This electronic version (PDF) was scanned by the International Telecommunication Union (ITU) Library & Archives Service from an original paper document in the ITU Library & Archives collections.

La présente version électronique (PDF) a été numérisée par le Service de la bibliothèque et des archives de l'Union internationale des télécommunications (UIT) à partir d'un document papier original des collections de ce service.

Esta versión electrónica (PDF) ha sido escaneada por el Servicio de Biblioteca y Archivos de la Unión Internacional de Telecomunicaciones (UIT) a partir de un documento impreso original de las colecciones del Servicio de Biblioteca y Archivos de la UIT.

هذه النسخة الإلكترونية (PDF) نتاج تصوير بالمسح الضوئي أجراه قسم المكتبة والمحفوظات في الاتحاد الدولي للاتصالات (ITU) نقلاً من وثيقة ورقية أصلية ضمن الوثائق المتوفرة في قسم المكتبة والمحفوظات.

此电子版（PDF 版本）由国际电信联盟（ITU）图书馆和档案室利用存于该处的纸质文件扫描提供。

Настоящий электронный вариант (PDF) был подготовлен в библиотечно-архивной службе Международного союза электросвязи путем сканирования исходного документа в бумажной форме из библиотечно-архивной службы МСЭ.

Documents of the World Radiocommunication Conference (WRC-97) (Geneva, 1997)

To reduce download time, the ITU Library and Archives Service has divided the conference documents into sections.

- This PDF includes Document DL No. 1-60
- The complete set of conference documents includes Document No. 1-405, DL No. 1-60, DT No. 1-157

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/1-E
27 October 1997
Original: English

HEADS OF DELEGATION

AGENDA

OF THE

MEETING OF HEADS OF DELEGATIONS

Monday, 27 October 1997, at 0930 hrs

(ITU Tower, Room B)

		Document
1.	Opening by the Secretary-General and designation of the Chairman of the meeting	-
2.	Approval of the agenda of the meeting	DL/1
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

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked to bring • their copies to the meeting since no others can be made available.

UNION INTERNATIONALE DES TELECOMMUNICATIONS

CMR-97 CONFERENCE MONDIALE DES RADIOCOMMUNICATIONS

GENEVE, 27 OCTOBRE – 21 NOVEMBRE 1997

Document DL/1-F
27 octobre 1997
Original: anglais

CHEFS DE DELEGATION

ORDRE DU JOUR DE LA REUNION DES CHEFS DE DELEGATION

Lundi, 27 octobre 1997, à 9 h 30

(Tour de l'UIT, Salle B)

		Document
1.	Ouverture par le Secrétaire général et désignation du Président de la réunion	-
2.	Approbation de l'ordre du jour de la réunion	DL/1
3.	Propositions pour l'élection du Président de la Conférence	-
4.	Propositions pour l'élection des Vice-Présidents de la Conférence	-
5.	Structure de la Conférence	DT/2
6.	Propositions pour l'élection des Présidents et Vice-Présidents des Commissions	-
7.	Projet d'ordre du jour de la première séance plénière	DT/3
8.	Répartition des documents entre les Commissions	DT/4
9.	Divers	-

Pekka TARJANNE
Secrétaire général

Pour des raisons d'économie, ce document n'a été tiré qu'en un nombre restreint d'exemplaires. Les participants sont donc priés de bien vouloir apporter à la réunion leurs documents avec eux, car il n'y aura pas d'exemplaires supplémentaires disponibles.

UNION INTERNACIONAL DE TELECOMUNICACIONES

CMR-97 CONFERENCIA MUNDIAL DE RADIOCOMUNICACIONES

GINEBRA, 27 DE OCTUBRE – 21 DE NOVIEMBRE DE 1997

Documento DL/1-S
27 de octubre de 1997
Original: inglés

JEFES DE DELEGACIÓN

ORDEN DEL DIA DE LA REUNION DE JEFES DE DELEGACION

Lunes, 27 de octubre de 1997, a las 9.30 horas

(Torre de la UIT, Sala B)

		Documento
1.	Apertura por el Secretario General y designación del Presidente de la reunión	-
2.	Aprobación del orden del día de la reunión	DL/1
3.	Propuestas para la elección del Presidente de la Conferencia	-
4.	Propuestas para la elección de los Vicepresidentes de la Conferencia	-
5.	Estructura de la Conferencia	DT/2
6.	Propuestas para la elección de los Presidentes y Vicepresidentes de las Comisiones	-
7.	Proyecto de orden del día de la primera sesión plenaria	DT/3
8.	Atribución de documentos a las Comisiones	DT/4
9.	Otros asuntos	-

Pekka TARJANNE
Secretario General

● Este documento se imprime en un número limitado de ejemplares, por razones de economía. Por tanto, se ruega a los participantes ● los lleven consigo a la reunión ya que no podrán disponer de otros adicionales.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/2-E
27 October 1997
Original: English

STEERING COMMITTEE

Draft

GENERAL SCHEDULE OF THE WORK OF THE CONFERENCE

Week 1 (27 - 31 October)

Organisation and commencement of work in Committees and Working Groups

Week 2 (3 - 7 November)

Continuation of work in Committees and Working Groups

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

Week 3 (10 - 14 November)

Continuation of work in Committees and Working Groups

Friday 14 - End of work of Working Groups of Committee 5

Week 4 (17 - 21 November)

Monday 17	-	End of work of Working Groups of Committee 4
Tuesday 18	-	End of work of Committee 4
	-	End of work of Committee 5
	-	Report of Committee 2
	-	Report of Committee 3
Wednesday 19	-	First reading by Plenary of last texts of the Final Acts
Thursday 20	-	Second reading by Plenary of last texts of the Final Acts
Friday 21	-	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

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked to bring • their copies to the meeting since no others can be made available.

UNION INTERNATIONALE DES TELECOMMUNICATIONS

CMR-97 CONFERENCE MONDIALE DES RADIOCOMMUNICATIONS

GENEVE, 27 OCTOBRE – 21 NOVEMBRE 1997

Document DL/2-F
27 octobre 1997
Original: anglais

COMMISSION DE DIRECTION

Projet

CALENDRIER GÉNÉRAL DES TRAVAUX DE LA CONFÉRENCE

1ère semaine (27 - 31 octobre)

Organisation et commencement des travaux des Commissions et des Groupes de travail

2ème semaine (3 - 7 novembre)

Continuation des travaux des Commissions et des Groupes de travail

Vendredi 7 - Fin des travaux des Groupes de travail de la Plénière

3ème semaine (10 - 14 novembre)

Continuation des travaux des Commissions et Groupes de travail

Vendredi 14 - Fin des travaux des Groupes de travail de la Commission 5

4ème semaine (17 - 21 novembre)

Lundi 17	-	Fin des travaux des Groupes de travail de la Commission 4
Mardi 18	-	Fin des travaux de la Commission 4
		Fin des travaux de la Commission 5
		Rapport de la Commission 2
		Rapport de la Commission 3
Mercredi 19	-	Première lecture par la Plénière des derniers textes des Actes Finals
Jeudi 20	-	Deuxième lecture par la Plénière des derniers textes des Actes Finals
Vendredi 21	-	Cérémonie de signature et séance de clôture

Note 1 - Les séances plénières seront fixées chaque semaine selon les besoins de la Conférence.

Note 2 - Ce calendrier peut être changé au cours des travaux de la Conférence.

Pour des raisons d'économie, ce document n'a été tiré qu'en un nombre restreint d'exemplaires. Les participants sont donc priés de bien vouloir apporter à la réunion leurs documents avec eux, car il n'y aura pas d'exemplaires supplémentaires disponibles.

UNION INTERNACIONAL DE TELECOMUNICACIONES

CMR-97 CONFERENCIA MUNDIAL DE RADIOCOMUNICACIONES

GINEBRA, 27 DE OCTUBRE – 21 DE NOVIEMBRE DE 1997

Documento DL/2-S
27 de octubre de 1997
Original: inglés

COMISION DE DIRECCIÓN

Proyecto

PROGRAMA GENERAL DE TRABAJO DE LA CONFERENCIA

Primera semana (27 - 31 de octubre)

Organización y comienzo de los trabajos de las Comisiones y Grupos de trabajo

Segunda semana (3 - 7 de noviembre)

Continuación de los trabajos de las Comisiones y Grupos de trabajo

Viernes 7 - Fin de los trabajos de los Grupos de trabajo de la Plenaria

Tercera semana (10 - 14 de noviembre)

Continuación de los trabajos de las Comisiones y Grupos de trabajo

Viernes 14 - Fin de los trabajos de los Grupos de trabajo de la Comisión 5

Cuarta semana (17 - 21 de noviembre)

Lunes 17 - Fin de los trabajos de los Grupos de trabajo de la Comisión 4

Martes 18 - Fin de los trabajos de la Comisión 4
Fin de los trabajos de la Comisión 5
Informe de la Comisión 2
Informe de la Comisión 3

Miércoles 19 - Primera lectura por la Plenaria de los últimos textos de las Actas Finales

Jueves 20 - Segunda lectura por la Plenaria de los últimos textos de las Actas Finales

Viernes 21 - Ceremonia de la firma y clausura

Nota 1 - Las sesiones plenarias se fijarán cada semana de la Conferencia, según sea necesario.

Nota 2 - Este programa puede cambiarse durante el curso de los trabajos de la Conferencia.

● Este documento se imprime en un número limitado de ejemplares, por razones de economía. Por tanto, se ruega a los participantes los lleven consigo a la reunión ya que no podrán disponer de otros adicionales. ●

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/3-E
27 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5C

Note by the Chairman

WRC-97 AGENDA ITEM 1.1 (NATIONAL FOOTNOTES)

Requests from administrations have been received as follows:

1) Requests to delete their country's name from footnotes or their country footnotes:

Documents 6 (Niger)
7 (Uzbekistan) (UZB/7/1-5, 8, 10, 11)
9 (Senegal)
10 (Spain)
11 (Lithuania)
12 (Denmark)
13 (Sweden)
14 (APT, Australia)
16 (Bulgaria)
17 (Democratic People's Republic of Korea) (KRE/17/5)
18 (Hungary)
19 (Turkey)
20 (Poland)
21 (Thailand)
23 (Slovak Republic)
34 (United Kingdom) (G/34/1, 3-5, 7-8, 13, 14, 16, 21, 27 and 28)
44 (Iran) (IRN/44/12)
45 (Belarus)
47 (Tanzania) (TZA/47/10-13)
59 (Uzbekistan) (UZB/59/6)
63 (Saudi Arabia) (ARS/63/1)
64 (Tajikistan) (TJK/64/1)
66 (Cuba) (CUB/66/1 and 2)
67 (Panama) (PNR/67/1)
70 (Kenya) (KEN/70/1)
72 (France)
75 (Guinea) (GUI/75/1 and 2)
80 (Tanzania) (TZA/80/1 and 2)
81 (Moldova) (MDA/81/1)
82 (Singapore)

88 (Malawi)
89 (Philippines) (PHI/89/1 and 2)
94 (Cameroon) (CME/94/1-4).

2) Requests for clarification of allocations:

Documents 7 (Uzbekistan) (UZB/7/7, 14)
15 (Russia)
34 (United Kingdom) (G/34/2, 6, 9-12, 14, 15, 17-20, 22-26 and 29)
48 (Armenia) (ARM/48/2)
49 (Brazil) (B/49/1)
54 (Israel)
55 (Uganda) (UGA/55/1)
57 (Colombia)
59 (Uzbekistan) (UZB/59/5, 7)
63 (Saudi Arabia) (ARS/63/2)
64 (Tajikistan) (TJK/64/2)
78 (Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Uzbekistan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Ukraine (ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKM/UKR/78/1).

3) Requests for additional country's names in footnotes:

Documents 7 (Uzbekistan) (UZB/7/9, 12, 13 and 15)
17 (Democratic People's Republic of Korea) (KRE/17/1-4, 6-9)
38 (China) (CHN/38/1)
44 (Iran) (IRN/44/13)
59 (Uzbekistan) (UZB/59/2-4)
77 (Czech Republic) (CZE/77/1)
79 (Korea, (Rep. of)) (KOR/79/1-3)
89 (Philippines) (PHI/89/3)
104 (Mexico) (MEX/104/1-2)

N. KISRAWI
Chairman of Working Group 5C

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/3(Rev.1)-E
28 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5C

Note by the Chairman

WRC-97 AGENDA ITEM 1.1 (NATIONAL FOOTNOTES)

Requests from administrations have been received as follows:

1) Requests to delete their country's name from footnotes or their country footnotes:

Documents 6 (Niger)
7 (Uzbekistan) (UZB/7/1-5, 8, 10, 11)
9 (Senegal)
10 (Spain)
11 (Lithuania)
12 (Denmark)
13 (Sweden)
14 (APT, Australia)
15 (Russia) (RUS/15/1)
16 (Bulgaria)
17 (Democratic People's Republic of Korea) (KRE/17/5)
18 (Hungary)
19 (Turkey)
20 (Poland)
21 (Thailand)
23 (Slovak Republic)
34 (United Kingdom) (G/34/1, 3-5, 7-8, 13, 14, 16, 21, 27 and 28)
44 (Iran) (IRN/44/12)
45 (Belarus)
47 (Tanzania) (TZA/47/10-13)
54 (Israel) (ISR/54/1 and 2)
55 (Uganda) (UGA/55/1)
59 (Uzbekistan) (UZB/59/6)
63 (Saudi Arabia) (ARS/63/1)
64 (Tajikistan) (TJK/64/1)
66 (Cuba) (CUB/66/1 and 2)
67 (Panama) (PNR/67/1)
70 (Kenya) (KEN/70/1)
72 (France)
75 (Guinea) (GUI/75/1 and 2)

80 (Tanzania) (TZA/80/1 and 2)
81 (Moldova) (MDA/81/1)
82 (Singapore)
88 (Malawi)
89 (Philippines) (PHI/89/1 and 2)
94 (Cameroon) (CME/94/1-4).

2) Requests for clarification of allocations:

Documents 7 (Uzbekistan) (UZB/7/7, 14)
15 (Russia) (RUS/15/2)
34 (United Kingdom) (G/34/2, 6, 9-12, 14, 15, 17-20, 22-26 and 29)
48 (Armenia) (ARM/48/2)
49 (Brazil) (B/49/1)
57 (Colombia)
59 (Uzbekistan) (UZB/59/5, 7)
63 (Saudi Arabia) (ARS/63/2)
64 (Tajikistan) (TJK/64/2)
78 (Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Uzbekistan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Ukraine (ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKM/UKR/78/1).

