS regulation IV/15.7

THE CONFERENCE,

HAVING ADOPTED the amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS Convention) concerning radiocommunications for the global maritime distress and safety system (GMDSS),

RECOGNIZING that the operation of the GMDSS is dependent upon implementation of the GMDSS by Contracting Governments in an effective manner,

RECOGNIZING FURTHER that Contracting Governments will be required to continually assess the requirements and means of attaining the goals and objectives of the GMDSS,

NOTING regulation IV/15.7 which refers to recommendations concerning the methods of equipment maintenance which are to be developed by the Organization,

1. **REQUESTS** the Maritime Safety Committee to periodically review the requirements of regulation IV/15.7 in the light of experience gained;

2. **FURTHER** requests the Secretary-General to circulate the results of these periodic reviews to Member Governments for their consideration.

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

CAMR-92 CAMR CHARGÉE D'ÉTUDIER LES ATTRIBUTIONS DE FRÉQUENCES DANS CERTAINES PARTIES DU SPECTRE

Document DL/13-E
6 February 1992
English only

MÁLAGA-TORREMOLINOS, FÉVRIER/MARS 1992

WORKING GROUP 5A1

NOTE BY THE CHAIRMAN OF WORKING GROUP 5A

Terms of reference for Working Group 5A1

WORKING GROUP 5A1
President: Mr. K. B. Malina (D), Box: 439

Terms of reference:

The Drafting Group 5A1 is to consider developing regulatory text for RR 3990 - 3992, which include the principle:

1) that ships which sail within or beyond the range of MF coast stations shall carry personnel holding a first class radio electronic certificate or a second class radio electronic certificate or a general operator's certificate; and

2) that ships which sail within the range of VHF stations carry personnel holding a first class radio electronic certificate or a general operator's certificate or a restricted operator's certificate.

Robert C. McIntyre
Chairman, Working Group 5A

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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WORKING GROUP 5A

REPORT OF THE CHAIRMAN OF DRAFTING GROUP 5A1 TO WORKING GROUP 5A

The group met under the Chairmanship of Mr. K. B. Malina of Germany on the 6th of February 1992; the following administrations and recognized organizations participated:

Denmark
United Kingdom
Canada
Japan
USA
Australia
New Zealand
Spain
IMO

As instructed by Working Group 5A, the Group considered the proposals for RR 3990 - 3992 with the aim of developing regulatory text taking into account the terms of reference specified in Document DL/13.

The results of these considerations which were unanimously agreed are given at Annex.

Annex: 1

K. B. Malina
Chairman, Working Group 5A1

ANNEX

MOD **3990** *a)* for stations on board ships which sail beyond the range of ~~MF~~ VHF coast stations, taking into account the provisions of the Convention for the Safety of Life at Sea, a holder of a first- or second-class radio electronic certificate or a general operator's certificate;
Mob-87

SUP **3991** *b)* SUPPRESSION CONFIRMED
Mob-87

MOD **3992** ~~*c)*~~ *b)* for ~~ship~~ stations on board ships which sail within the range of VHF coast stations, taking into account the provisions of the Convention for the Safety of Life at Sea: a holder of a first- or second-class radio electronic certificate or a general operator's certificate or a restricted operator's certificate.
Mob-87

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/15-E
10 February 1992
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Working Group 4B

Note by the Chairman of Working Group 4B

PROPOSED GROUPING OF TOPICS

1. 1 427-1 525 MHz and 2 300-3 000 MHz* (SWG-4B2)

Broadcasting-satellite and complementary terrestrial broadcasting
*(including proposals below 1 GHz)
Mobile-satellite services
Radiodetermination-satellite service
Radiolocation
Affected services

2. 1 525-1 670 MHz (SWG-4B3)

Mobile-satellite services
Radiodetermination-satellite service
Radioastronomy
Public correspondence with aircraft
Affected services

3. 1 670-2 025 MHz, 2 110-2 220 MHz, 2 290-2 300 MHz** (SWG-4B4)

Mobile services including future public land mobile telecommunication systems
Mobile-satellite services
Public correspondence with aircraft **(including proposals below 1 GHz)
Radioastronomy
Space Research
Affected services

4. 2 025-2 110 MHz and 2 200-2 290 MHz

Space research
Space operation
Earth exploration-satellite
Mobile
Effected services

5. 1 000-1 400 MHz

Fixed
Mobile

G.F. JENKINSON
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/16-E
10 February 1992
English only

Sub-Working Group 4B1

Note from the Chairman of the Sub-Working Group 4B1

Attached is the text of the proposals relevant to the work of Sub-Working Group 4B-1.

K. KOSAKA
Chairman

Text relevant to the work of SWG 4B-1

1 MSS below 1 GHz

Docs. 6, 7, 23, 30, 31, 34, 44, 45, 51, 52, 56, 63, 65, 74

Doc. 6 (ZWE)

ZWE/6/2

3. Agenda items 2.2.3, 2.2.4, 2.2.6 and 2.2.7

Zimbabwe believes that the new services requiring spectrum are many and that existing and planned services are essential services. As indicated in the introduction, Zimbabwe is concerned about the effect of introducing the services covered by these items within 500 - 3 000 MHz especially considering that the services require different radio frequency spectrum for operation while it may be argued by proponents that the only way forward is to free up spectrum for the new services. Zimbabwe would welcome such a move if adequate protection is given to existing services used nationally or notified to the IFRB.

Reasons: Zimbabwe operates many radio trunk links and subscriber links in the band 500 - 3 000 MHz and would like to see these services protected.

Doc. 7 (URS) + Corr. 2 (BLR/URS/UKR)

MHz
610 - 890

Allocation to Services		
Region 1	Region 2	Region 3
470 - 790	**608 - 614**	**610 - 890** FIXED MOBILE BROADCASTING
	614 - 806 BROADCASTING Fixed Mobile 675 692 692A 693	
790 - 862 FIXED BROADCASTING 694 695 695A 696 697 700A 702	**806 - 890** FIXED MOBILE BROADCASTING	
862 - 890 FIXED MOBILE except aeronautical mobile BROADCASTING 703 700A 704	692A 700	677 688 689 690 691 693 701

URS/7/48 MOD

URS/7/49 MOD

URS/7/50 ADD

700A Additional allocation: Region 1, the bands 806 - 890 and 942 - 960 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service. The use of this service is subject to agreement under the procedure established in Article 14.

MHz
942 - 960

Allocation to Services		
Region 1	Region 2	Region 3
942 - 960	**942 - 960**	**942 - 960**
FIXED	FIXED	FIXED
MOBILE except aeronautical mobile	Mobile	MOBILE
BROADCASTING 703		BROADCASTING
700A 704	708	701

URS/7/51
MOD

ADD ~~700A~~ (See proposal URS/7/50.)

MHz
273 - 322

	Allocation to Services		
	Region 1	Region 2	Region 3
BLR/URS/ UKR/7/67 MOD	273 - ~~322~~312	FIXED MOBILE MOD 641	
BLR/URS/ UKR/7/68 MOD	~~273~~312 - ~~322~~315	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 641A	
BLR/URS/ UKR/7/69 MOD	~~273~~315 - 322	FIXED MOBILE MOD 641	

MHz
335.4 - 399.9

	Allocation to Services		
	Region 1	Region 2	Region 3
BLR/URS/ UKR/7/70 MOD	335.4 - ~~399.9~~387	FIXED MOBILE MOD 641	
BLR/URS/ UKR/7/71 MOD	~~335.4~~387 - ~~399.9~~390	FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 641A	
BLR/URS/ UKR/7/72 MOD	~~335.4~~390 - 399.9	FIXED MOBILE MOD 641	

BLR/URS/UKR/7/73
MOD 641

Subject to agreement obtained under the procedure set forth in Article 14, the bands 235 - 312 MHz, 315 - 322 MHz ~~and~~, 335.4 - 387 MHz and 390 - 399.9 MHz may be used by the mobile-satellite service, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table.

BLR/URS/UKR/7/74
ADD 641A

Use of the frequency bands 312 - 315 MHz and 387- 390 MHz by the mobile-satellite service is limited to links with low-orbit satellites.

Doc 12 (USA)

MHz
137 - 138

Allocation to Services		
Region 1	Region 2	Region 3
137 - 138	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 596A 596B SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 596 597 598 599	

USA/12/39
MOD

USA/12/40
ADD

596A The mobile-satellite service is limited to low earth orbit satellite systems.

USA/12/41
ADD

596B The mobile-satellite (space-to-Earth) service is secondary to the meteorological-satellite (space-to-Earth) service in the frequency ranges 137.025 to 137.175 MHz and 137.825 to 137.975 MHz.

Reasons: To provide a mobile-satellite service (space-to-Earth) allocation for low earth orbit satellite systems while protecting meteorological-satellite operations.

MHz
146 - 149.9

	Allocation to Services		
	Region 1	Region 2	Region 3
USA/12/42 MOD	**146 - ~~149.9~~148** FIXED MOBILE except aeronautical mobile (R) ~~608~~	**146 - 148** AMATEUR 607	**146 - 148** AMATEUR FIXED MOBILE 607
USA/12/43 MOD	**~~146~~148 - 149.9** FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 596A 608	**148 - 149.9** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 596A 608	

ADD **596A** (See proposal USA/12/40)

Reasons: To provide a mobile-satellite service (Earth-to-space) allocation for low earth orbit satellite systems.

MHz
400.15 - 401

	Allocation to Services		
	Region 1	Region 2	Region 3
USA/12/44 MOD	**400.15 - 401**	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 596A SPACE RESEARCH (space-to-Earth) 647A Space Operation (space-to-Earth) 647	

ADD **596A** (See proposal USA/12/40)

USA/12/45
ADD **647A** The band 400.15 - 401 MHz is also allocated to the space research service in the space-to-space direction for communication with manned space vehicles. In this application, the space research service will not be regarded as a safety service.

Reasons:

1. To provide a mobile-satellite service (space-to-Earth) allocation for low earth orbit satellite systems.

2. To provide a primary allocation for a new space service application concerning communication links with manned space vehicles. This allocation will permit communications over larger distances than extra-vehicular activity, for example, during docking manoeuvres, and requiring higher power than that available from an astronaut's suit.

Doc. 16 (PNG)

IX. Agenda Item 2.2.4 d) - Consideration of up to 5 MHz of spectrum below 1 GHz for allocation to low-orbit satellites

It is noted that the power flux-density limit of -120 dBW/m² quoted in the CCIR report to WARC-92 for protection of the fixed and mobile services from LEO satellite down-link transmissions at 150 MHz exceeds the permissible limit for interference to these services in Papua New Guinea. Unless there are other mitigating factors, sharing of spectrum with fixed and mobile services in Papua New Guinea could be a problem.

The preferred band for LEO is 137 - 144 MHz which is relatively free of any assignments in Papua New Guinea. A bandwidth less than 5 MHz would be adequate. Allocation should be on a worldwide basis.

Doc. 23 (CAN)

~~Below 1 GHz (Low-Earth orbit satellites)~~

Under Agenda Item 2.2.4 d), Canada is examining with interest opportunities below 300 MHz for Low Earth Orbit (LEO) systems in the mobile-satellite service. We have identified significant benefits in the allocation of spectrum for such systems, but we are concerned about the potential impact on users of existing services in Canada in some of the bands which are under consideration. **Canada will be prepared to actively participate in a satisfactory resolution of these needs** at the Conference, and may submit additional proposals.

Doc. 30 (B)

MHz
146 - 149.9

	Allocation to Services		
	Region 1	Region 2	Region 3
B/30/13 MOD	**146 - ~~149.9~~148** FIXED MOBILE except aeronautical mobile (R) ~~608~~	**146 - 148** AMATEUR 607	**146 - 148** AMATEUR FIXED MOBILE 607
B/30/14 MOD	**~~146~~148 - 149.9** FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 599A 608	**148 - 149.9** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 599A 608	

Reasons: To provide a frequency allocation to the mobile-satellite service for the operation of low-Earth orbit satellite systems.

ADD **599A** (See proposal B/30/12).

MHz
136 - 138

	Allocation to Services		
	Region 1	Region 2	Region 3
B/30/9 MOD	136 - 137	AERONAUTICAL MOBILE (R) Fixed Mobile except aeronautical mobile (R) Space Operation (space-to-Earth) Meteorological-Satellite (space-to-Earth) Space Research (space-to-Earth) 591 594A595	
B/30/10 MOD	137 - 138	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) MOBILE-SATELLITE (space-to-Earth) 599A 596 597 598 599	

B/30/11
SUP 595
Mob-87

Reasons: The time limit has already expired.

B/30/12
ADD 599A The use of the bands 137 - 138 MHz (space-to-Earth), 148 - 149.9 MHz (Earth-to-space) and 400.15 - 401 MHz (space-to-Earth) by the mobile-satellite service is limited to low-Earth orbit satellite systems.

Reasons: To provide a frequency allocation to the mobile-satellite service for the operation of low-Earth orbit satellite systems.

MHz
400.15 - 401

Allocation to Services		
Region 1	Region 2	Region 3
400.15 - 401	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599A Space Operation (space-to-Earth) 647	

B/30/18 MOD

Reasons: To provide a frequency allocation to the mobile-satellite service for the operation of low-Earth orbit satellite systems.

ADD **599A** (See proposal B/30/12).

Doc. 31 (AUS)

~~Agenda item 2.2.4d: Low-Earth Orbit (LEO) systems below 1 GHz~~

Australia could accept an allocation for LEO MSS systems below 1 GHz provided that it can be accommodated with our current and planned use of the relevant band, and that adequate protection and coordination procedures are agreed so that harmful interference would not be caused to existing and planned national systems.

CHAPTER III
Frequencies

ARTICLE 8
Frequency Allocations

Doc. 34 (IND)

Section IV. Table of Frequency Allocations

MHz
137 - 138

	Allocation to Services		
	Region 1	Region 2	Region 3
IND/34/1 MOD	137 - ~~138~~137.3	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 596A 596B Fixed Mobile except aeronautical mobile (R) 596 597 598 599	
IND/34/2 MOD	~~137~~137.3 - ~~138~~137.5	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 596 597 598 599	
IND/34/3 MOD	~~137~~137.5 - 138	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 596A 596B Fixed Mobile except aeronautical mobile (R) 596 597 598 599	

IND/34/4
ADD 596A The mobile-satellite service is limited to low-Earth orbit systems.

8

IND/34/5
ADD 596B Unwanted emissions by services using spread spectrum modulation which generate a broad spectrum of sidebands, cause harmful interference to the radio astronomy service in adjacent or even well-removed bands. Low-Earth orbit satellite systems using spread spectrum modulation shall use adequate filtering to protect the radio astronomy service. The spectral power flux-density value representing the threshold of interference for radio astronomy is -223 dB ($W/m^2/4$ kHz) at 150 MHz with 1% Duty cycle (see also Nos. 343 and 344 and Article 36).

Reasons: To provide frequency allocation to the mobile-satellite service (space-to-Earth) for low-Earth orbit satellite systems and to protect the radio astronomy service from such systems using spread spectrum modulation.

MHz
146 - 149.9

	Allocation to Services		
	Region 1	Region 2	Region 3
IND/34/6 MOD	146 - ~~149.9~~148 FIXED MOBILE except aeronautical mobile (R) ~~608~~	146 - 148 AMATEUR 607	146 - 148 AMATEUR FIXED MOBILE 607
IND/34/7 MOD	~~146~~148 - ~~149.9~~149.4 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 596A 596B 608	148 - ~~149.9~~149.4 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 596A 596B 608	
IND/34/8 MOD	~~146~~149.4 - ~~149.9~~149.6 FIXED MOBILE except aeronautical mobile (R) 608	~~148~~149.4 - ~~149.9~~149.6 FIXED MOBILE 608	
IND/34/9 MOD	~~146~~149.6 - 149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 596A 596B 608	~~148~~149.6 - 149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 596A 596B 608	

ADD 596A (See proposal IND/34/4)

Doc. 44 (PAK)

PAK/44/4

The CCIR Report on WARC-92 suggests 100 - 500 MHz band for operation of low-Earth orbiting satellites.

Considering that new technologies for small payloads on board low Earth satellite systems have great potential to provide a number of radio services such as low-cost two-way data communication, the allocation of some suitable frequencies slots below 1 GHz is supported. The Administration of Pakistan proposes 137 - 138 and 272 - 273 MHz band.

Doc. 45 (EQA)

Ecuador proposes the allocation of 2 MHz in both directions to the mobile-satellite service for exclusive use by low-orbit satellites in the following bands: 420 - 422 MHz and 928 - 930 MHz.

Ecuador objects to the proposals from another adminstration it has examined for allocations to the mobile-satellite service on a primary basis in the band 148 - 149.9 MHz (Earth-to-space) on account of the fact that there are a large number of assignments in that band to the fixed and mobile services which cannot be relocated.

Should the Conference decide to allocate this band to the mobile-satellite service (low-orbit satellites), Ecuador will propose that the allocation be made on a secondary basis.

Doc. 51 (ISR)

ISR/51/6

Israel will support these allocations only if it can be shown that they will cause no interference to other systems in the band. We believe, therefore, that further studies should be taken before a decision is reached.

Doc. 52 (INS)

INS/52/6

Indonesia proposes the need to provide spectrum allocation for LEO mobile satellite systems below 1 GHz at 137 - 138 MHz (space-to-Earth), 400.15 - 401 MHz (space-to-Earth) and 148 - 149.9 MHz (Earth-to-space) on a worldwide basis with primary status.

Doc. 56 (THA)

THA/56/9

Thailand will support the frequency band of 137 - 150 MHz and 400 MHz allocated to LEO on the sharing condition specified by the CCIR report.

Doc. 63(MEX)

MHz
137 - 138

	Allocation to Services		
	Region 1	Region 2	Region 3
MEX/63/13 MOD	**137 - 138**	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 596A Fixed Mobile except aeronautical mobile (R) 596 597 598 599	

MEX/63/14
ADD 596A Operation of the mobile-satellite service is limited solely to low speed data transmissions using low-orbit satellite systems.

Reasons: To allocate radio spectrum to the new technologies in the mobile-satellite service.

MHz
146 - 149.9

	Allocation to Services		
	Region 1	Region 2	Region 3
MEX/63/15 MOD	146 - ~~149.9~~148 FIXED MOBILE except aeronautical mobile (R) ~~608~~	146 - 148 AMATEUR 607	146 - 148 AMATEUR FIXED MOBILE 607
MEX/63/16 MOD	~~146~~148 - 149.9 FIXED MOBILE ~~except aeronautical mobile (R)~~ MOBILE-SATELLITE (Earth-to-space) ~~608~~608A 608B	148 - 149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) ~~608~~608A 608B	

MEX/63/17
ADD 608A Operation of the mobile-satellite service is limited solely to low speed data transmissions using low-orbit satellite systems (see Nos. 416 and 419).

MEX/63/18
ADD 608B Mobile-satellite service (Earth-to-space) stations shall operate in this band on condition that no harmful interference is caused to stations operating in the fixed and mobile services and in conformity with the relevant CCIR Recommendations, in order to ensure compatibility between the services (see No. 435).

Reasons: To allocate radio spectrum to the new technologies in the mobile-satellite service, while guaranteeing priority for the fixed and mobile service plans, which have to be protected.

MHz
400.15 - 401

	Allocation to Services		
	Region 1	Region 2	Region 3
MEX/63/19 MOD	400.15 - 401	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 596A Space Operation (space-to-Earth) 647	

Reasons: To allocate radio spectrum to the new technologies in the mobile-satellite service.

Doc. 65 (CUB)

CUB/65/5

The Administration of Cuba considers that the allocation of a frequency band below 1 GHz to low-orbit satellites is only feasible on a secondary basis, in view of the fact that they will have to ensure protection for the existing services allocated on a primary basis, without imposing additional restrictions on them.

Doc. 74 (TZA)

If low-Earth orbiting satellite systems do not cause interference to existing systems, it is possible to allocate a frequency band to such systems on a secondary basis.

TZA/74/11

Tanzania proposes the following bands for this service: 148.0 - 150.05 MHz and 428 - 430 MHz.

2. Space Research / Operation Services below 1 GHz

Doc. 12, 20, 27, 30, 63

Doc. 12 (USA)

MHz
400.15 - 401

Allocation to Services		
Region 1	Region 2	Region 3
400.15 - 401	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 596A SPACE RESEARCH (space-to-Earth) 647A Space Operation (space-to-Earth) 647	

USA/12/44
MOD

~~ADD~~ ~~596A~~ ~~(See proposal USA/12/40)~~

USA/12/45
ADD 647A The band 400.15 - 401 MHz is also allocated to the space research service in the space-to-space direction for communication with manned space vehicles. In this application, the space research service will not be regarded as a safety service.

Reasons:

1. To provide a mobile-satellite service (space-to-Earth) allocation for low earth orbit satellite systems.

2. To provide a primary allocation for a new space service application concerning communication links with manned space vehicles. This allocation will permit communications over larger distances than extra-vehicular activity, for example, during docking manoeuvres, and requiring higher power than that available from an astronaut's suit.

MHz
410 - 420

Allocation to Services		
Region 1	Region 2	Region 3
410 - 420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 651A	

USA/12/46
MOD

USA/12/47
ADD 651A Use of the band 410 - 420 MHz by the space research service is limited to communication links within 5 km of an orbiting, manned space vehicle. In this application, the space research service will not be regarded as a safety service. Such space stations in this service shall not cause harmful interference to stations operating in the fixed and mobile services.

Reasons: To provide a primary allocation for a new space service application concerning communications with manned space vehicles, while protecting the interests of existing fixed and mobile allocations in the same band. The extra-vehicular activity (EVA) system is to provide communications among astronauts and base spacecraft while astronauts are performing activities outside the base spacecraft, e.g. maintenance.

Doc.20 (EUR)

ARTICLE 8

MHz
400.15 - 401.00

	Allocation to Services		
	Region 1	Region 2	Region 3
EUR/20/132 MOD	**400.15 - 401**	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) 674A Space Operation (Space-to-Earth) 647	

EUR/20/133 ADD 647A

The band 400.15 - 401 MHz may also be used by the Space Research Service, space-to-space, for the purpose of radiocommunications with manned space vehicles. The provisions of RR 953 shall not apply.

Reasons: To allocate a suitable frequency band to new (manned) applications within the Space Research Service. These new applications consist of low-power radiocommunications among astronauts and between astronauts and their parent spacecraft (extra-vehicular activities, including science and technical research) as well as proximity radiocommunications between spacecraft for the purpose of rendezvous and docking.

Doc.27(J)

MHz
400.15 - 401

	Allocation to Services		
	Region 1	Region 2	Region 3
J/27/28 MOD	**400.15 - 401**	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) (space-to-space) Space Operation (space-to-Earth) 647	

Reasons: To provide a primary allocation for a new space service application such as spacecraft proximity links.

Doc. 12 (USA)

MHz
410 - 420

Allocation to Services		
Region 1	Region 2	Region 3
410 - 420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 651A	

USA/12/46
MOD

USA/12/47
ADD

651A Use of the band 410 - 420 MHz by the space research service is limited to communication links within 5 km of an orbiting, manned space vehicle. In this application, the space research service will not be regarded as a safety service. Such space stations in this service shall not cause harmful interference to stations operating in the fixed and mobile services.

Reasons: To provide a primary allocation for a new space service application concerning communications with manned space vehicles, while protecting the interests of existing fixed and mobile allocations in the same band. The extra-vehicular activity (EVA) system is to provide communications among astronauts and base spacecraft while astronauts are performing activities outside the base spacecraft, e.g. maintenance.

Doc. 63 (MEX)

MHz
410 - 420

Allocation to Services		
Region 1	Region 2	Region 3
410 - 420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 651A	

MEX/63/20
MOD

MEX/63/21
ADD 651A

Use of the band 410 - 420 MHz by the Space Research Service (space-to-space) shall not be considered as a safety service. Space stations in that service may operate on condition that no harmful interference is caused to fixed and mobile service stations (see No. 435).

Reasons: To provide the possibility of setting up space-to-space communications while duly protecting the fixed and mobile service stations operating in this band.

Doc. 30 (B)

B/30/19
MOD 663

Additional allocation: in Brazil, France and the French Overseas Departments in Region 2, and India, the band 433.75 - 434.25 MHz is also allocated to the space operation service (Earth-to-space) on a ~~primary~~secondary basis~~, until 1 January 1990, subject to agreement obtained under the procedure set forth in Article 14. After 1 January 1990, the band 433.75 - 434.25 MHz will be allocated in the same countries to the same service on a secondary basis.~~

Reasons: The time limit has already expired.

3. Footnote 635

Docs. 6, 36, 55

Doc. 6 (ZWE)

ZWE/6/3 **4. Agenda item 2.2.8**

Zimbabwe asked the Secretary-General to have this item included in the agenda of the Conference by having Zimbabwe added to Footnote 635.

Reasons: During the AFBC (1) and (2) Zimbabwe was informed that its name could be added only by a competent conference such as this one. Zimbabwe has frequencies in the AFBC (2) Geneva 1989 plan in the band affected by Footnote 635 and intends to put into use those channels.

Doc. 36 (MOZ)

MOZ/36/1
MOD **635**

Alternative allocation: in Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland and Zambia, the bands 223 - 238 MHz and 246 - 254 MHz are allocated to the broadcasting service on a primary basis subject to agreement obtained under the procedure set forth in Article 14.

Reasons: Obtaining the inclusion of Mozambique in RR 635.

Doc. 55 (MWI)

MWI/55/7
MOD **635**

Alternative allocation: in Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland and Zambia, the bands 223 - 238 MHz and 246 - 254 MHz are allocated to the broadcasting service on a primary basis subject to agreement obtained under the procedure set forth in Article 14.

Reasons: The Malawi Administration has equipment to operate in this band.

4. Other MS below 1 GHz

Docs. 23, 63

Doc. 23 (CAN)

MHz
942 - 960

	Allocation to Services		
	Region 1	Region 2	Region 3
CAN/23/5 MOD	**942 - 960** FIXED MOBILE except aeronautical mobile BROADCASTING 703 704	**942 - 960** FIXED ~~Mobile~~ MOBILE ~~708~~	**942 - 960** FIXED MOBILE BROADCASTING 701

Reasons: The addition of the mobile service on a primary basis is proposed to meet evolving mobile requirements while at the same time permitting the continued use of the fixed service on an as-required basis.

CAN/23/6
SUP 708 Reasons: No longer required with mobile as primary.

Doc. 63 (MEX)

MHz
942 - 960

	Allocation to Services		
	Region 1	Region 2	Region 3
MEX/63/25 MOD	**942 - 960** FIXED MOBILE except aeronautical mobile BROADCASTING 703 704	**942 - 960** FIXED MOBILE ~~Mobile~~ ~~708~~	**942 - 960** FIXED MOBILE BROADCASTING 701

Reasons: To provide flexibility for use of the band 942 - 960 MHz.

MEX/63/26
SUP 708

Reasons: Consequence of the proposal to upgrade the status of the mobile service.

5. Others

Docs. 15, 25, 30, 41

Doc. 15 (KRE)

KRE/15/2
MOD **659**

Additional allocation: in Angola, Bulgaria, Cameroon, the Congo, Gabon, Hungary, Mali, Mongolia, Niger, Poland, the German Democratic Republic, Dem. People's Rep. of Korea, Roumania, Rwanda, Chad, Czechoslovakia and the U.S.S.R., the band 430 - 440 MHz is also allocated to the fixed service on a primary basis.

Reasons: This band is the same as that for radio-relay equipment procured from another country in 1980.

Doc. 25 (E)

E/25/4
SUP **614**

E/25/5
SUP **633**

E/25/6
SUP **634**

E/25/7
SUP **682**

Reasons: Are now obsolete.

E/25/11
MOD **703**

In Region 1, in the band 862 - 960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. 400 to 403) excluding Algeria, Egypt, Spain, Libya and Morocco, subject to agreement obtained under the procedure set forth in Article 14. ~~Such operations shall be in accordance with the Final Acts of the African VHF/UHF Broadcasting Conference, Geneva, 1963.~~

Doc. 30 (B)

B/30/11
SUP 595
Mob-87

Reasons: The time limit has already expired.

B/30/16
MOD 627

In Region 2, ~~the band 216—225 MHz is allocated to~~no new stations in the radiolocation service ~~on a primary basis until 1 January 1990~~may be authorized in the band 216 - 225 MHz. ~~On and after 1 January 1990, no new stations in that service may be authorized.~~ Stations authorized prior to 1 January 1990 may continue to operate on a secondary basis.