3) Requests for additional country's names in footnotes:

Documents 7 (Uzbekistan) (UZB/7/9, 12, 13 and 15)
17 (Democratic People's Republic of Korea) (KRE/17/1-4, 6-9)
38 (China) (CHN/38/1)
44 (Iran) (IRN/44/13)
59 (Uzbekistan) (UZB/59/2-4)
77 (Czech Republic) (CZE/77/1)
79 (Korea, (Rep. of)) (KOR/79/1-3)
89 (Philippines) (PHI/89/3)
104 (Mexico) (MEX/104/1-2)

N. KISRAWI
Chairman of Working Group 5C

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/3(Rev.2)-E
29 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5C

Note by the Chairman

WRC-97 AGENDA ITEM 1.1 (NATIONAL FOOTNOTES)

Requests from administrations have been received as follows:

1) Requests to delete their country's name from footnotes or their country footnotes:

Documents 6 (Niger)
7 (Uzbekistan) (UZB/7/1-5, 8, 10, 11)
9 (Senegal)
10 (Spain)
11 (Lithuania)
12 (Denmark)
13 (Sweden)
14 (APT, Australia)
15 (Russia) (RUS/15/1)
16 (Bulgaria)
17 (Democratic People's Republic of Korea) (KRE/17/5)
18 (Hungary)
19 (Turkey)
20 (Poland)
21 (Thailand)
23 (Slovak Republic)
34 (United Kingdom)
44 (Iran) (IRN/44/12)
45 (Belarus)
47 (Tanzania) (TZA/47/10-13)
48 (Armenia) (ARM/48/1)
54 (Israel) (ISR/54/1 and 2)
55 (Uganda) (UGA/55/1)
57 (Colombia)
59 (Uzbekistan) (UZB/59/6)
63 (Saudi Arabia) (ARS/63/1)
64 (Tajikistan) (TJK/64/1)
66 (Cuba) (CUB/66/1 and 2)
67 (Panama) (PNR/67/1)
70 (Kenya) (KEN/70/1)

72 (France)
75 (Guinea) (GUI/75/1 and 2)
80 (Tanzania) (TZA/80/1 and 2)
81 (Moldova) (MDA/81/1)
82 (Singapore)
88 (Malawi)
89 (Philippines) (PHI/89/1 and 2)
94 (Cameroon) (CME/94/1-4).
116 (Norway)

2) Requests for clarification of allocations:

Documents 7 (Uzbekistan) (UZB/7/7, 14)
15 (Russia) (RUS/15/2)
48 (Armenia) (ARM/48/2)
49 (Brazil) (B/49/1)
59 (Uzbekistan) (UZB/59/4, 5, 7)
63 (Saudi Arabia) (ARS/63/2)
64 (Tajikistan) (TJK/64/2)
78 (Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Uzbekistan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Ukraine) (ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKM/UKR/78/1).

3) Requests for additional country's names in footnotes:

Documents 7 (Uzbekistan) (UZB/7/9, 12, 13 and 15)
17 (Democratic People's Republic of Korea) (KRE/17/1-4, 6-9)
38 (China) (CHN/38/1)
44 (Iran) (IRN/44/13)
59 (Uzbekistan) (UZB/59/2, 3, 6)
63 (Saudi Arabia) (ARS/63/3 and 4)
77 (Czech Republic) (CZE/77/1)
79 (Korea, (Rep. of)) (KOR/79/1-3)
89 (Philippines) (PHI/89/3)
104 (Mexico) (MEX/104/1-2)

N. KISRAWI
Chairman of Working Group 5C

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/4-E
27 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5A

Note by the Chairman

INTRODUCTION

This document has been prepared to assist us in consideration of the numerous proposals relevant to the agenda items before us.

It is intended that the topics will be introduced by the administration or regional organization whose proposal is shown in this document.

Differing proposals may be introduced, briefly, during the ensuing discussion.

R. TAYLOR
Chairman of Working Group 5A

Agenda item 1.9.2
Resolutions 211 (WARC-92), 710 (WARC-92) and Resolution 712 (Rev.WRC-95)

Resolutions 211 (WARC-92)
(2 025 - 2 110 & 2 200 - 2 290 MHz)

EUR/5/232
MOD S5.391

In making assignments to the mobile service in the bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz, administrations shall not introduce high density mobile systems and shall take into account ~~Resolution 211 (WARC-92)~~Recommendation ITU-R **SA.1154** for the introduction of any other type of mobile system.

B/49/24
MOD S5.391 ~~In making assignments to the mobile service in the bands 2025 - 2110 MHz and 2200 - 2290 MHz, administrations shall take into account Resolution 211 (WARC-92).~~

The use of the bands 2025 - 2110 MHz and 2200 - 2290 MHz by the mobile service is limited to low-density mobile systems. High-density or conventional type land mobile systems shall not be permitted in these bands.

Resolutions 710 (WARC-92)
(Primary service requirements for the meteorological-satellite and earth exploration-satellite services in the band 401 - 403 MHz)

ASP/14/186
MOD

MHz
400.15 – 410

Allocation to Services		
Region 1	Region 2	Region 3
401 – 402	EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (Earth-to-space) SPACE OPERATION (space-to-Earth) ~~Earth Exploration-Satellite (Earth-to-space)~~ Fixed ~~Meteorological-Satellite (Earth-to-space)~~ Mobile except aeronautical mobile ADD S5.xxx	
402 – 403	EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (Earth-to-space) ~~Earth Exploration-Satellite (Earth-to-space)~~ Fixed ~~Meteorological-Satellite (Earth-to-space)~~ Mobile except aeronautical mobile ADD S5.xxx	

ASP/14/187
ADD S5.xxx

In the band 401 - 403 MHz, emissions from data collection platforms operating in the earth exploration-satellite and meteorological-satellite services shall conform with Recommendation ITU-R [Doc. 7/70].

Resolution 712 (Rev.WRC-95), resolves 3
(use of existing allocations by space-based active sensors operating in the Earth exploration-satellite and space research services in frequency bands shared with the radiolocation or radionavigation services, between 1 and 25 GHz, with a view to the possibility of establishing common worldwide primary allocations)

D02

1 215 - 1 300 MHz (CPM 5.5.2.1)

J/29/33
MOD

MHz
890 – 1 240

Allocation to Services		
Region 1	Region 2	Region 3
1 215 – 1 240	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.329 S5.330 S5.331 ~~S5.333~~	

J/29/34
MOD

MHz
1 240 – 1 452

Allocation to Services		
Region 1	Region 2	Region 3
1 240 – 1 260	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.329 Amateur S5.330 S5.331 ~~S5.333~~ S5.334	
1 260 – 1 300	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION Amateur S5.282 S5.330 S5.331 ~~S5.333~~ S5.334	

USA/30/134
ADD S5.332

In the band 1 215 - 1 300 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service or the radionavigation-satellite service.

J/29/35
MOD S5.333

In the bands ~~1 215 - 1 300 MHz,~~ 3 100 - 3 300 MHz, ~~5 250 - 5 350 MHz,~~ 8 550 - 8 650 MHz, 9 500 - 9 800 MHz and ~~13.4~~13.75 - 14.0 GHz, radiolocation stations installed on spacecraft may also be employed for the earth exploration-satellite and space research services on a secondary basis.

USA/30/135
SUP S5.333

USA/30/136
ADD S5.335

In the United States in the band 1 240 - 1 300 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause interference to, claim protection from, or otherwise impose constraints on operation or development of the aeronautical radionavigation service.

3 100 - 3 300 MHz (CPM 5.5.2.2)

USA/30/139
MOD

MHz
2 670 – 3 300

D02

Allocation to Services		
Region 1	Region 2	Region 3
3 100 – 3 300	RADIOLOCATION EARTH EXPLORATION-SATELLITE S5.428A SPACE RESEARCH S5.428A S5.149 ~~S5.333~~ S5.428	

USA/30/140
ADD S5.428A

Use of the band 3 100 – 3 300 MHz by the earth exploration- satellite and/or space research services is limited to active spaceborne sensors and such use shall not claim protection from, cause harmful interference to, or otherwise impose constraints on the radiolocation service.

5 250 - 5 350 MHz (CPM 5.5.2.3)

AUS/26/4
MOD

MHz
4 500 – 5 470 D02

Allocation to Services		
Region 1	**Region 2**	**Region 3**
5 250 – ~~5 255~~5 350 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) ~~Space Research~~ ~~S5.333~~ S5.448		
~~**5 255 - 5 350**~~ ~~RADIOLOCATION~~ ~~S5.333 S5.448~~		

EUR/5/243
ADD S5.448A

Emission characteristics and interference sharing criteria for spaceborne active sensors operating in the band 5 250 - 5 350 MHz should be in accordance with Recommendation ITU-R [xyz] and shall not constrain the future development and deployment of the radiolocation service.

5 150 - 5 250 & 5 350 - 5 470 MHz (CPM 5.5.2.4)

CAN/35/25
MOD

MHz
4 500 – 5 470

Allocation to Services		
Region 1	Region 2	Region 3
5 350 – 5 460	AERONAUTICAL RADIONAVIGATION S5.449 EARTH EXPLORATION-SATELLITE (active) ADD S5.448A Radiolocation	

CAN/35/26
ADD S5.448A

Stations of the earth exploration-satellite service shall not cause harmful interference to, nor constrain the development of, the aeronautical radionavigation service in the band 5 350 - 5 460 MHz.

8 550 - 8650 MHz (CPM 5.5.2.5)

AUS/26/5
MOD

MHz
8 175 – 8 750

Allocation to Services		
Region 1	**Region 2**	**Region 3**
8 500 – ~~8 750~~8 550 **RADIOLOCATION** ~~**S5.333**~~ **S5.468 S5.469**		
~~8 500 – 8 750~~8 550 – 8 650 **RADIOLOCATION** **SPACE RESEARCH (active)** **EARTH EXPLORATION-SATELLITE (active)** ~~**S5.333**~~ **S5.468 S5.469**		
~~8 500~~8 650 – 8 750 **RADIOLOCATION** ~~**S5.333**~~ **S5.468 S5.469**		

9 500 - 9 800 MHz (CPM 5.5.2.6)

AUS/26/6
MOD

MHz
8 750 – 10 000

Allocation to Services		
Region 1	**Region 2**	**Region 3**
9 500 – 9 800 **RADIOLOCATION** **RADIONAVIGATION** **SPACE RESEARCH (active)** **EARTH EXPLORATION-SATELLITE (active)** ~~**S5.333**~~		

EUR/5/239
ADD S5.476A In the band 9 500 - 9 800 MHz, stations of the Earth exploration-satellite service (active) shall be designed in accordance with Recommendation ITU-R [Doc. 7/98-8/47].

EUR/5/240
ADD S5.476B In the band 9 500 - 9 800 MHz, the Earth exploration-satellite service (active) shall not cause interference to stations of the radionavigation and radiolocation services nor constrain their use and development.

13.25 - 13.4 GHz & 13.4 - 13.75 GHz (CPM 5.5.2.8 & 5.5.2.9)

USA/30/147
MOD

GHz
12.5 – 14.25

Allocation to Services		
Region 1	Region 2	Region 3
13.25 – 13.4	AERONAUTICAL RADIONAVIGATION S5.497 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) ~~S5.498~~ S5.499	
13.4 – 13.75	RADIOLOCATION EARTH EXPLORATION-SATELLITE (active) S5.501A SPACE RESEARCH S5.501B Standard Frequency and Time Signal-Satellite (Earth-to-space) ~~Space Research~~ ~~S5.333~~ S5.499 S5.500 S5.501	
13.75 – 14	FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Standard Frequency and Time Signal-Satellite (Earth-to-space) Space Research ~~S5.333~~ S5.499 S5.500 S5.501 S5.502 S5.503 S5.503A	

USA/30/149
ADD S5.501A

The use of the band 13.4 - 13.75 GHz by the earth exploration-satellite service (active) shall be subject to criteria in ITU-R [7/116 - 8/93].

USA/30/150
ADD S5.501B

The allocation of the band 13.4 - 13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors whose use is subject to the criteria in ITU-R [7/116 - 8/93]. Other uses of the band by the space research service are on a secondary basis.

EUR/5/236
ADD S5.498B

Active sensors of the Earth exploration-satellite (active) service operating within the 13.25 - 13.75 GHz band are limited to Radar Altimeters, Scatterometers and Rain Radar with typical characteristics as contained in Recommendation ITU-R **SA.1166**. In the band 13.4 - 13.75 GHz, the design of space-based active sensors should conform to preliminary draft new Recommendation ITU-R [7-8R/48] in order to ensure compatibility with terrestrial radars. Other types of active sensor are permitted to operate within the Earth exploration-satellite service in this band on a secondary basis.

17.2 - 17.3 GHz (CPM 5.5.2.10)

AUS/26/8
MOD

GHz
14.8 – 17.3

Allocation to Services		
Region 1	**Region 2**	**Region 3**
17.2 – 17.3	RADIOLOCATION EARTH EXPLORATION SATELLITE (active) SPACE RESEARCH (active) ~~Earth Exploration-Satellite (active)~~ ~~Space Research (active)~~ S5.512 S5.513	

Resolution 712 (Rev.WRC-95), resolves 4
(use of existing allocations in the frequency range from 7 to 20 GHz to the Earth exploration-satellite, meteorological-satellite, space research and space operation services, with a view to the possibility of establishing common worldwide primary allocations to these services in appropriate bands, taking into account Recommendation 706)

7 450 - 7 550 & 7 750-7 900 MHz (CPM 5.6.1)

EUR/5/247
MOD

MHz
7 450 – 8 175

Allocation to Services		
Region 1	Region 2	Region 3
7 450 - 7 550	FIXED FIXED-SATELLITE (space-to-Earth) ~~METEOROLOGICAL-SATELLITE (space-to-Earth)~~ MOBILE except aeronautical mobile ADD S5.461A	
7 550 - 7 750	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	
7 750 - ~~7 900~~7 850	FIXED MOBILE except aeronautical mobile METEOROLOGICAL-SATELLITE (space-to-Earth) ADD S5.461B	
~~7 750~~7 850 - 7 900	FIXED MOBILE except aeronautical mobile	

EUR/5/248
ADD S5.461A

Meteorological-satellite systems notified before 30 November 1997 in the band 7 450 - 7 550 MHz may continue to operate on primary basis until the end of their lifetime.