Reasons: The time limit has already expired.

B/30/17
SUP 633 and
634

Reasons: The time limits have already expired.

B/30/20
SUP 682

Reasons: The time limit has already expired.

Doc. 41 (YEM)

YEM/41/10

MOD **596** Different category of service: in Afghanistan, Saudi Arabia, Bahrain, Brunei, China, the United Arab Emirates, India, Indonesia, Iran, Iraq, Kuwait, Malaysia, Oman, Pakistan, Qatar, Singapore~~,~~ and Thailand, ~~Yemen A.R. and Yemen (P.D.R. of),~~ the allocation of the band 137 - 138 MHz to the fixed and mobile, except aeronautical mobile (R), services is on a primary basis (see No. 425).

YEM/41/11

MOD **604** Additional allocation: in Ethiopia, Finland, Kenya, Malta, Somalia, Sudan, Tanzania~~, Yemen A.R.~~ and Yugoslavia, the band 138 - 144 MHz is also allocated to the fixed service on a primary basis.

YEM/41/12

MOD **621**
Mob-87 Additional allocation: in the Federal Republic of Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Monaco, Norway, the Netherlands, the United Kingdom, Sweden~~,~~ and Switzerland ~~and Yemen (P.D.R. of)~~, the band 174 - 223 MHz is also allocated to the land mobile service on a permitted basis. However, the stations of the land mobile service shall not cause harmful interference to, nor claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

YEM/41/13

MOD **622** Different category of service: in the Federal Republic of Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Luxembourg, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Sweden~~,~~ and Switzerland ~~and Yemen (P.D.R. of)~~, the band 223 - 230 MHz is allocated to the land mobile service on a permitted basis (see No. 425). However, the stations of the land mobile service shall not cause harmful interference to, nor claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

While it would like to have its name corrected as from 22 May 1990, in the following footnotes.

YEM/41/14

MOD **676** Additional allocation: in Burundi, Cameroon, the Congo, Ethiopia, Israel, Kenya, Libya, Senegal, Sudan, Syria, and Yemen ~~(P.D.R. of)~~, the band 470 - 582 MHz is also allocated to the fixed service on a secondary basis.

Doc. 63 (MEX)

MEX/63/22
MOD

MHz
470 - 890

Allocation to Services		
Region 1	Region 2	Region 3
470 - 790 BROADCASTING 676 677A 682 683 684 685 686 686A 687 689 693 694	**470 - 512** BROADCASTING Fixed Mobile 674 MOD 675	**470 - 585** FIXED MOBILE BROADCASTING 673 677 679
	512 - 608 BROADCASTING MOD 678	
	608 - 614 RADIO ASTRONOMY Mobile-Satellite except aeronautical mobile-satellite (Earth-to-space)	**585 - 610** FIXED MOBILE BROADCASTING RADIONAVIGATION 688 689 690
	614 - 806 BROADCASTING Fixed Mobile MOD 675 692 692A 693	
790 - 862 FIXED BROADCASTING 694 695 695A 696 697 700A 702		**610 - 890** FIXED MOBILE BROADCASTING
	806 - 890 FIXED MOBILE BROADCASTING	
862 - 890 FIXED MOBILE except aeronautical mobile BROADCASTING 703 704	 692A 700	 677 688 689 690 691 693 701

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/17(Rev.1)-E
13 February 1992
Original: English

SUB-WORKING GROUP 4B1

Note by the Chairmen of Sub-Working Group 4B1

USA PROPOSAL FOR EVA (EXTRA VEHICLE ACTIVITY) AT 410 - 420 MHz

MHz
410 - 420

Allocation to Services		
Region 1	Region 2	Region 3
410 - 420	FIXED MOBILE except aeronautical mobile Space Research (space-to-space) 651A	

651A Use of the band 410 - 420 MHz by the space research service is limited to communication links within 5 km of an orbiting, manned space vehicle.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/17-E
11 February 1992
Original: English

SUB-WORKING GROUP 4B-1

Note by the Chairmen of Sub-Working Group 4B-1

ALTERNATIVE USA PROPOSAL FOR EVA (EXTRA VEHICLE ACTIVITY) AT 410 - 420 MHz

MHz
410 - 420

	Allocation to Services		
	Region 1	Region 2	Region 3
USA/12/46 MOD	410 - 420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 651A	

USA/12/47
ADD

651A Use of the band 410 - 420 MHz by the space research service is limited to communication links within 5 km of an orbiting, manned space vehicle. In this application, the space research service will not be regarded as a safety service. Stations in the space research service shall not claim protection from stations in the fixed and mobile services operating in this band. The maximum power flux-density produced at the surface of the Earth by a space station in the space research service in this band shall not exceed -156 dB (W/m2/4 kHz) for angle of arrivals between 0 and 5 degrees; -156 + 0.108 (θ-5) dB (Wm2/4 kHz) for 5 to 70 degrees; -149 dB (W/m2/4 kHz) for 70 to 90 degrees. Circularly polarized emissions are permitted to exceed these limits by 3 dB.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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12 February 1992
English only

DRAFTING GROUP 4B2

FREQUENCY BANDS		PRESENT STATUS (primary only)		ROK	URS/CUB	ALG/VUT/BFA/CHN/BEN/CLN	EQA	CEPT (30 countries)	IND	J
1515,0	1525,0	FIXED/MOBILE	NOC	NOC			MSS down >1514.5		MSS down	NOC
1525,0	1530,0	SPACE OPS/FIXED	NOC	MMSS down	MMSS down	MSS down	MMSS/lmss down	MMSS/lmss down		MMSS/lmss down
1530,0	1533,0	MMSS down LMSS down	NOC	NOC	NOC					
1533,0	1535,0	MMSS down	NOC	NOC	NOC					
1535,0	1544,0	MMSS down	NOC	NOC	NOC					NOC
1544,0	1545,0	MSS down	NOC	NOC	NOC					NOC
1545,0	1548,0	AMS(R)S down	NOC	NOC	NOC					NOC
1548,0	1555,0									NOC
1555,0	1559,0	LMSS down	NOC	NOC	NOC					NOC

2110,0	2130,0	FIXED/MOBILE	NOC	NOC						
2130,0	2140,0									
2140,0	2160,0									
2160,0	2170,0									
2170,0	2180,0									

2483,5	2500,0	RDSS (R2) down	NOC	NOC					RDSS/MSS down	NOC
2500,0	2520,0	FIXED/FSS/BSS	NOC	NOC						MSS down except AMS(R)S (domestic/regional)
2520,0	2535,0							MSS down>2005		
2535,0	2570,0							MMSS/LMSS down >2005/2010		

Generic MOBSAT		no	no	no/ext	no /yes	extensions only	extensions only	extensions only	-
TOTAL MOBSAT BANDS		34,0	34,0	34,0	34,0	44,5	84,0	60,5	69,0

FREQUENCY BAND		PRESENT STATUS (primary only)	PAK/NIG/ISR/TZA	NZL	AUS	MEX	CAN	USA	B	unspecified
1515,0	1525,0	FIXED/MOBILE							MSS down	
1525,0	1530,0	SPACE OPS/FIXED	MMSS down	MSS down	MSS down	MSS down	MSS down	MSS down	MMSS/LMSS down	
1530,0	1533,0	MMSS down LMSS down						MSS down (priority to MMSS safety)		
1533,0	1535,0	MMSS down								
1535,0	1544,0	MMSS down								
1544,0	1545,0	MSS down		NOC	NOC					
1545,0	1548,0	AMS(R)S down		NOC	MSS down (priority to AMS(R)S)	MSS down (priority to AMS(R)S	AMS(R)S down	MSS down (priority to AMS(R)S)		
1548,0	1555,0						MSS down (priority to (AMS(R)S)			
1555,0	1559,0	LMSS down		MSS down	MSS down					

2110,0	2130,0	FIXED/MOBILE						MSS down		
2130,0	2140,0									
2140,0	2160,0						MSS down >2003			
2160,0	2170,0							MSS down		
2170,0	2180,0									

2483,5	2500,0	RDSS (R2) down				MSS down	MSS down	RDSS/MSS down		
2500,0	2520,0	FIXED/FSS/BSS						mobsat down R1 & R3 domestic		
2520,0	2535,0	FIXED/FSS/BSS	MSS down >2005							
2535,0	2570,0	FIXED/FSS/BSS								

Generic MOBSAT			extensions only	yes	yes	yes	yes	yes	extensions only	
TOTAL MOBSAT BANDS			84,0	50,5	44,0	50,5	90,5	107,0	84,0	

FREQUENCY BANDS		PRESENT STATUS (primary only)	NOC	ROK	URS/CUB	ALG/VUT/BFA/CHN/BEN	EQA	CEPT (30 countries)	IND	J	INS	CLN
1610,0	1613,8	RDSS (R2) up AERONAUTICAL RADIONAVIGATION	NOC	NOC	NOC				MSS up RDSS up	NOC		MSS up
1613,8	1616,0											MSS down mss up
1616,0	1621,5						MSS up				MSS up/down	
1621,5	1626,5											
1626,5	1631,5	MMSS up	NOC	NOC	NOC				MSS up	NOC		
1631,5	1645,5											
1645,5	1646,5	MSS safety up	NOC	NOC	NOC					NOC		
1646,5	1649,5	AMS(R)S up	NOC	NOC	NOC					NOC		
1649,5	1656,5											
1656,5	1660,0	LMSS up	NOC	NOC	NOC					NOC		
1660,0	1660,5	LMSS up/RADIOASTRONOMY	NOC	NOC	NOC					NOC		
1670,0	1720,0	FS/MS/METEO/METEOSAT	NOC	NOC								
1765,0	1775,0		NOC						MSS up			
2390,0	2430,0	FS/MS	NOC							NOC		
2638,5	2640,0	FS/MS/BSS/FSS	NOC									
2640,0	2655,0							MSS up >2005				
2655,0	2690,0							MMSS/LMSS up > 2005/2010		MSS up except AMS(R)S (domestic/regional)		
Generic MOBSAT			no	no	no	no/extensions	extensions only	extensions only	extensions	-	-	-
TOTAL MOBSAT BANDS			34,0	34,0	34,0	34,0	44,5	84,0	60,5	69,0	44,5	50,5

FREQUENCIES		PRESENT STATUS (primary only)	PAK/NIG/ISR/TZA	NZL	AUS	MEX	CAN	USA	B	unspecified
1610,0	1613,8	RDSS (R2) up AERONAUTICAL RADIONAVIGATION		RDSS up MSS up/down	MSS up	MSS up	MSS up	RDSS/MSS up		PNG opposed
1613,8	1616,0				MSS up MSS down		MSS up/mss down	RDSS/MSS up mss down		
1616,0	1621,5									
1621,5	1626,5						MSS up/mss down no non GEO <2001			
1626,5	1631,5	MMSS up		MSS up	MSS up		MSS up	MSS up (priority to MMSS safety)	MMSS/LMSS up	
1631,5	1645,5									
1645,5	1646,5	MSS safety up		NOC	NOC					
1646,5	1649,5	AMS(R)S up		NOC	MSS up (priority to AMS(R)S)		AMS(R) up	MSS up (priority to AMS(R)S)		
1649,5	1656,5						MSS up (priority to AMS(R)S)			
1656,5	1660,0	LMSS up		MSS up	MSS up					
1660,0	1660,5	LMSS up/RADIOASTRONOMY								
1670,0	1720,0	FS/MS/METEO/METEOSAT							MSS up	
1765,0	1775,0									
2390,0	2430,0	FS/MS						MSS up		PNG opposed
2638,5	2640,0	FS/MS/BSS/FSS					MSS up			PNG opposed
2640,0	2655,0		MSS up >2005					mss up R1 & R3 domestic		
2655,0	2690,0									
Generic MOBSAT			extensions only	yes	yes	-	yes	yes	extensions only	
TOTAL MOBSAT BANDS			84,0	50,5	50,5	50,5	102,0	90,5	84,0	

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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DRAFTING GROUP 4B4

Doc.12/Add8 (USA)

Agenda item 2.2.4a, 2.6

I. Introduction

The United States proposes an allocation footnote (proposal USA/12/82) to add the mobile-satellite service to the band 1 850 - 1 990 MHz without direction indicators. This addition is intended to complement the existing fixed and mobile services, which share an allocation in the 1 850 - 1 990 MHz band. The added flexibility should permit greater sharing of the bands and promote the development of a variety of personal communications services.

II. Discussion

The United States does not endorse a mobile allocation designated for FPLMTS since there are many services competing for spectrum in the 1 - 3 GHz band and the CCIR studies to develop the technical parameters of the service have not been completed. The United States believes that it is premature to designate a specific mobile service band to FPLMTS and questions whether a separate allocation is required at all.

Within the FPLMTS architecture is a satellite component that can be used in place of the terrestrial service as the need warrants. It is anticipated that the same equipment can be used on both the satellite and the terrestrial portion of the FPLMTS. Since the same equipment is to be used in both portions of the network, especially in the case of the hand-held telephony units, it is important that a mobile-satellite allocation be close to the allocation for the terrestrial mobile portion so that the same RF on the mobile/mobile earth terminal can be utilized to access the satellite or the terrestrial base station.

As with the FPLMTS in general, the CCIR has not yet completed its technical study of the satellite portion of the FPLMTS. The United States believes that an MSS allocation for this service needs to be made now, but should be made without direction indicators to allow for flexibility in the implementation of the satellite service. For instance, there is a proposal for a personal communications system using an MSS system that transmits its up link and down link in the same band. An MSS allocation without direction indicators can permit the implementation of a LEO, HEO or GSO satellite system using any variety of access and modulation schemes. It also allows for different types of implementations in different regions of the world and permits each region to decide what specific part of the band to allocate for the satellite portion of the service without predetermining the characteristics of the system.

III. Technical considerations

CCIR Working Party 8D in its December 1991 meeting drafted two Recommendations concerning the satellite interworking with FPLMTS. The first Recommendation described some general characteristics of the satellite portion and the second Recommendation set up a framework for the detailed Recommendations that are to come at a later date.

There were four draft Recommendations that were forwarded related to possible spectrum allocations for the satellite portion.

"5. that the spectrum used for the satellite network be as close as possible to those of the terrestrial networks, particularly with respect to the Earth-to-space frequencies of the satellite network in which case separations of less than [10%] are advantageous;

6. that in selecting frequency bands for operation of the satellite network in the space-to-Earth direction account should be taken of the constraints which could be imposed by power flux-density limits which may apply in the relevant bands. In the case of direct access, power flux-density limits may be particularly constraining on system design;

13. that there is a need for common channels of frequency bands to facilitate regional and/or worldwide operation, particularly with the increasing use of personal (hand-held, portable) terminals;

14. that the use of internationally agreed frequency bands will facilitate the planning of national networks and reduce the risk of harmful interference with other radio services."

These Recommendations indicate that the satellite and the terrestrial portions of the FPLMTS will be operating in a common band of frequencies that will enable a person to roam worldwide using their personal communications device, switching freely between the terrestrial and satellite portion of the service, whichever has the coverage with greater signal levels. An allocation like the one proposed by the United States will facilitate the development of both portions of the service.

IV. Summary

The text of the Working Party 8D proposed Recommendations does not specify the technical parameters of the satellite portion of the FPLMTS. In WP 8D and TG 8-1 Recommendations, it is stated that there have been no clear cost advantages identified for adoption of TDMA, FDMA or CDMA or for a combination of these access techniques in either or both the satellite and the terrestrial modes. It is the intention of the Working Party to study these options during the current cycle of the CCIR. These studies will not be completed for a year or two, further emphasizing the need to maintain flexibility in the allocation.

The Recommendations of the Working Party concerning spectrum does specifically state that the spectrum allocation for the satellite portion of FPLMTS needs to be "close" to the terrestrial mobile portion (within 10% or so), universal and as unencumbered as possible with power flux-density limitations. All of these features can be identified within the United States allocation proposals.

USA - Doc. 42

V. Mobile services in the approximate range 1 - 3 GHz

Mobile service allocations and future public land mobile telecommunication systems

The demand for spectrum for the mobile services is growing. Considerable emphasis has been placed on accommodating future mobile service needs by providing suitable allocations in the 1 700 - 2 450 MHz band. These needs include personal communication networks, cordless telephones and future public land mobile telecommunication systems (FPLMTS). As the Table of Frequency Allocations contains a primary mobile allocation in Region 2 from 1 700 - 2 690 MHz, which could permit future implementation of mobile services, we see no need to make specific allocation proposals for Region 2.

Further, we note that the WARC will specifically consider possible designation of a band of frequencies for use by future public land mobile telecommunication systems (FPLMTS). This concept, which embraces a wide variety of personal communications applications, has been under intensive study by the CCIR. Proponents wish to set aside a band of frequencies for future use which they indicate would facilitate global roaming of personal stations. While we support the work of the CCIR on FPLMTS, we believe that the WARC must exercise caution before reserving spectrum, particularly because of the numerous demands in the 1 - 3 GHz frequency range. Furthermore, technical standards such as modulation parameters, protocols, and channelization schemes will be just as important as an allocated band in facilitating any requirements for global roaming. These standards and protocols may obviate the need for a common world-wide band for international roaming. We believe that it is premature to designate a frequency band until the CCIR has progressed further in its work.

KOR - Doc. 8

2. Agenda item 2.2.4 c) for the development of the international use of the mobile service for future public land mobile telecommunication systems, as indicated in Recommendation 205 (Mob-87), or designate for this use a band already allocated to the mobile service

The explosive growth of demands for the land mobile communication services necessitates development of more spectrum-efficient technology, and furthermore, the trend toward personalized communication needs requires implementation of a world-wide compatible system. These new phenomena require an adjustment of the current allocation of frequency spectrum, which can be discussed at the WARC-92.

The Administration proposes that the bands 1 875 - 2 025 MHz and 2 110 - 2 200 MHz be designated on a world-wide basis for the use of FPLMTS in order to facilitate the introduction of FPLMTS together with other services. This proposal is based on the on-going studies of CCIR Study Groups on the expected demand and spectrum sharing. The use of these bands for the FPLMTS can be achieved without any significant change in the Table of Frequency Allocations, since the band 1 710 - 2 290 MHz is already allocated to the mobile service.

2.8 Agenda Item 2.2.4 c): future public land mobile telecommunications systems (FPLMTS)

NIG/9/7 Nigeria registers its interest in FPLMTS but adequate protection should be provided for existing and future fixed services

PNG - Doc. 16

VIII. **Agenda Item 2.2.4 c) - Allocation of frequency bands in the range 1 - 3 GHz for future public land mobile telecommunications systems**

Papua New Guinea recognizes the impact FPLMTS will have on personal communications in the future and supports:

- the allocation of spectrum on a worldwide basis to fully exploit roaming possibilities as well as to minimize equipment and infrastructure costs through standardization;
- spectrum allocation on the basis of need so that more spectrum than is needed to meet the particular requirements of countries is not unnecessarily allocated.

Furthermore, to minimize disruption of existing fixed services it is preferred that allocated spectrum should overlap the fixed link band gaps at 1 806 and 2 101 MHz. Adequate time should also be given to ensure smooth transfer of affected services to alternative bands.

EUR - Doc. 20

Future Public Land Mobile Telecommunications System

6. The CEPT has considered the extensive work done by the CCIR and others on the characteristics of land mobile systems (FPLMTS) capable of providing a wide range of services, voice and non-voice, including personal communications with regional and/or international roaming facilities, plus the potential value to developing countries and others with sparsely populated areas having limited communications facilities. The development of such systems and services must clearly be supported by the designation of a suitable frequency band, if possible on a worldwide basis with all the advantages of compatibility, access and cost reductions due to large scale production that would result. Against this background the CEPT takes the view that a frequency band of the order of 200 MHz bandwidth be designated and, having regard to the other services existing and planned in this part of the spectrum, concludes that the bands 1 900 - 2 025 MHz and 2 110 - 2 200 MHz be so chosen.

7. In those bands, the use of space techniques, in accordance with the Recommendations of the CCIR may also be authorized in connection with FPLMTS.

CAN/23

1 710 - 2 290 MHz

Under **Agenda Item 2.2.4 c)**[3], WARC-92 will make provisions as necessary for the Future Public Land Mobile Telecommunication System (FPLMTS). The CCIR has identified a requirement for 230 MHz of spectrum, of which 60 MHz is for "personal" systems, and the remainder in support of "vehicular" systems. These maximum requirements are projected in large urban areas. Canada anticipates and supports a personal segment that will be ubiquitous and highly portable, requiring spectrum on a worldwide basis. On the other hand, the mobile vehicular segment will operate from base stations which can have frequencies selected from national or regional channelling plans. Studies indicate that sharing between the vehicular stations and fixed point-to-point systems is reasonably viable, either on adjacent frequencies within the same area, or on overlapping frequencies, in which case tens of kilometres provide adequate separation between the stations of the two services.

Canada is proposing ADD 746A which designates the band 1 900 - 1 960 MHz as a core of spectrum for FPLMTS intended to satisfy the personal component needs. This band has been chosen to reduce the impact on existing and future fixed systems as 1 900 MHz is a boundary between two CCIR channelling arrangements. The remaining spectrum for FPLMTS may be chosen from the other mobile primary spectrum which is suitable for these applications.

Under Agenda Item 2.2.4 a), Canada is proposing the allocation of the bands 1 960 - 1 990 MHz and 2 140 - 2 170 MHz to the mobile-satellite service, to become effective in the year 2003 as shown in Figure 2. The proximity to the proposed designation of spectrum for FPLMTS in the band 1 900 - 1 960 MHz will leave open the possibility of synergy between these two services. The space-to-Earth direction will be added on a secondary basis in the band 1 960 - 1 990 MHz to support bi-directional satellite transmission. ADD 732A will support non-GSO operation in both bands.

MHz
1 710 - 2 025

	Allocation to Services		
	Region 1	Region 2	Region 3
CAN/23/57 MOD	1 710 - ~~2 290~~2 025 FIXED ~~Mobile~~ MOBILE 722 732A 743A ~~744~~746 746A 746B 746C ~~747 748 750~~	1 710 - ~~2 290~~2 025 FIXED MOBILE 722 732A 744 745 746 746A 746B 746C~~747 748 749 750~~	

ADD **732A** (See proposal CAN/23/40).

SUP **749** (See proposal CAN/23/64).

SUP **750** (See proposal CAN/23/66).

CAN/23/58

ADD **746A** Use of the band 1 900 - 1 960 MHz by the mobile service is designated on a worldwide basis for personal public land mobile telecommunications systems having characteristics in accordance with the Recommendations of the CCIR. The band 1 900 - 1 930 MHz shall be available for such use commencing in 1998 and the band 1 930 - 1 960 MHz shall be made available after the year 2003. Use of these bands by these systems has priority over other mobile uses of the bands.

Reasons: To enable the introduction of personal public mobile systems in a common band of spectrum having characteristics as defined in Recommendations of the CCIR addressing Future Public Land Mobile Telecommunications Systems (FPLMTS). This work is currently underway in the CCIR Task Group 8-1. The intent of the wording of the proposed ADD 746A is to provide a priority only over other mobile systems, thus allowing the continued use of the fixed service, should an administration choose this. It is noted that additional spectrum will be necessary for the implementation of all the various applications of FPLMTS in the future particularly in urban areas. It is envisaged that administrations would designate other spectrum allocated to the mobile service in the 1 - 3 GHz range for this purpose on a national basis or as a result of bilateral or multilateral agreements. It is also proposed to align the status of the mobile service worldwide in the band 1 710 - 2 450 MHz to facilitate the development of worldwide application of FPLMTS.

CAN/23/59
ADD 746B After 1 January 2003, the band 1 960 - 1 990 MHz is also allocated to the mobile-satellite service (Earth-to-space) on a primary basis and (space-to-Earth) on a secondary basis.

NZL/26

Agenda item 2.2.4c - For the development of the international use of the mobile service for FPLMTS or designate for this use a band already allocated to the mobile service

Please refer to Annex 4 for proposed changes to Article 8.

New Zealand supports the designation for FPLMTS on a worldwide basis. This is essential for the economic implementation of FPLMTS and would facilitate worldwide roaming.

Consistent with this, New Zealand proposes a modification to Article 8 to change the mobile service allocation in Region 1 from secondary to primary in the band 1 710 - 2 450 MHz, noting that the band 1 700 - 2 450 MHz has primary mobile allocation status in Regions 2 and 3. (See also 2.2.4a.)

New Zealand would support the designation, by footnote, for worldwide use, in the range 1 720 - 2 300 MHz. Noting the spectrum requirements in the CCIR Report, New Zealand supports the designation of up to 230 MHz. As a minimum, 60 MHz should be designated for FPLMTS, to support personal stations.

Finally, noting that the use of Frequency Division Duplex/Time Division Duplex (FDD/TDD) may require different approaches for spectrum utilization, the preferred designation may need to be in two equal bands to support either duplex technique.

ANNEX 4

Agenda item 2.2.4c

MHz
1 710 - 2 290

	Allocation to Services		
	Region 1	Region 2	Region 3
NZL/26/19 MOD	**1 710 - 2 290** FIXED MOBILE ~~Mobile~~ 722 743A 743B 744 746 747 748 750	**1 710 - 2 290** FIXED MOBILE 722 743B 744 745 746 747 748 749 750	

NZL/26/20
ADD **743B** The band [1 720 - 2 300 MHz] is designated for use by FPLMTS.

Reasons: To provide up to 230 MHz for the worldwide roaming element from within this band.

J/27

b) For the development of the international use of the mobile service for future public land mobile telecommunication systems, as indicated in Recommendation No. 205 (Mob-87), or designated for this use a band already allocated to the mobile service.

In WARC MOB-87 a study concerning future public land mobile telecommunication systems (FPLMTS) was recommended.

CCIR continues to study technical characteristics of future public land mobile telecommunication systems (FPLMTS), and has not reached a conclusion yet. CCIR considers that worldwide interoperability is necessary.

Analyses on sharing between FPLMTS and both of the mobile satellite and the space operation services were conducted in CCIR JIWP WARC-92. The result shows that it is unfeasible for FPLMTS to share the same frequency bands with those services because unacceptable interferences with each other will occur.

In Japan, suitable frequency bands have been studied in the frequency range from 1 to 3 GHz based on the agenda item. Japan has used the 1.5 GHz band for the terrestrial mobile service whose demand is increasing rapidly. The 2.6 GHz band is considered to be suitable for the mobile-satellite and the broadcasting-satellite (sound) service. Therefore, Japan considers that it is desirable to select bands for FPLMTS from the 2 GHz band taking the sharing analyses by CCIR into account.

In order to achieve the worldwide interoperability which is recommended in the CCIR JIWP WARC-92 report, Japan considers that the allocation should be made on a worldwide basis. However, it is not necessary to allocate all of the band on a worldwide basis, which is needed for FPLMTS. Considering the result of CCIR JIWP WARC-92, about 60 MHz bandwidth would be appropriate for worldwide allocation.

Because technical characteristics of FPLMTS are not clear even in a CCIR study, it is difficult to discuss appropriate frequency bands for all of the system. Therefore, Japan proposes that the parts of the frequency band for FPLMTS, which are the bands for personal stations, should be allocated on a primary worldwide basis. Taking into account the allocation to the space operation service, Japan proposes to allocate 1 995 - 2 010 MHz band (from 1 July 1998), 2 010 - 2 025 MHz band (from 1 January 2005) and 2 170 - 2 200 MHz band (from 1 July 1998) to FPLMTS.

J/27/41
ADD 750A The frequency bands 1 995 - 2 010 MHz and 2 170 - 2 200 MHz are designated for Future Public Land Mobile Telecommunication Systems (FPLMTS) from 1 July 1998, and the band 2 010 - 2 025 MHz from 1 January 2005.

Reasons: To assure the frequency band for FPLMTS on a worldwide basis.

FNL/29

Introduction

Finland is in favour of Document 20, Part V, concerning frequency bands for Mobile Services within 1 700 MHz - 2 300 MHz and the Space Services at 2 000 MHz and is willing to support the document except the proposed Footnote 746A (See proposal EUR/20/84).