EUR/5/249
ADD S5.461B

The use of the band 7 750 - 7 850 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellites. Regarding sharing between geostationary meteorological satellites and the fixed service see Resolution [EUR-8].

EUR/5/250
MOD

TABLE **S21-4**

Frequency band	Service	Limit in dB(W/m^2) for angle of arrival (d) above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
...					
7 250 - ~~7 750~~ 7 850 MHz	Meteorological-Satellite (S-E)	-152	-152+0.5(δ-5)	-142	4 kHz
...					

EUR/5/251
ADD

DRAFT RESOLUTION [EUR-8]

SHARING STUDIES CONCERNING THE POSSIBLE USE OF THE BAND 7 750 - 7 850 MHz BY GEOSTATIONARY SPACE STATIONS IN THE METEOROLOGICAL-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, WRC-97),

considering

a) that the meteorological-satellite service has been re-allocated from the band 7 450 - 7 550 MHz to 7 750 - 7 850 MHz at WRC-97;

b) that the fixed service has a primary status in the band 7 750 - 7 850 MHz;

c) that the power flux-density limits given in Table S21-4 of the Radio Regulations are suitable to protect the terrestrial services from emissions of non-geostationary space stations in the meteorological-satellite service;

d) that existing fixed service stations have been installed without pointing restrictions towards the GSO since this band was not shared with space services before the re-allocation;

e) that excessive interference may be caused to fixed service stations from emissions of geostationary space stations in the meteorological-satellite service,

resolves

1 that GSO MetSat space stations shall not be deployed until suitable provisions to protect stations in the fixed service have been adopted by a future competent WRC;

2 to invite the ITU-R to perform technical studies on the feasibility of sharing the band 7 750 - 7 850 MHz between the fixed service and GSO MetSat space stations and the required means for preventing harmful interference to the fixed service.

7 145 - 7 235 MHz (CPM 5.6.2)

AUS/26/9
MOD

MHz
5 850 – 7 450

Allocation to Services		
Region 1	**Region 2**	**Region 3**
7 075 – ~~7 250~~7 145 **FIXED** **MOBILE** **S5.458 S5.459 ~~S5.460~~**		
~~7 075 – 7 250~~7 145 – 7 235 **FIXED** **MOBILE** **SPACE RESEARCH (Earth-to-space)** **~~S5.458~~ S5.459 MOD S5.460**		
~~7 075~~7 235 – 7 250 **FIXED** **MOBILE** **S5.458 ~~S5.459 S5.460~~**		

AUS/26/10
MOD S5.460

~~*Additional allocation:* the band 7 145 - 7 235 MHz is also allocated to the space research (Earth-to-space) service on a primary basis, subject to agreement obtained under No. S9.21.~~ The use of the band 7 145 - 7 190 MHz by the space research service (Earth-to-space) is restricted to deep space; no emissions to deep space shall be effected in the band 7 190 - 7 235 MHz.

RUS/15/7
ADD S5.459A

Additional allocation: In Russia, the bands 7 100 - 7 155 MHz and 7 190 - 7 235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **S9.21**.

USA/30/142
SUP S5.459

8 025 - 8 400 MHz (CPM 5.6.3)

MHz

7 450-8 175

	Allocation to Services		
	Region 1	Region 2	Region 3
CHN/38/11 MOD	**8 025 - 8 175** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOD S5.463[814] ~~Earth-Exploration-Satellite (space-to-Earth)~~ ~~S5.462[813] S5.464[815]~~	**8 025 - 8 175** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOD S5.463[814]	**8 025 - 8 175** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOD S5.463[814] ~~Earth-Exploration-Satellite (space-to-Earth)~~ ~~S5.462[813] S5.463[815]~~

MHz

8 175-8 750

	Allocation to Services		
	Region 1	Region 2	Region 3
CHN/38/12 MOD	**8 175 - 8 215** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space)	**8 175 - 8 215** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space)	**8 175 - 8 215** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOTOLOGICAL-SATELLITE (Earth-to-space)

MOBILE MOD S5.463[814] ~~Earth-Exploration-Satellite (space-to-Earth)~~ ~~S5.462[813]S5.464[815]~~	MOBILE MOD S5.463[814]	MOBILE MOD S5.463[814] ~~Earth-Exploration-Satellite (space-to-Earth)~~ ~~S5.462[813]S5.464[815]~~
8 215 - 8 400 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOD S5.463[814] ~~Earth-Exploration-Satellite (space-to-earth)~~ ~~S5.462[813]~~ ~~S5.464[815]~~	**8 215 - 8 400** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOD S5.463[814]	**8 215 - 8 400** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOD S5.463[814] ~~Earth-Exploration-Satellite (space-to-Earth)~~ ~~S5.462[812] S5.464[815]~~

CHN/38/13
SUP S5.462

Reasons: Consequential to the proposed allocation modifications.

CHN/38/14
MOD S.5.463

~~In Region 2, a~~ Aircraft stations are not permitted to transmit in the band 8025-8400MHz.

Reasons: Consequential to the proposed allocation modifications.

CHN/38/15
SUP S5.464

Reasons: Consequential to the proposed allocation modifications.

12.75 - 13.25 & 16.6 ~17.1 GHz (CPM 5.6.4)

J/29/39
NOC

GHz
12.5 – 14.25

Allocation to Services		
Region 1	Region 2	Region 3
12.75 – 13.25	FIXED FIXED-SATELLITE (Earth-to-space) S5.441 MOBILE Space Research (deep space) (space-to-Earth)	

18.6 - 18.8 GHz (CPM 5.6.5)

USA/30/152
MOD

GHz
18.6 – 20.2

Allocation to Services		
Region 1	Region 2	Region 3
18.6 – 18.8	**18.6 – 18.8**	**18.6 – 18.8**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)
FIXED	FIXED	FIXED
FIXED-SATELLITE (space-to-Earth) ~~S5.523~~S5.523E	FIXED-SATELLITE (space-to-Earth) ~~S5.523~~S5.523E	FIXED-SATELLITE (space-to-Earth) ~~S5.523~~S5.523E
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	SPACE RESEARCH (passive)
~~Earth Exploration-Satellite (passive)~~		~~Earth Exploration-Satellite (passive)~~
~~Space Research (passive)~~		~~Space Research (passive)~~
~~S5.522~~S5.523F	~~S5.522~~S5.523F	~~S5.522~~S5.523F

USA/30/153
SUP S5.522

USA/30/154
SUP S5.523

USA/30/155
ADD S5.523E

In the band 18.6 - 18.8 GHz, the fixed-satellite service shall be limited to a power flux-density at the Earth's surface of -101 dBW/m^2 in a 200 MHz band for all angles of arrival.

USA/30/156
ADD S5.523F

In the band 18.6 – 18.8 GHz, the fixed and mobile services shall be limited to a maximum power delivered to the antenna of -3 dBW.

Resolution 712 (Rev.WRC-95), resolves 5
(provision of up to 500 MHz of frequency spectrum around 35 GHz and up to 1 GHz of frequency spectrum around 95 GHz for use by spacebased active Earth sensors)

ASP/14/193
MOD

GHz
31.8 – 37

Allocation to Services		
Region 1	Region 2	Region 3
35.2 – ~~36~~35.5	METEOROLOGICAL AIDS RADIOLOCATION S5.549 ~~S5.551~~	
~~35.2~~35.5 – 36	EARTH EXPLORATION-SATELLITE (active) METEOROLOGICAL AIDS RADIOLOCATION SPACE RESEARCH (active) S5.549 ~~S5.551~~	

ASP/14/194
SUP S5.551

GHz
86 - 116

CHN/38/9
MOD

Allocation to Services		
Region 1	Region 2	Region 3
92-~~95~~94	FIXED FIXED-SATELLITE(Earth-to-space) MOBILE RADIOLOCATION S5.149 S5.556	
94-94.1	EARTH EXPLORATION SATELLITE (active) ~~FIXED~~ ~~FIXED-SATELLITE(Earth-to-space)~~ ~~MOBILE~~ RADIOLOCATION SPACE RESEARCH (active) ~~S5.149~~ ADD S5.561X - ~~S5.556~~	

94.1-95	FIXED FIXED-SATELLITE(Earth-to-space) MOBILE RADIOLOCATION ~~S5.149 S5.556~~

CHN/38/10
ADD S5.561A The use of the band 94 - 94.1 GHz by the Earth exploration-satellite service is restricted to spaceborne cloud radars.

Agenda item 1.9.4.3

the existing frequency allocations near 60 GHz and, if necessary, their re-allocation, with a view to protecting the Earth exploration-satellite (passive) service systems operating in the unique oxygen absorption frequency range from about 50 GHz to about 70 GHz,

ARTICLE S5

EUR/5/252
MOD

GHz
42.5 – 54.25

Allocation to Services		
Region 1	Region 2	Region 3
50.2 - 50.4	EARTH EXPLORATION-SATELLITE (passive) ~~FIXED~~ ~~MOBILE~~ SPACE RESEARCH (passive) MOD S5.340 ADD S5.555A	
50.4 - 51.4	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Mobile-satellite (Earth-to-space)	
51.4 - ~~54.25~~52.6	~~EARTH EXPLORATION-SATELLITE (passive)~~ FIXED MOBILE ~~SPACE RESEARCH (passive)~~ ~~S5.340~~ S5.556	
~~51.4~~52.6 - 54.25	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) MOD S5.340 S5.556	

EUR/5/253
MOD

GHz
54.25 – 71

Allocation to Services		
Region 1	Region 2	Region 3
54.25 - ~~58.2~~55.78	EARTH EXPLORATION-SATELLITE (passive) ~~FIXED~~ INTER-SATELLITE ADD S5.558A ~~MOBILE S5.558~~ SPACE RESEARCH (passive) MOD S5.557	
~~54.25~~55.78 - 58.2	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE ADD S5.558A MOBILE S5.558 SPACE RESEARCH (passive) MOD S5.557	
58.2 - 59	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) ~~S5.340~~ S5.556	
59 - ~~64~~60.3	FIXED INTER-SATELLITE MOBILE S5.558 RADIOLOCATION S5.559 S5.138	
~~59~~60.3 - ~~64~~61.3	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE ADD S5.558A MOBILE S5.558 RADIOLOCATION S5.559 SPACE RESEARCH (passive) S5.138	

~~5961.~~3 - 64	FIXED INTER-SATELLITE MOBILE S5.558 RADIOLOCATION S5.559 S5.138
64 - 65	~~EARTH EXPLORATION-SATELLITE (passive)~~ FIXED ~~SPACE RESEARCH (passive)~~ ~~S5.340~~ S5.556
65 - 66	EARTH EXPLORATION-SATELLITE FIXED MOBILE ~~SPACE RESEARCH~~ ~~Fixed~~ ~~Mobile~~
66 - 71	INTER-SATELLITE MOBILE S5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE S5.554

EUR/5/254
ADD S5.555A

The band 50.2 - 50.4 GHz is also allocated, on a primary basis to the fixed and mobile services until 1 July 2000.

EUR/5/255
MOD S5.340

All emissions are prohibited in the following bands:
1 400 - 1 427 MHz,
2 690 - 2 700 MHzexcept those provided for by Nos. **S5.421** and **S5.422**,
10.68 - 10.7 GHz except those provided for by No. **S5.483**,
15.35 - 15.4 GHz except those provided for by No. **S5.511**,
23.6 - 24 GHz,
31.3 - 31.5 GHz,
31.5 - 31.8 GHz in Region 2,
48.94 - 49.04 GHz from airborne stations,
50.2 - 50.4 GHz,
~~51.4 - 54.25 GHz,~~

52.6 - 54.25 GHz,
~~58.2 - 59 GHz,~~
~~64 - 65 GHz,~~
86 - 92 GHz,
105 - 116 GHz,
140.69 - 140.98 GHz from airborne stations and from space stations in the space-to-Earth direction,
182 - 185 GHz except those provided for by No. **S5.563**,
217 - 231 GHz.

EUR/5/256
MOD S5.557 *Additional allocation*: in Japan ~~and the United Kingdom~~, the band 54.25 - 58.2 GHz is also allocated to the radiolocation service on a primary basis.

J/29/53
ADD **Section IIA. Control of Interference to Spaceborne Passive Sensors**

J/29/54
ADD S22.5B § 5B In the frequency bands 54.25 - 58.2 GHz and 60.3 - 61.3 GHz, the maximum single entry power flux-density produced at altitudes of 1 000 km or less above the surface of the Earth by a station in the inter-satellite service shall not exceed -147 dB(W/m^2) in any 100 MHz band.

USA/30/171
MOD S5.558

In the bands ~~54.25~~55.78 - 58.2 GHz, 59 - ~~64~~65 GHz, 66 - 71 GHz, 116 - 134 GHz, 170 - 182 GHz and 185 - 190 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **S5.43**).

Agenda item 1.9.5
allocations to the space research service (space-to-space) near 400 MHz,

CAN/35/42
MOD

MHz
410 – 420

Allocation to Services		
Region 1	Region 2	Region 3
410 – 420	FIXED MOBILE except aeronautical mobile ~~Space Research (space-to-space) S5.268~~ SPACE RESEARCH (space-to-space) MOD S5.268	

CAN/35/43
MOD S5.268

Use of the band 410 - 420 MHz by the space research service is limited to communications within 5 km of an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from extra-vehicular activities shall not exceed -153 dB(W/m^2) for $0^o \leq \Phi \leq 5^o$, $-153 + 0.077 (\Phi \leq -5)$ dB(W/m^2) for $5^o \leq \Phi \leq 70^o$ and -148 dB(W/m^2) for $70^o \leq \Phi \leq 90^o$ where Φ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. **S4.10** [953] does not apply to extra-vehicular activities.

SEN/9/39
It is proposed that any improvement in the allocation status of the space research service (space-to-space), in the band 410 - 420 MHz, for the purpose of giving it primary status, should only be made if the provisions of the Radio Regulations guarantee unconstrained development of fixed and mobile systems.
To this end, the use of interference mitigation techniques may be recommended for space research service systems, in order to protect the existing fixed and mobile systems.