As stated in the CCIR Report to WARC-92, the spectrum requirement for FPLMTS is 230 MHz. This requirement is considered to be sufficient for large metropolitan areas with a high density of traffic and, therefore, a lesser amount of spectrum is likely to suffice for other areas in the foreseeable future. Consequently, the designation of a frequency band for FPLMTS should be done in such a flexible way that the future use of the same spectrum by presently allocated services would not be unduly restricted.

A minimum requirement for FPLMTS to be internationally compatible for roaming stations is that signalling and control can be carried out in a common band.

According to the CCIR Report to WARC-92, a future choice of duplexing method - frequency division or time division - does not affect the total spectrum requirement. Unfortunately, this would not hold true in case only a small amount of common spectrum for signalling and control could be designated by the Conference. In this case, one small block of frequencies would be required for time division duplex but two separate blocks would be necesary for frequency division duplex. Furthermore, for frequency division duplex the two blocks should be separated from each other by a suitable frequency separation (duplex separation).

It is not advisable for the Conference to prejudge the outcome of further CCIR studies on basic characteristics of the FPLMTS such as the duplexing method.

The optimum solution in this situation would clearly be to earmark a contiguous band fulfilling the total requirement of spectrum for FPLMTS on a worldwide basis, and leave to future studies to specify which parts of the spectrum should be taken into use and within what kind of time-table and sharing constraints.

When considering possible candidate bands for FPLMTS the following should be taken into account:

The bands 2 025 MHz - 2 110 MHz and 2 200 MHz - 2 290 MHz are allocated to certain Space Services. According to the CCIR Report to WARC-92, sharing between these Space Services and FPLMTS is not feasible.

In the band 2 400 MHz - 2 500 MHz a large number of ISM-equipment is being used, and this equipment could cause interference problems in particular for the Personal Stations in FPLMTS.

An allocation for Mobile-Satellite Services above 2 520 MHz is proposed, which makes, from the sharing point of view, use of that part of the spectrum impossible for FPLMTS.

On the basis of the above reasons the only possible contiguous band is between 1 700 MHz - 2 025 MHz.

ARTICLE 8

Frequency Allocations

Section IV. Table of Frequency Allocations

The following footnote is proposed:

FNL/29/1
ADD **746A**

The frequency band 1 700 MHz - 1 950 MHz is designated and shall be made available from the year 2000 as required for Future Public Land Mobile Telecommunications Systems (FPLMTS), the technical characteristics of which are being studied by the CCIR.

Reference to this footnote is proposed to be added to the part of Article 8, Section IV which gives allocations to services within the band 1 700 MHz - 1 710 MHz and 1 710 MHz - 2 290 MHz.

MHz
1 700 - 2 290

	Allocation to Services		
	Region 1	Region 2	Region 3
FNL/29/2 **MOD**	**1 700 - 1 710** FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) Mobile except aeronautical mobile 671 722 743A 746A	**1 700 - 1 710** FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 671 722 743 746A	
FNL/29/3 **MOD**	**1 710 - 2 290** FIXED Mobile 722 743A 744 746 746A 747 748 750	**1 710 - 2 290** FIXED MOBILE 722 744 745 746 746A 747 748 749 750	

B/30

2.7 Future Public Land Mobile Telecommunications Systems (FPLMTS)

The Brazilian Administration takes the view that the spectrum allocated in the approximate range 1 - 3 GHz to the mobile services in Region 2 is sufficient to meet their requirements until the year 2010. Furthermore, it agrees with the conclusion of the CCIR that a common 60 MHz spectrum should be designated on a worldwide basis to accommodate the personal stations of the Future Public Land Mobile Telecommunications Systems (FPLMTS).

The development of such systems supported by the designation of a suitable common frequency band on a worldwide basis will bring to all countries the advantages of compatibility and cost reductions due to large scale production that would result. Any additional spectrum necessary to the operation of the FPLMTS mobile stations should be designated on a domestic basis or through regional agreements, and taking into account the convenience of being contiguous to the band designated to personal stations.

To accommodate the requirement for FPLMTS personal stations Brazil proposes the designation of the 1 880 - 1 940 MHz band.

MHz
1 720 - 2 025

	Allocation to Services		
	Region 1	Region 2	Region 3
B/30/34 MOD	~~1 710~~1 720 - ~~2 290~~1 880 FIXED Mobile 722 743A 744 746 ~~747 748 750~~	~~1 710~~1 720 - ~~2 290~~2 025 FIXED MOBILE 746A	
B/30/35 MOD	~~1 710~~1 880 - ~~2 290~~1 940 FIXED ~~Mobile~~MOBILE 746A ~~722~~743A ~~744 746 747 748 750~~		
B/30/36 MOD	~~1 710~~1 940 - ~~2 290~~2 025 FIXED Mobile ~~722~~ 743A ~~744 746 747 748 750~~	722 744 745 746 ~~747 748 749 750~~	

SUP **747, 748 and 750** (See proposal B/30/42).

SUP **749** (See proposal B/30/44).

B/30/37
ADD **746A** The band 1 880 - 1 940 MHz is designated, on a worldwide basis, effective from 1 January 2000, for the operation of the personal stations of the Future Public Land Mobile Telecommunications Systems (FPLMTS), whose technical characteristics are to be defined by the CCIR.

Reasons: To enable the introduction of the personal segment of FPLMTS in a common worldwide band of spectrum thus facilitating the planning and implementation of these systems.

AUS/31

Agenda item 2.2.4c: Future public land mobile telecommunication system (FPLMTS)

Australia strongly supports measures that will assist in the introduction of worldwide system standards for future public land mobile telecommunications systems. Australia considers that there are significant economic, technical and operational advantages for designating common worldwide frequency allocations for the FPLMTS interfaces. These advantages are:

a) the provision of cost effective telecommunications, particularly for developing countries and remote areas, through the use of common technology;

b) the development of common standards for FPLMTS mobile and personal stations will facilitate global markets which lead to greater cost effectiveness for equipment manufacturers and service providers;

c) efficient spectrum utilization by FPLMTS mobile and personal stations will facilitate the planning and implementation of the system and sharing with other services;

d) facilitation of a worldwide roaming capability for FPLMTS personal stations.

We therefore consider that Article 8 should contain footnote provisions designating the bands to be used by FPLMTS.

Australian studies on FPLMTS spectrum requirements in high density traffic areas support the estimates of the CCIR of 170 MHz for the mobile station (R1) interface and 60 MHz for the personal station (R2) interface. For lower traffic density areas, sharing with other services within the same bands will be practicable.

Australia considers that the 1 700 - 2 300 MHz band is the most suitable for FPLMTS. In Australia and many other countries this band is currently utilized by fixed service systems providing low and medium capacity radio relay links, and by the space research, space operations and earth exploration-satellite services in the upper portion of the band. This band is also being considered by many countries for the introduction of cordless and personal communication systems.

Taking this situation into account, we consider that the following factors are particularly important in the designation of spectrum for FPLMTS:

a) the rapid growth of new mobile, personal and wireless systems, and the need to provide for migration of existing and pre-FPLMTS mobile technologies (such as DCS-1800 and DECT) to FPLMTS;

b) there is a need to maximize spectrum efficiency of the 600 MHz wideband (1 700 - 2 300 MHz) for fixed and mobile applications, and to minimize the impact on the fixed service. Considering that the current CCIR fixed service plans in this band require bandwidths of either 200 MHz or 400 MHz, and that FPLMTS requires a bandwidth of around 200 MHz, the band should be considered as three 200 MHz segments. As sharing between FPLMTS and the space research, space operations and earth exploration-satellite services in the second and third segments would be difficult, FPLMTS should be substantially located in the first segment;

c) if FPLMTS is located in either of the second or third segments, the needs of the space research, space operations and earth exploration-satellite services (see our comments on agenda item 2.2.6) may limit the usage of the remaining spectrum by the fixed service;

d) the FPLMTS personal station (R2) interface should overlap the boundary at 1 900 MHz of the CCIR 1 800 and 2 100 MHz fixed service channel plans. This would allow countries to adopt the R2 interface and international roaming while still retaining their fixed service channel plans;

e) there is a need to make provision for the application of space techniques to FPLMTS.

Australia therefore proposes designating spectrum for FPLMTS as follows:

1 700 - 1 870 MHz:	FPLMTS vehicular stations (R1 interface)
1 870 - 1 930 MHz:	FPLMTS personal stations (R2 interface).

MHz
1 710 - 2 300 (cont'd)

	Allocation to Services		
	Region 1	Region 2	Region 3
AUS/31/34 MOD	~~1 710~~2 200 - 2 290 FIXED MOBILE SPACE RESEARCH (space-to-Earth) (space-to-space) SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) ~~Mobile~~ ~~722 743A 744 746~~ ~~747 748 750~~750A	~~1 710~~2 200 - 2 290 FIXED MOBILE SPACE RESEARCH (space-to-Earth) (space-to-space) SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) ~~722 744 745 746~~ ~~747 748 749 750~~750A	
AUS/31/35 MOD	2 290 - 2 300 FIXED SPACE RESEARCH (deep space) (space-to-Earth) Mobile except aeronautical mobile 743A 750A	2 290 - 2 300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth) 750A	

ADD **744A** (See proposal AUS/31/29)

AUS/31/36
ADD **744B** Use of the band 1 700 - 1 870 MHz by the mobile service is designated for the R1 interface (vehicular stations) of public land mobile telecommunication systems having characteristics in accordance with the Recommendations of the CCIR.

AUS/31/37
ADD **744C** Use of the band 1 870 - 1 930 MHz by the mobile service is designated for the R2 interface (personal stations) of public land mobile telecommunication systems having characteristics in accordance with the Recommendations of the CCIR.

AUS/31/38
ADD 744D

In the bands 1 710 - 1 870 MHz and 1 870 - 1 930 MHz, the use of space techniques, in accordance with the Recommendations of the CCIR, may also be authorized when they are used in connection with the uses specified in Nos. 744B and 744C.

AUS/31/39
SUP 747

AUS/31/40
SUP 750

AUS/31/41
ADD 750A

Additional use: In Australia [and .....] , the bands 2 200 - 2 290 MHz and 2 290 - 2 300 MHz are also used for Very Long Baseline Interferometry (VLBI) observations between widely separated terrestrial stations for radio astronomy, geodesy and spacecraft navigation.

Reasons:

1. Agenda item 2.2.4c: To designate a band for the R1 and R2 interfaces of FPLMTS in the bands 1 700 - 1 870 MHz and 1 870 - 1 930 MHz, and to make provision for the application of space techniques to FPLMTS above 1 710 MHz.
2. Agenda item 2.2.6: To satisfy the requirements of the space research, space operation and earth exploration-satellite services identified in Recommendation 716 (Orb-88) by providing allocations on a primary basis to the space research, space operation and earth exploration-satellite services in the table in the bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz. Consequential deletion of footnote allocations to these services in these bands in RR 747 and RR 750 are therefore proposed.
3. Agenda item 2.2.4b: To provide a more suitable allocation for aeronautical public correspondence (see also proposal AUS/31/29).
4. Agenda item 2.2.6: To indicate the use of the band 2 200 - 2 300 MHz for VLBI observations and measurements in certain countries in the space research and radio astronomy services.

GHz
14.5 - 14.8

AUS/31/42
NOC

Allocation to Services		
Region 1	Region 2	Region 3
14.5 - 14.8	FIXED FIXED-SATELLITE (Earth-to-space) 863 MOBILE Space Research	

AUS/31/43

Australia supports the thrust of draft Resolution No. RRR submitted by the CEPT countries concerning the 14.5 - 14.8 GHz band (Document 20, proposal EUR/20/131).

Reasons: Agenda item 2.2.5: The existing allocations are required to be maintained.

MLI/39/9

No new or supplementary allocation should be made to terrestrial APC systems in the above-mentioned bands reserved for the aeronautical service.

c) Development of the use of future public land mobile telecommunication systems

Pursuant to Recommendation No. 205 (Mob-87), the CCIR has examined this question and defined the characteristics and operational conditions which would be desirable for this system. In view of the enormous size of its territory, Mali considers however that greater protection should be given to the fixed service and to other services.

PAK/44

Agenda Item 2.2.4c - Consideration of allocation of frequency band for the development of international use of mobile service for future land/mobile telecommunications systems (FPLMTS)

The minimum bandwidth requirement estimated for future public land mobile telecommunication systems is 230 MHz (60 MHz for personal stations and 170 MHz for mobile stations) in the CCIR Report to WARC-92. The potential of FPLMTS for providing economic and rapid communication facilities to rural areas is an attractive feature for developing countries.

The frequency bands from 1 700 - 2 690 MHz have primary allocation for mobile service in Regions 2 and 3 providing a total bandwidth of 990 MHz sharing with other services. Thus, as far as Region 3 is concerned, future mobile services can be implemented without the need for any modification to the Table of Frequency Allocations in Article 8.

Regarding the specific designation of a frequency band for future use by FPLMTS, it is proposed that this may be considered after further progress of CCIR work on technical standards for the system i.e. modulation parameters, protocols, etc. In view of the extensive use and future demands on the spectrum in the frequency bands mentioned above, we favour a cautious approach to reservation of a frequency band of the order of 230 MHz bandwidth for FPLMTS at this stage.

V. FPLMTS

VUT/48/8

Vanuatu supports measures that would lead to a worldwide standard for FPLMTS and we support our regional neighbour, Australia's, proposal for the following FPLMTS bands:

1 700 - 1 870 MHz Vehicular stations (Document 31, proposal AUS/31/36)

1 870 - 1 930 MHz Personal stations (Document 31, proposal AUS/31/37)

VUT/48/9

Our fixed digital microwave links lie in the band 2.1 GHz - 2.3 GHz and consequently we would not like to see FPLMTS allocations within these frequencies.

Agenda item 2.2.4c - Development of future public land mobile telecommunication systems

INS/52/5

For the initial implementation of FPLMTS, the meeting agreed to propose the centre frequency of fixed service at the 1.8 GHz band (1 790.5 - 1 825.5 MHz) and 2.0 GHz (1 982.5 - 2 017.5 MHz).

6. Agenda item 2.2.4c - On the allocation of frequency bands 1 - 3 GHz for the development of the international use of the mobile service for future public land mobile telecommunication systems

FPLMTS will meet the rapid increase in demand for mobile radio worldwide. The CCIR report indicated the wide bandwidth of spectrum required for FPLMTS. Thailand considered that the frequency band 1.8 GHz (1 713.5 - 1 902.5 MHz) and 2.0 GHz (1 905.5 - 2 094.5 MHz) shared with the fixed service is appropriate. Thailand proposes that:

THA/56/7

- The centre gap frequency of 35 + 35 MHz of the fixed service in the band 1.8 GHz (1 790.5 - 1 825.5 MHz) and 2.0 GHz (1 982.5 - 2 017.5 MHz) be allocated to FPLMTS.

THA/56/8

- Future extension of frequency bands for FPLMTS to meet the minimum spectrum bandwidth requirement of 170 MHz for mobile stations and 60 MHz for personal stations should be on the 1.8 GHz (1 713.5 - 1 902.5 MHz) and the 2.0 GHz (1 905.5 - 2 094.5) bands.

MEX/63

3. Allocations to the mobile service and to future public land mobile telecommunication systems

A growing demand for spectrum for the mobile services, both in radiotelephony and data transmission, has been noted in Mexico in the past few years. Personal communications have been on the increase owing to the acceptance by the public of cellular technologies, trunks for vehicle fleets and radio-paging, etc. Since the future of personal communications is of interest to Mexico, it is proposed that the Conference should adopt measures which make for greater flexibility in the use of the bands below 1 GHz so that these needs can be met. In particular, Mexico proposes to add its name under Nos. 675 and 678 of the Radio Regulations and to raise to primary status the present secondary allocation to the mobile service in the band 942 - 960 MHz.

MEX/63/23

MOD 675 Different category of service: in Chile, Colombia, Ecuador, the United States, Guyana ~~and~~, Jamaica and Mexico, the allocation of the bands 470 - 512 MHz and 614 - 806 MHz to the fixed and mobile services is on a primary basis (see No. 425), subject to agreement obtained under the procedure set forth in Article 14.

Reasons: To provide flexibility for use of the bands 470 - 512 MHz and 614 - 806 MHz.

MEX/63/24

MOD 678 Additional allocation: in Costa Rica, El Salvador, Ecuador, the United States, Guatemala, Guyana, Honduras, Jamaica, Mexico and Venezuela, the band 512 - 608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under the procedure set forth in Article 14.

Reasons: To provide flexibility for use of the band 512 - 608 MHz.

MHz
942 - 960

Allocation to Services		
Region 1	Region 2	Region 3
942 - 960	942 - 960	942 - 960
FIXED	FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE ~~Mobile~~	MOBILE
BROADCASTING 703		BROADCASTING
704	~~708~~	701

MEX/63/25
MOD

Reasons: To provide flexibility for use of the band 942 - 960 MHz.

MEX/63/26
SUP 708

Reasons: Consequence of the proposal to upgrade the status of the mobile service.

~~TZA/74/9~~

The fact that worldwide systems using satellite will soon be introduced, Tanzania is of the view that new frequency allocation on a worldwide basis to terrestrial systems for public correspondence with aircraft is not necessary.

c) for the development of the international use of the mobile service for future public land mobile telecommunication systems, as indicated in Recommendation No. 205 (Mob-87), or designate for this use a band already allocated to the mobile service,

TZA/74/10

Tanzania is of the view that a frequency band be allocated for future public land mobile telecommunications systems (FPLMTS) on a worldwide basis to provide a wide range of services, voice and non-voice, with the potential value to developing countries and others with sparsely populated areas having limited communication facilities. The frequency band 1 429 - 1 525 MHz is considered appropriate for this service.

SEN/75

The Administration of Senegal wishes to express its interest in future public land mobile telecommunication systems, while drawing attention to the need to protect existing systems.

ANNEX

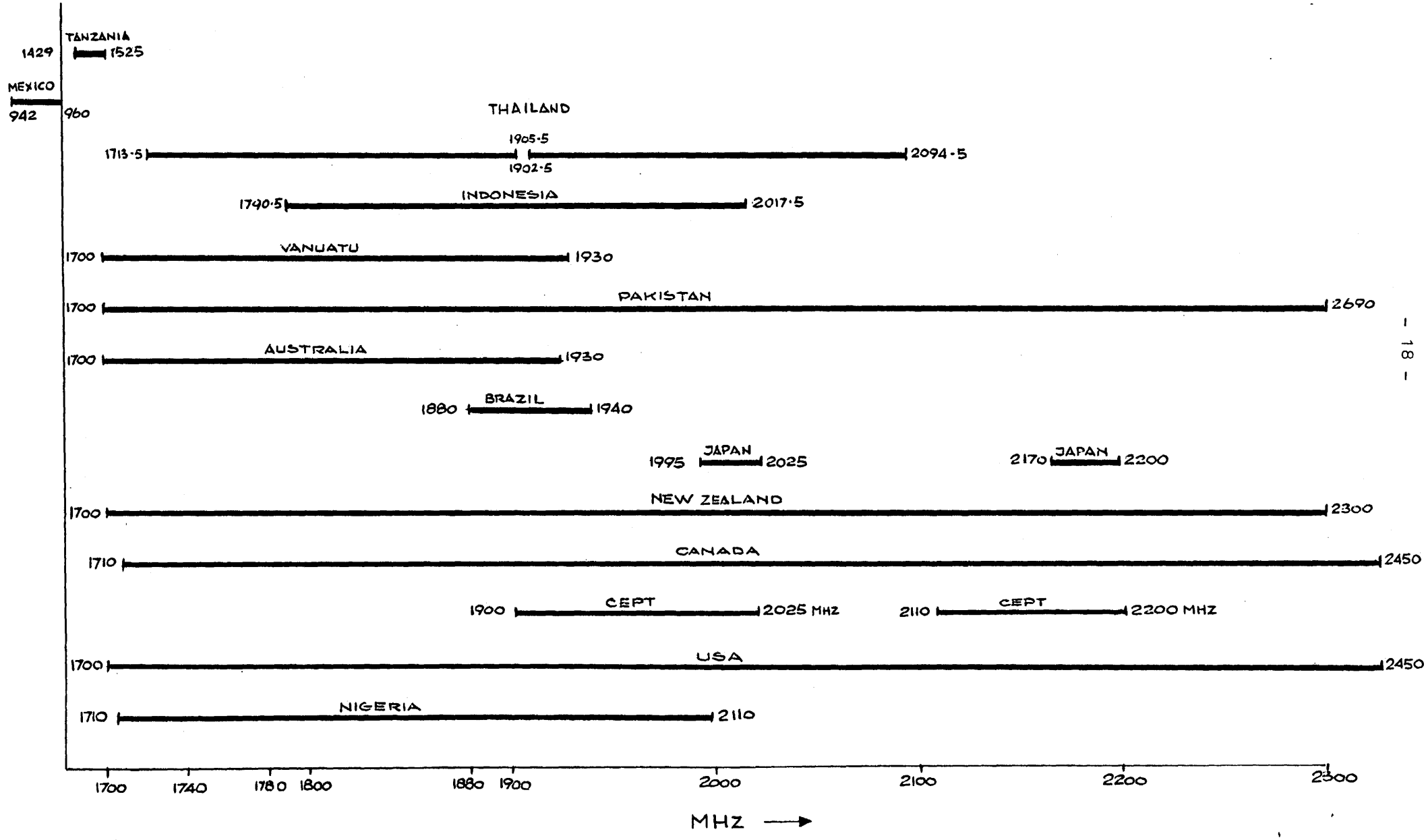
DRAFT PROPOSAL ON FUTURE PUBLIC LAND MOBILE TELECOMM SYSTEM (FPLMTS)

S.NO	NAME OF THE COUNTRY	DOC NO	PAGE	FREQ BAND (MHZ)	BW (MHZ)	REMARKS
1.	BELARUS, RUSSIN FED & UKRAINE.	7-E	-	-	-	a) NO SPECIFIC PROPOSAL ON FPLMTS. b) MOBILE SERVICE 'UPGRADED TO PRIMARY' IN R-1.
2.	NIGERIA	9-E	3	1710 — 2110	—	NO SPECIFIC PROPOSAL ON FPLMTS
3.	U S A.	12-E ADD-8	1,2	1700 - 2450	-	NO SPECIFIC ALLOCATION PROPOSED ON FPLMTS.
4.	CEPT	20E	41 43	1900-2025 2110 - 2200	200	a) MOBILE SERVICE 'UPGRADED TO PRIMARY IN R-1 (746-A & 746-B added for FPLMTS)
5.	CANADA	23-E	9 37	1900-1960 Remaing bet 1710 - 2450	60 (P-C) 170	a) MOBILE SERVICE 'UPGRADED TO PRIMARY IN R-1 (746-A added for FPLMTS)
6.	NEWZELAND	26	4 17	bet 1720 - 2300	230	MOBILE SERVICE UPGRADED TO PRIMARY IN R-1 (743-B added for FPLMTS).
7.	JAPAN	27	586 19	1995 - 2025 2170 - 2200	60 (PC)	a) DIFFICULT TO DISCUSS b) MOBILE SERVIC UPGRADED TO PRIMARY IN R-1 (750-A added for FPLMTS)
8	BRAZIL	30	4 17	1880 - 1940 Remaining bt 1-3GHz	60 (PC)	Add 746-A.

9	AUSTRALIA	31	9 & 10
			24&25
				1700 - 1870
				1870 - 1930
					170 (S/VC)
					60 (S/PC)
						ADD 744-B, 744-D
						ADD 744-C, 744-D
						MOBILE SERVICE UPGRADED TO PRIMARY IN R-1.

10.	PAKISTAN	44	4	1700 - 2690	—	NO SPECIFIC ALLOCATION PROPOSED
11.	VANUATU	48	4	1700 - 1870 1870 - 1930	170 (PC 30 (VC)	—
12.	INDONESIA	52	2	1790.5 - 1825.5 1982.5 - 2017.5	30 35 } 75	—
13.	THAILAND	56	283	1713.5 - 1902.5 1905.5 - 2094.5	89 89 } 178	IN TWO PHASES
14.	MEXICO	63	4 14	942 - 960	18	MOBILE SERVICE UPGRADED TO PRIMARY IN R-2.
15.	TANZANIA	74	4	1429 - 1525	96	-

PROPOSED FREQUENCY BAND FOR FPLMTS
(COUNTRY-WISE)



INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/20-E
13 February 1992
Original: English

WORKING GROUP 4B

Third Report of the Chairman of Sub-Working Group 4B1 to Working Group 4B

ALLOCATION OF FREQUENCY BAND 400.15 - 401 MHz TO THE SPACE RESEARCH SERVICE AND FREQUENCY BAND 942 - 960 MHz TO MS BELOW 1 GHz

The modification to the Table of Frequency Allocations together with associated text of RR 641A as approved by Sub-Working Group 4B1 are put forward for consideration in Working Group 4B.

MHz
400.15 - 401

	Allocation to Services		
	Region 1	Region 2	Region 3
MOD	**400.15 - 401**	METEROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) 674A Space Operation (space-to-Earth) 647	

ADD **647A** The band 400.15 - 401 MHz is also allocated to the space research service in the space-to-space direction for communication with manned space vehicles. In this application, the space research service will not be regarded as a safety service.

MHz
942 - 960

	Allocation to Services		
	Region 1	Region 2	Region 3
MOD	**942 - 960** FIXED MOBILE except aeronautical mobile BROADCASTING 703 704	**942 - 960** FIXED ~~Mobile~~ MOBILE ~~708~~	**942 - 960** FIXED MOBILE BROADCASTING 701

SUP **708**

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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WORKING GROUP 4C

TERMS OF REFERENCE FOR DG 1 TO WG 4C

To examine proposals for frequency allocations to a general-satellite service with the aim of reaching a consensus on the requirement for such a service and, if necessary, the most appropriate frequency band for the allocation.

J.R. CONNOLLY
Chairman of WG 4C/DG 1

GENERAL SATELLITE SERVICE
FREQUENCY ALLOCATIONS

List of Drafting Group participants:

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Please note that the meeting of DG 1 will take place from 1245 to 1445 hours on Friday, 14 February 1992 in ANTEQUERRA room.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

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Draft Second Report of the Chairman of Sub-Working Group 4B1
to the Chairman of the Working Group 4B

LEO BELOW 1 GHz

POSSIBLE ALLOCATIONS OF FREQUENCY BANDS BELOW 1 GHZ TO LOW-ORBITING MOBILE SATELLITE SYSTEMS ON THE BASIS OF APPROPRIATE SHARING CRITERIA

Down-link Allocations

MHz
137 - 138

Allocation to Services		
Region 1	Region 2	Region 3
137 - ~~138~~137.025	~~SPACE OPERATION (space-to-Earth)~~ METEOROLOGICAL SATELLITE (space-to-Earth) SPACE OPERATION (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE SATELLITE (space-to-Earth) ~~Fixed~~ ~~Mobile except aeronautical mobile (R)~~ 596 597 598 599 599A	
~~137~~137.025 - ~~138~~137.175	~~SPACE OPERATION (space-to-Earth)~~ METEOROLOGICAL SATELLITE (space-to-Earth) SPACE OPERATION (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile Satellite (space-to-Earth) ~~Fixed~~ ~~Mobile except aeronautical mobile (R)~~ 596 597 598 599 599A	

MHz
137 - 138

Allocation to Services		
Region 1	Region 2	Region 3
~~137~~137.175 - ~~138~~137.825	~~SPACE OPERATION (space-to-Earth)~~ METEOROLOGICAL SATELLITE (space-to-Earth) SPACE OPERATION (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE SATELLITE (space-to-Earth) ~~Fixed~~ ~~Mobile except aeronautical mobile (R)~~ 596 597 598 599 599A	
~~137~~137.825 - 138	~~SPACE OPERATION (space-to-Earth)~~ METEOROLOGICAL SATELLITE (space-to-Earth) SPACE OPERATION (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile Satellite (space-to-Earth) ~~Fixed~~ ~~Mobile except aeronautical mobile (R)~~ 596 597 598 599 599A	

ADD **599A** Coordination between mobile satellite systems will be in accordance with the provisions [of Resolution ....] The mobile-satellite service will be limited to a power flux-density of -120 dBW/m2/4 kHz, at the surface of the Earth. This power flux-density limit should not be exceeded for more than 1% of the time. The mobile-satellite service will limit out-of-band emission in the band 150 - 153 MHz to [-233 dB (W/m24 kHz)].