Agenda item 1.9.4.2

frequency allocations near 26 GHz to the Earth exploration-satellite service (space-to-Earth),

ASP/14/201
MOD

GHz
24.45 – 27

Allocation to Services		
Region 1	Region 2	Region 3
25.5 – 27	EARTH EXPLORATION-SATELLITE space-to-Earth) ADD S5.536A ADD S5.536B FIXED INTER-SATELLITE S5.536 MOBILE ~~Earth Exploration-Satellite (space to Earth)~~ Standard Frequency and Time Signal-Satellite (Earth-to-space)	

ASP/14/202
ADD S5.536A In the band 25.5 - 27 GHz, the earth exploration-satellite service should adapt to Recommendation ITU-R SA.[Doc. 7/104(Rev.1)]. Administrations are urged to limit the number of earth exploration-satellite stations in any area and site such stations in rural areas to facilitate sharing with the fixed and mobile services.

Resolution 712 (Rev.WRC-95), resolves 2
(provision of up to 3.5 MHz of frequency spectrum to the Earth exploration-satellite service (active sensors) in the frequency range 420 to 470 MHz)

HOL/25/1 **MHz**
MOD **410 – 455**

Allocation to Services		
Region 1	Region 2	Region 3
430 – ~~440~~432 AMATEUR RADIOLOCATION S5.138 S5.271 S5.272 S5.273 S5.274 S5.275 S5.276 S5.277 S5.280 S5.281 S5.282 S5.283	**430 – ~~440~~432** RADIOLOCATION Amateur S5.271 S5.276 S5.277 S5.278 S5.279 S5.281 S5.282	
~~430 – 440~~432 – 438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) S5.xxx S5.138 S5.271 S5.272 S5.273 S5.274 S5.275 S5.276 S5.277 S5.280 S5.281 S5.282 S5.283	**~~430 – 440~~432 – 438** RADIOLOCATION Amateur Earth exploration-satellite (active) S5.xxx S5.271 S5.276 S5.277 S5.278 S5.279 S5.281 S5.282	
~~430~~438 – 440 AMATEUR RADIOLOCATION S5.138 S5.271 S5.272 S5.273 S5.274 S5.275 S5.276 S5.277 S5.280 S5.281 S5.282 S5.283	**~~430~~438 – 440** RADIOLOCATION Amateur S5.271 S5.276 S5.277 S5.278 S5.279 S5.281 S5.282	

HOL/25/2
ADD S5.xxx

The use of the band 432 - 438 MHz by the earth exploration-satellite service shall be in accordance with the provisions of Recommendation ITU-R SA.577-4.

SEN/9/36

In view of the fact that:

- the duration of interference to fixed and mobile receivers may be sufficiently long to significantly disrupt mobile and/or fixed service operations;
- further study is needed to determine the duration and frequency of interference between the Earth exploration service and the amateur services,it is proposed that WRC-97 take adequate measures for the protection of terrestrial services by allocating a portion of spectrum to the Earth exploration-satellite service (active sensors) in the frequency range 420 - 470 MHz.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/5-E
27 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5C

Note by the Chairman

Attached please find an updated version of Document DT/1, concerning agenda items of WG 5C.

N. KISRAWI
Chairman of Working Group 5C

Agenda item 1.1

requests from administrations to delete their country footnotes or to have their country's name deleted from footnotes, if no longer required, within the limits of Resolution 26 (WRC-95)

Provision No.	Proposal	Proposal No.
S5.55	MOD	BLR/45/1
S5.58	MOD	BLR/45/2
S5.63	SUP	G/34/1
S5.67	MOD MOD SUP SUP	ARM/48/1 BLR/45/3 RUS/15/1 TJK/64/1
S5.87A	ADD	UZB/7/13, UZB/59/4
S5.91	MOD MOD	ASP/14/1 KRE/17/1
S5.96	NOC (G)	G/34/2
S5.98	MOD MOD MOD	F/72/1 KEN/UGA/TZA/47/10 UZB/7/1, UZB/59/1
S5.99	MOD	UZB/7/6, UZB/59/2
S5.112	MOD MOD	E/10/1 G/34/3
S5.114	MOD MOD	E/10/2 G/34/4
S5.117	MOD MOD	E/10/3 G/34/5
S5.128	MOD	ASP/14/2
S5.140	MOD	KRE/17/2
S5.149	MOD	ASP/14/4
S5.152	MOD MOD	BLR/45/4 KRE/17/3
S5.154	MOD MOD	BLR/45/5 KRE/17/4
S5.160	MOD	AFS/71/1
S5.164	MOD NOC	CZE/77/1 G/34/6
S5.174	MOD	SVK/23/1

Provision No.	Proposal	Proposal No.
S5.175	MOD	UZB/7/7,8, UZB/59/5
S5.175A	ADD	UZB/7/9
S5.177	MOD	HNG/18/1
S5.181	MOD MOD	E/10/4 G/34/7
S5.184	MOD	HNG/18/2
S5.186	SUP SUP	ASP/14/3 IRN/44/12
S5.190	MOD MOD	F/72/2 ISR/54/1
S5.192	MOD	PHI/89/1
S5.194	SUP MOD MOD MOD SUP SUP MOD	ARM/48/1 BLR/45/6 BUL/16/1 UZB/7/2, UZB/59/1 RUS/15/1 TJK/64/1 TUR/19/1
S5.197	MOD MOD MOD	E/10/5 ISR/54/2 G/34/8
S5.201	MOD	LTU/11/1
S5.202	MOD MOD	IRN/44/13 LTU/11/2
S5.204	MOD	ARS/63/2
S5.210	NOC	G/34/9
S5.211	NOC	G/34/10
S5.221	MOD NOC	IAP/40/220 G/34/11
S5.235	NOC	G/34/12
S5.237	MOD	KEN/UGA/TZA/47/11 UGA/55/1
S5.244	MOD	G/34/13
S5.259	MOD MOD	KOR/79/1 G/34/14
S5.269	NOC	G/34/15

Provision No.	Proposal	Proposal No.
S5.271	SUP MOD MOD SUP SUP	ARM/48/1 UZB/7/3, UZB/59/1 G/34/16 RUS/15/1 TJK/64/1
S5.277	MOD MOD MOD	BUL/16/2 NGR/6/1 KRE/17/5
S5.281	NOC	B/49/1
S5.290	MOD	BUL/16/3
S5.296	NOC (G) MOD	G/34/17 TUR/19/2
S5.302	NOC	G/34/18
S5.310	SUP	CUB/66/1
S5.312	MOD	LTU/11/3
S5.313	MOD	E/10/6
S5.314	MOD	UZB/7/15, UZB/59/3
S5.317	NOC	B/49/2
S5.322	SUP	AFS/71/2
S5.323	MOD MOD MOD MOD MOD MOD MOD MOD	ARM/48/2 ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKM/UKR/78/1 BLR/45/18 LTU/11/1 UZB/7/14, UZB/59/7 KRE/17/5 RUS/15/2 TJK/64/2
S5.330	MOD MOD	GUI/67/1 THA/21/1
S5.338	SUP MOD SUP SUP	ARM/48/1 BLR/45/7 RUS/15/1 TJK/64/1
S5.347	MOD MOD MOD MOD MOD	CLM/57/1 E/10/7 HNG/18/3 PNR/67/1 S/13/1

Provision No.	Proposal	Proposal No.
S5.349	SUP MOD MOD MOD SUP SUP	ARM/48/1 BLR/45/9 BUL/16/4 UZB/7/4, UZB/59/1 RUS/15/1 TJK/64/1
S5.350	SUP MOD SUP SUP	ARM/48/1 BLR/45/9 RUS/15/1 TJK/64/1
S5.353	NOC	B/49/3
S5.355	MOD MOD	ARS/63/1 NGR/6/2
S5.369	MOD	CHN/38/1
S5.382	MOD MOD MOD	KEN/70/1 KEN/UGA/TZA/47/12 KRE/17/6
S5.384	MOD	THA/21/1
S5.387	MOD	BUL/16/5
S5.389B	NOC	B/49/1
S5.393	MOD	MEX/104/1
S5.400	MOD	SEN/9/1
S5.408	NOC	G/34/19
S5.412	SUP MOD SUP SUP	ARM/48/1 BLR/45/10 RUS/15/1 TJK/64/1
S5.422	MOD MOD MOD	BUL/16/6 THA/21/3 LTU/11/5
S5.428	SUP MOD SUP SUP	ARM/48/1 BLR/45/11 RUS/15/1 TJK/64/1
S5.429	MOD	KOR/79/2
S5.432	MOD	KOR/79/3
S5.430	SUP MOD SUP SUP	ARM/48/1 BLR/45/12 RUS/15/1 TJK/64/1

Provision No.	Proposal	Proposal No.
S5.431	NOC	G/34/20
S5.434	MOD MOD	DNK/12/1 G/34/21
S5.437	MOD	DNK/12/2
S5.439	MOD	PHI/89/2
S5.447	NOC	G/34/22
S5.448	SUP MOD SUP SUP	ARM/48/1 BLR/45/13 RUS/15/1 TJK/64/1
S5.450	SUP MOD SUP SUP	ARM/48/1 BLR/45/14 RUS/15/1 TJK/64/1
S5.451	NOC	G/34/23
S5.453	MOD	NGR/6/3
S5.464	MOD	NGR/6/4 SEN/9/2
S5.467	NOC	G/34/24
S5.468	MOD MOD MOD	GUI/75/2 NGR/6/5 THA/21/4
S5.469	MOD	UZB/7/10, UZB/59/6
S5.469A	ADD	UZB/7/12
S5.477	MOD MOD	KRE/17/7 THA/21/5
S5.478	SUP MOD MOD SUP SUP	ARM/48/1 BLR/45/15 HNG/18/4 RUS/15/1 TJK/64/1
S5.480	MOD	MEX/104/2
S5.483	MOD MOD	BUL/16/7 CUB/66/2
S5.494	MOD	NGR/6/6
S5.495	MOD	E/10/8

Provision No.	Proposal	Proposal No.
S5.496	SUP MOD MOD MOD MOD SUP SUP	ARM/48/1 BLR/45/16 BUL/16/8 HNG/18/5 UZB/7/5, UZB/59/1 RUS/15/1 TJK/64/1
S5.500	MOD MOD	GUI/75/3 NGR/6/7
S5.501	SUP MOD NOC (G) SUP SUP	ARM/48/1 BLR/45/17 G/34/25 RUS/15/1 TJK/64/1
S5.505	MOD	NGR/6/8
S5.508	MOD MOD NOC (G)	E/10/9 DNK/12/3 G/34/26
S5.512	MOD MOD	S/13/2 THA/21/6
S5.521	MOD MOD	POL/20/1 G/34/27
S5.524	MOD MOD MOD	NGR/6/9 KRE/17/8 THA/21/7
S5.542	MOD MOD MOD MOD	NGR/6/10 KRE/17/9 THA/21/8 PHI/89/3
S5.545	MOD	POL/20/2
S5.546	MOD	POL/20/3
S5.549	MOD MOD MOD MOD MOD	E/10/10 GUI/75/4 KEN/UGA/TZA/47/13 NGR/6/11 THA/21/9
S5.557	MOD	G/34/28
S5.563	NOC	G/34/29
S5.564	MOD	S/13/3

Agenda item 1.7

review of Appendix 8 to the Radio Regulations taking into account Recommendation 66 (Rev.WARC-92)

Provision No.	Proposal	Proposal No.
S3.6	MOD	USA/30/69
Ap.S3	MOD SUP	EUR/5/329 IAP/40/113
Ap.S3/Title	MOD	USA/30/70
Ap.S3/Section I	MOD	ASP/14/136,137,138,139,140,141,142,143,144
Ap.S3/Section II	ADD	EUR/5/330
Ap.S3/Table II/Title	MOD	AUS/26/1
Ap.S3/An.2	ADD	IAP/40/114
Ap.S3B	ADD	USA/30/71
Rec.66(Rev.WARC-92)	MOD SUP	ASP/14/145 IAP/40/115
Draft Rec. [CAN-A]	ADD	CAN/35/1
Draft Rec. [EUR-B]	ADD	EUR/5/331
Draft Rec. [IAP-A]	ADD	IAP/40/116
Other proposals		UZB/59/12 TZA/80/20 MDV/81/5 IND/85/7

Agenda item 1.8

the possible deletion of all secondary allocations from the band 136 -137 MHz, which is allocated to the aeronautical mobile (R) service on a primary basis, in accordance with Resolution 408 (Mob-87) and in order to meet the special needs of the aeronautical mobile (R) service

Provision No.	Proposal	Proposal No.
75.2 - 137 Mhz	MOD	IAP/40/213
117.975 - 137 MHz	MOD MOD	AUS/26/2 EUR/5/335
136 - 137 MHz	MOD	B/49/17 USA/30/72 AFS/71/8
S5.198	MOD MOD MOD	B/49/18 USA/30/72,73 IAP/40/214
S5.201	MOD	ARS/63/3
S5.202	MOD	ARS/63/4 EUR/5/334
S5.203	SUP MOD MOD MOD MOD	AUS/26/3 B/49/19 USA/30/72,74 EUR/5/333 IAP/40/215
S5.198	SUP	TZA/80/21
S5.203	SUP	TZA/80/22
Res.408(Mob-87)	SUP	B/49/20 SYR/76/19
Other proposals		GUI/75/6 KEN/70/20 KEN/UGA/TZA/47/27 UZB/59/13 SEN/9/19 CME/94/15

Agenda item 1.9

taking into account the needs of other services to which the relevant frequency bands are already allocated:

Agenda item 1.9.3

Recommendation 621 (WARC-92) (Wind profile radars)

Provision No.	Proposal	Proposal No.
S5.162A	ADD	EUR/5/337,339
S5.162B	ADD	EUR/5/338,339,340,341
S5.284A	ADD	CAN/35/32,33,34
S5.291A	ADD	D/69/1
S5.bbb	ADD	ASP/14/198, 200
470 - 500 MHz		SEN/9/38
S5.337A	ADD	J/29/41,42
Rec. 621(WARC-92)	MOD SUP	CAN/35/35 USA/30/161 UZB/59/26
Draft Rec. [USA-A]	ADD	USA/30/162
Other proposals		ASP/14/199

Agenda item 1.9

taking into account the needs of other services to which the relevant frequency bands are already allocated:

Agenda item 1.9.6

the identification of suitable frequency bands above 30 GHz for use by the fixed service for high-density applications,

Provision No.	Proposal	Proposal No.
S1.66A	ADD	EUR/5/344
S1.X	ADD	J/29/55
S4.15A	ADD	J/29/56
S4.16A	ADD	EUR/5/345
S5.546	MOD	G/73/3,4
31.8 - 33.4 GHz	MOD	EST/FIN/LVA/POR/S/24/1
40.5 - 42.5 GHz	MOD	USA/30(Add.2)/97
S5.549	MOD	CAN/35/45
S5.549A	ADD	CAN/35/38,44,46,48
S5.549B	ADD	CAN/35/44,47
S5.551A	ADD	EUR/5/242,243
S5.552A	ADD ADD ADD	ASP/14/207,208 EUR/5/346,347 J/29/57,58
S5.552B	ADD ADD	ASP/14,207,209 J/29/57,59
S5.554	ADD	CAN/35/49,50
S5.554A	ADD	IAP/40/109,110
S11.24	MOD MOD	EUR/5/348 IAP/40/265
S11.26	ADD ADD	EUR/5/349 IAP/40/266
Draft Res. [CAN-2]	ADD	CAN/35/51
Draft Res. [EUR-15]	ADD	EUR/5/350
Draft Res. [J-2]	ADD	J/29/60
Other proposals		AFS/71/9H IAP/40(Add.1)/42 IND/85/4

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/5(Rev.1)-E
28 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5C

Note by the Chairman

Attached please find an updated version of Document DT/1, concerning agenda items of WG 5C.