MHz
400.15 - 401

Allocation to Services		
Region 1	Region 2	Region 3
400.15 - 401	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Space Operation (space-to-Earth) MOBILE SATELLITE (space-to-Earth) 647 647A	

ADD **647A** Coordination between mobile satellite systems will be in accordance with the provision of Resolution ... To protect fixed and mobile services, the mobile-satellite service will be limited to a power flux-density of -120 dBW/m2/4 kHz. The mobile-satellite service will limit out-of-band in the band 406.1 - 410 MHz to [-223 dB(W/m2/4 kHz)].

Up-link Allocations

MHz
148 - 150.05

Allocation to Services		
Region 1	Region 2	Region 3
148 - 149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE SATELLITE 608 608A	**148 - 149.9** FIXED MOBILE MOBILE SATELLITE 608 608A	
149.9 - 150.05	RADIONAVIGATION-SATELLITE MOBILE SATELLITE (Earth-to-space) 609 609A 609B	

ADD **608A** The mobile-satellite service shall not constrain the development and use of fixed, mobile and space operations services in this allocation. MSS mobile earth station transmitters will not cause a power flux-density in excess of -150 dBW/m^2/4 kHz outside of national boundaries more than 1% of any 1 hour period.

ADD **609B** The mobile-satellite service shall be secondary in this allocation until 1 January 1997.

Annex: 1

ANNEX

Record of Drafting Group Discussions

1. Introduction

This report gives the results of discussions with respect to proposals presented to WARC-92 for new allocations to the mobile-satellite service (MSS) in the 137 - 138 MHz, 148 - 149.9 MHz, 149.9 - 150.05 MHz and 400.15 - 401 MHz bands. The Conference received proposals for MSS allocations in these bands from a number of Administrations. In addition, other countries expressed strong support for some or all of the proposals.

In addition, a number of countries have expressed concern that the proposed service will be able to protect existing systems, and wanted to have assurances that their systems would receive no unacceptable interference from new systems in the proposed MSS operating in the same bands.

The CCIR/JIWP Report to the Conference addresses this service in the proposed bands and gives guidance as to the characteristics of the systems and the sharing criteria to existing systems in the same bands (Tables II and III). Notes to these tables give indications of the frequency allocations in the CCIR study. The allocations indicated above are in agreement with those assumed by the CCIR.

This report discusses:

1) the expressed concerns;
2) the sharing criteria and techniques to protect the existing systems; and
3) the proposed allocation, for both down-link and up-link allocations. A description of the requirement for the services is also provided.

2. Service objective

This new service to be provided at VHF/UHF, will use non-geostationary space stations to provide basic message communications to millions of people who have no reliable radio service. These services can fill service and geographic gaps in the existing worldwide telecommunications network. A constellation of LEO satellites could provide time continuous coverage either geographical or nearly globally. LEO systems have the ability to provide one or two-way data communications and position location to terminals which are small and lightweight. These pocket-sized terminals could be in wide demand for purposes such as emergency alerting, data collection, paging, position location and short message transmission, and limited digital data transfer, using store and forward techniques to unserved areas to support economic development.

3. Down-link proposed allocations

The proposed down links for the MSS are 137 - 138 MHz and 400.15 - 401 MHz.

3.1 Concerns

The following concerns were expressed by different Administrations:

- India and the United Kingdom expressed concern about out-of-band emissions which could cause unacceptable interference to a radio astronomy site operating at 150 MHz if spread spectrum modulation is used in these allocations;
- the United Kingdom and Canada expressed concern about interference to radio astronomy in the 406.1 - 410 MHz band for the same reason;

- Australia expressed concern about sharing with television;
- Kenya, the United Kingdom, with other European countries, and a number of other Administrations expressed concern about sharing with fixed and mobile services;
- the Russian Federation expressed concern over compatibility with existing mobile services, specifically the aeronautical-mobile service;
- the WMO expressed concern about sharing with the METSAT service.

3.2 Sharing Considerations

Sharing with other space services with primary allocations in this band will be accomplished either by channel and geographic separation (existing space services use narrow-band carriers) or by a reduction in power flux-density below -150 dBW/m2/4 kHz. Sharing with fixed and mobile services in the 137 - 138 MHz band will be accomplished by an MSS power flux-density limitation of -120 dBW/m2/4 kHz. This is a value comparable to the transmissions from existing and planned meteorological satellites using this band.

It was the conclusion of the Drafting Party that it would be better to use another approach (e.g. by Committee 5) than Article 14 to provide for the necessary coordination, since in the past it may have unnecessarily inhibited the introduction of beneficial new systems. It was also noted that Article 14 is a candidate for suppression by the VGE.

4. Proposed up-link allocations

4.1 Concerns

- a number of Administrations expressed concern with respect to ensuring that the transmissions of MSS earth stations would not cause interference to their existing fixed and mobile systems in the band 148 - 149.9 MHz;
- Canada and India expressed concern that their existing high power transmitters could cause interference to the MSS satellite, particularly if spread spectrum techniques were used by the MSS systems;
- the United Kingdom expressed the concern that their existing and planned high density land mobile systems could cause interference to the MSS satellites;
- concern was also expressed that the MSS should not put constraints on the development of fixed and mobile systems;
- the Russian Federation expressed concerns over compatibility with existing service in the bands 148 - 149.9 MHz and 149.9 - 150.05 MHz which is exclusively allocated to radionavigation-satellite service;
- concern was also expressed about the potential for cross-border interference.

4.2 Sharing

There were presentations by proposed LEO system operators on the specific technical characteristics of their systems with respect to how sharing would take place with existing systems. The techniques are described below.

One technique is called dynamic channel assignment. With this technique the satellite first scans the entire up-link band. The power level in each potential channel is recorded by the satellite. The channels are then prioritized according to the potential for interference, and stored on-board the satellite. This information is updated continuously (i.e. every few seconds). When a user desires to transmit, the satellite commands it to the appropriate frequency.

Dynamic channel assignment, combined with the statistics of MSS mobile earth station transmissions, avoid harmful interference to fixed and mobile services. Analyses indicate that during any period of time the power flux-density (pfd) at a terrestrial station receiver from all MSS earth station transmissions will not be exceeded more than 1% of the time. The CCIR Working Party on mobile satellites is in the process of developing a Recommendation on calculation methods to precisely determine the protection of fixed and mobile receivers.

Another proposed sharing technique is spread spectrum modulation which lowers the e.i.r.p. density of the satellite and ground station terminal transmissions by spreading the signal across on megahertz of bandwidth. The result of this technique is to produce power flux-density levels at ground level which are well below the allowable limits for the fixed and mobile services receivers. The same spreading technique inherently rejects interference from the narrow channel transmissions of the fixed and mobile service transmitters. In addition, the very short burst (approximately 100 milliseconds) transmission technique of the spread spectrum system in most cases will not be perceptible to the average fixed or mobile system receiver. This very short time of message transmission allows the LEO MSS system to operate at very high levels of capacity and still not exceed the 1% duty cycle rate.

In general, the proposed MSS systems below 1 GHz are for domestic use. Each country can refuse to authorize the use of the frequency of MSS up links. Each territory can control the use of the up-link frequencies assigned through its own domestic control station. Normal regulatory provisions can be used to control cross-border interference problems.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/23-E
14 February 1992
English only

DRAFTING GROUP 4B-4

Draft

REPORT BY THE CHAIRMAN OF DRAFTING GROUP 4B-4 TO THE CHAIRMAN OF WORKING GROUP 4B

SUMMARY OF WRITTEN PROPOSALS ON AGENDA ITEM 2.2.4c

This report contains a summary of written proposals only. The proposals listed below on the future public land mobile telecommunication systems (FPLMTS) are in the attached annexes as detailed under:

a) proposals on FPLMTS extracted from documents of various administrations — Annex I

b) proposed band designated for FPLMTS — Annex II

c) salient features of the proposals on FPLMTS of various administrations — Annex III

Drafting Group 4B-4 is composed of representatives of administrations from New Zealand, Japan, Venezuela, Brazil, Yugoslavia, Switzerland, Germany, Italy, Israel, Mexico, France, India, China, Papua New Guinea, Spain, Australia, Pakistan, Canada, Austria, Sweden, Indonesia, Korea (DPR), United States, UK/CEPT (27 countries), Saudi Arabia, Finland, Hungary.

ARSUMUHD A. SHAIKH
Chairman

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

CAMR-92 CAMR CHARGÉE D'ÉTUDIER LES ATTRIBUTIONS DE FRÉQUENCES DANS CERTAINES PARTIES DU SPECTRE

Document DL/24-E
17 February 1992
Original: English

MÁLAGA-TORREMOLINOS, FÉVRIER/MARS 1992

COMMITTEE 5

Note by the Chairman of Drafting Group [5A]

Draft

RESOLUTION No. ....

PROVISIONAL APPLICATION OF ARTICLES 55 AND 56 TO ENSURE HARMONIZATION WITH THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA (SOLAS) AS REVISED IN 1988

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Málaga-Torremolinos, 1992),

considering that

a) the provisions of Articles 55 and 56 of the Radio Regulations were modified at the World Administrative Radio Conference for the Mobile Services, Geneva, 1987, and were not accepted by all administrations in regard to carriage of personnel certificated for maintenance of shipborne equipment for distress and safety communications;

b) the 1988 Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974 on the Global Maritime Distress and Safety System (GMDSS) adopted maintenance requirements to ensure equipment availability which were more flexible than those adopted by the World Administrative Radio Conference for Mobile Services, Geneva, 1987;

c) the resulting inconsistency between the ITU Radio Regulations and IMO SOLAS Convention relating to this matter of standards for maintenance and operation of shipborne GMDSS equipment has significant implications related to the safety of life at sea and should be reconciled;

d) the Administrative Council, in accordance with Resolution No. 7 of the Plenipotentiary Conference, Nice 1989, included Articles 55 and 56 in the WARC-92 agenda to find an appropriate solution to this problem;

noting

that this Conference took appropriate decisions regarding Articles 55 and 56 to harmonize the provisions of the Radio Regulations with the IMO SOLAS Convention;

recognizing

that appropriate action should be taken so that administations desiring to immediately implement the GMDSS on a voluntary basis may do so without a conflict between the Radio Regulations and the SOLAS Convention;

resolves

that during the period preceding the date of entry into force of the partial revision of the Radio Regulations administrations shall apply Articles 55 and 56, as contained in the Final Acts of the WARC-92, on a provisional basis.

Robert C. McIntyre
Chairman, Drafting Group [5A]

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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18 February 1992
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SUB-WORKING GROUP 5B4

Sub-Working group 5B4

DRAFT

RESOLUTION No.COM 5/[5B4]

Relating to the Introduction of HDTV Systems of the Broadcasting-Satellite Service (BSS) in the Band [21.4 - 22.0] GHz

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

a) that this present Conference has re-allocated the band [21.4 - 22.0] GHz to the broadcasting-satellite service to be implemented after [1 April 2005] and that by [ADD 873A] it is intended for use by the BSS for wide RF-band high-definition television (HDTV);

b) that until [1 April 2005] the existing services operating in the band [21.4 - 22.0] GHz in accordance with the Table of Frequency Allocations are therefore entitled to continue in operation without harmful interference from other services;

c) that nevertheless it is desirable to facilitate the introduction of experimental HDTV systems into this band before the year [2005] without affecting the continued operation of existing services;

d) that it also may be possible to introduce operational HDTV systems into this band before the year [2005] without affecting the continued operation of existing services;

e) that after [1 April 2005] the introduction of HDTV systems into this band must be regulated in a flexible and equitable manner until such time as a future competent WARC has adopted definitive provisions for this purpose in accordance with Resolution No. 507;

f) that procedures are required for the three sets of circumstances envisaged in **considerings** c), d) and e) above,

resolves

1. to adopt the interim procedures contained in the Annex hereto;

2. to invite all Administrations to comply with the procedures;

3. to instruct the IFRB to apply the procedures;

4. to establish [1 April 1992] as the starting date for the application of the elements of these procedures which are relevant to the situation before [1 April 2005].

ANNEX TO RESOLUTION No. COM 5/[5B4]

Interim Procedures for the Introduction of BSS (HDTV) Systems in the Band [21.4 - 22.0] GHz

Section I. General Provisions

1. It shall be understood that prior to [1 April 2005] all existing services in the band [21.4 - 22.0] GHz 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 only on the basis of [No. 873A] of the Radio Regulations; they shall neither cause harmful interference to BSS (HDTV) systems nor be entitled to claim protection from such systems. It shall be understood that prior to a future competent Conference the introduction of an operational BSS (HDTV) system into the band [21.4 - 22.0] GHz should be regulated by an interim procedure in a flexible and equitable manner and shall be ended when a new procedure, to be adopted by this future Conference, comes into force.

Section II. Interim Procedure Relating to Experimental BSS (HDTV) Systems Introduced Before [1 April 2005]

2. For the purpose of introducing experimental BSS (HDTV) systems in the band [21.4 - 22.0] GHz before [1 April 2005] under the provisions of Article 34 of the Radio Regulations, the procedures contained in Resolution No. 33 shall be applied.

Section III. Interim Procedure Relating to Operational BSS (HDTV) Systems Introduced Before [1 April 2005]

3. For the purpose of introducing operational BSS (HDTV) systems in the band [21.4 - 22.0] GHz before [1 April 2005] the procedure contained in Resolution No. 33 shall be applied, if the power flux-density at the Earth's surface produced by emissions from a space-station exceeds;

- [-115] dB(W/m^2) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

  or

- [-105] dB(W/m^2) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane;

  or

- values to be derived by linear interpolation between these limits for angles of arrival between 5 and 25 degrees above the horizontal plane.

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 Sections B and C of Resolution No. 33 only shall be applied.

Section IV. Interim Procedure Relating to BSS (HDTV) Systems Introduced After [1 April 2005]

4. For the purpose of introducing and operating BSS (HDTV) systems in the band [21.4 - 22.0] GHz after [1 April 2005] and before a future Conference has taken decisions on definitive procedures the procedure in Sections B and C of Resolution No. 33 shall be applied.

5. 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.

6. Administrations shall to the maximum extent possible seek to ensure that operational BSS(HDTV) systems introduced into the band [21.4 - 22.0] GHz under Sections III or IV of this Resolution have characteristics which take into account the studies of the CCIR for the preparation of a future competent WARC.

T.G. JEACOCK

Chairman, Sub-Working Group 5B4

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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AD HOC 6/4B1

Ad hoc 6 to 4B

DRAFT TERMS OF REFERENCE

BROADCASTING-SATELLITE SERVICE (SOUND) AND COMPLIMENTARY

1. Cancellation of the frequency bands proposed for BSS (Sound) and complimentary terrestrial broadcasting
2. Bandwidth requirement
3. Identification of a preferred band, preferably on a worldwide basis
4. Methods for protection or accommodation of existing services in the bands considered
5. Proposals for timed introduction
6. Cancellation of geostationary and non-geostationary orbit possibilities
7. Implications for planning

R. BARTON
Chairman of ad hoc 6 to 4B

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

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MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

GT-PLEN Ad-hoc

Note by the Chairman of GT-PLEN Ad-hoc

The following texts relevant to Doc. DT/63 have been included to facilitate consideration.

M. MUROTANI
Chairman of Working Group
to the Plenary

RESOLUTION No. 6

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

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

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

recognizing

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

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

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

resolves

that the IFRB should, as soon as possible after the World Administrative Radio Conference, Geneva, 1979, prepare a handbook incorporating appropriate graphical material, including flow charts, to help the staff of administrations to apply the regulatory procedures of Chapter IV of the Radio Regulations;

instructs the Secretary-General

1. to publish the handbook prepared by the IFRB;

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

RES9-1

RESOLUTION No. 9

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

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

recognizing

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

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

recognizing also

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

RES9-2

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

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

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

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

resolves

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

further resolves

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

invites administrations and the IFRB

to participate fully and promptly in this procedure.

RES9-3

ANNEX TO RESOLUTION No. 9

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

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

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

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

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

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

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

---

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

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

RES9-4

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

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

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

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

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

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

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

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

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

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

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

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

8.2 send to administrations a copy of their National List;

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

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

RES9-6

TABLE

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

RES9-7

TABLE *(cont.)*

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

RESOLUTION No. 36

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

The World Administrative Radio Conference, Geneva, 1979,

having adopted

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

considering

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

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

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

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

noting

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

RES36-2

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

resolves

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

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

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

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

RESOLUTION No. 62

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

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

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

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

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

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

resolves

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

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

RESOLUTION No. 64

Relating to CCIR Study of Lightning Protection of Radio Equipment

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

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

considering further

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

invites the CCIR

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

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

and invites administrations

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

RESOLUTION No. 67

Relating to Improvements in the Design and Use of Radio Equipment

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

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

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

resolves

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

RESOLUTION No. 68

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

The World Administrative Radio Conference, Geneva, 1979,

having considered and adopted

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

believing

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

recognizing however

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

RES68-2

recommends

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

instructs the Secretary-General

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

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

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

RESOLUTION No. 108 (Orb-88)

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

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

considering

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

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

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

resolves

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

instructs the IFRB

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

RES324-1

RESOLUTION No. 324 (Mob-87)

Procedures to be Applied for the Coordination of the Use of the Frequency 518 kHz for the International NAVTEX System

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

considering

a) that this Conference has adopted, as a new Article 14A, a procedure to be applied by administrations and the IFRB for the coordination of the planned use of the frequency 518 kHz for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships by means of automatic narrow-band direct-printing telegraphy (International NAVTEX system);

b) that this Conference has decided to abrogate Resolution 318 (Mob-83);

resolves

that the administrations and the Board shall, with immediate effect, apply the procedures as described in the new Article 14A in their activities to coordinate the planned use of the frequency 518 kHz for the International NAVTEX system;

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization (IMO), the International Hydrographic Organization (IHO) and the World Meteorological Organization (WMO).

RESOLUTION No. 325 (Mob-87)

Use of the Additional Channels Reserved for Duplex Radiotelephony in the HF Bands Allocated to the Maritime Mobile Service

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

considering

a) that there is an increasing demand for additional duplex channels for radiotelephony in the HF bands allocated on an exclusive basis to the maritime mobile service;

b) that this Conference has modified Appendices 16 and 31 of the Radio Regulations and has provided a number of additional duplex channels for radiotelephony (channel Nos.:

from 427 to 429
from 607 to 608
832, and from 834 to 837
from 1233 to 1241
from 1642 to 1656
from 1801 to 1805, and from 1807 to 1815
from 2241 to 2253
from 2501 to 2509);

c) that it is necessary to develop procedures for the establishment of initial duplex radiotelephony allotments for the newly available channels, as well as for the updating of the use of these channels;

noting

that the current Appendix 25 Allotment Plan together with Article 16 of the Radio Regulations have effectively served the maritime mobile service and the latter may be used for the updating of the use of the new channels;

resolves

1. that the newly available channels shall be initially allotted in accordance with the procedure contained in the Annex to this Resolution;

2. that Appendix 25 shall be updated by including in it the allotments resulting from the application of the provisions of the Annex to this Resolution;

3. that, following the application of *resolves* 2 above, the administrations shall apply the procedure of Article 16 for any modification to existing allotments or the addition of new allotments.

ANNEX TO RESOLUTION No. 325 (Mob-87)

Procedure for Establishing an Initial Allotment Arrangement in the Newly Available Channels for Duplex Radiotelephony in the HF bands

1. Administrations intending to use one of the new channels indicated in *considering b)* shall send their requirements to the Board by providing the information listed in Appendix 5 to the Radio Regulations before 1 April 1989.[1]

2. Following the receipt of this information, the Board shall examine these requirements and, if necessary, request the Administrations to communicate any missing information. Only those requirements which are complete will be taken into account in this procedure.

3. Using its Technical Standards, the Board shall prepare an initial allotment arrangement following the order indicated in paragraph 4 below.

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[1] *Note* – Administrations that cannot use channels Nos. 428, 429, 834, 835, 836, 837 shall indicate accordingly when submitting their requirements.

4. The initial allotment arrangement for the new channels shall include for a given band and a given allotment area the requirements in the following order:

4.1 requirements of administrations having no allotments in Appendix 25 to the Radio Regulations and which require such allotments;

4.2 requirements of administrations which, following the application of Article 16, could not be given an allotment in the current Appendix 25 with the required protection criteria;

4.3 requirements of administrations asking for additional allotments to supplement their existing allotments in order to satisfy an increase in radiotelephony traffic.

5. The Board shall consult those administrations whose requirements could not be included in the allotment arrangement for the new channels and, if an administration insists, the Board shall determine from all the channels available for duplex radiotelephony the channel which is the least affected, and shall include the requirement in this channel.

6. Not later than 1 October 1990 the Board shall publish the allotment arrangement for the new channels so that administrations may comment on it.

7. If within a period of 60 days following this publication, an administration informs the Board that its proposed allotment is not acceptable to it, the Board shall endeavour to identify an alternative channel as indicated in paragraph 5 above.

8. If following the application of paragraph 7 above, the administration concerned is not in a position to accept the Board's recommendation, the requirement will be returned to the administration concerned with the suggestion that it apply the Article 16 procedure.

9. At 1 July 1991 the Board shall enter the allotment arrangement for the new channels in Appendix 25 and shall prepare a revised version of Appendix 25 for publication by the Secretary-General.

RES326-1

RESOLUTION No. 326 (Mob-87)

Transfer of Frequency Assignments of Radiotelephone Stations Operating in Accordance with Appendix 25

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

considering

a) that this Conference has modified Appendices 16 and 31 of the Radio Regulations and has placed the paired frequencies reserved for radiotelephony in the HF bands allocated to the maritime mobile service at intervals of 3.0 kHz as opposed to 3.1 kHz;

b) that it will be necessary to make a consequential modification to Appendix 25 of the Radio Regulations;

c) that coast and ship radiotelephone stations will need to change their transmitting and receiving frequencies to bring them into conformity with the corresponding channels in Appendix 16 (Section A);

d) that there should be an orderly transition to the revised paired frequencies reserved for radiotelephony in the HF bands allocated to the maritime mobile service;

resolves

1. that, at 0001 hours UTC on 1 July 1991, coast and ship radiotelephone stations shall change their transmitting and receiving frequencies to the replacement frequencies indicated for the same channel number in Appendix 16;

2. that within three months prior to 1 July 1991 the administrations shall notify the Board of the transfer of their assignments to the replacement frequencies;

3. that an assignment for a replacement frequency, the other basic characteristics of which are not modified, shall be recorded with the date 1 July 1989 in column 2a;

4. that frequency assignments for which the Board received no notification for the frequency indicated in Appendix 16 shall bear a symbol to indicate that they will no longer be taken into account. The Board shall apply the provisions of Article 16 to the corresponding allotment appearing in Appendix 25.

RESOLUTION No. 327 (Mob-87)

Transfer of Paired Frequency Assignments Reserved for Narrow-Band Direct-Printing Telegraphy and Data Transmission Systems

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

considering

that it has provided for additional narrow-band direct-printing and data transmission channels;

recognizing

a) that the transfer of frequency assignments from the channels established by the World Maritime Administrative Radio Conference, Geneva, 1974, and already in use, to the channels adopted by this Conference, should be made with the least possible disruption of the service provided by each station;

b) that a satisfactory procedure for the use and notification of paired frequencies for narrow-band direct-printing telegraphy and data transmission has been established in Resolution **300 (Rev.Mob-87)**;

c) that the present coast station assignment arrangements for paired narrow-band direct-printing telegraphy and data transmission have been effective;

resolves

1. that, at 0001 hours UTC on 1 July 1991, coast and ship stations using paired narrow-band direct-printing and data transmission shall change their transmitting and receiving frequencies to bring them into conformity with Appendix **32**;

2. that, within three months prior to 1 July 1991, administrations shall notify the Board of the transfer of their assignments to the frequency indicated for the same channel number in Appendix **32**;

3. that notices of frequency assignments whose basic characteristics, other than the frequency, are not modified, shall be recorded in the Master International Frequency Register;

4. that frequency assignments for which the Board has received no notification for the frequency indicated in Appendix **32** shall bear a symbol to show that they will no longer be taken into account in the application of Resolution **300 (Rev.Mob-87)**.

RESOLUTION No. 328 (Mob-87)

Transfer of Frequency Assignments to Coast Stations for Wideband Telegraphy, for A1A or A1B Morse Telegraphy, for Facsimile, Special and Data Transmission Systems and for Direct-Printing Telegraphy Systems Operating in the Bands Allocated Exclusively to the Maritime Mobile Service Between 4 000 and 27 500 kHz

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

considering

a) that the frequency bands allocated to the maritime mobile service for coast stations have been changed as a result of the general review of the HF maritime mobile service bands;

b) that new frequency limits for coast stations for wideband telegraphy, for A1A or A1B Morse telegraphy, for facsimile, special and data transmission systems and for direct-printing telegraphy systems (hereafter referred to collectively as "wideband telegraphy" in this Resolution), are laid down in the revised provisions of Appendix 31;

c) that this Conference has not established a channelling arrangement for these bands;

d) that there should be an orderly transition of the frequency assignments to the newly allocated bands;

resolves

1. that those frequency assignments recorded in the Master Register, having an assigned frequency band totally within that part of the band which is no longer allocated to coast station wideband telegraphy, shall be transferred in blocks, as follows:

4 MHz band:	from	4 219.4 -	4 221	to	4 349.4 - 4 351
6 MHz band:	from	6 325.4 -	6 332.5	to	6 493.9 - 6 501
8 MHz band:	from	8 435.4 -	8 438	to	8 704.4 - 8 707
12 MHz band:	from	12 652.3 -	12 658.5	to	13 070.8 - 13 077
16 MHz band:	from	16 859.4 -	16 904.5	to	17 196.9 - 17 242
22 MHz band:	from	22 310.5 -	22 445.5	to	22 561 - 22 696

2. that the IFRB shall identify those frequency assignments recorded in the Master Register having an assigned frequency band overlapping the part of the band which is no longer allocated to coast station wideband telegraphy, shall search for an alternative frequency in accordance with Nos. **1445** to **1450** and shall propose it to the administration concerned;

3. that when the frequency transfer results in a degradation of operating conditions of any of these coast stations, the IFRB shall search for an alternative frequency in accordance with Nos. **1445** to **1450** and shall propose it to the administration concerned;

4. that at 0001 UTC on 1 July 1991 administrations shall transfer the transmitting frequencies of their stations to the newly designated frequencies, notifying the IFRB of these transfers, in accordance with the provisions of Article **12** of the Radio Regulations;

5. that replacement frequency assignments whose basic characteristics, other than the frequency, are not modified, shall be recorded without modifying the date appearing in column 2a or 2b;

6. that frequency assignments for which the Board has received no notification of changeover shall be examined under Article **12** of the Radio Regulations with respect to all the transferred assignments irrespective of the date of their notification to the Board. Following this examination the Board shall advise the administration to delete this assignment and enter a symbol to indicate that the assignment is not in conformity with this Resolution.

RESOLUTION No. 335 (Mob-87)

Use of Non-Paired Ship Station Frequencies for Narrow-Band Direct-Printing Telegraphy and Data Transmission Systems[1]

(see Article 60 and Appendix 33)

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

considering

a) that certain sections of the HF bands allocated to the maritime mobile service are reserved for narrow-band direct-printing telegraphy and data transmission systems operating on a non-paired frequency basis;

b) that neither the World Maritime Administrative Radio Conference, Geneva, 1974, nor the World Administrative Radio Conference, Geneva, 1979, were in a position to decide the extent to which it was necessary to regulate the orderly use of frequencies for the transmission by ship stations of non-paired direct-printing telegraphy signals or on what basis this might be done;

c) that administrations operating or bringing into operation non-paired narrow-band direct-printing telegraphy and data transmission systems for ships have notified the IFRB, for recording in the Master Register, the frequencies on which ship stations transmit;

d) that these notices have not been subject to technical examination by the IFRB, and that the assignments notified have been recorded in the Master Register for information only, with no date in Column 2;

e) that this Conference has provided administrations with guidance on how the frequencies reserved for non-paired narrow-band direct-printing telegraphy and data transmission systems should be used by ship stations;

resolves

1. that administrations operating or bringing into operation non-paired narrow-band direct-printing telegraphy and data transmission systems for ships shall not be required to notify to the IFRB the frequencies on which ship stations transmit;

2. to instruct the IFRB to delete from the Master Register all assignments recorded as a result of the application of Resolution 301.

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[1] Replaces Resolution 301 of the World Administrative Radio Conference, Geneva, 1979.

RESOLUTION No. 337 (Mob-87)

Resolutions and Recommendations Which Remain in Effect Until the Provisions of the Radio Regulations as Partially Revised by WARC Mob-87 Take Effect

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

considering

a) that the essential parts of Resolution **320 (Mob-83)** have been incorporated into the Radio Regulations, as partially revised by WARC Mob-87;

b) that this Conference has therefore decided to suppress Resolutions **304** and **320 (Mob-83)** and that Recommendations **302** and **312** shall eventually be suppressed;

noting

a) that as a general rule, Resolutions and Recommendations become effective at the time of the signing of the Final Acts of a Conference;

b) that the provisions of the Radio Regulations, as partially revised by this Conference, will become effective only at a much later date;

noting further

that, as a general rule, Resolutions and Recommendations which a WARC has decided to suppress, become ineffective at the time of the signing of the Final Acts of the Conference;

recognizing

a) that, in accordance with the general rule, such a suppression would effectively remove the guidelines contained in the Resolutions and Recommendations referred to above upon the signing of the Final Acts;

b) that these guidelines should, however, remain in effect until the entry into force of the provisions of the Radio Regulations, as partially revised by this Conference;

resolves

that Resolutions **304** and **320 (Mob-83)** and Recommendations **302** and **312** shall remain in effect until the entry into force of the provisions of the Radio Regulations, as partially revised by this Conference, at which date they shall become ineffective and definitively suppressed.

RESOLUTION No. 501

Relating to Examination by the IFRB of the Notices Referring to Stations in the Broadcasting Service in Region 2 in the Band 535 - 1 605 kHz During the Period Preceding the Entry into Force of the Final Acts of the Regional Administrative MF Broadcasting Conference (Region 2)

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that a Regional Administrative MF Broadcasting Conference (Region 2) will be convened, in two sessions, to draw up a plan for the broadcasting service in the band 535 - 1 605 kHz;

b) that the first session of that Conference will be held in March 1980, and the second session in November 1981;

c) that the relevant provisions of Article 12 have been modified by the present Conference;

d) that the Regional Administrative MF Broadcasting Conference (Region 2) should adopt provisions to be applied by the Board for notification and recording in the Master Register of frequency assignments included in the plan;

e) that it is therefore necessary to establish a procedure to be applied by the Board for the examination of notices referring to broadcasting stations in Region 2 in the band 535 - 1 605 kHz in the period between the entry into force of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, and the entry into force of the Final Acts of the Regional Administrative MF Broadcasting Conference (Region 2);

resolves

that between the date of entry into force of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, and the date of entry into force of the Final Acts of the Regional Administrative MF Broadcasting Conference (Region 2), the Board shall not examine, with respect to the provisions of No. **1241**, frequency assignment notices to a broadcasting station of Region 2 in the band 535 - 1 605 kHz and shall record them with no date in Column 2a or in Column 2b, the date in Column 2c being given for information only.

RESOLUTION No. 505

Relating to the Broadcasting-Satellite Service (Sound) in the Frequency Range 0.5 GHz to 2 GHz

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that several administrations have made proposals concerning frequency band allocations for broadcasting-satellite service (sound) in the range 0.5 - 2 GHz;

b) that the frequency bands presently allocated to the broadcasting-satellite service do not provide the possibility of individual reception of sound programmes by portable receivers and receivers installed in automobiles;

c) that the introduction of the broadcasting-satellite service (sound) in the range 0.5 - 2 GHz is technically feasible and will afford the possibility of individual reception with portable and automobile receivers;

d) that simulated experiments have confirmed certain postulations made in theoretical studies; however, no working system has yet been demonstrated;

e) that further studies are necessary before the implementation of operational systems;

f) that CCIR has initiated studies concerning this service in accordance with Study Programme 34B/10;

g) that the appropriate frequency range for the service is limited at the lower end to 0.5 GHz (because of increasing man-made noise and transmit antenna size with decreasing frequency) and at the upper end to 2 GHz (because of decreasing effective area of the receive antenna with increasing frequency);

h) that, because of the high power flux-density requirement, sharing with terrestrial services seems extremely difficult;

noting

a) that there are proposals by administrations for the frequency range 1 429 - 1 525 MHz;

b) that the radio astronomy service has an allocation in a lower neighbouring band and that for that reason the lower part of the band 1 429 - 1 525 MHz may not be considered for an allocation to the broadcasting-satellite service (sound);

c) that in the experimental phase a bandwidth of a few hundred kHz would suffice;

resolves

1. that administrations shall be encouraged to carry out experiments with a broadcasting-satellite service (sound) within the band 0.5 - 2 GHz, in appropriately placed narrow sub-bands, subject to agreement of administrations concerned. One area where such a sub-band may be placed is the band 1 429 - 1 525 MHz;

2. that the CCIR shall continue and expedite studies relating to the technical characteristics of a satellite sound-broadcasting system for individual reception by portable and automobile receivers, the feasibility of sharing with terrestrial services, and the appropriate sharing criteria;

3. that the next world administrative radio conference dealing with space radiocommunication services in general or with a specific space radiocommunication service shall be authorized to consider the results of various studies and to take appropriate decisions regarding the allocation of a suitable frequency band;

4. that the aforementioned conference shall also develop appropriate procedures for protection, and if necessary re-accommodation in other bands, of assignments to stations of terrestrial services which may be affected.

RESOLUTION No. 509

Relating to the Convening of a Regional Broadcasting Conference to Review and Revise the Provisions of the Final Acts of the African VHF/UHF Broadcasting Conference, Geneva, 1963

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the last African VHF/UHF Plan was drawn up in Geneva in 1963 for Sound Broadcasting in Band II (87.5 - 100 MHz) and for Television Broadcasting in Band I (47 - 68 MHz), Band III (174 - 223 MHz), Band IV (470 - 582 MHz) and Band V (582 - 960 MHz);

b) that some of the African countries could not participate in the African VHF/UHF Broadcasting Conference, Geneva, 1963;

c) that many more sovereign African countries have emerged and will need to be included in a new plan;

noting

a) that for the band 87.5 - 108 MHz an FM sound-broadcasting planning conference is foreseen for Region 1 (see Resolution 510);

b) the extension of the primary allocation to the broadcasting service (television) in Region 1 from 174 - 223 MHz to 174 - 230 MHz;

RES509-2

realizing

that there is a need to update the existing Plan;

resolves

that a regional conference be convened as soon as possible, preferably by 1984, to review and revise the provisions of the existing Television Broadcasting VHF/UHF Plan (Geneva, 1963) for the African Broadcasting Area, taking into account the assignments contained in the Stockholm Plan, 1961;

invites the Administrative Council

to take all necessary steps for convening the conference and to fix the date and agenda for the conference;

requests the CCIR

to carry out the necessary technical studies;

requests the IFRB

to carry out the preparations for the conference.

RESOLUTION No. 510

Relating to the Convening of a Planning Conference for Sound Broadcasting in the Band 87.5 - 108 MHz for Region 1 and Certain Countries Concerned in Region 3

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the extension of the primary allocation to the broadcasting service in Region 1 from 87.5 - 100 MHz to 87.5 - 108 MHz;

b) that in Region 1 the band 100 - 108 MHz is at present allocated to the mobile, except aeronautical mobile (R), service and in some countries also to the fixed service;

c) that several countries in Region 3 with land boundaries adjoining Region 1 also use this band for the broadcasting service;

d) that for those countries in Region 1 which use or intend to use the band 87.5 - 100 MHz for frequency-modulated sound broadcasting, there is a need to establish a new sound-broadcasting plan for the whole of the band 87.5 - 108 MHz;

e) that for other countries in Region 1 there is a need to establish a sound-broadcasting plan for the band 100 - 108 MHz;

f) that this new plan should in no way affect existing or planned assignments to television stations in the band 87.5 - 100 MHz made in accordance with the Regional Agreement (Stockholm, 1961);

g) that this new plan in the band 87.5 - 100 MHz should not result in the deterioration of the service areas of those existing sound-broadcasting stations operating in accordance with the Regional Agreement (Stockholm, 1961) which are situated in the coordination area with countries using this band for television in accordance with the Regional Agreement (Stockholm, 1961);

h) the requirement to introduce sound-broadcasting stations in the band 100 - 108 MHz in accordance with this plan at the earliest possible date;

i) that radio equipment used by aircraft for automatic landing purposes, which operates in the adjacent band 108 - 112 MHz, may be subject to harmful interference from nearby broadcasting stations operating in the band 87.5 - 108 MHz if the frequencies of the respective stations are not selected with care and that such interference can put human life at risk;

resolves

1. that a regional conference shall be convened before 31 December 1983 to draw up an agreement for Region 1 and the countries concerned in Region 3 and an associated plan for sound broadcasting in the band 87.5 - 108 MHz for Region 1 and for parts of Afghanistan and Iran which are contiguous with Region 1;

2. that this conference shall take place in two sessions:

- the first session will establish the technical bases for the preparation of the plan, including mutual criteria for sharing between sound broadcasting and other services, including television broadcasting, operating within the band 87.5 - 108 MHz;
- the second session, preferably to be separated from the first session by a period of more than six months, but not more than twelve months, will draw up the agreement and associated plan;

3. that countries concerned in Region 3 must be given the opportunity to participate in this conference;

requests the CCIR

to study, as a matter of urgency, the necessary technical bases required for planning and determining the protection criteria between sound-broadcasting stations and television-broadcasting stations and between sound-broadcasting stations and stations in the fixed and mobile, except aeronautical mobile (R), services;

invites the Administrative Council

to fix the dates and agenda for this conference;

calls upon administrations

to bear in mind the problems of compatibility with radionavigation systems operating in the adjacent band when planning the use of the band 87.5 - 108 MHz.

RESOLUTION No. 704 (Mob-83)

Relating to the Holding of a Regional Administrative Radio Conference to Prepare Frequency Assignment Plans for the Maritime Mobile Service in the Bands Between 435 kHz and 526.5 kHz and in Parts of the Band Between 1 606.5 kHz and 3 400 kHz in Region 1 and to Plan for the Aeronautical Radionavigation Service in the Band 415 - 435 kHz in Region 1

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

considering

a) that Recommendation 300 of the World Administrative Radio Conference, Geneva, 1979, confirmed that the Copenhagen Plan of 1948 (which provided frequency assignments for coast stations in the European Maritime Area using telegraphy in the bands between 415 kHz and 490 kHz and between 510 kHz and 525 kHz) had become out of date and that some of the technical standards used therein had been revised;

b) that the same Conference allocated the bands 505 - 526.5 kHz in Region 1 to the maritime mobile service on a primary basis and to the aeronautical radionavigation service on a permitted basis;

c) that Resolution 38 of the same Conference stressed the need for frequency assignment plans to be drawn up for Region 1 for the band 1 606.5 - 2 850 kHz for the maritime mobile service;

d) that the present Conference was unable to prepare frequency assignment plans for these two bands but has nevertheless taken the necessary decisions upon which assignment plans could be based;

e) that there is an urgent need for frequency assignment plans to be prepared for the bands mentioned above and brought into force for the benefit of the maritime mobile service and for other services requiring early access to certain bands to be vacated by that service;

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f) that objective traffic statistics would form a useful basis for the determination of requirements to be included in the planning exercise;

g) that the present Conference modified the provisions of No. 4188 of the Radio Regulations concerning the subdivisions of the bands between 1 606.5 kHz and 3 800 kHz;

considering further

h) that the World Administrative Radio Conference, Geneva, 1979, allocated the band 415 - 435 kHz in Region 1 to the aeronautical radionavigation service on a primary basis and to the maritime mobile service on a permitted basis;

i) that this allocation permits the preparation of a frequency plan for the aeronautical radionavigation service;

j) that there is an urgent need for the band 415 - 435 kHz to be made available to the aeronautical radionavigation service in Region 1;

k) that in order to use the band 415 - 435 kHz to the maximum extent, it is necessary to plan this band for the aeronautical radionavigation service and to make adequate provisions for the use of this band by the maritime mobile service;

l) that to enable a coordinated introduction of the aeronautical radionavigation service in the band 415 - 435 kHz, the planning of this band should coincide with the planning of the band 435 - 526.5 kHz for the maritime mobile service;

m) that the planning of the band 415 - 435 kHz in Region 1 for the aeronautical radionavigation service will be of benefit to aircraft of all nations flying in these areas;

resolves

1. that a regional administrative radio conference for Region 1 be convened to prepare frequency assignment plans for the maritime mobile service in the frequency bands between 435 kHz and 526.5 kHz and in parts of the band between 1 606.5 kHz and 2 850 kHz and for the aeronautical radionavigation service in the band 415 - 435 kHz;

2. that the Tables of Recommended Assignable Frequencies appearing in Appendices 1 and 2 to this Resolution be used as a basis for the planning of the bands 435 - 526.5 kHz, 1 606.5 - 1 625 kHz, 1 635 - 1 800 kHz and 2 045 - 2 160 kHz for the maritime mobile service;

3. that when planning the band 415 - 435 kHz for the aeronautical radionavigation service, provision shall be made for the use of this band also by the maritime mobile service and when planning the band 505 - 526.5 kHz for the maritime mobile service provision shall be made for the use of this band also by the aeronautical radionavigation service;

4. that, in accordance with *resolves* 2 of the aforementioned Resolution 38, replacement frequencies for stations of the maritime mobile service shall be provided in the frequency assignment plan mentioned above, together with the arrangements for their implementation;

recommends

that the Table of Recommended Assignable Frequencies appearing in Appendix 3 to this Resolution be used by administrations when planning and assigning frequencies in the bands 1 850 - 2 045 kHz, 2 194 - 2 498 kHz, 2 502 - 2 850 kHz, 3 155 - 3 400 kHz and 3 500 - 3 800 kHz to stations of the maritime mobile service;

invites the Administrative Council

1. to take all necessary steps (including fixing the date and the agenda) to convene at an early date, if possible early in 1985, a regional administrative radio conference for Region 1 for the purpose of:

a) establishing an agreement and associated plans in the bands listed in *resolves* 2 and 3 of the present Resolution;

b) establishing the final texts of Appendices to the Radio Regulations containing the channelling arrangements in the bands referred to above;

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2. include in the agenda of the World Administrative Radio Conference for the Mobile Services foreseen for 1987 an item covering the inclusion in the Radio Regulations of the Appendices mentioned in paragraph 1 *b)* above;

invites the administrations concerned

to take the appropriate steps with a view to adopting the instrument for abrogation of the European Regional Convention for the maritime mobile service, Copenhagen, 1948, and the associated Plan;

requests the IFRB

1. to give technical assistance in the preparation for and organization of the Conference;

2. to invite administrations to submit at an appropriate date their requirements using the characteristics contained in Appendix 1 to the Radio Regulations;

requests the CCIR

to establish the necessary technical basis;

requests the Secretary-General

to forward this Resolution to the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO).

APPENDIX 1 TO RESOLUTION No. 704 (Mob-83)

Tables of Recommended Assignable Frequencies for Planning for the Maritime Mobile Service in the Band Between 435 kHz and 526.5 kHz in Region 1

1. The Tables below show the frequencies assignable to stations of the maritime mobile service for narrow-band direct-printing telegraphy, digital selective calling and Morse telegraphy in the band between 435 kHz and 526.5 kHz in Region 1. The frequency assignment plan will be based on a 0.5 kHz spacing. Until 1 January 1990, when tighter frequency tolerances for A1A Morse telegraphy become applicable, frequencies for A1A Morse telegraphy may be assigned with a channel spacing of 1 kHz.

a) coast stations (29 channels)

435.5	439	442.5	446	449.5
436	439.5	443	446.5	
436.5	440	443.5	447	
437	440.5	444	447.5	
437.5	441	444.5	448	
438	441.5	445	448.5	
438.5	442	445.5	449	

b) coast stations, ship stations, intership working (23 channels)

450	453	456	459
450.5	453.5	456.5	459.5
451	454 *	457	460
451.5	454.5	457.5	460.5
452	455	458	461
452.5	455.5	458.5	

Note: When choosing from the above frequencies, the use of 455 kHz as an intermediate frequency in broadcast receivers should be borne in mind.

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* See Nos. 4237 and 4238.

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c) ship stations (57 channels)

461.5	467.5	473.5	479.5	485.5
462	468	474	480	486
462.5	468.5	474.5	480.5	486.5
463	469	475	481	487
463.5	469.5	475.5	481.5	487.5
464	470	476	482	488
464.5	470.5	476.5	482.5	488.5
465	471	477	483	489
465.5	471.5	477.5	483.5	489.5
466	472	478	484	
466.5	472.5	478.5	484.5	
467	473	479	485	

d) coast stations (13 channels)

510.5	512.5	514	515.5	517
511	513	514.5	516	
511.5	513.5	515	516.5	

e) coast stations, narrow-band direct-printing telegraphy (with forward error correction)

518 kHz (see Resolution 318 (Mob-83))

f) coast stations (15 channels)

519	520.5	522	523.5	525
519.5	521	522.5	524	525.5
520	521.5	523	524.5	526

2. The recommended assignable frequencies 435.5 - 449.5 kHz to be used by coast stations shall be paired with the frequencies 475.5 - 489.5 kHz to be used by ship stations and the recommended assignable frequencies 461.5 - 475 kHz to be used by ship stations shall be paired with the frequencies in paragraphs *d)* and *f)*.

3. Frequency 512 kHz is used as a supplementary calling frequency by ship and coast stations (see Nos. 4239 and 4241).

APPENDIX 2 TO RESOLUTION No. 704 (Mob-83)

Tables of Recommended Assignable Frequencies for Planning for the Maritime Mobile Service in the Bands 1 606.5 - 1 625 kHz, 1 635 - 1 800 kHz and 2 045 - 2 160 kHz in Region 1

a) *Coast stations, narrow-band direct-printing telegraphy, digital selective calling*

1 607 kHz ... 36 channels spaced 0.5 kHz ... 1 624.5 kHz.

b) *Coast stations, single-sideband radiotelephony*

1 636.4 kHz (1 635 kHz) ... 55 channels spaced 3 kHz ... 1 798.4 kHz (1 797 kHz).

c) *Ship stations, single-sideband radiotelephony* *

2 046.4 kHz (2 045 kHz) ... 32 channels spaced 3 kHz ... 2 139.4 kHz (2 138 kHz).

d) *Ship stations, narrow-band direct-printing telegraphy, digital selective calling*

2 142 kHz ... 36 channels spaced 0.5 kHz ... 2 159.5 kHz.

Note 1: Frequencies listed under *a)* and *b)* to be used by coast stations shall be paired with frequencies listed under *d)* and *c)* respectively to be used by ship stations.

Note 2: The frequencies between parentheses are the carrier frequencies.

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* For the conditions of use of certain frequencies of this sub-band, see Nos. 4358 to 4360, 4362, 4363, 4365 and 4366.

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APPENDIX 3 TO RESOLUTION No. 704 (Mob-83)

Tables of Recommended Assignable Frequencies to be Used by Administrations in Region 1 when Planning and Assigning Frequencies in the Bands 1 850 - 2 045 kHz, 2 194 - 2 498 kHz, 2 502 - 2 850 kHz, 3 155 - 3 400 kHz and 3 500 - 3 800 kHz

a) ***Coast stations, single-sideband radiotelephony***

1 852.4 kHz (1 851 kHz) ... 33 channels spaced 3 kHz ... 1 948.4 kHz (1 947 kHz).

b) ***Ship stations, single-sideband radiotelephony***

1 952.4 kHz (1 951 kHz) ... 31 channels spaced 3 kHz ... 2 042.4 kHz (2 041 kHz).

c) ***Ship stations, single-sideband radiotelephony***

2 196.4 kHz (2 195 kHz) ... 22 channels spaced 3 kHz ... 2 259.4 kHz (2 258 kHz).

d) ***Intership, single-sideband radiotelephony***

2 264.4 kHz (2 263 kHz) ... 78 channels spaced 3 kHz ... 2 495.4 kHz (2 494 kHz).

e) ***Ship stations, narrow-band direct-printing telegraphy***

2 502.5 kHz ... 150 channels spaced 0.5 kHz ... 2 577.5 kHz.

f) ***Coast stations, narrow-band direct-printing telegraphy and single-sideband radiotelephony***

2 580.4 kHz (2 579 kHz) ... 90 channels spaced 3 kHz ... 2 847.4 kHz (2 846 kHz).

or

2 578.5 kHz ... 543 channels spaced 0.5 kHz ... 2 849.5 kHz.

g) ***Ship stations, narrow-band direct-printing telegraphy***

3 155.5 kHz ... 89 channels spaced 0.5 kHz ... 3 199.5 kHz.

h) ***Ship stations, single-sideband radiotelephony***

3 202.4 kHz (3 201 kHz) ... 46 channels spaced 3 kHz ... 3 337.4 kHz (3 336 kHz).

i) ***Intership, single-sideband radiotelephony***

3 341.4 kHz (3 340 kHz) ... 20 channels spaced 3 kHz ... 3 398.4 kHz (3 397 kHz).

j) ***Intership, single-sideband radiotelephony***

3 501.4 kHz (3 500 kHz) ... 33 channels spaced 3 kHz ... 3 597.4 kHz (3 596 kHz).

k) ***Coast stations, single-sideband radiotelephony***

3 602.4 kHz (3 601 kHz) ... 66 channels spaced 3 kHz ... 3 797.4 kHz (3 796 kHz).

Note: **The frequencies between parentheses are the carrier frequencies.**

RESOLUTION No. 709 (Orb-88)

Coordination Between Feeder-Link Earth Stations and Stations of other Services in the Bands 14.5 - 14.8 GHz and 17.7 - 18.1 GHz in Regions 1 and 3

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

considering

a) that in Regions 1 and 3 the frequency bands 14.5 - 14.8 GHz and 17.7 - 18.1 GHz are allocated to several services on an equal primary basis;

b) that prior to the commencement of this Conference the IFRB was in receipt of notices for recording in the Master Register, concerning stations of services not included in the planning process;

c) that this Conference recognized in its agenda that the rights of such services must be taken into account;

d) that nevertheless administrations should be in a position to implement their feeder-link earth stations operating in accordance with Appendix **30A (Orb-88)** in shared bands;

resolves

1. that administrations in Regions 1 and 3 should examine within a period of six months after the end of this Conference whether it would be necessary to coordinate with the administrations identified in accordance with paragraph 5.1.4 of Appendix **30A (Orb-88)**;

2. that, if such a coordination with the administrations identified in accordance with paragraph 5.1.4 of Appendix **30A (Orb-88)** appears necessary, these administrations should inform those administrations responsible for existing stations mentioned in *considering b)*, the notices of which were submitted to the IFRB prior to 29 August 1988, of their intention to bring into use their frequency assignments in conformity with the Regions 1 and 3 feeder-link Plans as soon as they are able to do so;

3. that administrations responsible for such existing stations mentioned in *considering b)* shall make every effort to accelerate the process of coordination in order not to delay unduly the implementation of feeder-link earth stations.

RECOMMENDATION No. 3

Relating to the Transmission of Electric Power by Radio Frequencies from a Spacecraft

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that it may become technically feasible in the future to convert some portions of the sun's radiation into electric power on board a spacecraft and to transmit that power to Earth by means of radio transmissions and that such power could augment the world's energy resources;

b) that the possibility of such high power radiation may adversely affect the propagation of radio waves for other services through the ionosphere;

recognizing

a) that it would be necessary to ensure that the radio transmission of electric power from space did not give rise to harmful interference to radiocommunication services;

b) that an assessment needs to be made of any likely ecological and biological effects of radio transmissions of power from space, including in particular to aircraft passing through antenna beams used for such transmissions;

noting

that the Special Preparatory Meeting report to the World Administrative Radio Conference, Geneva, 1979, recognized the technical possibility of a solar power satellite;

noting also

the provisions of Article 6 of the Radio Regulations referring to the obligations on administrations not to cause harmful interference to radiocommunication services operating in accordance with the Regulations;

recommends that the CCIR

undertake appropriate studies on all aspects of the effects of such radio transmissions of power from space on radiocommunication services and make appropriate recommendations taking into account the ecological and biological implications;

invites the Secretary-General

to send this Recommendation to the Secretary-General of the United Nations.

RECOMMENDATION No. 12

Relating to the Convening of Future Administrative Radio Conferences to Deal with Specific Services

The World Administrative Radio Conference, Geneva, 1979,

noting

a) that item 2.10 of its terms of reference calls on the Conference to propose to the Administrative Council and to the Plenipotentiary Conference a programme for the convening of future administrative radio conferences to deal with specific services;

b) that several Resolutions and Recommendations of this Conference call for, or refer to, the convening of such future conferences;

considering

a) that, in drawing up a programme of future world administrative radio conferences, account needs to be taken of other conferences involving Members of the Union, including regional and sub-regional conferences, the Plenipotentiary Conference, and the meetings of the CCIR;

b) that conferences need to be spaced out sufficiently to allow adequate time for preparation for each conference by administrations and by the permanent organs of the Union;

c) that a number of individual subjects raised in the Resolutions and Recommendations referred to in *noting b)* should be treated by a competent conference and that it will be for the Administrative Council to take the necessary action at the appropriate time for each matter concerned to be included in the agenda of such a conference;

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recommends that the Administrative Council and, as appropriate, the Plenipotentiary Conference

1. include the following world administrative radio conferences in the programme of future conferences:

- world administrative radio conference for the mobile services (see Resolution 202);
- world administrative radio conference for the planning of the HF bands allocated to the broadcasting service (see Resolution 508 and Recommendations 500 and 501);
- world administrative radio conference on the use of the geostationary-satellite orbit and the planning of space services utilizing it (see Resolution 3);

2. include the following regional administrative radio conferences, some of which are already arranged, in the programme of future conferences:

- final session, Region 2, medium frequency broadcasting conference (already arranged for November 1981);
- Region 2 broadcasting-satellite planning conference (already arranged for the second quarter of 1983 – see Resolution 701);
- planning conference for sound broadcasting in the band 87.5 - 108 MHz for Region 1 and certain countries concerned in Region 3 (see Resolution 510);
- conference to draw up agreements and associated plans for feeder links to broadcasting satellites operating in the 12 GHz band in Regions 1 and 3 (see Resolution 101);
- regional administrative radio conference to establish criteria for the shared use of the VHF and UHF bands allocated to fixed, broadcasting and mobile services in Region 3 (see Resolution 702);

- conference to revise the Plan annexed to the Copenhagen Convention, 1948, for the European Maritime Area – Region 1 (see also Recommendation 300 on this subject);
- conference to review and revise the provisions of the Final Acts of the African VHF/UHF Broadcasting Conference, Geneva, 1963 (see Resolution 509);
- planning conference for broadcasting in the band 1 605 - 1 705 kHz in Region 2 (see Recommendation 504);

3. take the necessary steps to convene each of these conferences as soon as practicable after the completion, in each case, of the necessary preparatory work, bearing in mind:

a) the timing of the conferences, as expressed in the Recommendations and Resolutions mentioned in *recommends* 1 and 2;

b) the need for the conferences to be adequately spaced so as to allow administrations and the permanent organs of the Union adequate time for preparation;

c) the programme of planned or foreseen conferences, other than administrative radio conferences, involving Members of the Union;

d) the resources which will need to be devoted by individual administrations and by the Union as a whole to the completion of this programme of conferences.

RECOMMENDATION No. 67

Relating to the Definitions of "Service Area" and "Coverage Area"

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the terms "service area" and "coverage area" are often used in the official texts of the ITU;

b) that these two terms are used with the same meaning or with different meanings according to the different services;

c) that there are no definitions of the terms "service area" and "coverage area" in Article 1 of the Radio Regulations;

noting

a) that the term "service area" is already used in the texts of the Appendices 1, 3, 4, 5 and 25 of the Radio Regulations;

b) that a definition of "service area" for broadcasting, based on the usable field strength, exists in CCIR Recommendation 499-1;

c) that a definition very similar to that of Recommendation 499-1 is given in Annex 2 to the Final Acts of the Regional Administrative LF/MF Broadcasting Conference (Regions 1 and 3), Geneva, 1975;

d) that a definition of "service area" for satellite broadcasting is given in Annex 8 to the Final Acts of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977. This definition is of an administrative nature. It is accompanied by a technical note, in which reference is made to an appropriate power flux-density and protection against interference based on the agreed protection ratio;

e) that technical and administrative aspects are sometimes involved in the definition of "service area" and cannot easily be separated;

f) that a definition of "coverage area" for satellite broadcasting is given in the above-mentioned Annex 8, based on the value of a certain power flux-density which permits the wanted quality of reception in the absence of interference;

recognizing

that the existing definitions of "service area" and "coverage area" are related to the definitions of usable field strength or usable power flux-density, either in the presence or in the absence of interfering signals;

invites the CCIR

1. to specify a general definition for "coverage area";

2. to specify the technical basis for a general definition of "service area" which takes into account the present usage of this term throughout all official ITU texts in order to enable future administrative conferences to determine the administrative aspects of such a definition.