N. KISRAWI
Chairman of Working Group 5C

Agenda item 1.1

requests from administrations to delete their country footnotes or to have their country's name deleted from footnotes, if no longer required, within the limits of Resolution 26 (WRC-95)

Provision No.	Proposal	Proposal No.
S5.55	MOD	BLR/45/1
S5.58	MOD	BLR/45/2
S5.63	SUP	G/34/1
S5.67	MOD MOD SUP SUP	ARM/48/1 BLR/45/3 RUS/15/1 TJK/64/1
S5.87A	ADD	UZB/7/13, UZB/59/4
S5.91	MOD MOD	ASP/14/1 KRE/17/1
S5.96	NOC (G)	G/34/2
S5.98	MOD MOD MOD	F/72/1 KEN/UGA/TZA/47/10 UZB/7/1, UZB/59/1
S5.99	MOD	UZB/7/6, UZB/59/2
S5.112	MOD MOD	E/10/1 G/34/3
S5.114	MOD MOD	E/10/2 G/34/4
S5.117	MOD MOD	E/10/3 G/34/5
S5.128	MOD	ASP/14/2
S5.140	MOD	KRE/17/2
S5.149	MOD	ASP/14/4
S5.152	MOD MOD	BLR/45/4 KRE/17/3
S5.154	MOD MOD	BLR/45/5 KRE/17/4
S5.160	MOD	AFS/71/1
S5.164	MOD NOC	CZE/77/1 G/34/6
S5.174	MOD	SVK/23/1

Provision No.	Proposal	Proposal No.
S5.175	MOD	UZB/7/7,8, UZB/59/5
S5.175A	ADD	UZB/7/9
S5.177	MOD	HNG/18/1
S5.181	MOD MOD	E/10/4 G/34/7
S5.184	MOD	HNG/18/2
S5.186	SUP SUP	ASP/14/3 IRN/44/12
S5.190	MOD MOD	F/72/2 ISR/54/1
S5.192	MOD	PHI/89/1
S5.194	SUP MOD MOD MOD SUP SUP MOD	ARM/48/1 BLR/45/6 BUL/16/1 UZB/7/2, UZB/59/1 RUS/15/1 TJK/64/1 TUR/19/1
S5.197	MOD MOD MOD	E/10/5 ISR/54/2 G/34/8
S5.201	MOD	LTU/11/1
S5.202	MOD MOD	IRN/44/13 LTU/11/2
S5.204	MOD	ARS/63/2
S5.210	NOC	G/34/9
S5.211	NOC	G/34/10
S5.221	MOD NOC	IAP/40/220 G/34/11
S5.235	NOC	G/34/12
S5.237	MOD	KEN/UGA/TZA/47/11 UGA/55/1
S5.244	MOD	G/34/13
S5.259	MOD MOD	KOR/79/1 G/34/14
S5.269	NOC	G/34/15

Provision No.	Proposal	Proposal No.
S5.271	SUP MOD MOD SUP SUP	ARM/48/1 UZB/7/3, UZB/59/1 G/34/16 RUS/15/1 TJK/64/1
S5.277	MOD MOD MOD	BUL/16/2 NGR/6/1 KRE/17/5
S5.281	NOC	B/49/1
S5.290	MOD	BUL/16/3
S5.296	NOC (G) MOD	G/34/17 TUR/19/2
S5.302	NOC	G/34/18
S5.310	SUP	CUB/66/1
S5.312	MOD	LTU/11/3
S5.313	MOD	E/10/6
S5.314	MOD	UZB/7/15, UZB/59/3
S5.317	NOC	B/49/1
S5.322	SUP	AFS/71/2
S5.323	MOD MOD MOD MOD MOD MOD MOD MOD	ARM/48/2 ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKM/UKR/78/1 BLR/45/18 LTU/11/1 UZB/7/14, UZB/59/7 KRE/17/5 RUS/15/2 TJK/64/2
S5.330	MOD MOD	GUI/67/1 THA/21/1
S5.338	SUP MOD SUP SUP	ARM/48/1 BLR/45/7 RUS/15/1 TJK/64/1
S5.347	MOD MOD MOD MOD MOD	CLM/57/1 E/10/7 HNG/18/3 PNR/67/1 S/13/1

Provision No.	Proposal	Proposal No.
S5.349	SUP MOD MOD MOD SUP SUP	ARM/48/1 BLR/45/9 BUL/16/4 UZB/7/4, UZB/59/1 RUS/15/1 TJK/64/1
S5.350	SUP MOD SUP SUP	ARM/48/1 BLR/45/9 RUS/15/1 TJK/64/1
S5.353	NOC	B/49/3
S5.355	MOD MOD	ARS/63/1 NGR/6/2
S5.369	MOD	CHN/38/1
S5.382	MOD MOD MOD	KEN/70/1 KEN/UGA/TZA/47/12 KRE/17/6
S5.384	MOD	THA/21/1
S5.387	MOD	BUL/16/5
S5.389B	NOC	B/49/2
S5.393	MOD	MEX/104/1
S5.400	MOD	SEN/9/1
S5.408	NOC	G/34/19
S5.412	SUP MOD SUP SUP	ARM/48/1 BLR/45/10 RUS/15/1 TJK/64/1
S5.422	MOD MOD MOD	BUL/16/6 THA/21/3 LTU/11/5
S5.428	SUP MOD SUP SUP	ARM/48/1 BLR/45/11 RUS/15/1 TJK/64/1
S5.429	MOD	KOR/79/2
S5.432	MOD	KOR/79/3
S5.430	SUP MOD SUP SUP	ARM/48/1 BLR/45/12 RUS/15/1 TJK/64/1

Provision No.	Proposal	Proposal No.
S5.431	NOC	G/34/20
S5.434	MOD MOD	DNK/12/1 G/34/21
S5.437	MOD	DNK/12/2
S5.439	MOD	PHI/89/2
S5.447	NOC	G/34/22
S5.448	SUP MOD SUP SUP	ARM/48/1 BLR/45/13 RUS/15/1 TJK/64/1
S5.450	SUP MOD SUP SUP	ARM/48/1 BLR/45/14 RUS/15/1 TJK/64/1
S5.451	NOC	G/34/23
S5.453	MOD	NGR/6/3
S5.464	MOD	NGR/6/4 SEN/9/2
S5.467	NOC	G/34/24
S5.468	MOD MOD MOD	GUI/75/2 NGR/6/5 THA/21/4
S5.469	MOD	UZB/7/10, UZB/59/6
S5.469A	ADD	UZB/7/12
S5.477	MOD MOD	KRE/17/7 THA/21/5
S5.478	SUP MOD MOD SUP SUP	ARM/48/1 BLR/45/15 HNG/18/4 RUS/15/1 TJK/64/1
S5.480	MOD	MEX/104/2
S5.483	MOD MOD	BUL/16/7 CUB/66/2
S5.494	MOD	NGR/6/6
S5.495	MOD	E/10/8

Provision No.	Proposal	Proposal No.
S5.496	SUP MOD MOD MOD MOD SUP SUP	ARM/48/1 BLR/45/16 BUL/16/8 HNG/18/5 UZB/7/5, UZB/59/1 RUS/15/1 TJK/64/1
S5.500	MOD MOD	GUI/75/3 NGR/6/7
S5.501	SUP MOD NOC (G) SUP SUP	ARM/48/1 BLR/45/17 G/34/25 RUS/15/1 TJK/64/1
S5.505	MOD	NGR/6/8
S5.508	MOD MOD NOC (G)	E/10/9 DNK/12/3 G/34/26
S5.512	MOD MOD	S/13/2 THA/21/6
S5.521	MOD MOD	POL/20/1 G/34/27
S5.524	MOD MOD MOD	NGR/6/9 KRE/17/8 THA/21/7
S5.542	MOD MOD MOD MOD	NGR/6/10 KRE/17/9 THA/21/8 PHI/89/3
S5.545	MOD	POL/20/2
S5.546	MOD	POL/20/3
S5.549	MOD MOD MOD MOD MOD	E/10/10 GUI/75/4 KEN/UGA/TZA/47/13 NGR/6/11 THA/21/9
S5.557	MOD	G/34/28
S5.563	NOC	G/34/29
S5.564	MOD	S/13/3

Agenda item 1.3

review of Appendix 28 (S7) to the Radio Regulations, taking into account Resolution 60 (WARC-79), Resolution 712 (Rev.WRC-95) and Recommendation 711 (WARC-79)

Provision No.	Proposal	Proposal No.
Appendix S7 (28)	NOC	ASP/14/20 IAP/40/111 AFS/71/4
Recommendation 711 (WARC-79)		SEN/9/8
Other proposals		ARS/76/25, 26, 27, 28 UGA/55/17 UZB/59/9

Agenda item 1.7

review of Appendix 8 to the Radio Regulations taking into account Recommendation 66 (Rev.WARC-92)

Provision No.	Proposal	Proposal No.
S3.6	MOD	USA/30/69
Ap.S3	MOD SUP	EUR/5/329 IAP/40/113
Ap.S3/Title	MOD	USA/30/70
Ap.S3/Section I	MOD	ASP/14/136,137,138,139,140,141,142,143,144
Ap.S3/Section II	ADD	EUR/5/330
Ap.S3/Table II/Title	MOD	AUS/26/1
Ap.S3/An.2	ADD	IAP/40/114
Ap.S3B	ADD	USA/30/71
Rec.66(Rev.WARC-92)	MOD SUP	ASP/14/145 IAP/40/115
Draft Rec. [CAN-A]	ADD	CAN/35/1
Draft Rec. [EUR-B]	ADD	EUR/5/331
Draft Rec. [IAP-A]	ADD	IAP/40/116
Other proposals		UZB/59/12 TZA/80/20 MDV/81/5 IND/85/7

Agenda item 1.8

the possible deletion of all secondary allocations from the band 136 -137 MHz, which is allocated to the aeronautical mobile (R) service on a primary basis, in accordance with Resolution 408 (Mob-87) and in order to meet the special needs of the aeronautical mobile (R) service

Provision No.	Proposal	Proposal No.
75.2 - 137 Mhz	MOD	IAP/40/213
117.975 - 137 MHz	MOD MOD	AUS/26/2 EUR/5/335
136 - 137 MHz	MOD	B/49/17 USA/30/72 AFS/71/8
S5.198	MOD MOD MOD SUP	B/49/18 USA/30/72,73 IAP/40/214 TZA/80/21
S5.201	MOD	ARS/63/3
S5.202	MOD	ARS/63/4 EUR/5/334
S5.203	SUP MOD MOD MOD MOD SUP	AUS/26/3 B/49/19 USA/30/72,74 EUR/5/333 IAP/40/215 TZA/80/22
Res.408(Mob-87)	SUP	B/49/20 SYR/76/19
Other proposals		GUI/75/6 KEN/70/20 KEN/UGA/TZA/47/27 UZB/59/13 SEN/9/19 CME/94/15

Agenda item 1.9

taking into account the needs of other services to which the relevant frequency bands are already allocated:

Agenda item 1.9.3

Recommendation 621 (WARC-92) (Wind profile radars)

Provision No.	Proposal	Proposal No.
S5.162A	ADD	EUR/5/337,339
S5.162B	ADD	EUR/5/338,339,340,341
S5.284A	ADD	CAN/35/32,33,34
S5.291A	ADD	D/69/1
S5.aaa S5.bbb	ADD	NZL/37/31-34
S5.bbb	ADD	ASP/14/198, 200
470 - 500 MHz		SEN/9/38
S5.337A	ADD	J/29/41,42
Rec. 621(WARC-92)	MOD SUP	CAN/35/35 USA/30/161 UZB/59/26
Draft Rec. [USA-A]	ADD	USA/30/162
Other proposals		ASP/14/199

Agenda item 1.9

taking into account the needs of other services to which the relevant frequency bands are already allocated:

Agenda item 1.9.6

the identification of suitable frequency bands above 30 GHz for use by the fixed service for high-density applications,

Provision No.	Proposal	Proposal No.
S1.66A	ADD	EUR/5/344
S1.X	ADD	J/29/55
S4.15A	ADD	J/29/56
S4.16A	ADD	EUR/5/345
S5.546	MOD	G/73/3,4
31.8 - 33.4 GHz	MOD	EST/FIN/LVA/POR/S/24/1
40.5 - 42.5 GHz	MOD	USA/30(Add.2)/97
S5.549	MOD	CAN/35/45
S5.549A	ADD	CAN/35/38,44,46,48
S5.549B	ADD	CAN/35/44,47
S5.551A	ADD	EUR/5/342, 343
S5.552A	ADD ADD ADD	ASP/14/207,208 EUR/5/346,347 J/29/57,58
S5.552B	ADD ADD	ASP/14/207,209, 210 J/29/57,59
S5.554	ADD	CAN/35/49,50
S5.554A	ADD	IAP/40/109,110
S11.24	MOD MOD	EUR/5/348 IAP/40/265
S11.26	ADD ADD	EUR/5/349 IAP/40/266
Draft Res. [CAN-2]	ADD	CAN/35/51
Draft Res. [EUR-15]	ADD	EUR/5/350
Draft Res. [J-2]	ADD	J/29/60
Other proposals		AFS/71/9H IAP/40(Add.1)/42 IND/85/4

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/6-E
31 October 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SUB-WORKING GROUP 5B-1

COMPOSITE PROPOSALS

AGENDA ITEM 1.9.1, MSS BELOW 1 GHz

MSS BELOW 1 GHz

Provision No.	Proposal	Proposal No.
87-108 MHz	NOC	J/29/1
	NOC	NZL/37/18

J/29/1
NOC

Reasons: In Japan 87 - 90 MHz are assigned to VHF-FM broadcasting, while 90 - 108 MHz are assigned to TV broadcasting. As pointed in the CPM Report, the protection requirements for sound broadcasting are still preliminary and sharing studies between MSS and sound broadcasting are required. Also, the protection requirements for TV broadcasting in this frequency band were not discussed in CPM-97. Therefore, Japan considers that it is inappropriate to allocate the band 87 - 108 MHz to the MSS.