RECOMMENDATION No. 70

Relating to Studies of the Technical Characteristics of Equipment [1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

that the available technical information concerning the various types of apparatus used for the reception of the different classes of emission in the several services needs to be more complete and more precise in order to permit the most efficient planning of the use of the radio frequency spectrum;

invites the CCIR

1. to continue to study, and to make Recommendations for the bandwidth, selectivity, sensitivity and stability characteristics of various types of apparatus used for the reception of the different classes of emission in the several services;

2. to continue to study practical methods of achieving the recommended characteristics;

3. to study the minimum practicable spacing between adjacent channels for the different classes of emission for the several services in the various bands;

4. to study other desirable conditions to be fulfilled by the complete systems employed by the different services in order to determine the required technical performance of the equipment, including the station terminal apparatus and the antennae;

5. to study methods for determining whether the equipment satisfies the recommended requirements;

6. to give particular attention to those studies which will assist in the further refinement of the Technical Standards used by the IFRB.

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[1] Replaces Recommendation No. 6 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 100

Relating to Preferred Frequency Bands for Systems Using Tropospheric Scatter

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971, requested the CCIR to study the preferred frequency bands for tropospheric scatter systems and proposed that a future world administrative radio conference should consider this matter;

b) the technical and operational difficulties pointed out by the CCIR (Report of the Special Preparatory Meeting, Geneva, 1978) in the bands shared by tropospheric scatter systems, space systems and other terrestrial systems;

c) the additional allocation of frequency bands which this Conference has made for the space services in view of their increasing development;

d) that the IFRB requires administrations to supply specific information on systems using tropospheric scatter in order to verify compliance with certain provisions of the Radio Regulations (such as Nos. 763, 2560 and 2564);

recognizing nevertheless

that, to meet certain telecommunication requirements, administrations will wish to continue using tropospheric scatter systems;

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noting

that the proliferation of such systems in all frequency bands and particularly in those shared with the space systems is bound to aggravate an already difficult situation;

recommends that the CCIR

1. continue studies, as a matter of urgency, of the frequency bands presenting more appropriate propagation features for systems using tropospheric scatter;

2. continue studying the possibilities and criteria for sharing between systems using tropospheric scatter and other systems, particularly space systems;

3. prepare, on the basis of these studies, and if possible before its next Plenary Assembly, a Recommendation concerning the specific frequency bands found preferable for such systems. The choice of these bands should take into account allocations to other services, particularly allocations to the space services;

recommends that administrations

1. collaborate with the CCIR, as a matter of urgency and within the limits of their possibilities, by sending it contributions relating to the aforementioned studies;

2. for the assignment of frequencies to new stations in systems using tropospheric scatter, take into account the latest information prepared by the CCIR to ensure that systems established in the future use a limited number of certain frequency bands;

3. in frequency assignment notifications to the IFRB, indicate expressly whether they relate to stations of tropospheric scatter systems;

invites the Administrative Council

to make the necessary arrangements for a future world administrative radio conference to consider the frequency bands of the fixed service which shall be used in preference by the new tropospheric scatter systems, taking into account the allocations to the space radiocommunication services and the relevant CCIR Recommendations.

RECOMMENDATION No. 101

Relating to Feeder Links for the Broadcasting-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the need for ample information on the characteristics of feeder links for planning the broadcasting-satellite service;

b) the studies being pursued by the CCIR under the appropriate Study Programme;

c) that the carrier-to-noise ratios for the feeder links to broadcasting satellites should be of the order of ten times greater than those for the down-links;

d) that, as regards feeder link interference between broadcasting satellites at different orbital positions, adequate up-link protection ratios (approximately 10 dB greater than those in the down-link) would appear to be readily achievable by antenna pattern discrimination in earth station transmitting antennae which would clearly have to be larger in diameter than the receiving antennae used in the down-links;

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[1] Replaces Recommendation No. Sat – 5 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.

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e) that, where planning is based on isolation parameters such as radiation patterns for space station transmitting antennae, carrier interleaving, or polarization discrimination in meeting the down-link carrier-to-interference requirements between service areas served from a single orbital position, the increased carrier-to-interference requirements in the up-links serving the satellite(s) at that same orbital position will have to use the same isolation parameters, provided that this produces an improvement of about 10 dB in net isolation. The characteristics of the transmitting earth station will clearly not affect this isolation, apart from the purity of their on-beam polarization;

f) that in the implementation of broadcasting-satellite systems, consideration must be given to all aspects of associated space operation service functions (tracking, telemetry, telecommand and ranging) in connection with the operation of broadcasting satellites;

invites the CCIR

1. to continue the study of those radiation characteristics of receiving antennae of space stations in the broadcasting-satellite service which, singly or in combination with other means of discrimination, would give the necessary protection ratios for the feeder links of systems in the broadcasting-satellite service for (a) satellite(s) occupying a given position in the geostationary-satellite orbit;

2. to continue the study of those polarization characteristics of receiving antennae of space stations in the broadcasting-satellite service which, singly or in combination with other means of discrimination, would give the necessary protection ratios for the feeder links of systems in the broadcasting-satellite service for (a) satellite(s) occupying a given position in the geostationary-satellite orbit;

3. to continue the study of the technical feeder link characteristics required to implement the Plan for this service;

4. to study the technical and design characteristics and requirements which affect the provision of "space operation service functions" of space stations in the broadcasting-satellite service;

5. to study the requirements for adjacent-channel isolation in feeder links for (a) satellite(s) in the broadcasting-satellite service occupying a given position in the geostationary-satellite orbit.

RECOMMENDATION No. 102

Relating to the Study of Modulation Methods for Radio-Relay Systems in Relation to Sharing with Fixed-Satellite Service Systems [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that Article 8 of the Radio Regulations permits the sharing of certain frequency bands by the fixed-satellite service and the fixed service;

b) that the sharing criteria to avoid mutual interference between the stations in these two services have been established in Articles 27 and 28;

c) that among many factors of overall efficiency of utilization of frequency bands it seems that the reduction of interference between two services is most important;

noting

a) that the overall efficiency of utilization of the frequency bands shared by the two services depends on the methods of modulation used by the systems concerned;

b) that studies of the preferred modulation characteristics for fixed-satellite service systems are to be carried out under Study Programme 2D-1/4 of the CCIR;

recommends that the CCIR

should study especially, under the general framework of Question 2-3/4, modulation methods (such as pulse-code modulation using phase or frequency modulation) in particular for line-of-sight radio-relay systems in relation to sharing with fixed-satellite service systems.

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

RECOMMENDATION No. 103

Relating to Carrier Energy Dispersal in Systems in the Fixed-Satellite Service [1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that use of carrier energy dispersal techniques in systems in the fixed-satellite service can result in a substantial reduction of interference to stations of a terrestrial service operating in the same frequency bands;

b) that the use of such techniques can result in a substantial reduction in the level of interference between systems in the fixed-satellite service operating in the same frequency bands and in a corresponding increase of efficiency in the utilization of the geostationary-satellite orbit;

c) that such techniques are being regularly and successfully employed in systems in the fixed-satellite service without noticeable deterioration of the quality of operation;

recommends

1. that systems in the fixed-satellite service employing angle modulation by analogue signals should use carrier energy dispersal techniques as far as is practicable with a view to spreading energy at all times and in a manner consistent with the satisfactory operation of the systems;

2. that systems in the fixed-satellite service employing digital modulation should use carrier energy dispersal techniques when this becomes technically feasible and is practical.

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[1] Replaces Recommendation No. Spa2 – 11 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

RECOMMENDATION No. 104 (Mob-87)

Provision of Frequency Bands for Feeder Links in the Fixed-Satellite Service for the Mobile-Satellite Service or for the Aeronautical, Land, or Maritime Mobile-Satellite Services in the Bands 1 530 - 1 559 MHz and 1 626.5 - 1 660.5 MHz

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

considering

a) that No. 726 of the Radio Regulations provides that the allocation to the maritime mobile-satellite service in the band 1 530 - 1 535 MHz shall be effective from 1 January 1990, and that up to that date the fixed service shall be on a primary basis in Regions 1 and 3;

b) that feeder links are required for the aeronautical mobile-satellite service, the land mobile-satellite service, the maritime mobile-satellite service and the mobile-satellite service operating in the bands 1 530 - 1 559 MHz and 1 626.5 - 1 660.5 MHz;

c) that, although No. 27 of the Radio Regulations provides that such feeder links may be part of the mobile-satellite service, No. 22 of the Radio Regulations indicates that the fixed-satellite service may also include feeder links for the mobile-satellite services;

d) that the majority of such feeder links are in the bands 3 400 - 4 200 MHz and 5 925 - 7 075 MHz;

e) that the bands mentioned in *considering d)* above are becoming increasingly congested, thus causing some difficulties during the coordination process;

f) that the lack of homogeneity of the technical characteristics of the feeder links of the mobile-satellite services and the links of the fixed-satellite service results in coordination difficulties;

g) that distress and safety traffic is carried on feeder links of the mobile-satellite services;

h) that the extension of the spectrum necessary for feeder links in contiguous frequency bands would be desirable from a technical and economic point of view, but may cause significant problems of sharing or allocation, or both;

noting

that, at this Conference, certain administrations made proposals for sub-bands in the frequency bands 3 400 - 4 200 MHz and 5 925 - 7 075 MHz in which the feeder links for the aeronautical, land, maritime and mobile-satellite services would have priority over other assignments to the fixed-satellite service, while other administrations considered that the frequency spectrum required for the feeder links for the mobile-satellite services can more readily be provided in the fixed-satellite service bands by the normal coordination process;

recommends

that the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and on the Planning of the Space Services Utilizing It (WARC Orb-88) take note of the concerns expressed in the *considerings* and *noting* above in its decisions with respect to feeder links for the aeronautical mobile-satellite service, the land mobile-satellite service, the maritime mobile-satellite service and the mobile-satellite service in the bands 1 530 - 1 559 MHz and 1 626.5 - 1 660.5 MHz;

invites the CCIR

to continue its study relating to this matter;

instructs the Secretary-General

to forward this Recommendation to WARC Orb-88.

RECOMMENDATION No. 504

Relating to the Preparation of a Broadcasting Plan in the Band 1 605 - 1 705 kHz in Region 2

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the band 1 605 - 1 705 kHz has been allocated to the broadcasting service in Region 2 by this Conference;

b) that in accordance with No. 480, the use of this band by the broadcasting service is subject to a broadcasting plan to be established by a regional administrative radio conference;

c) that, in the Table of Frequency Allocations in Region 2, the band 1 605 - 1 625 kHz is allocated exclusively to the broadcasting service, and the band 1 625 - 1 705 kHz is allocated to the broadcasting service on a shared basis with other services;

recognizing

the provisions of No. 346 of the Radio Regulations;

recommends

1. that a regional administrative radio conference be convened to establish a plan for the broadcasting service in the band 1 605 - 1 705 kHz in Region 2;

2. that such a conference be convened in 1985 at the latest;

3. that the exact dates of coming into force of the plan be decided at the said regional administrative radio conference. Nevertheless, the use of these bands by the broadcasting service should not commence before 1 July 1987 for the frequencies between 1 625 kHz and 1 665 kHz, and 1 July 1990 for the frequencies between 1 665 kHz and 1 705 kHz;

invites

1. *the Administrative Council* to take the necessary steps for the convening of a Region 2 administrative radio conference to plan the use of the band 1 605 - 1 705 kHz by the broadcasting service;

2. *the CCIR* to perform the necessary technical studies relating to the Region 2 broadcasting conference bearing in mind the allocations to other services in Regions 1 and 3 and the need for sharing criteria;

encourages administrations of Region 2

to promote the development and availability of receivers suitable for the broadcast band extended to 1 705 kHz.

RECOMMENDATION No. 602 (Rev.Mob-83)

Relating to the Planning of Frequencies in the Band 283.5 - 315 kHz Used by Maritime Radiobeacons in the European Maritime Area

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

considering

a) that the "Regional Arrangement for Maritime Radiobeacons in the European Area of Region 1, Paris, 1951", referred to hereinafter as the "Paris Arrangement, 1951" is largely based on the geographical disposition of radiobeacons existing before 1939 and on the state of maritime navigation at that time;

b) that, since the conclusion of the Paris Arrangement, 1951, the geographical disposition and certain characteristics of maritime radiobeacons have been changed by bilateral or multilateral agreements, particularly to take into account the changes which have occurred in the rules and procedures of maritime navigation;

c) that the Paris Arrangement, 1951, is based essentially on the use of aural direction-finding receivers;

d) that studies conducted by administrations, the International Association of Lighthouse Authorities (IALA) and the CCIR have demonstrated the need to review the provisions of the Paris Arrangement, 1951;

e) that the parts of those studies relating to adjacent channel spacing and modulation characteristics should be clarified;

f) that the frequency band 283.5 - 315 kHz used by maritime radiobeacons is also allocated, on a permitted basis, to the aeronautical radionavigation service;

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noting

a) the existence in Chapter VIII of the Radio Regulations (Article 35, Section IV, paragraph C "Maritime Radiobeacons") of provisions Nos. 2860 to 2865;

b) the existence in Chapter III (Article 8, Section I) of No. 405, which defines the European Maritime Area;

recommends

that a regional administrative conference for the European Maritime Area should be convened to revise the provisions of the Paris Arrangement, 1951, and prepare a plan of maritime radiobeacons in the European Maritime Area in the band 283.5 - 315 kHz;

invites the Administrative Council

to take the necessary steps to convene a regional administrative conference on the basis of Articles 7 and 54 of the International Telecommunication Convention (Malaga-Torremolinos, 1973), at an early date, if possible early in 1985;

invites the CCIR

to establish the technical bases needed for the work of that conference;

requests the Secretary-General

to communicate this Recommendation to the International Maritime Organization (IMO), the International Association of Lighthouse Authorities (IALA) and the International Civil Aviation Organization (ICAO).

RECOMMENDATION No. 620

Relating to the Meteorological Aids Service in the Band 27.5 - 28 MHz [1]

The World Administrative Radio Conference, Geneva, 1979,

recommends

that administrations whose stations in the meteorological aids service operate in the band 27.5 - 28 MHz should arrange, as soon as possible, for the transfer of these operations to higher frequency bands which are allocated to the meteorological aids service;

invites the World Meteorological Organization

to study this question and to proceed with such coordination among administrations as appears necessary.

[1] Replaces Recommendation No. 33 of the Administrative Radio Conference, Geneva, 1959.

RECOMMENDATION No. 708

Relating to Frequency Bands Shared Between Space Radiocommunication Services and Between Space and Terrestrial Radiocommunication Services [1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

a) the value to the Conference of the material contained in the Report of the CCIR Special Preparatory Meeting, Geneva, 1978;

b) that further studies on a wide range of problems dealing with space radiocommunications form the subject of CCIR Questions and Study Programmes approved by the XIVth Plenary Assembly;

considering however

a) that certain CCIR Recommendations, listed below, call for further work and study:

Recommendation 355-2	"Frequency sharing between systems in the fixed-satellite service and terrestrial radio services in the same frequency bands"
Recommendation 465-1	"Reference earth station radiation pattern for use in coordination and interference assessment in the frequency range from 2 to about 10 GHz"

[1] Replaces Recommendation No. Spa2 – 15 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.

Recommendation 466-2	"Maximum permissible level of interference in a telephone channel of a geostationary satellite network in the fixed-satellite service employing frequency modulation with frequency-division multiplex, caused by other networks of this service";

b) that the deliberations of this Conference, particularly in relation to the provisions of Articles 27, 28 and 29, and of other relevant Articles of the Radio Regulations, have shown that further information is required to reply to the following current Questions and Study Programmes of the CCIR:

Question 1-2/4	"Antennae for systems in the fixed-satellite service"
Question 2-3/4	"Technical characteristics of systems in the fixed-satellite service"
Study Programme 2A-3/4	"Feasibility of frequency sharing between systems in the fixed-satellite service and terrestrial services"
Study Programme 2J-2/4	"Technical factors influencing the efficiency of use of the geostationary-satellite orbit by radiocommunication satellite networks sharing frequency bands allocated to the fixed-satellite service";

c) that it would be useful to have specific numerical values of power flux-density from space stations of the broadcasting-satellite service which would permit differentiation between "individual reception" and "community reception" in the broadcasting-satellite service;

d) that frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) has been adopted in the frequency band 14 - 14.3 GHz;

recommends

1. that administrations, recognized private operating agencies, and other participants in the work of the CCIR consider as a matter of priority the submission of contributions on these subjects, so that draft Recommendations on them can be prepared at the meetings of the relevant Study Groups for consideration by the Plenary Assembly of the CCIR;

2. that the CCIR study or, as appropriate, continue to study:

2.1 the reference antenna patterns for earth station antennae, which may be appropriate for setting minimum standards of performance with a view to recommending specific patterns for this purpose, in order to improve utilization of the bands shared between the fixed-satellite service and terrestrial radiocommunication services, and of the bands shared by space radiocommunication services, and to improve the utilization of the geostationary-satellite orbit;

2.2 the reference antenna patterns for satellite antennae, which may be appropriate for setting minimum standards of performance, particularly outside the main beam, in order to improve the utilization of the geostationary-satellite orbit and to increase the possibilities for frequency re-use;

2.3 the reference cross-polarization antenna patterns which may be appropriate for setting minimum standards of performance and, in this connection, further study:

2.3.1 the portions of the spectrum within which linear-orthogonal or circular-orthogonal polarizations might be most appropriate;

2.3.2 the relative desirability, taking into account technical and orbit utilization factors, of using orthogonal polarizations within a single satellite as against with two satellites;

2.4 the necessary limitation of spurious emissions and the frequency tolerances to be observed in both the terrestrial and space

radiocommunication services insofar as they may affect sharing of frequency bands;

2.5 the criteria of permissible interference for the various space radiocommunication services and terrestrial radiocommunication services sharing the frequency bands allocated by this Conference, in order to permit the determination of:

2.5.1 the coordination distance and the probability of interference between stations within that distance;

2.5.2 the necessary limits of power flux-density set up at the Earth's surface by space stations;

2.6 the maximum permissible level of interference into a geostationary-satellite link from any other single interfering geostationary-satellite network and from the aggregate of all other geostationary-satellite networks, particularly in the case of:

2.6.1 frequency-modulated telephony signals,

2.6.2 frequency-modulated television signals,

2.6.3 digitally-modulated signals,

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

2.7 the interference criteria applicable to frequency sharing between non-geostationary-satellite networks and geostationary-satellite networks;

2.8 the possibility of establishing a technical criterion for expressing the efficiency of use of the geostationary-satellite orbit;

2.9 the possibility of improving and simplifying the method of determining the coordination area as described in Appendix 28 to the Radio Regulations;

2.10 the conditions for frequency sharing in those bands allocated to the broadcasting-satellite service by this Conference with a view to issuing appropriate Recommendations as soon as possible so that administrations and the IFRB shall have the necessary technical data required to carry out examination procedures, in particular regarding Articles 11, 12 and 13 of the Radio Regulations and those in Resolution 33;

2.11 the power flux-densities required for individual and community reception in the broadcasting-satellite service, with a view to specifying numerical values which will differentiate between these types of reception;

2.12 the criteria for frequency sharing between the radionavigation service and the fixed-satellite service (Earth-to-space) in the frequency band 14 - 14.3 GHz.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

Document DL/28-E
19 February 1992
English only

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

GT-PLEN Ad-hoc

Note by the Chairman of GT-PLEN Ad-hoc

THE MAXIMUM ALLOWABLE INCLINATION ANGLE OF SATELLITE NETWORKS USING SLIGHTLY INCLINED GEOSTATIONARY-SATELLITE ORBITS

1. Introduction

The CCIR has been studying the maximum allowable inclination angle of satellite networks using slightly inclined geostationary-satellite orbits for some years. This document is a summary of the current status of CCIR studies.

2. From the viewpoint of interference between satellite networks in the fixed-satellite service

Attachment I shows draft new Recommendation [Doc. 4/6] contained in Document 4/BL/32 (the first three pages only. A complete text is available from the Chairman of the Working Group to the Plenary).

The status of this text is as follows:

- the text was unanimously approved by CCIR Study Group 4 in November 1991;
- the text has been sent to administrations seeking for approval in accordance with CCIR Resolution 97;
- hopefully, it will become an official CCIR Recommendation on 7 March 1992.

The attention is drawn to recommends 1 and 2.

3. From the viewpoint of interference between terrestrial systems and satellite networks in the fixed-satellite service

CCIR Working Party 4-9S (joint Working Party of Study Groups 4 and 9) has been tackling this issue, but has not been able to arrive at a conclusion.

June 1991 meeting of Working Party 4-9S was able to produce a preliminary draft Recommendation (a working document within Working Party) as presented in Attachment II. The main difficulty is that there are two views expressed in recommends 1. June 1992 meeting of Working Party 4-9S is expected to arrive at an agreement to produce a draft Recommendation.

4. Summary

From the technical standpoint, the following may be pointed out:

- in frequency bands which are not shared with terrestrial systems, "geostationary satellites" can operate until the natural inclination limit without causing significant interference to other satellite networks;

- in frequency bands shared with terrestrial systems, the maximum inclination angle is yet to be defined.

Therefore, from the technical standpoint, a geostationary satellite using slightly inclined orbits may be characterized as follows:

- geosynchronous orbit

- circular orbit

- inclination angle not exceeding the natural limit (some 15 degrees).

M. MUROTANI
Chairman, GT-PLEN Ad-hoc

ATTACHMENT I

Documents
CCIR Study Groups
Period 1990-1994

Document 4/BL/32-E
7 November 1991

Reference: Doc. 4/6

Study Group 4

DRAFT NEW RECOMMENDATION [Doc. 4/6]

THE COORDINATION OF SATELLITE NETWORKS USING SLIGHTLY INCLINED GEOSTATIONARY-SATELLITE ORBITS AND BETWEEN SUCH NETWORKS AND SATELLITE NETWORKS USING NON-INCLINED GSO SATELLITES

(Question 51/4)

The CCIR,

considering

(a) that the definition of a geostationary satellite in the Radio Regulations (RR 181) has no indication for a maximum value of the angle of inclination of the orbit of a geostationary satellite;

(b) that station-keeping fuel on geostationary space stations constitutes an appreciable portion of in-orbit mass and tends to be the limiting factor of a geostationary space station's life;

(c) that north-south station-keeping consumes up to 90% of the total fuel;

(d) that in the absence of north-south station-keeping a geostationary-satellite orbit is subject to no more than about 0.9 degrees of orbit change per year, and the inclination will never exceed the natural limit of 15 degrees;

(e) that, on the other hand, the absence of north-south station-keeping may require additional equipments at the earth stations, such as angular tracking, polarization tracking and for digital transmissions also larger size elastic buffers and more complex synchronization methods.

(f) that WARC ORB-88 considered the matter of coordinating slightly inclined geostationary satellite networks, and referred action to the IFRB and the CCIR;

(g) that the IFRB requested the CCIR to study the related problems:

- the technical aspects of coordination between geostationary satellites and those in inclined geostationary orbits;
- the technical aspects of coordination between satellites in inclined geostationary orbits;

(h) that there appears to be no intrinsic limitation on the coordination of satellite networks using slightly inclined geostationary orbits;

(j) that the data required by Appendices 3 and 4 (WARC ORB-88) of the Radio Regulations include the effects of using slightly inclined geostationary-satellite orbits,

noting that

i) under co-coverage conditions, the isolation between geostationary-satellite networks with one using a slightly inclined orbit, will be equal to or greater than that between two geostationary-satellite networks (near 0° inclination);

ii) under co-coverage conditions, the isolation between two geostationary-satellite networks using slightly inclined orbit may be either less, or greater than, between two geostationary-satellite networks near 0° inclination, depending on the relative nodal phase;

iii) under co-coverage conditions the isolation between two closely spaced geostationary-satellite networks with frequency re-use by dual linear orthogonal polarization, one or both of which use slightly inclined orbit, may be less than two geostationary-satellite networks, depending on the relative nodal phase;

iv) under non co-coverage conditions, between two geostationary-satellite networks, one or both of which use slightly inclined orbits, the isolation may be less, or greater than, between two geostationary-satellite networks, depending on a number of factors, in addition to the relative nodal phase,

recommends

1. that the coordination of geostationary-satellite networks using slightly inclined geostationary-satellite orbits be performed in accordance with the Radio Regulations that apply to geostationary-satellite networks based upon the minimum separation between the satellites concerned;

2. that in bands shared with terrestrial services the inclination limit for the application of § 1 may need to be determined by the inter-service sharing considerations; in other bands § 1 may be applied up to the natural inclination limit for satellites launched initially into a geostationary or near-geostationary orbit if N/S station-keeping manoeuvres are not undertaken;

3. that for interference considerations involving the coordination of geostationary-satellite networks using slightly inclined geostationary orbits, the information given in Annex I to this Recommendation should be utilized;

4. that, the relative nodal phase between the orbits be adjusted if practicable, and/or other measures should be used to minimize any deleterious effects.

ANNEX I

1. Introduction

The information contained in this annex should be used in connection with the coordination of satellite networks using slightly inclined geostationary-satellite orbits and between such networks and other satellite networks using non inclined GSO satellites.

During slightly inclined geostationary-satellite orbit operation, there are basically three factors which affect the interference between two satellite networks. These are:

- the exocentric angular separation between the coverage areas of the networks as seen from either satellite;
- the exocentric angular width of the coverage areas as seen from either satellite;
- the topocentric angular spacing between the satellites as seen from an earth station of either network.

These factors cause the net antenna discrimination (earth station and satellite antenna) between the two networks to vary in time. In cases where satellite networks have a common service area (co-coverage networks), the earth-station antenna is the basic element providing discrimination between the networks. Where satellite networks have separated service areas (non co-coverage networks), both the earth station and satellite antenna contribute to the discrimination between the networks.

2. Geometric considerations

The geocentric angle, φ_g, between two slightly inclined geostationary satellites with latitudes (γ_1 and γ_2) and longitudes (φ_1) and (φ_2) may be determined by:

The latitude φ and longitude excursions Dj of a satellite as a function of the orbit inclination angle i and the satellite phase angle position in the orbit Dg as measured from the ascending node are:

With small angle approximations for sin i and cos i, equations (2) and (3) become:

The longitudinal excursions of a satellite in a circular geostationary orbit can be determined from the above equations. Figure 1 shows a plot of the maximum excursions as a function of inclination.