NZL/37/18
NOC

S5.208	MOD	CAN/35/2
	MOD	USA/30/75,76
	MOD	EUR/5/261
	MOD	B/49/21
	MOD	IAP/40/216
	MOD	CUB/66/92,93

(see below APS5/An.1/1.1, 1.1.1, 1.1.2, Res.46, Res.46/An.2/A2.1.1)

CAN/35/2
MOD S5.208 subject to coordination under Resolution **46 (Rev. WRC-95)**/No. **S9.11A**. The power flux density ~~limit~~ threshold indicated in Annex 2 of Resolution **46 (Rev. WRC-95)**/Annex 1 of Appendix **S5** shall apply~~. until such time as a competent world radiocommunication conference revises it. Additionally, until that time, the provisions of Resolution 714 (WRC-95) apply.~~

USA/30/75,76
MOD S5.208 The use of the band 137 - 138 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The power flux-density ~~limit~~threshold indicated in Annex 2 of Resolution **46 (Rev.WRC-95)**/Annex 1 of Appendix **S5** shall apply~~ until such time as a competent world radiocommunication conference revises it. Additionally, until that time, the provisions of Resolution 714 (WRC-95) apply~~. Non-geostationary mobile-satellite service networks submitting Appendix 3 information after November 1996 with a power flux-density exceeding -140 dBW/m^2/4 kHz will coordinate via Resolution 46 **(Rev.WRC-95)**/No. **S9.11** with those administrations listed in RR No. **S5.206** and with the aeronautical mobile (OR) systems of those administrations listed in RR No. **S5.204** as of this date. However, any replacement of satellites using similar parameters to an existing non-geostationary mobile-satellite network which had submitted its coordination request to the BR before 1 November 1996, need coordinate only if its power flux-density exceeds -125 dBW/m^2/4 kHz.

Reasons: The sharing analyses, and experience to date indicates that the coordination threshold of -125 dBW/m^2/4 kHz is a useful and valid coordination criteria for use with all terrestrial services for the type of non-GSO MSS FDMA system transmissions using this allocation. This approach was endorsed by CPM-97.

EUR/5/261
MOD S5.208 The use of the band 137 - 138 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. ~~The power flux-density limit indicated in Annex 2 of Resolution 46 (Rev.WRC-95)/ Annex 1 of Appendix S5 shall apply until such time as a competent world radiocommunication conference revises it. Additionally, until that time, the provisions of Resolution 714 (WRC-95) apply.~~

Reasons: The more stringent coordination trigger level of -140 dB(W/m^2/4 kHz) is required to protect the aeronautical mobile (OR) service from harmful interference.

B/49/21
MOD **S5.208** . The use of the band 137 - 138 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The ~~power flux-density limit~~ coordination thresholds indicated in Annex 2 of Resolution **46 (Rev.WRC-95)**/Annex 1 of Appendix **S5** shall apply ~~until such time as a competent world radiocommunication conference revises it. Additionally, until that time, the provisions of Resolution 714 (WRC-95) apply~~.

Reasons: To strike out the reference to Resolution 714, as the studies have been completed, and to indicate the new set of power flux-density thresholds agreed during the CPM-97 meeting.

IAP/40/216
MOD **S5.208** The use of the band 137 - 138 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The ~~power flux-density limit~~coordination thresholds indicated in Annex 2 of Resolution **46 (Rev.WRC-95)**/Annex 1 of Appendix **S5** shall apply ~~until such time as a competent world radiocommunication conference revises it. Additionally, until that time, the provisions of Resolution 714 (WRC-95) apply~~.

Reasons: To strike out the reference to Resolution **714**, as the studies have been completed, and to indicate the new set of pfd thresholds agreed during the CPM-97 meeting.

CUB/66/92
MOD

MHz
137 – 138

Allocation to Services		
Region 1	Region 2	Region 3
137 – 137.025	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.208A S5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) S5.204 S5.205 S5.206 S5.207 MOD S5.208	
137.025 – 137.175	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-Satellite (space-to-Earth) S5.208A S5.209 Mobile except aeronautical mobile (R) S5.204 S5.205 S5.206 S5.207 MOD S5.208	
137.175 – 137.825	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.208A S5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) S5.204 S5.205 S5.206 S5.207 MOD S5.208	

137.825 – 138	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-Satellite (space-to-Earth) S5.208A S5.209 Mobile except aeronautical mobile (R) S5.204 S5.205 S5.206 S5.207 MOD S5.208

CUB/66/93
MOD S5.208 The use of the band 137 - 138 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-~~95~~97)**/No. **S9.11A**. The power flux-density limit indicated in Annex 2 of Resolution **46 (Rev.WRC-~~95~~97)**/Annex 1 of Appendix **S5** shall apply until such time as a competent world radiocommunication conference revises it. ~~Additionally, until that time, the provisions of Resolution **714 (WRC-95)** apply.~~
Reasons: See proposals CUB/66/98 and 99 for the deletion of Resolution 714 (WRC-95).

146 - 148 MHz	NOC	NZL/37/19

NZL/37/19
NOC

148 - 150.05 MHz	MOD	ASP/14/149A
	MOD	USA/30/77
	MOD	EUR/5/262
	NOC	IRN/44/4
	MOD	CUB/
	MOD	INS/84/2

ASP/14/149A
MOD

MHz
148 – 156.8375

Allocation to Services		
Region 1	Region 2	Region 3
149.9 – 150.05 space) MOD S5.209 ~~S5.224~~	~~LAND~~ MOBILE-SATELLITE (Earth-to- RADIONAVIGATION-SATELLITE MOD S5.220 S5.222 S5.223	

USA/30/77
MOD

MHz
148 – 156.8375

Allocation to Services		
Region 1	Region 2	Region 3
148 – 149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) S5.209 S5.218 MOD S5.219 S5.221	**148 – 149.9** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.218 MOD S5.219 S5.221	

ARTICLE S5

EUR/5/262
MOD

MHz
148 – 156.8375

Allocation to Services		
Region 1	Region 2	Region 3
149.9 – 150.05	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) S5.209 ~~S5.224~~ RADIONAVIGATION-SATELLITE S5.220 S5.222 S5.223 ADD S5.224A ADD S5.224B	

IRN/44/10

8 Sharing in the band 148 - 149.9 MHz between non-GSO/MSS and LMS

Considering the extensive use of this band by the land mobile service in the Islamic Republic of Iran, it is proposed that sharing between non-GSO and LMS should not be considered.

INS/84/2
MOD

MHz
148 – 156.8375

Allocation to Services		
Region 1	Region 2	Region 3
148 – 149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) S5.209 S5.218 MOD S5.219 ~~S5.221~~	**148 – 149.9** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.218 MOD S5.219 ~~S5.221~~	

170 - 230 MHz	NOC NOC NOC	NZL/37/20 J/29/7 MLA/68/6

NZL/37/20
NOC

J/29/7 NOC Reasons: As pointed out in the CPM Report, the values are still preliminary and sharing studies between MSS and sound broadcasting are required. In Japan 170 - 222 MHz are allocated to TV broadcasting and the protection requirements for TV broadcasting in this frequency band was not discussed in CPM-97. Therefore, Japan considers that it is inappropriate to allocate the band 170 - 230 MHz to the MSS.

MLA/68/6
174 - 230 MHz

The band 470 - 960 MHz is extensively used for the terrestrial broadcasting services in Malaysia. There is a need for a study on sharing between MSS and FM sound broadcasting and digital sound broadcasting services.

In addition, protection requirements for TV broadcasting services in this band also should be studied.

Malaysia is proposing not to allocate MSS in the band 174 - 230 MHz until sharing studies between MSS and the above services are performed.

399.9 - 400.6 MHz	MOD	USA/30/79
	MOD	CAN/35/124
	MOD	IAP/40/221
	MOD	ASP/14/149B
	MOD	EUR/5/263

USA/30/79
MOD

MHz
400.15 – 410

Allocation to Services		
Region 1	Region 2	Region 3
402 – 403	METEOROLOGICAL AIDS Earth Exploration-Satellite (Earth-to-space) Fixed Meteorological-Satellite (Earth-to-space) Mobile except aeronautical mobile Mobile-Satellite (space-to-Earth) MOD S5.208A MOD S5.209 ADD S5.265	
403 – ~~406~~405	METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile Mobile-Satellite (space-to-Earth) MOD S5.208A MOD S5.209 ADD S5.265	
~~403~~405 – 406	~~METEOROLOGICAL AIDS~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.208A MOD S5.209 ADD S5.265B Fixed Meteorological Aids Mobile except aeronautical mobile ADD S5.265A	

CAN/35/124
MOD

MHz
400.15 – 410

Allocation to Services		
Region 1	Region 2	Region 3
403 – ~~406~~405	METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile	
403 – ~~406~~405	METEOROLOGICAL AIDS MOBILE-SATELLITE (space-to-Earth) MOD S5.208A MOD S5.209 ADD S5.209B Fixed Mobile except aeronautical mobile ADD S5.209A	

Reasons: To meet new needs while protecting requirements still existing in some countries

IAP/40/221
MOD

MHz
400.15 – 410

Allocation to Services		
Region 1	Region 2	Region 3
403 – ~~406~~405	METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile	
~~403~~405 – 406	METEOROLOGICAL AIDS MOBILE-SATELLITE (space-to-Earth) MOD S5.208A MOD S5.209 ADD S5.209B Fixed Mobile except aeronautical mobile ADD S5.209A	

Reasons: To meet new needs while protecting requirements still existing in some countries.

ASP/14/149B
MOD

MHz
322 – 400.15

Allocation to Services		
Region 1	Region 2	Region 3
399.9 – 400.05	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) MOD S5.209 RADIONAVIGATION-SATELLITE	
S5.222 S5.260	MOD S5.220 ~~S5.224~~	

ARTICLE S5

EUR/5/263
MOD

MHz
322 – 400.15

Allocation to Services		
Region 1	Region 2	Region 3
399.9 – 400.05	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) S5.209 RADIONAVIGATION-SATELLITE S5.222 S5.260 S5.220 ~~S5.224~~ ADD S5.224A ADD S5.224B	

S5.208A	MOD	USA/30/79,80
	MOD	CAN/35/124,125
	MOD	IAP/40/221,222

(see also Res.214 below)

USA/30/80
MOD S5.208A In making assignments to space stations in the mobile-satellite service in the bands 137 - 138 MHz, 387 - 390 MHz, ~~and~~ 400.15 - 401 MHz, and 402 - 406 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05 - 153 MHz, 322 - 328.6 MHz, 406.1 - 410 MHz and 608 - 614 MHz from harmful interference from unwanted emissions. For information, the threshold levels of interference detrimental to the radio astronomy service to be protected are shown in Table 1 of Recommendation ITU-R RA.769-1.

Reasons: To protect radio astronomy.

CAN/35/125
MOD S5.208A In making assignments to space stations in the mobile-satellite service in the bands 137 - 138 MHz, 387 - 390 MHz, ~~and~~ 400.15 - 401 MHz, and 405-406 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05 - 153 MHz, 322 - 328.6 MHz, 406.1 - 410 MHz and 608 - 614 MHz from harmful interference from unwanted emissions. For information, the threshold levels of interference detrimental to the radio astronomy service to be protected are shown in Table 1 of Recommendation ITU-R RA.769-1.

Reason: To protect the radio astronomy service.

IAP/40/222
MOD S5.208A In making assignments to space stations in the mobile-satellite service in the bands 137 - 138 MHz, 387 - 390 MHz, ~~and~~ 400.15 - 401 MHz and 405 - 406 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05 - 153 MHz, 322 - 328.6 MHz, 406.1 - 410 MHz and 608 - 614 MHz from harmful interference from unwanted emissions. For information, the threshold levels of interference detrimental to the radio astronomy service to be protected are shown in Table 1 of Recommendation ITU-R RA.769-1.

Reasons: To protect the radio astronomy service.

S5.209	MOD	ASP/14/**149A, 149B,**150
	MOD	USA/30/**79**,81,**310,311**,312
	NOC	J/29/3
	MOD	IRN/44/4
	MOD	CAN/35/**124**,126,132
	MOD	IAP/40/**221**,223

(see also Res.214 below)

ASP/14/150

MOD **S5.209** The use of the bands 137 - 138 MHz, 148 - 149.9 MHz, 149.9 - 150.05 MHz, 399.9 - 400.05 MHz, 400.15 - 401 MHz, 455 - 456 MHz and 459 - 460 MHz by the mobile-satellite service ~~and the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the land mobile-satellite service~~ is limited to non-geostationary-satellite systems.

USA/30/81

MOD **S5.209** The use of the bands 137 - 138 MHz, 148 - 149.9 MHz, 400.15 - 401 MHz, 402 - 406 MHz, 455 - 456 MHz and 459 - 460 MHz by the mobile-satellite service and the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the land mobile-satellite service is limited to non-geostationary-satellite systems.

Reasons: To facilitate sharing.

USA/30/1312

MOD

S5.209 The use of the bands 137 - 138 MHz, 148 - 149.9 MHz, 400.15 - 401 MHz, 405 - 406 MHz, ~~454~~456 MHz and 459 - 460 MHz by the mobile-satellite service and the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the land mobile-satellite service is limited to non-geostationary satellite systems.

Reasons: To extend the limitation to non-geostationary satellite systems to the bands identified for MSS in this proposal. 405-406 MHz for MSS (space-to-Earth) is included in another proposal by the United States.

J/29/3

NOC **S5.209**

IRN/44/4

MOD **S5.209** The use of the bands 137 - 138 MHz, 148 - 149.9 MHz, 400.15 - 401 MHz, 455 - 456 MHz and 459 - 460 MHz ~~by the mobile-satellite service and the bands~~, 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the ~~land~~ mobile-satellite service is limited to non-geostationary-satellite systems.

IAP/40/223

MOD **S5.209** The use of the bands 137 - 138 MHz, 148 - 149.9 MHz, 400.15 - 401 MHz, 405 - 406 MHz, 455 - 456 MHz and 459 - 460 MHz by the mobile-satellite service and the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the land mobile-satellite service is limited to non-geostationary-satellite systems.

Reasons: To facilitate sharing with other services in these bands.

CAN/35/126,132

MOD **S5.209** The use of the bands 137 - 138 MHz, 148 - 149.9 MHz, 400.15 - 401 MHz, 405 - 406 MHz, 450 - 451 MHz, ~~455~~454 - 456 MHz and 459 - 460 MHz by the mobile-satellite service and the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the land mobile-satellite service is limited to non-geostationary-satellite systems.

Reasons: To facilitate sharing with other services in these bands.

S5.209A	ADD	CAN/35/**124**,127
	ADD	IAP/40/**221**,224

CAN/35/127

ADD **S5.209A** The use of the band 405 - 406 MHz by the meteorological aids and the mobile-satellite service shall be in accordance with Resolution [NVNG]. The use of the band 405 - 406 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A.**

Reasons: The WMO identified that improvements in radiocommunication characteristics and the development of more spectrum efficient radiosondes are needed to accommodate other interests of radio spectrum users. A reduction in the allocation to the meteorological aids may impact meteorological aids operations, if sufficient time is not given to allow for the transition to more spectrally efficient radiosonde equipment. Resolution [NVNG] invites the ITU-R, with the participation of the WMO, to establish the steps for the transition of meteorological aids out of the band which would minimize the impact on this service, while taking into account that many NGSO MSS networks below 1 GHz plan to implement by the year 2002 or earlier. The transition plan will provide a period of time for national weather agencies and other users to consolidate their operations out of the 405 - 406 MHz band, possibly by using radiosondes with narrower bandwidths in the interim, the API of mobile-satellite systems will be permitted and S9.11A will be used to coordinate between MSS systems.

IAP/40/224

ADD S5.209A The use of the band 405 - 406 MHz by the meteorological aids and the mobile-satellite service shall be in accordance with Resolution [IAP-9]. The use of the band 405 - 406 MHz by the mobile-satellite service is subject to coordination under **S9.11A.**

S5.209B	ADD ADD	CAN/35/**124**,128 IAP/40/**221**,225

CAN/35/128

ADD S5.209B The use of the band 405 - 406 MHz by the mobile-satellite service is limited to systems using narrow-band modulation techniques until further ITU-R studies conclude that other modulation techniques can protect Cospas-Sarsat (406 - 406.1 MHz) and radio astronomy (406.1 - 410 MHz).

Reasons: To protect Cospas-Sarsat and the radio astronomy service.

IAP/40/225

ADD S5.209B The use of the band 405 - 406 MHz by the mobile-satellite service is limited to systems using narrow-band modulation techniques until further ITU-R studies conclude that other modulation techniques can protect COSPAS-SARSAT (406 - 406.1 MHz) and radio astronomy (406.1 - 410 MHz).

Reasons: To protect COSPAS-SARSAT and radio astronomy.

S5.218	NOC	J/29/2,4

J/29/4

NOC S5.218

S5.219	MOD MOD NOC MOD MOD	CAN/35/5 USA/30/**77**,78 J/29/5 IAP/40/219 INS/84/3

USA/30/78

MOD S5.219

The use of the band 148 - 149.9 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the band 148 - 149.9 MHz. Systems of the mobile-satellite service using FDMA techniques shall utilize the characteristics shown in MOD Recommendation ITU-R M.1039. Systems of the mobile-satellite service using spread spectrum techniques shall utilize the characteristics shown in MOD Recommendation ITU-R M.1087.

Reasons: To ensure use of the sharing capabilities provided by the DCAAS technique described in MOD Recommendation ITU-R M.1039 and spread spectrum techniques in MOD Recommendation ITU-R M.1087.

CAN/35/5 MOD S5.219

The use of the band 148-149.9 MHz by the mobile satellite service is subject to coordination under **46 (Rev. WRC-95)**/No. **S9.11A**. The operation of mobile satellite ~~service~~ systems in the band 148-149.9 MHz shall not cause harmful interference nor ~~not~~ constrain the development and use of the fixed, mobile and space operation services operating in accordance with the Table of Frequency Allocations ~~in the band 148-149.9 MHz~~. See Resolution XXX.

J/29/5
NOC S5.219

IAP/40/219
MOD S5.219 The use of the band 148 - 149.9 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the band 148 - 149.9 MHz. Systems of the mobile-satellite service using FDMA techniques shall utilize the characteristics shown in Recommendation ITU-R M.1039-1. Systems of the mobile-satellite service using spread spectrum techniques shall utilize the characteristics shown in Recommendation ITU-R M.1087.

Reasons: To ensure use of the sharing capabilities provided by the DCAAS technique described in Recommendation ITU-R M.1039-1 and spread spectrum techniques in Recommendation ITU-R M.1087.

INS/84/3
MOD S5.219 The use of the band 148 - 149.9 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The operation of mobile-satellite ~~service~~ systems in the band 148 - 149.9 MHz shall not cause harmful interference to or constrain the development and use of the fixed, mobile and space operation services ~~in the band 148 - 149.9 MHz~~ operating in accordance with the Table of Frequency Allocations.
NOTE - Draft Resolution [INS-1] would guarantee the protection of fixed, mobile and space operation services against harmful interference from the MSS.

S5.220	MOD	ASP/14/**149A,149B**,151
	MOD	EUR/5/**262,263**,264
	MOD	IRN/44/5

ASP/14/151
MOD S5.220 The use of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the ~~land~~-mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The ~~land~~-mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz.

EUR/5/264
MOD S5.220 The use of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the ~~land~~ mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The ~~land~~-mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz.

IRN/44/5
MOD S5.220 The use of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the land mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The ~~land~~ mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz.

S5.221	SUP	CAN/35/6
	NOC	J/29/6
	NOC	IAP/40/220
	NOC	UGA/55/5
	NOC	G/34/11
	MOD	CUB/66/94,95
	SUP	INS/84/4

CAN/35/6 SUP S5.221

~~Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, ... Zambia, and Zimbabwe.~~

Reason: The ITU-R has studied many sharing and interference mitigation techniques which demonstrate that footnote S5.221 is no longer necessary . Taking into account these studies and the VGE's recommendation that the Radio Regulations footnotes be simplified, it is proposed that No. S5.221 be deleted, and footnote S5.219 modified to provide the appropriate assurances for interference free operations for the other services operating in this band. Reference is made to a new Resolution XXX urging the continuation of these studies, and that mobile satellite operators adopt the interference mitigation techniques developed by the ITU-R.

J/29/6
NOC **S5.221** **Reasons:** ITU-R Recommendation M.1039 does not cover all cases on frequency sharing between the non-GSO/MSS and other services with respect to technical and operational criteria. To protect the stations of the fixed and the mobile services from harmful interference, footnote S5.221 is required to be maintained.

IAP/40/220
MOD **S5.221** Stations of the mobile-satellite service in the band 148 - 149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brunei Darussalam, Bulgaria, Burkina Faso, Cameroon, ~~Canada,~~ China, Cyprus, ~~Colombia,~~ Congo, the Republic of Korea, Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, [~~Ecuador,~~] Eritrea, Spain, Estonia, Ethiopia, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Honduras, Hungary, India, Indonesia, the Islamic Republic of Iran, Ireland, Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakstan, Kenya, Kuwait, Latvia, The Former Yugoslav Republic of Macedonia, Lebanon, Libya, Liechtenstein, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, Philippines, Poland, Portugal, Qatar, Syria, Kyrgyzstan, Slovakia, Romania, the United Kingdom, Russia, Senegal, Sierra Leone, Singapore, Slovenia, Sri Lanka, South Africa, Sweden, Switzerland, ~~Suriname,~~ Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Yugoslavia, Zambia, and Zimbabwe.

Reasons: The ITU-R studies and the results of the testing of operational MSS systems utilizing narrow-band dynamic channels assignment techniques have shown that the fixed and mobile services will be protected from harmful interference from mobile earth terminals.

UGA/55/5
1) WRC-97 should urge completion of all studies by WRC-99 before any changes in allocations are made.
2) WRC-97 should not review No. S5.221 until all studies have been completed.
3) Such technologies as DCAAS should be tried out in various scenarios, in the form of experimental projects, to serve as a reference point.
4) MSS operators should show commitment to the use of DCAAS and any such technologies that are identified as enhancing sharing possibilities.
5) WRC-97 should encourage adoption of a uniform technology that can accommodate other technologies like DCAAS in future.

G/34/11
NOC **S5.221**

CUB/66/95
NOC S5.221

INS/84/4
SUP **S5.221**
Reasons: In view of the recent tests being conducted by some administrations and the possible additional test results indicated in § 4.1.1.3 of the CPM-97 Report, it is not necessary to retain footnote No. S5.221, which ironically includes countries (Indonesia as well) proposing to utilize such mobile-satellite services.
From an analysis assuming multiple worst-case conditions as described in § 4.1.1.1.1 of the CPM-97 Report, the land mobile station would experience minimal acceptable interference. Furthermore, as the non-GSO MSS network will be able to identify active mobile channels, the actual interference from non-GSO MSS mobile earth stations (MES) to a given land mobile station will be much less than that calculated under the worst-case assumptions used.
The use of DCAAS significantly reduces the potential for interference between MESs of a single non-GSO MSS network and terrestrial services with land mobile stations modelled as described above, since occupied channels detected by DCAAS are avoided. On average, the probability that satellite DCAAS scanning receivers will not detect LMS channel activity is extremely

low. Footnote No. S5.219 is modified to provide the appropriate assurances that the other services operating in the band can operate free of harmful interference.

S5.224	SUP	ASP/14/**149A,149B**,152
	SUP	EUR/5/**262,263**,265
	SUP	IRN/44/6

ASP/14/152
SUP S5.224 **Reasons:** To facilitate the development of the MSS. The restriction to a secondary allocation is no longer necessary after 1 January 1997, and recognizes proposal to change 149.9 - 150.05 MHz and 399.9 - 400.05 MHz allocations from LMSS to MSS.

EUR/5/265
SUP S5.224

IRN/44/6
SUP S5.224

S5.224A	ADD	EUR/5/**262,263**,266

EUR/5/266
ADD S5.224A The use of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015.

S5.224B	ADD	EUR/5/**262,263**,267

EUR/5/267
ADD S5.224B The allocation of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz to the radionavigation-satellite service ceases to be valid on 1 January 2015.

Reasons:
1 The allocation of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz should be changed to generic mobile-satellite service as soon as the radionavigation-satellite service has ceased its operation in these bands in order to improve spectrum efficiency.
2 No. S5.224 will be outdated at the time of WRC-97.

401-406 MHz	NOC	J/29/10
	NOC	IRN/44/11
		UGA/55/7
	MOD	CAN/35/**124**
	MOD	IAP/40/**221**

J/29/10 NOC Reasons: Sharing between the meteorological service and the mobile-satellite service may not be feasible. Japan believes that the 5 MHz bandwidth is still needed for the meteorological aids service from now on. Therefore, new allocation to the mobile-satellite service is not acceptable

IRN/44/11
9 Sharing between MSS (space-to-Earth) and MET-SAT or Earth exploration-satellite services in the band 401 - 406 MHz
Considering the use of this band by the MetSat system and that sharing between non-GSO and the MetSat system according to the CPM Report, Section 4.1.1.6.1 is generally not feasible, it is proposed that the above-mentioned sharing should not be considered.

UGA/55/7
Noting that:
1) sharing studies completed to date have shown that co-channel sharing is generally not possible and that band segmentation may be the alternative;

2) one study has shown that sharing may be possible if the feeder links of certain non-GSO MSS systems use spread spectrum techniques with certain limitations;
3) WRC-97 will consider an upgrade to the meteorological satellite and earth exploration-satellite service allocations on a worldwide basis in the band 401 - 403 MHz to co-primary;
4) development of improved meteorological aids systems is continuing in order to minimize the required bandwidth.

Uganda:
1) does not support band segmentation until such time as it is clearly affordable;
2) an initial period of 10 years should be given to administrations to consolidate MetAid operations. This period should be reviewed at a competent WRC.

S5.265	ADD	USA/30/79,82

USA/30/82
ADD S5.265 The use of the band 402 - 405 MHz by the mobile-satellite service is limited to non-geostationary satellite systems and is subject to coordination under No. **S9.11A**. The power flux-density of the mobile-satellite service on the Earth's surface shall not exceed -158.3 dBW/m^2/300 kHz. To protect the meteorological-satellite service in the band 402 - 403 MHz, the power flux-density from stations of the mobile-satellite service at the geostationary orbit shall not exceed -212.9 dBW/m^2/Hz.

Reasons: To prevent harmful interference.

S5.265A	ADD	USA/30/79,83

USA/30/83
ADD S5.265A The use of the band 405 - 406 MHz by the meteorological aids service and the mobile-satellite service shall be in accordance with Resolution [USA-9].

Reasons: See Resolution [USA-9].

S5.265B	ADD	USA/30/79,84

USA/30/84
ADD S5.265B The use of the band 405 - 406 MHz by the mobile-satellite service is limited to systems using narrow-band modulation techniques and is subject to coordination under No. **S9.11A**.

Reasons: To protect radio astronomy.

406.1 - 410 MHz	NOC	NZL/37/21
410 - 430 MHz	NOC	NZL/37/22

NZL/37/21
NOC

NZL/37/22
NOC

NZL/37/24
NOC

Reasons: New Zealand supports the little-LEO concept, recognizes the need for the new services that will be supported by such systems, and acknowledges the importance of these services for many countries in Region 3. However, New Zealand does not support the sharing of spectrum between little-LEOs and existing terrestrial services (particularly broadcasting and high density land mobile) until such time as competent and impartial sharing studies have demonstrated that the effect on existing services is acceptable.

NOTE - New Zealand does not support additional allocations to little-LEO MSS services in any band below 1 GHz at this time. The frequency bands listed above are a sample of the bands with which New Zealand has a concern, and should not be interpreted as the only bands with which New Zealand has a concern.