For two satellites having inclinations i_1 and i_2, designating $\Delta\gamma_0$ as the phase angle difference between the satellite orbit positions ($0 \leq \Delta\gamma_0 \leq 2\pi$) and φ_s as the angle between the ascending nodes, the minimum value of the geocentric angular separation φ_g may be derived from the preceding equations and is closely approximated by:

ATTACHMENT II

Documents
CCIR Study Groups
Period 1990-1994

Document 4-9S/TEMP/14-E
Kobe, 21 June 1991
English only

Source: Documents 4-9S/2, 12, 13
Report 1142

Sub-Working Group 4-9S-2

PRELIMINARY DRAFT NEW RECOMMENDATION

POSSIBLE INCLINATION OF THE GEOSTATIONARY ORBIT USED BY SATELLITES IN THE FIXED SATELLITE SERVICE IN BANDS SHARED WITH THE FIXED SERVICE

The CCIR,

CONSIDERING

(a) that the use of inclined orbit is attractive for operations in the fixed satellite service for prolonging the useful life of satellites;

(b) that inclined orbit usage may be designed at the planning stages of satellite systems;

(c) that nominally geostationary satellites have a "natural" drift of approximately $\pm 15^{o}$ at the rate of about 0.9^{o} per year;

(d) that systems in inclined orbit operating with the power flux density limits given in Recommendation 358 could cause interference to terrestrial systems by exposing a larger number of terrestrial stations to direct interference;

(e) that while the end to end performance of terrestrial systems might not be affected by the degree of inclination, the probability of individual hops being affected could increase with the amount of inclination;

(f) that it might therefore be desirable to limit the amount of permissible inclination, while taking into account the needs of the FSS;

(g) that the FSS operations themselves impose constraints which would in most cases limit the amount of inclination which would be used by the network to values considerably less than the natural limit described in considering (c);

(h) that the existing terrestrial networks in most bands currently shared with the FSS are in a mature state and operate on the basis of assuming satellites are located at their nominal GSO locations;

(j) that the impact of terrestrial stations currently observing the limits in Recommendation 406 on satellites in inclined orbit depends upon the amount of inclination, but is minimal at small inclinations;

(k) the sharing studies included in the Annex I,

RECOMMENDS

[1. that FSS geostationary space stations may be operated on satellites in orbit inclined with respect to the equatorial plane without additional constraints beyond those employed for operational purposes within the FSS itself;]

or

[1. that FSS geostationary space stations be operated on satellites in orbit inclined by no more than X degrees with respect to the equatorial plane;]

2. that FSS space stations continue to observe Recommendation 358 from all positions within their orbit;

3. that FS systems continue to observe Recommendation 406;

4. that the following notes may be considered part of this Recommendation.

Note 1 - It is understood that in the large majority of cases the operational constraints referred to in Recommends 1 include, inter alia:

- the amount of inclination is restricted by the absence of tracking capability in most earth stations, and

- satellite beam-pointing shall remain within a reasonable tolerance of the original beam direction.

Note 2 - It is understood that earth stations would be coordinated or re-coordinated, taking into account the degree of tracking used to accommodate the use of inclined orbit.

Note 3 - Recommendations 358 and 406 have values similar to those in Articles 28 and 27 respectively, and the Radio Regulations have precedence.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/29(Rev.1)-E
20 February 1992
Original: English

SUB-WORKING GROUP
AD HOC 6 TO 4B

Note from Drafting Group 1 to Working Group ad hoc 6 to 4B

TECHNICAL CONSIDERATIONS ON BROADCASTING-SATELLITE SERVICE (SOUND) AND COMPLEMENTARY

1. Add the following text before the table of Document DL/29.

"**1. Terms of reference**

To summarize technical considerations for those bands under consideration in Working Group 4B and also service objectives. This summarization is based heavily on the CCIR Report to WARC-92 (Document 3), on proposals made by administrations and on comments made both within the ad hoc 4B6 discussion and the Drafting Group.

2. Service objectives

The service objectives for satellite sound broadcasting may play an important role in determining the type of system to be used and the overall system design and cost.

Administrations have expressed their quality objectives. Those can range from grade 3 on the 5 point CCIR scale for a simple monophonic system to grade 4.5 for an advanced digital system whose objective is to provide a high quality stereophonic service, comparable to compact disc quality. Other aspects of service objectives such as, for example, the reliability have not been discussed.

3. Summary

Some administrations' delegates noted their belief that BSS (Sound), using modern digital techniques is technically and economically feasible throughout the frequency range from approximately 1 400 MHz to approximately 2 700 MHz. Other administrations' delegates believe that technical feasibility, and particularly costs, become increasingly difficult above 2 GHz, and even prohibition for BSS (Sound).

The accompanying table summarizes the advantages and disadvantages, as compiled by the Drafting Group, of 1.5 GHz, 2.3 GHz and 2.5 GHz frequency utilization. This table strictly refers to technical aspects of BSS (Sound) independently of other considerations, and must be considered with the other parts of the report. As far as the 2.3 GHz is concerned, the Drafting Group believe it is close enough to 2.5 GHz so that the 2.5 GHz tabular entries apply to it.

This table indicates that from a technical viewpoint, 1.5 GHz is preferable."

FREQUENCY BANDS	ADVANTAGES	DISADVANTAGES

1.5 GHz	- Less satellite power required to provide the same coverage area (see disadvantages at 2.5 GHz).
	- The same as above for complementary terrestrial coverage.
	- Given present and foreseeable technical limitations in satellite technology:
	  - a wider range of service coverage is achievable;
	  - an earlier implementation is feasible.
	- With all other factors held constant, the space segment cost per channel may be up to five times lower than at 2.5 GHz.
	- The mixed satellite/terrestrial approach provides for a wider receiver market and hence a lower cost per unit.
	- 1.5 GHz provides more flexibility in implementing the services:
	  - there is experimental evidence for this band which confirms the feasibility of implementing a mixed satellite/terrestrial service where the same frequency band is used for both services with a common receiver;
	  - less Doppler effects constraints (see disadvantages at 2.5 GHz)
	- Greater spectrum efficiency through a more flexible implementation co-frequency terrestrial retransmitters (i.e., gap-fillers and coverage extenders) which enables a better frequency reuse for both the satellite and terrestrial service.
		- Larger on-board satellite antenna is required for the same beam size.

FREQUENCY BANDS	ADVANTAGES	DISADVANTAGES
2.3 GHz	Closer to 2.5 GHz	Closer to 2.5 GHz

2.5 GHz	- For the same coverage area size, a physically smaller antenna is required.
	- Narrower beamwidths are feasible for the coverage of geographically small countries
		- To overcome propagation effects, four to six times more satellite power is required for the same service coverage area, in comparison to 1.5 GHz
		- For complementary terrestrial coverage, up to six times more radiated power is required for the same coverage area size, in comparison to 1.5 GHz.
		- With all other factors held constant the space segment cost per channel may be up to five times greater than at 1.5 GHz.
		- To provide identical coverage to that achieved at 1.5 GHz would require more terrestrial gap-fillers. This applies equally to the satellite and terrestrial service.
		- Provides less flexibility in implementing the service:
		  - due to Doppler effects; there would be more constraints on the use of co-frequency terrestrial retransmitters (i.e., gap-fillers or coverage extenders), which would make it more difficult to implement mixed satellite/terrestrial service or the hybrid system concept;
		  - the range of achievable satellite beamwidths is significantly more limited for geographically large countries.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 **WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM**

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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SUB-WORKING GROUP
AD HOC 6 to 4B

Note from Drafting Group 1 to Working Group ad hoc 6 to 4B

TECHNICAL CONSIDERATIONS ON BROADCASTING-SATELLITE SERVICE (SOUND) AND COMPLEMENTARY

FREQUENCY BANDS	ADVANTAGES	DISADVANTAGES

1.5 GHz	- Less satellite power required to provide the same coverage area (see disadvantages at 2.5 GHz).
	- The same as above for complementary terrestrial coverage.
	- Given present and foreseeable technical limitations in satellite technology:
	  - a wider range of service coverage is achievable;
	  - an earlier implementation is feasible.
	- With all other factors held constant, the space segment cost per channel may be up to five times lower than at 2.5 GHz.
	- The mixed satellite/terrestrial approach provides for a wider receiver market and hence a lower cost per unit.
	- 1.5 GHz provides more flexibility in implementing the services:
	  - there is experimental evidence for this band which confirms the feasibility of implementing a mixed satellite/terrestrial service where the same frequency band is used for both services with a common receiver;
	  - less Doppler effects constraints (see disadvantages at 2.5 GHz)
	- Greater spectrum efficiency through a more flexible implementation co-frequency terrestrial retransmitters (i.e., gap-fillers and coverage extenders) which enables a better frequency reuse for both the satellite and terrestrial service.
		- Larger on-board satellite antenna is required for the same beam size.

FREQUENCY BANDS	ADVANTAGES	DISADVANTAGES
2.3 GHz	Closer to 2.5 GHz	Closer to 2.5 GHz

2.5 GHz	- For the same coverage area size, a physically smaller antenna is required.
	- Narrower beamwidths are feasible for the coverage of geographically small countries
		- To overcome propagation effects, four to six times more satellite power is required for the same service coverage area, in comparison to 1.5 GHz
		- For complementary terrestrial coverage, up to six times more radiated power is required for the same coverage area size, in comparison to 1.5 GHz.
		- With all other factors held constant the space segment cost per channel may be up to five times greater than at 1.5 GHz.
		- To provide identical coverage to that achieved at 1.5 GHz would require more terrestrial gap-fillers. This applies equally to the satellite and terrestrial service.
		- Provides less flexibility in implementing the service:
		  - due to Doppler effects; there would be more constraints on the use of co-frequency terrestrial retransmitters (i.e., gap-fillers or coverage extenders), which would make it more difficult to implement mixed satellite/terrestrial service or the hybrid system concept;
		  - the range of achievable satellite beamwidths is significantly more limited for geographically large countries.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/30-E
19 February 1992
Original: English

REPORT OF THE CHAIRMAN OF AD HOC GROUP 4B5 TO THE CHAIRMAN OF WORKING GROUP 4B

1. The terms of reference of ad hoc Group 4B5 included the space operations, space research and earth exploration-satellite services in the bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz; consequential changes to Articles 27 and 28; Resolution No. EEE (Document EUR/20); Recommendation No. JJ (Document J/27); and the space research service (space-to-Earth) (deep space) at 2 110 - 2 120 MHz.

2. The following Administrations participated in the work of ad hoc Group 4B5: Germany, Brazil, Australia, Canada, New Zealand, Mexico, Korea, the United States, the United Kingdom, France, Spain, China, Japan, Pakistan and ESA.

3. The ad hoc Group met on 19 February 1992.

4. Annexes [1 and 2] are presented to Working Group 4B.

5. The Delegation of Canada requested that the issue of sharing conditions for the space services for non-geostationary orbit space systems be drawn to the attention of Committee 5.

6. The Delegation of Canada requested that their proposed ADD 747A (CAN/23/63) be referred to Working Group 4B. Several other delegations indicated that they saw no value in the proposed ADD 747A.

7. The ad hoc Group agreed to the establishment of a Drafting Group, under the chairmanship of Mr. J. Miller (United States) to examine:

a) a possible Resolution on sharing between the mobile and space services in the 2 GHz range;

b) a Resolution or Recommendation relating to the possible transfer of space services to bands above 20 GHz.

J.G. ROLSTON
Chairman

ANNEX 1

MOD	~~1 710~~2 025 - ~~2 290~~2 110 FIXED SPACE RESEARCH (Earth-to-space, space-to-space) SPACE OPERATION (Earth-to-space, space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space, space-to-space) Mobile 722 743A 744 746 748 ~~750~~ [750A]	~~1 710~~2 025 - ~~2 290~~2 110 FIXED MOBILE SPACE RESEARCH (Earth-to-space, space-to-space) SPACE OPERATION (Earth-to-space, space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space, space-to-space) 722 744 745 746 MOD 747 748~~-749 750~~ [750A]
MOD	~~1 710~~2 200 - 2 290 FIXED SPACE RESEARCH (space-to-Earth, space-to-space) SPACE OPERATION space-to-Earth, space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth, space-to-space) Mobile 722 743A 744 746 ~~747~~–748 [750A]	~~1 710~~2 200 - 2 290 FIXED SPACE RESEARCH (space-to-Earth, space-to-space) SPACE OPERATION (space-to-Earth, space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth, space-to-space) MOBILE 722 744 745 746 ~~747~~–748 ~~749~~–[750A]

SUP **747**

SUP **749**

SUP **750**

ADD **750A** Additional use: in Australia [and .....] , the bands 2 200 - 2 290 MHz and 2 290 - 2 300 MHz are also used for Very Long Baseline Interferometry (VLBI) observations between widely separated terrestrial stations for radio astronomy, geodesy and spacecraft navigation.

ADD **750A** The bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz may also be used for space-to-space transmissions in the space research, space operation, and earth exploration-satellite services. These transmissions shall be in accordance with the provisions of Nos. 2557 to 2560 and shall not cause harmful interference to Earth-to-space and space-to-Earth transmissions of these space services.

ANNEX 2

ARTICLE 27

Terrestrial Radiocommunication Services Sharing Frequency Bands with Space Radiocommunication Services Above 1 GHz

Section I. Choice of Sites and Frequencies

Section II. Power Limits

MOD **2509** (5) The limits given in Nos. 2502, 2505, 2506 and 2507 apply in the following frequency bands allocated to the fixed-satellite service, the meteorological-satellite service and the mobile-satellite service, the space operations service, the space research service and the Earth exploration satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

1 626.5 - 1 645.5 MHz	(for countries mentioned in No. 730)
1 646.5 - 1 660 MHz	(for countries mentioned in No. 730)
2 025 - 2 110 MHz	
2 200 - 2 290 MHz	
2 665 - 2 690 MHz[1]	(for Regions 2 and 3)
5 725 - 5 755 MHz[1]	(for countries of Region 1 mentioned in Nos. 803 and 805)
5 755 - 5 850 MHz[1]	(for countries of Region 1 mentioned in Nos. 803, 805 and 807)
5 850 - 7 075 MHz	
7 900 - 8 400 MHz	

MOD **2558**
Mob-87 b) The limits given in No. 2557 apply in the frequency bands listed in No. 2559 which are allocated to the following space radiocommunication services:

- meteorological-satellite service (space-to-Earth);
- space research service (space-to-Earth) (space-to-space);
- space operation service (space-to-Earth) (space-to-space);
- earth exploration-satellite service (space-to-Earth) (space-to-space);

for transmission by space stations where these bands are shared with equal rights with the fixed or mobile service, and to the

- radiodetermination-satellite service (space-to-Earth).

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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19 February 1992
Original: English only

Source: Document 20

WORKING GROUP 5B

Sub-Working Group 5B4

Third Report of Sub-Working 5B4 to Working Group 5B

RESOLUTION No. COM 5/[5B4-3]

Relating to the Introduction of the Broadcasting-Satellite (Sound) Service

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

a) that this Conference has made allocations to the broadcasting-satellite service (sound) for complementary terrestrial broadcasting and for the associated feeder links [that will become available for use from 1 January 2005];

b) that some administrations or groups of administrations may wish to take a lead in an early, [i.e. before 1 January 2005], introduction of BSS (Sound) systems of an experimental nature without affecting the continued operation of existing services in other countries;

c) that it will be necessary to ensure that the introduction of BSS (Sound) systems into this band proceeds in a flexible and equitable manner,

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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20 February 1992
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SUB-WORKING GROUP
AD HOC 6 TO 4B

REPORT OF THE CHAIRMAN OF DRAFTING GROUP 2 ON BSS (SOUND) SHARING WITH OTHER SERVICES

1. Terms of reference

To summarize sharing considerations - problems and possible solutions - for those bands under consideration in Working Group 4B. This summarization is to be based upon ad hoc 4B6 discussion, discussion within the Drafting Group, and CCIR documentation and official input documents to this Conference.

2. Sharing problems by existing service

1) Radio astronomy: The IUCAF representative provided computations and conclusions on two bands of interest to radio astronomy: below 1 427 MHz and above 2 690 MHz. His conclusions were:

   a) considering Advanced Digital System II characteristics as specified in the CCIR JIWP WARC-92 Document (Document 3), a frequency separation between the band edges of approximately 18 MHz would be required to protect the radio astronomy service in the 1 400 - 1 427 MHz primary passive band; and

   b) that a similar frequency separation should be considered below 2 690 MHz (roughly 30 MHz would be ample).

   For terrestrial broadcasting, it was noted by one delegate that a narrower frequency separation would be possible.

2) Fixed: The Drafting Group unanimously agreed that broadcast channel frequencies could not realistically be shared in the same geographic area with fixed services. This conforms to CCIR documentation. Realistic BSS (Sound) spectral power flux-densities for high quality broadcast services are too high for co-frequency use within a satellite beam or within the coverage area of complementary terrestrial transmitters.

3) Mobile: The Drafting Group had the same unanimous opinion on BSS (Sound) sharing with mobile services as it did with fixed services.

4) Broadcasting satellite: Note was taken of the comments in the 4B6 meeting by ARABSAT users for television services in the 2 500 to 2 690 MHz band, and also after the meeting regarding India's INSAT for the same type of service. As with fixed and mobile services, it was agreed that co-frequency sharing between BSS (Sound) and BSS (TV) in the same geographic area is not realistic.

5) Other: Delegates noted that at 2.3 GHz and between 2.5 - 2.69 GHz, MDS (multipoint distribution systems) bands are used in a number of countries. Also ENG links, featuring transportable equipment and low margins, use the 2.6 GHz band. As stated in 2.2) co-frequency use in a BSS (Sound) area is not realistic.

3. Special problems by band

During the 4B6 meetings, a number of administrations expressed total rejection of the use for their administrations of one or more of the 1.5 GHz, 2.3 GHz, or 2.6 GHz bands. This was not discussed further in the Drafting Group; it was just noted as a major problem in reaching a conclusion on a BSS (Sound) allocation at this Conference.

1) 1 429 - 1 515 MHz: Radio astronomy's problem, up to approximately 1 445 MHz as noted in 2.1) above. Two administrations have formally introduced no change proposals. Also, it was noted that some administrations use this band for long distance "over the horizon" links, which could cause additional sharing problems. It was also noted that this use occurs at the higher frequencies, but that the effective ranges would be less, perhaps causing less of an interference problem.

2) 2 310 - 2 360 MHz: During discussions in the 4B6 meetings and in the Drafting Group, special fixed service use was mentioned, and is noted in 2.5) above.

3) 2 500 - 2 690 MHz: Radio astronomy's need for a guard band is noted in 2.1) above. ARABSAT's and INSAT's concerns are noted in 2.4) above. Special fixed service use, such as MDS, is noted in 2.5) above.

4. Miscellaneous comments

In a 4B6 meeting, two administrations suggested that the new technology - BSS (Sound) - should be placed in the highest frequencies, i.e., 2 500 - 2 690 MHz, and let the existing fixed and mobile services in the below 2 GHz region, which is already crowded, remain as they are.

5. Suggested solutions

No one had "the solution". A few "partial solutions" were mentioned in the 4B6 meeting, and expanded upon in the Drafting Group.

1) "Mixed approach", i.e., satellite and local terrestrial delivery: The spectral efficiency of using the same frequency band for satellite and local terrestrial broadcasting was noted. Since satellite frequency requirements within a single beam will always be a small fraction of the total allocation, local broadcasting using the same signal modulation techniques can make very efficient use of a combined BSS (Sound) and BS allocation.

2) Mid-band "gaps": Three administrations noted the frequency gap between some terrestrial services that could permit inserting BSS (Sound) frequencies in the gap. One delegate noted this might work for low density areas, but that its administration "interleaved" these gaps with more links of the same type of service.

3) Naturally long lead times: It was agreed in the Drafting Group that planning, designing, launching and otherwise getting satellite systems to become operational takes many years to accomplish. Therefore, there will be a natural, long time transition period that will minimize the effect on existing services. It was also agreed that terrestrial DAB in the allocated band could begin service earlier than satellite, and that they, being more localized, might have a lesser impact on some of the affected existing services.

4) Satellite channel bandwidth requirements: It was noted that the spectrum required per spot beam will be a small fraction of a total allocation, that satellite antenna beams will be narrow, and that "off-beam" frequency sharing within the total allocation could limit the impact on some of the existing services.

6. Major conclusions

1) It is unrealistic to consider frequency sharing of broadcast channels with other services at the same frequencies within a BSS (Sound) allocation in the same geographic area.

2) Long lead times to bring communication satellite systems into operation allow reasonable transition periods. Existing services could continue to use the worldwide BSS (Sound) allocation for predictable time periods if either or both of the following apply:

   - the allocation segments were phased;
   - BSS (Sound) would be introduced in a given area at a specified future date, at which time existing services are to be phased out.

H.D. MESSER
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/32-E
19 February 1992
Original: English

SUB-WORKING GROUP
AD HOC 6 TO 4B

REPORT OF THE CHAIRMAN OF DRAFTING GROUP 2 ON BSS (SOUND) SHARING WITH OTHER SERVICES

1. Terms of reference

To summarize sharing considerations - problems and possible solutions - for those bands under consideration in Working Group 4B. This summarization is to be based upon ad hoc 4B6 discussion, discussion within the Drafting Group, and CCIR documentation and official input documents to this Conference.

2. Sharing problems by existing service

1) Radio astronomy: The IUCAF representative provided computations and conclusions on two bands of interest to radio astronomy: below 1 427 MHz and above 2 690 MHz. His conclusions were:

   a) BSS (Sound) frequencies should not be lower than 1 445, or possibly 1 450 MHz; and

   b) that a similar "guard band" should be considered below 2 690 MHz (roughly 30 MHz would be ample).

   For terrestrial broadcasting, it was noted by one delegate that a narrower "guard band" would be possible.

2) Fixed: The Drafting Group unanimously agreed that broadcast channel frequencies could not realistically be shared in the same geographic area with fixed services. This conforms to CCIR documentation. Realistic BSS (Sound) spectral power flux-densities for high quality broadcast services are too high for co-frequency use within a satellite beam or within the coverage area of complementary terrestrial transmitters.

3) Mobile: The Drafting Group had the same unanimous opinion on BSS (Sound) sharing with mobile services as it did with fixed services.

4) Broadcasting satellite: Note was taken of the comments in the 4B6 meeting by Arabsat users for television services in the 2 500 to 2 690 MHz band, and also after the meeting regarding India's Insat for the same type of service. As with fixed and mobile services, it was agreed that co-frequency sharing between BSS (Sound) and BSS (TV) in the same geographic area is not realistic.

5) Other: One delegate noted at 2.3 GHz and between 2.5 - 2.69 GHz, MDS bands are used in a number of countries in Region 3. Also ENG links, featuring transportable equipment and low margins, use the 2.6 GHz band.

3. Special problems by band

During the 4B6 meeting, a number of administrations expressed total rejection of the use for their administrations of one or the other of the 1.5 GHz or 2.6 GHz bands. This was not discussed further in the Drafting Group; it was just noted as a major problem in reaching a conclusion on a BSS (Sound) allocation at this Conference.

1) 1 429 - 1 515 MHz: Radio astronomy's problem, up to approximately 1 450 MHz as noted in 2.1) above. Two administrations have formally introduced no change proposals. Also, it was noted that some administrations use this band for long distance over the horizon" links, which could cause additional sharing problems. It was also noted that this use occurs at the higher frequencies, but that the effective ranges would be less, perhaps causing less of an interference problem.
2) 2 310 - 2 360 MHz: No problems were noted in the 4B6 meeting. During discussion in the Drafting Group, fixed service use was mentioned, and is noted in 2.5) above.
3) 2 500 - 2 690 MHz: Radio astronomy's need for a guard band is noted in 2.1) above. Arabsat's and Insat's concerns are noted in 2.4) above.

4. Miscellaneous comments

In the 4B6 meeting, two administrations suggested that the new technology - BSS (Sound) - should be placed in the highest frequencies, i.e., 2 500 - 2 690 MHz, and let the existing fixed and mobile services in the below 2 GHz region, which is already crowded, remain as they are.

5. Suggested solutions

No one had "the solution". A few "partial solutions" were mentioned in the 4B6 meeting, and expanded upon in the Drafting Group.

1) "Mixed approach", i.e., satellite and local terrestrial delivery: The spectral efficiency of using the same frequency band for satellite and local terrestrial broadcasting was noted. Since satellite frequency requirements within a single beam will always be a small fraction of the total allocation, local broadcasting using the same signal modulation techniques can make very efficient use of a combined BSS (Sound) and BS allocation.
2) Mid-band "gaps": Three administrations noted the frequency gap between some terrestrial services that could permit inserting BSS (Sound) frequencies in the gap. One delegate noted this might work for low density areas, but that its administration "interleaved" these gaps with more links of the same type of service.
3) Naturally long lead times: It was agreed in the Drafting Group that planning, designing, launching and otherwise getting satellite systems to become operational takes many years to accomplish. Therefore, there will be a natural, long time transition period that will minimize the effect on existing services. It was also agreed that terrestrial DAB in the allocated band could begin service earlier than satellite, and that they, being more localized, might have a lesser impact on some of the affected existing services.
4) Satellite channel bandwidth requirements: It was noted that the spectrum required per spot beam will be a small fraction of a total allocation, that satellite antenna beams will be narrow, and that "off-beam" frequency sharing within the total allocation could limit the impact on some of the existing services.

6. Major conclusions

1) It is unrealistic to consider frequency sharing of broadcast channels with other services at the same frequencies within a BSS (Sound) allocation in the same geographic area.

2) Long lead times to bring communication satellite systems into operation and allow reasonable transition periods. Existing services could continue to use the worldwide BSS (Sound) allocation for predictable time periods if either or both of the following apply:

   - the allocation segments were phased;
   - BSS (Sound) would be introduced in a given area at a specified future date, at which time existing services are to be phased out.

H.D. MESSER
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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AD HOC 6 TO
WORKING GROUP 4B

Report of Drafting Group 3 of ad hoc 6 to Working Group 4B

BANDWIDTHS, TIMINGS AND ORBITS FOR THE BSS (SOUND)

This report summarizes the requirements and possibilities expressed by administrations on bandwidth for the service, timing of bringing into operation and satellite orbits to be used.

1. Bandwidth for the service

The bandwidth requirements for the BSS (Sound) lie in the range from 30 MHz to 100 MHz. Details are given in Document DT/51(Rev.) and can be broadly summarized as follows:

Bandwidth requested	< 48 MHz	48 - 50 MHz	60 - 65 MHz	> 65 MHz
Number of countries	3	34	8	4

In discussion, several administrations thought that in order to reduce the impact on existing services, a lesser bandwidth could be made available to the BSS (Sound) in the early years, possibly in the range 12* - 40 MHz. However, this would be only with the certain knowledge that the full bandwidths required would become available later. Nevertheless, such reduced bandwidths are mainly based on requirements of individual countries and have not been fully evaluated across any given region. In addition, several administrations cautioned against starting with the lower bandwidth values because the economics of BSS (Sound) systems are highly dependent on the amount of bandwidth utilized (i.e. economy of scale in a system).

2. Timing of bringing into operation

Some administrations, notably in Region 2, wish to make a start as soon as possible, within the next 2 to 5 years, initially providing protection to other existing services. Others, particularly in Region 1, believe that the start of the BSS (Sound) should be in 8 to 10 years time, but the general consensus was the need to maintain maximum flexibility on timing over the introduction period. Overall, the full bandwidth would probably be required in 10 to 15 years time.

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* For monophonic service in some developing countries.

3. Satellite orbits to be used

CCIR studies on BSS (Sound) (see Document 3) envisage the potential use of satellites in both geostationary and non-geostationary, highly-inclined elliptical orbits, as appropriate to the service area, in order to minimize satellite powers required and thus to maximize the efficient use of the frequency band.

Several administrations in the lower latitude regions felt that the geostationary-satellite orbit should preferably be used, but accepted that the special needs of the higher latitude countries should also be taken into account, where use of highly-inclined elliptical orbits would be of benefit, particularly for spectrum sharing. However, the use of low-Earth orbit satellites which traverse the service very rapidly were thought to be unsuitable for the BSS (Sound).

It was generally accepted that no special regulatory provisions would be required to use non-geostationary orbits of the highly-inclined elliptical type, already much used by at least one administration. Normal provisions for the geostationary-satellite orbit would be applied with calculations on sharing criteria undertaken using the worst-case service arc position. There was strong support for requesting further CCIR studies on the use of highly-inclined elliptical orbits in the BSS (Sound) including shared use with satellites in the geostationary-satellite orbit.

P.A. RATLIFF
Chairman

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

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20 February 1992
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WORKING GROUP 4B

DRAFT

REPORT OF AD HOC 6 TO WORKING GROUP 4B

CONSIDERATION OF AGENDA ITEM 2.2.3A

1. Introduction

The ad hoc Group held four meetings spanning five sessions and had very wide participation from administrations. Part of one session was devoted to coordinated views of administrations having proposals generally aligned in respect of each of the three frequency bands which have emerged, around 1.5 GHz, 2.3 GHz and 2.5 GHz, respectively.

2. Terms of reference

The terms of reference were confirmed at the first meeting and are given in Annex I.

3. Consideration of the proposals

The various aspects of the proposals from administrations were considered under three segments and Drafting Groups were formed to prepare concise reports on each segment:

a) Drafting Group I, chaired by Mrs. Giovachini (France), prepared the report regarding technical feasibility and service objectives, which is Annex II to this report;

b) Drafting Group II, chaired by Mr. Messer (United States) prepared the report regarding sharing, which is Annex III;

c) Drafting Group III, chaired by Dr. Ratcliffe (United Kingdom) prepared the report on bandwidth requirements, timing and orbit options, which is Annex IV.

4. Current views of administrations

During the considerations, the ad hoc Group noted the variations in the views of administrations as to their preference to each of the three candidate bands and modified the tables of the input Document DT/51(Rev.1) to record the status of opinions. The current positions are recorded in Annex V.

5. Possibilities for consensus

At the second meeting I requested that the delegates consider possible options which could be followed to achieve consensus on the choice of frequency bands and offered to present them as Chairman's suggestions without attribution if so desired, but encouraged the preferred course of administrations putting forward the possibilities themselves. As this matter was left open at the last moment, the outcome is reported in a separate part of this document as Annex VI, [together with the Chairman's final summary. It is to be emphasized that Annex VI has not been considered by the ad hoc Group and thus does not necessarily represent the Group's view, only that of the Chairman.]

6. Summary

Although there has been some movement in the positions of administrations during the two days allocated to the work of the Group, there remains a clear polarization of views. While these can be divided between preference for around 1.5 GHz and around 2.5 GHz, the latter contains the views of a small number of administrations whose specific preference is firmly for an allocation between 2.3 and 2.4 GHz. The majority of that Group with preference around 2.5 GHz is for the range 2.5 - 2.64 GHz.

Despite this polarization, there is a unity of opinion regarding major points of substance.

1) That there is a need to introduce the new BSS (Sound) and complementary service in the near term. For developed countries to provide a new quality of service with expanded broadcasting capacity, and for developing countries to also provide for rural broadcasting development and multi-channel capacity.
2) That spectrum of at least 50 MHz and preferably at least 60 MHz must be identified by this Conference. One administration considers that 74 MHz is essential to meet the full demand for sound broadcasting.
3) That technically around 1.5 GHz is the best solution which will also be the better solution economically, both points addressing the implications for the broadcasting service.
4) That the major difficulties in deciding the spectrum choice are related to the sharing implications. As the planning of the relevant bands for other services varies widely between countries, it is that reason which currently dominates the preferences of countries.

For the majority of administrations the major sharing issue is related to fixed-service planning, while for others it relates to land mobile or aeronautical telemetry. For a significant group of administrations in the African and Asian areas, a major determinant is the use of the 2.5 GHz band for television broadcasting and distribution.

As determined by the Working Group, the ad hoc Group did not specifically address the issue of planning although some of the discussions touched on implications for planning and several of the points covered in the annexes will be relevant for that subject.

Acknowledgements

The Group worked with considerable harmony and my first appreciation is expressed to all participants for their cooperation and hard work over quite long hours. Particular thanks are due to the Chairpersons of the Drafting Groups, Mrs. Giovachini, Mr. Messer and Dr. Ratcliffe who all worked virtually non-stop through a very long day to progress the first stage of the considerations and to prepare the attached annexes.

R.M. BARTON
Chairman of ad hoc 6
to Working Group 4B

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MALAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/35-E
21 February 1992
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PLEN AD HOC 1

Report by the Chairman of ad hoc 1 of the Plenary

1. Ad hoc 1 of the Plenary met on 20 and 21 February 1992. The meetings were attended by delegates from F, MEX, MRC, NIG, NZL, SNG, SYR and USA.

2. According to the terms of reference (see Document DT/89) the ad hoc Group considered possible solutions for the development of an arrangement for the allotment of frequencies for the aeronautical mobile (OR) service in the exclusive bands between 3 025 kHz and 18 030 kHz and associated provisions in Article 12 and Appendix 26.

The ad hoc Group came to the following conclusions:

a) The channelling arrangement as prepared by the IFRB is satisfactory.

b) this Conference is not a planning conference and not authorized to revise the Plan contained in Part IV of Appendix 26.

c) The allotment arrangement to be developed by the IFRB shall be based on the following principles:

- Each existing allotment will be transferred to a new allotment in the same band in the new allotment arrangement.
- Allotments will be included in the new allotment arrangement for those administrations having no allotment in the present Plan.
- Allotments will be included for those assignments which are not covered by an allotment according to the two steps indicated above.
- The IFRB will endeavour to resolve any difficulties that may arise from the sharing of a channel by two or more allotments in consultation with the administrations concerned.
- The IFRB will propose to each administration concerned single-sideband carrier frequencies to be included in the allotment arrangement.

d) A procedure for modification and maintenance of the allotment arrangement will be provided, so that any future requirements for allotments may be met.

3. Taking into account the conclusions of section 2 above and the texts prepared by Committee 5, the ad hoc Group submits the following texts for consideration by the Plenary:

a) a draft Resolution, Relating to the Development of an Arrangement for the Allotment of Frequencies for the Aeronautical Mobile (OR) Service in the Exclusive Bands Between 3 025 kHz and 18 030 kHz (Annex 1);

b) draft modifications to Article 12 (Annex 2);

c) draft modifications to Appendix 26, later to be known as Appendix 26(Rev.), with the exclusion of Part III relating to the allotment arrangement (Annex 3);

d) two further draft Resolutions associated with the issue (Annex 4).

It should be noted that the texts referred to in b), c) and d) do contain only minor amendments compared to the corresponding source texts from Committee 5 as contained in Document 180 (B.2), whereas the text referred to in a) is a complete new draft.

It should be noted further that all texts have been approved in the Group by unanimity.

E. GEORGE
Chairman PLEN ad hoc 1

Annexes: 4

ANNEX 1

RESOLUTION [PLEN/AH-1]

Relating to the Development of an Arrangement for the Allotment of Frequencies for the Aeronautical Mobile (OR) Service in the Exclusive Bands Between 3 025 kHz and 18 030 kHz

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

a) that Resolution No. 9 of the Plenipotentiary Conference, Nice, 1989 instructed the IFRB to undertake actions relating to the improvement of use by the aeronautical mobile (OR) service of the frequency bands governed by Appendix 26 to the Radio Regulations;

b) that the IFRB prepared, following consultation with administrations, a draft channelling arrangement which was adopted by the Conference as Part II of Appendix 26(Rev.);

c) that Article 12 and Appendix 26 have been revised by this Conference;

d) that an updated version of Part IV of Appendix 26 is to be derived from the allotments appearing in that Part to be complemented by allotments derived from assignments recorded in the Master Register, which will be included as Part III in Appendix 26(Rev.);

e) that there may be a need for additional allotments,

appreciating

the efforts made by the IFRB despite the limited resources available,

resolves

1. that the IFRB shall apply in the order described below, immediately after the Conference the following method to develop Part III of Appendix 26(Rev.):

1.1 to transfer every allotment of Part IV of Appendix 26 to a 3 kHz allotment to the nearest possible channel in the same band;

1.2 to include in appropriate bands for those administrations having no allotments in Part IV of Appendix 26:

a) a 3 kHz allotment in the band concerned on the nearest possible channel corresponding to the assignment notified to the IFRB before 3 February 1992;

b) a 3 kHz allotment in the band concerned for each of the requirements received by the IFRB before 3 February 1992 from an administration having no assignments in the Master Register;

1.3 the action under 1.1 and 1.2 above shall be terminated before 15 December 1992 and administrations to which new allotments have been indicated shall be informed that these allotments are indicated on a provisional basis until such time as the IFRB has completed the process;

1.4 to include a 3 kHz allotment on the nearest possible channel in the same band for every additional assignment recorded in the Master Register not covered under 1.1 and 1.2 above;

1.5 to propose to each administration concerned single-sideband carrier frequencies intended to be included in the allotment arrangement;

1.6 in applying the above process, to endeavour to resolve any difficulties that may arise from the sharing of a channel by two or more allotments in consultation with the administrations concerned;

1.7 to distribute to all administrations Part III of Appendix 26(Rev.) by [15 October 1992];

1.8 the IFRB shall delete from the Master Register the allotments appearing in Part IV of Appendix 26 and record the allotments appearing in Part III of Appendix 26(Rev.) on [15 December 1992];

2. that the IFRB shall include in Part III of Appendix 26(Rev.) such additional allotments in accordance with Part V of Appendix 26(Rev.) for which requirements have been submitted by administrations to the Conference;

3. to request the Secretary-General to publish Part III of Appendix 26(Rev.) after the IFRB has completed its tasks under **resolves** 1 and 2.

ANNEX 2

ARTICLE 12

NOC **Sub-Section IIC. Procedure to Be followed for Aeronautical Stations Operating in the Bands Allocated Exclusively to the Aeronautical Mobile Services Between 2 850 kHz and 22 000 kHz**

NOC **1343** § 27. (1) Examination of Notices Concerning Frequency Assignments to Aeronautical Stations in the Aeronautical Mobile (OR) Service in the Bands Allocated Exclusively to that Service Between 3 025 kHz and 18 030 kHz (see No. 1239).

NOC **1344** (2) The Board shall examine each notice covered by No. 1343 to determine whether:

MOD **1344A Mob-87** (a) the notice is in conformity with the provisions of No. 1240 and those contained in Part II of Appendix 26(Rev.);

MOD **1345** (b) the assignment is in conformity with an allotment contained in Part III of Appendix 26(Rev.);

SUP 1346 - 1348

(MOD) **1348A Mob-87** (3) A notice which is not in conformity with the provisions of No. 1344A shall be examined with respect to Nos. 1267 and 1268. The date to be entered in Column 2b shall be determined in accordance with the relevant provisions of Section III of this Article.

ADD **1348B** (4) Any frequency assignment for which the finding is favourable with respect to Nos. 1344A and 1345 shall be recorded in the Master Register. The date to be entered in Column 2a shall be determined in accordance with the relevant provisions of Section III of this Article.

ADD **1348C** (5) A notice which is in conformity with the provisions of No. 1344A, but not with those of No. 1345, shall be examined with respect to the allotments in Part III of Appendix 26(Rev.). In so doing, the Board shall apply the technical criteria specified in Part IV of Appendix 26(Rev.). The date to be entered in Column 2a or 2b shall be determined in accordance with the relevant provisions of Section III of this Article.

SUP **1349 Mob-87**

NOC **Section III**

NOC **1406** § 45. (1) Frequency Bands Allocated Exclusively to the Aeronautical Mobile (OR) Service Between 3 025 kHz and 18 030 kHz.

MOD **1407** (2) If the finding is favourable with respect to Nos. 1344A and 1345, the date of [15 December 1992] shall be entered in Column 2a.

MOD **1408** (3) If the finding is favourable with respect to No. 1348C, the date of [15 December 1992] shall be entered in Column 2a.

SUP **1409**

MOD **1410** (4) In all other cases covered by No. 1343, the date of [16 December 1992] shall be entered in Column 2b.

(MOD) **1411** (5) For assignments to stations other than aeronautical stations in the aeronautical mobile (OR) service, the relevant date shall be entered in Column 2b (see Nos. 1271 and 1272).

ANNEX 3

APPENDIX 26(Rev.)
to the WARC-92 Radio Regulations

**Provisions and Associated Frequency Allotment Plan
for the Aeronautical Mobile (OR) Service
in the Bands Allocated Exclusively to that Service
Between 3 025 kHz and 18 030 kHz**

(see Article 50 of the Radio Regulations)

PART I: General Provisions, Definitions

26/1 The provisions of this Appendix shall apply to the aeronautical mobile (OR) service in the following frequency bands:

3 025	- 3 155 kHz	
3 900	- 3 950 kHz	(Region 1 only)
4 700	- 4 750 kHz	
5 680	- 5 730 kHz	
6 685	- 6 765 kHz	
8 965	- 9 040 kHz	
11 175	- 11 275 kHz	
13 200	- 13 260 kHz	
15 010	- 15 100 kHz	
17 970	- 18 030 kHz	

26/2 For the purpose of this Appendix, the terms used comprise the following:

26/2.1 Frequency Allotment Plan

The Plan for the aeronautical mobile (OR) service contained in Part III of this Appendix.

26/2.2 Allotment in the aeronautical mobile (OR) service

A frequency allotment in the aeronautical mobile (OR) service which comprises:

- a frequency channel from the channels appearing in the channelling arrangement in No. 26/3;
- a bandwidth of up to 2.8 kHz, situated wholly within the frequency channel concerned;
- a power within the limits laid down in No. 26/4.4 [and/or] specified against the allotted frequency channel;
- an allotment area which is the area in which the aeronautical station can be situated and which coincides with all or part of the territory of the country, or of the geographical area, as indicated against the frequency channel concerned in the Frequency Allotment Plan.

PART II. Technical Bases Used for the Establishment of the Frequency Allotment Plan for the Aeronautical Mobile (OR) Service in the Bands Allocated Exclusively to that Service Between 3 025 kHz and 18 030 kHz

26/3 Channelling arrangement

26/3.1 The channelling arrangement for the frequencies to be used by aeronautical stations in the aeronautical mobile (OR) service in the bands allocated exclusively to that service between 3 025 kHz and 18 030 kHz is indicated in Table 1 below:

TABLE 1

Frequency band 3 025 - 3 155 kHz: 43 + 1 channels

3 023[1]	3 026	3 029	3 032	3 035	3 038	3 041	3 044	3 047	3 050
3 053	3 056	3 059	3 062	3 065	3 068	3 071	3 074	3 077	3 080
3 083	3 086	3 089	3 092	3 095	3 098	3 101	3 104	3 107	3 110
3 113	3 116	3 119	3 122	3 125	3 128	3 131	3 134	3 137	3 140
3 143	3 146	3 149	3 152						

Frequency band 3 900 - 3 950 kHz (Region 1 only): 16 channels

3 900	3 903	3 906	3 909	3 912	3 915	3 918	3 921	3 924	3 927
3 930	3 933	3 936	3 939	3 942	3 945				

Frequency band 4 700 - 4 750 kHz: 16 channels

4 700	4 703	4 706	4 709	4 712	4 715	4 718	4 721	4 724	4 727
4 730	4 733	4 736	4 739	4 742	4 745				

Frequency band 5 680 - 5 730 kHz: 15 + 1 channels

5 680[1]	5 684	5 687	5 690	5 693	5 696	5 699	5 702	5 705	5 708
5 711	5 714	5 717	5 720	5 723	5 726				

Frequency band 6 685 - 6 765 kHz: 26 channels

6 685	6 688	6 691	6 694	6 697	6 700	6 703	6 706	6 709	6 712
6 715	6 718	6 721	6 724	6 727	6 730	6 733	6 736	6 739	6 742
6 745	6 748	6 751	6 754	6 757	6 760				

Frequency band 8 965 - 9 040 kHz: 25 channels

8 965	8 968	8 971	8 974	8 977	8 980	8 983	8 986	8 989	8 992
8 995	8 998	9 001	9 004	9 007	9 010	9 013	9 016	9 019	9 022
9 025	9 028	9 031	9 034	9 037					

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[1] For use of the carrier (reference) frequencies 3 023 kHz and 5 680 kHz, see No. 26/3.4.

Frequency band 11 175 - 11 275 kHz: 33 channels

11 175	11 178	11 181	11 184	11 187	11 190	11 193	11 196	11 199	11 202
11 205	11 208	11 211	11 214	11 217	11 220	11 223	11 226	11 229	11 232
11 235	11 238	11 241	11 244	11 247	11 250	11 253	11 256	11 259	11 262
11 265	11 268	11 271							

Frequency band 13 200 - 13 260 kHz: 20 channels

13 200	13 203	13 206	13 209	13 212	13 215	13 218	13 221	13 224	13 227
13 230	13 233	13 236	13 239	13 242	13 245	13 248	13 251	13 254	13 257

Frequency band 15 010 - 15 100 kHz: 30 channels

15 010	15 013	15 016	15 019	15 022	15 025	15 028	15 031	15 034	15 037
15 040	15 043	15 046	15 049	15 052	15 055	15 058	15 061	15 064	15 067
15 070	15 073	15 076	15 079	15 082	15 085	15 088	15 091	15 094	15 097

Frequency band 17 970 - 18 030 kHz: 20 channels

17 970	17 973	17 976	17 979	17 982	17 985	17 988	17 991	17 994	17 997
18 000	18 003	18 006	18 009	18 012	18 015	18 018	18 021	18 024	18 027

26/3.2 The frequencies indicated in No. 26/3.1 are the carrier (reference) frequencies.

26/3.3 With the exception of the carrier (reference) frequencies 3 023 kHz and 5 680 kHz (see 26/3.4 below), one or more frequencies from Table 1 may be assigned to any aeronautical station [and/or] aircraft station, in accordance with the Frequency Allotment Plan, as contained in Part III of this Appendix.

26/3.4 The carrier (reference) frequencies 3 023 kHz and 5 680 kHz are intended for worldwide common use (see also Appendix 27 Aer2 Nos. 27/208 to 27/214).

26/3.5 The aeronautical radiotelephone stations shall use only single-sideband emissions (J3E). The upper sideband shall be employed, and the assigned frequency (see No. 142 of the Radio Regulations) shall be 1 400 Hz higher than the carrier (reference) frequency.

26/3.6 The channelling arrangement specified in No. 26/3.1 does not prejudice the rights of Administrations to establish, and to notify assignments to stations in the aeronautical mobile (OR) service other than those using radiotelephony, provided that:

- the occupied bandwidth does not exceed 2 800 Hz and is situated wholly within one frequency channel (see also Resolution COM5/1);
- the limits of unwanted emission are met (see Appendix 27 Aer2 No. 27/66C).

26/4 Classes of emission and power

26/4.1 In the aeronautical mobile (OR) service, in the bands governed by this Appendix, the use of the emissions listed below is permissible; additionally, the use of other emissions is also permissible, subject to compliance with No. 26/3.6.

26/4.2 Telephony

- J3E (single-sideband, suppressed carrier).

26/4.3 Telegraphy (including automatic data transmission)

- A1A, A1B, F1B;
- (A,H)2(A,B);
- (R,J)2(A,B,D);
- J(7,9)(B,D,X).

26/4.4 Unless otherwise specified in Part II of this Appendix, the following transmitter power limits (i.e., power supplied to the antenna), shall be applied:

Class of emission	Power limit values (peak envelope power supplied to the antenna)	
	Aeronautical station	Aircraft station
J3E	36 dBW (PX)	23 dBW (PX)
A1A, A1B	30 dBW (PX)	17 dBW (PX)
F1B	30 dBW (PX)	17 dBW (PX)
A2A, A2B	32 dBW (PX)	19 dBW (PX)
H2A, H2B	33 dBW (PX)	20 dBW (PX)
(R,J)2(A,B,D)	36 dBW (PX)	23 dBW (PX)
J(7,9)(B,D,X)	36 dBW (PX)	23 dBW (PX)

26/4.5 On the assumption that no antenna gain is involved, the transmitter powers specified in No. 26/4.4 above will result in a mean effective radiated power of 1 kW (for the aeronautical stations) and 50 W (for the aircraft stations), used as the basis for the establishment of the Plan contained in Part II of this Appendix.

PART III: Arrangement for the Allotment of Frequencies for the Aeronautical Mobile (OR) Service in the Exclusive Bands Between 3 025 kHz and 18 030 kHz

(to be developed by the IFRB in accordance with Resolution PLEN/AH-1)

PART IV: Criteria for Compatibility Assessment

26/6 For assessment of the possibilities of sharing between the allotments contained in Part III of this Appendix, and any new assignment which is not covered by an appropriate allotment, the following criteria shall be used:

26/6.1 A new station, not covered by an allotment, which uses the standardized transmission characteristics (J3E, 36 dBW PX) shall be considered compatible with the Plan, if it fulfils the criterion of being separated from any point of any allotment area, indicated in the Plan on the given channel, by the repetition half-distance, determined for the given conditions of operation (frequency band used, geographical position of the station, direction of propagation), which are given below:

Frequency band (kHz)	Repetition half-distance (in km)			
	Northern hemisphere		Southern hemisphere	
	North-South	East-West	North-South	East-West
3 025 - 3 155	550	600	550	600
3 900 - 3 950	650	650	650	650
4 700 - 4 750	725	775	725	775
5 680 - 5 730	1 175	1 325	1 150	1 300
6 685 - 6 765	1 350	1 600	1 225	1 425
8 965 - 9 040	2 525	3 525	2 225	3 075
11 175 - 11 275	3 375	5 575	2 675	3 925
13 200 - 13 260	4 550	6 650	3 475	5 625
15 010 - 15 100	5 050	7 450	4 800	7 100
17 970 - 18 030	5 750	8 250	5 675	7 475

26/6.2 The relevant value of the repetition half-distance for paths which are situated partly in the northern hemisphere and partly in the southern hemisphere shall be corrected using the linear interpolation procedure. This procedure shall be used to calculate the correction due to the azimuth of the propagation path with respect to true North.

26/6.3 The relevant value of the repetition half-distance, obtained in accordance with No. 26/6.2, shall be corrected, where necessary, to take into account the difference in the radiated power of the assignment with respect to the reference radiated power (30 dBW, mean radiated power) on the basis that a variation of 1 dB in the radiated power corresponds to a variation of 4% in the repetition distance.

PART V: Procedure for Modification and Maintenance of Part III

26/7 Part III will be updated by the Board in accordance with the following procedure:

26/7.1 a) when a country which has no allotment in Part III requests an allotment, the Board shall select an appropriate allotment on a priority basis and shall enter it in Part III;

26/7.2 b) when a request is submitted for an additional allotment, the Board shall apply the criteria of Part IV, and, where appropriate, enter the corresponding allotment in Part III;

26/7.3 c) when an administration informs the Board that it renounces the use of an allotment, the Board shall cancel the allotment concerned from Part III;

26/8 The Board shall maintain an up-to-date master copy of Part III, and shall periodically, but no less frequently than once a year, prepare recapitulative documents listing all amendments made to Part III.

26/9 The Secretary-General shall publish an up-to-date version of Part III in an appropriate form at least once every four years.

ANNEX 4

RESOLUTION COM5/1

Implementation of the New Provisions Applicable in the Frequency Bands Allocated Exclusively to the Aeronautical Mobile (OR) Service Between 3 025 kHz and 18 030 kHz

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

a) that the conditions for use of each of the frequency bands between 3 025 kHz and 18 030 kHz allocated exclusively to the aeronautical mobile (OR) service were modified by this Conference so as to enable a more efficient usage of the available frequency spectrum;

b) that the implementation of the modified conditions of use will entail a considerable workload for administrations, since a large number of frequency assignments to both aircraft and aeronautical stations will have to be transferred from existing frequencies to the new frequencies and channels designated by this Conference;

c) that the full implementation of the modified provisions for the frequency usage may require considerable investment for the replacement of the existing equipment;

d) that, nevertheless, the modified provisions for frequency usage should be implemented fully and as soon as possible so that the advantages of the new arrangement may be realized at the earliest opportunity;

e) that the changeover to the new conditions of operation should be effected with the least possible disruption to the service rendered by each station,

recognizing

a) that the implementation of the decisions made by the present Conference relating to the new arrangement of the frequency bands allocated exclusively to the aeronautical mobile (OR) service between 3 025 kHz and 18 030 kHz should follow an orderly procedure for the transfer of existing services from the old to the new conditions of operation;

b) that the procedures for the transfer of the existing frequency assignments in the aeronautical mobile (OR) service, in the bands allocated exclusively to that service between 3 025 kHz and 18 030 kHz, are specified in Resolution COM5/2 adopted by this Conference,

resolves

1. that the provisions of Appendix 26(Rev.), as well as the relevant provisions of Article 12 of the Radio Regulations, as modified by this Conference, shall apply to any new frequency assignment, as from 0001 UTC on [15 December 1992];

2. that administrations shall take all the necessary measures to comply with the new conditions of use of the bands governed by Appendix 26(Rev.) by not permitting the installation of new equipment whose emissions occupy a necessary bandwidth exceeding 2 800 Hz as from [15 December 1992];

3. that, until [15 December 1995], administrations may continue to use their existing assignments in accordance with the characteristics recorded in the Master International Frequency Register. After that date administrations shall take all necessary measures to modify the characteristics of their assignments so as to ensure their conformity with the provisions of Appendix 26(Rev.);

4. that, not later than [15 December 1997], administrations shall discontinue all emissions whose bandwidth exceeds 2 800 Hz,

invites Administrations

to make every effort to eliminate incompatibilities which may occur in the transition period.

RESOLUTION COM5/2

Transfer of Frequency Assignments of Aeronautical Stations Operating in the Frequency Bands Allocated Exclusively to the Aeronautical Mobile (OR) Service Between 3 025 kHz and 18 030 kHz

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

a) that the conditions for use of each of the frequency bands between 3 025 kHz and 18 030 kHz allocated exclusively to the aeronautical mobile (OR) service were modified by this Conference so as to enable a more efficient usage of the frequency spectrum available;

b) that administrations will need to change the frequencies of their aeronautical and aircraft stations to bring them into conformity with the new Frequency Allotment Plan, as contained in Appendix 26(Rev.), and to notify such transfers, where appropriate, to the Board,

resolves

1. that, at an appropriate date the Board shall send each Administration a list of assignments to stations of the aeronautical mobile (OR) service entered on its behalf in the Master Register in the bands allocated exclusively to that service between 3 025 kHz and 18 030 kHz;

2. that, in the above list, the Board shall indicate, for each frequency assignment, a replacement frequency(-ies) which fulfil(s) the provisions of Appendix 26(Rev.) and which is(are) intended to replace the frequency of the assignment concerned;

3. that, after receipt of the above list, administrations shall take all the necessary measures to modify the characteristics of their assignments, so as to bring them into conformity with the provisions of Appendix 26(Rev.), as early as possible and in any event, not later than [15 December 1997]; any modification which has been implemented shall be notified to the Board in accordance with No. 1214 of the Radio Regulations;

4. that the frequency assignments notified by administrations under paragraph 3 above shall be examined by the Board under the relevant provisions of Sub-Section IIC and Section III of Article 12 of the Radio Regulations, as modified by this Conference;

5. that the assignments existing in the Master Register on [15 December 1997] which are not in conformity with the provisions of Appendix 26(Rev.) shall be treated as follows:

5.1 within 60 days from [15 December 1997], the Board shall send relevant extracts of the Master Register to the administrations concerned advising them that, under this Resolution, the assignments in question are to be modified, within a period of 90 days, so as to meet the provisions of Appendix 26(Rev.);

5.2 if an administration fails to notify the Board of the modifications within the prescribed period, the original entry will be retained in the Master Register for information only, without a date in Column 2, without a finding in Column 13A and with a suitable remark in the Remarks column. The administration will be advised of this action.

INTERNATIONAL TELECOMMUNICATION UNION

WARC-92 WARC FOR DEALING WITH FREQUENCY ALLOCATIONS IN CERTAIN PARTS OF THE SPECTRUM

MÁLAGA-TORREMOLINOS, FEBRUARY/MARCH 1992

Document DL/37-E
25 February 1992

ADHOC 2 TO COMMITTEE 5

RESOLUTION No. COM 5/ [ ]

Relating to Changes in Frequency Allocations Which Necessitate the Transfer of Existing Assignments

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992),

considering

a) that major changes have been made in the Table of Frequency Allocations extending bands allocated to some services and allocating bands to new services in order to facilitate the development of new technologies ;

b) that these extensions of bands and new allocations necessitate the transfer of existing frequency assignments to stations of services in the reallocated bands;

c) that many of these assignments correspond to services which are vital to the telecommunication networks of many countries, particularly developing countries;

d) that the allocations mentioned in considering a) cannot come into effect until the process of transferring the existing assignments therin has been concluded in a satisfactory manner ;

e) that the transfer of these assignments will necessitate investments and in many cases a transfer of technology , which will require both resources and technical training;

rocognizing

a) that , owing to the world economic situation of the developing countries still lack the resources needed for investment in various sectors of development;

b) that the Nice Plenipotentiary Conference established Telecommunications Development Conferences and the Telecommunications Development Bureau (BDT) ;

resolves

1. that a future World Development Conference should consider, when defining the priorities of the BDT , the need to take account of the assistance to developing countries and should provide them with the resources needed to implement the required modification to their radiocommunication networks ;

2. that the Telecommunication Development Conference should instruct the BDT accordingly and should monitor its activities in this respect;

requests the Director of the BDT

to include this Resolution on the draft agenda of the next World Development Conference;

requests the IFRB and the CCIR

to provide the BDT with their assistance in the implementation of this Resolution;

invites the Administrative Council

to ensure that this Resolution is included on the agenda of the Next World Development Conference.