470 - 890 MHz	NOC NOC NOC	NZL/37/23 J/28/8 UGA/55/9 MLA/68/6 TZA/80/26

NZL/37/23
NOC

J/29/8 NOC Reasons: As pointed out in the CPM Report, the studies on sharing between MSS and television are required. The values on the Tables 4.1 and 4.2 themselves have not been verified by experimental means and need to be reviewed in the relevant ITU-R Study Group. There is also a need to establish all relevant protection ratio values for different digital systems. Therefore, Japan considers that it is inappropriate to allocate the frequency band 470 - 960 MHz to the MSS.

UGA/55/9
Uganda has extensive use of the bands 470 - 582 MHz and 582 - 960 MHz, and considering the uncompleted studies, proposes only that:
1) WRC-97 should call for completion of the studies.
2) No additional spectrum for MSS should be considered until the studies have been completed.
3) The studies should be completed by WRC-99.

MLA/68/6

Sharing of MSS (space-to-Earth) with the Broadcasting Service

470 - 960 MHz

The band 470 - 960 MHz is extensively used for the terrestrial broadcasting services in Malaysia. There is a need for a study on sharing between MSS and broadcasting services. However, this has not been performed yet.

As stated in the CPM-97 report, the values of protection ratio given in Tables 4.1 and 4.2 should be reviewed by the relevant ITU-R study groups.

The Administration of Malaysia proposes that the band 470 - 960 MHz not be allocated to the MSS services until such studies have been performed.

TZA/80/26
Tanzania takes note of the CPM-97 Report on sharing criteria and limit levels of transmissions of proposed digital broadcasting. Tanzania supports the view that sharing between MSS and broadcasting services requires further studies to be carried out.

890 - 960 MHz	NOC NOC	NZL/37/24 J/28/9 UGA/55/9 MLA/68/6 TZA/80/26

NZL/37/24
NOC

J/29/9 NOC

UGA/55/9

450-470 MHz	MOD	UGA/55/6,8 CAN/35/130,131 USA/30/310,311 TZA/80/25 INS/84/5

UGA/55/6

Noting that studies were carried out around the 460 MHz band and that the results show that sharing with land mobile systems with certain characteristics and of other types needs further study.

Uganda proposes that:

1) other types of LMS should also be studied before additional spectrum can be considered;
2) considering that some administrations accord priority to the provision of communication services by terrestrial means and others by non-GSO MSS, and if no clear majority is in view, no decision on this issue should be taken by WRC-97 so as to allow time for operational experience to indicate the way forward;
3) in any case, no operational or technical constraints should be placed on the development of terrestrial fixed and mobile services.

UGA/55/8

Noting that:

1) the results of the technical and operational studies have shown that the band 450 - 470 MHz can be shared using DCAAS;
2) DCAAS may be supplemented by additional sharing techniques which may permit more efficient use of bands below 1 GHz shared with the fixed service, and still protect terrestrial fixed systems, and that these techniques require further study;
3) further studies are also needed to establish the benefits of digital implementation on analogue with a view to recommending a specific sharing scenario. These studies should be completed in time for WRC-99.

Uganda proposes that:

1) this band should be studied further with respect to use of DCAAS and the additional sharing techniques, the sharing studies on which have not been completed;
2) the sponsors of these techniques should look into ways of carrying out experimental studies in different countries for ease of reference.

CAN/35/130
MOD

MHz
410 – 455

Allocation to Services		
Region 1	Region 2	Region 3
450 – ~~455~~451	FIXED MOBILE MOBILE SATELLITE (Earth-to-space) MOD S5.209 MOD S5.286A ADD S5.286D S5.271 S5.286 MOD S5.286B MOD S5.286C	
~~450 – 455~~451 – 454	FIXED MOBILE S5.271 ~~S5.286~~	
~~450 – 455~~454 – 455	FIXED MOBILE MOBILE SATELLITE (Earth-to-space) MOD S5.209 MOD S5.286A ADD S5.286D S5.271 ~~S5.286~~MOD S5.286B MOD S5.286C	

CAN/35/131
MOD

MHz
455 – 470

Allocation to Services		
Region 1	Region 2	Region 3
455 – 456 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D	**455 – 456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D	**455 – 456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D
456 – 459	FIXED MOBILE S5.271 S5.287 S5.288	
459 – 460 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A S5.286B S5.286C ADD S5.286D	**459 – 460** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A S5.286B S5.286C ADD S5.286D	**459 – 460** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A S5.286B S5.286C ADD S5.286D

MHz
450 – 460

Allocation to Services		
Region 1	Region 2	Region 3
USA/30/310 **MOD** **450 ~~– 455~~454**	FIXED MOBILE S5.271 S5.286	
~~450~~ 454 ~~455~~	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A S5.286 MOD S5.286B MOD S5.286C ADD S5.286D	
USA/ 30/311 **MOD** **455 – 456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286 MOD S5.286B MOD S5.286C ADD S5.286D	**455 – 456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D	**455 – 456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D
456 – 459	FIXED MOBILE S5.271 S5.287 S5.288	
459 – 460 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D	**459 – 460** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D	**459 – 460** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) MOD S5.209 S5.271 MOD S5.286A MOD S5.286B MOD S5.286C ADD S5.286D

Reasons: To provide world-wide allocations that enable use of global coverage features of non-GSO MSS systems. Studies have shown feasibility of sharing with fixed and mobile systems. Allocations in bands as shown allow selection of different mobile satellite service channels in different parts of the world to accommodate varying intensities of use by the mobile service and by other services.

TZA/80/25

The band 450 - 470 MHz is being heavily used by FS in Tanzania and therefore the existing systems that are operational in this band must be protected adequately from MSS interference.

INS/84/5
MOD

MHz
455 – 470

Allocation to Services		
Region 1	Region 2	Region 3
455 – 456 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C	**455 – 456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C	**455 – 456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C
...		
459 – 460 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C	**459 – 460** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C	**459 – 460** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C
...		

Reasons: For countries with an extensive geography and consisting of many islands, like Indonesia, additional spectrum is required to facilitate smooth development. This proposal is based on the sharing studies performed at 460 MHz between non-GSO MSS below 1 GHz (Earth-to-space links) and the land mobile service, as reflected in § 4.1.1.2.1 of the CPM-97 Report; WRC-97 should consider that application of the techniques in question is useful in order to facilitate sharing with the fixed and land mobile services for new non-GSO MSS Earth-to-space allocations below 1 GHz. The dynamic channel assignment techniques described in §§ 4.1.1.2.1 and 4.1.1.9 were developed to facilitate sharing between the non-GSO MSS and fixed and land mobile services in bands below 1 GHz. These techniques are currently being applied to the existing non-GSO MSS allocation at 148 - 149.9 MHz. Hence, they can also be applied to the Region 2 allocations and to new allocations for Regions 1 and 3, in the bands 455 - 456 MHz and 459 - 460 MHz, for non-GSO MSS.

S5.286A	MOD	CAN/35/**130,131**,133
	MOD	USA/30/**310,311**,313

CAN/35/133

MOD **S5.286A** The use of the bands 450 - 451 MHz, ~~455~~454 - 456 MHz and 459 - 460 MHz by the mobile-satellite service is subject to coordination under Resolution ~~**46 (Rev.WRC-95)**~~/No. **S9.11A**.

Reasons: Studies undertaken in Region 2 addressing the feasibility of sharing between MSS and terrestrial services in the 450 - 470 MHz band have shown that co-frequency sharing is possible. These low power, low duty cycle mobile-satellite systems providing data-only services require access to a limited number of unoccupied channels within an allocation. It was determined, based on these studies and the constraints proposed, that a minimum amount of spectrum within this range was required to reduce the probability of interference to well within acceptable levels as suggested by ITU-R. Resolution [AAA] invites further study of the constraints imposed on non-GSO MSS systems by these footnotes.

USA/30/313 **S5.286A** **MOD** The use of the bands 454~~55~~-456 MHz and 459 - 460 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev. WRC-95)**/No. **S9.11A**.

Reasons: To extend the coordination procedures to the additional bands for the non-geostationary MSS systems.

S5.286B	MOD	CAN/35/**130,131**,134 USA/30/**310,311**,314

CAN/35/134

MOD **S5.286B** Stations in the mobile-satellite service in the bands 450 - 451 MHz, ~~455~~454 - 456 MHz and 459 - 460 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services.

USA/30/314 **S5.286B** Stations in the mobile-satellite service in the bands 454~~455~~-456 MHz and 459 - 460 MHz shall not cause
MOD harmful interference to, or claim protection from, stations of the fixed or mobile services.

S5.286C	MOD	CAN/35/**130,131**,135 USA/30/**310,311**,315

CAN/35/135

MOD **S5.286C** Stations in the mobile-satellite service in the bands 450 - 451 MHz, ~~455~~454 - 456 MHz and 459 - 460 MHz shall not constrain the development and use of the fixed and mobile services.

USA/30/315 **S5.286C** Stations in the mobile-satellite service in the bands 454~~455~~- 456 MHz and 459 - 460 MHz shall not
MOD constrain the development and use of the fixed and mobile services.

Reason: Apply footnotes **S5.286B** and **S5.286C** to the additional allocations.

S5.286D	ADD	CAN/35/**130,131**,136 USA/30/**310,311**,316

CAN/35/136

ADD **S5.286D** Consecutive transmissions from an individual mobile-satellite service mobile earth station operating on the same frequency in the bands 450 - 451 MHz, 454 - 456 MHz and 459 - 460 MHz shall be separated by at least 1 minute, and any single transmission from an individual mobile earth station shall not exceed 450 ms in duration. The constraints on an individual mobile earth station repeat cycle on the same frequency and the transmission duration in this footnote shall apply, subject to review by ITU-R and based on the studies referred to in Resolution **[CAN-4]**, until changed by a future competent world radiocommunication conference.

USA/30/316

ADD **S5.286D** Consecutive transmissions from an individual mobile-satellite service mobile earth station operating on the same frequency in the bands 454 - 456 MHz and 459 - 460 MHz shall be separated by at least 1 minute, and any single transmission from an individual mobile earth station shall not exceed 450 ms in duration. The constraints on an individual mobile earth station repeat cycle on the same frequency and the transmission duration in this footnote shall apply, subject to review by the ITU-R and based on the studies referred to in Resolution **[USA-16]**, until changed by a future competent world radiocommunication conference.

Reason: Studies have shown that the duration and duty cycle constraints imposed on the MSS by this footnote result in the probability of interference being reduced to well within acceptable levels as suggested by the ITU-R. Further study (**Resolution [USA-16]**) is required to confirm the appropriate values for the constraints imposed on non-GSO MSS systems by this footnote considering the use of interference mitigating techniques which may be employed to promote compatibility with terrestrial services.

Ap.S5/An.1/1.1	MOD	EUR/5/258
Res. 46/An.2/A2.1.1	NOC	SEN/9/22
	MOD	CAN/35/3
	MOD	B/49/22A
	MOD	IAP/40/217
		KEN/70/23
	MOD	CUB/66/98,99

ANNEX 2 TO RESOLUTION 46 (Rev.WRC-95)*
AND
ANNEX 1 TO APPENDIX S5**

EUR/5/258

MOD **A2.1.1*** *Below 1 GHz*
and ~~In the bands 137 - 138 MHz and 400.15 - 401 MHz, coordination of a space station of~~
1.1** ~~the MSS (space to Earth) with respect to terrestrial services is required only if the power flux-density produced by the station exceeds -125 dB(W/m^2/4 kHz) at the Earth's surface~~

SEN/9/22
We should also like the power flux-density threshold of -125 dB (W/m^2/4 kHz) to be maintained.

CAN/35/3
MOD **(Rev. WRC-95)**
RES46 A2.1.1

In the bands 137-138 MHz and 400.15-401 MHz, coordination of a space station of the MSS (space-to-Earth), with respect to terrestrial services is required only if the power flux-density produced by the station exceeds -125 dBW/m^2/4kHz at the Earth's surface.
In the band 137-138 MHz, coordination of a space station of the MSS (space-to-Earth), for which coordination information was communicated to the Bureau after 1 November 1996, is required with the aeronautical mobile (OR) service only if the power flux-density produced by the station exceeds -140 dBW/m^2/4kHz at the Earth's surface in those Administrations with AMS(OR) systems operating in accordance with No. **S5.204** and No. **S5.206** as of 1 November 1996.

Reason: Existing AMS(OR) operations may be affected if a large number of LEO MSS systems are implemented in the 137-138 MHz band with pfd levels exceeding -140 dBW/m^2/4kHz. The large number of advance publication and coordination requests currently filed for this band seems to indicate that the band has already reached a steady state situation with the maximum number of MSS systems that could occupy the band. Therefore, new systems entering the band could only be replacing old systems, and the overall interference effect to terrestrial systems would not increase. New systems submitting coordination information after 1 November 1996 would be required to coordinate with AMS(OR) systems if their pfd exceeds -140 dBW/m^2/4kHz. According to Appendix **S5**, no coordination is required for changes to the characteristics of an existing assignment if such changes do not increase the interference to or from, as appropriate, the assignments of other Administrations. Therefore coordination of replacement satellites of a system which has submitted coordination information prior to 1 November 1996 will only be required if its pfd exceeds -125 dB(W/m^2/4kHz). No. **S5.208** has been modified to clarify that the pfd value is a threshold for coordination and is not a limit, which is in line with Resolution **46** and in accordance with the CPM Report. The above proposal is based on agreements reached at the CPM-97 meeting.

Note: This proposal has been prepared as a modification to Annex 2 of Resolution **46**. However it is understood that Annex 2 will likely be included in a finalized version of Appendix **S5** at WRC-97.

B/49/22A
MOD

ANNEX 2 TO RESOLUTION 46 (Rev.WRC-95)[1]

A2.1.1 *Below 1 GHz*

In the bands 137 - 138 MHz and 400.15 - 401 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services (except the aeronautical mobile (OR) service) is required only if the power flux-density produced by the station exceeds

–125 dB(W/m^2/4 kHz) at the Earth's surface.

In the band 137 - 138 MHz, coordination of a space station of the MSS (space-to-Earth), for which Appendix **S4** information has been submitted to the Bureau after 1 November 1996, is required only if the power flux-density produced by the station exceeds

B/49/22B

[1] The same modification should be made in item 1.1 of the Annex 1 to Appendix **S5**.

-140 dB(W/m^2/4 kHz) at the Earth's surface in those administrations with AMS(OR) systems operating in accordance with **S5.204** and **S5.206**.
In the band 137 - 138 MHz no coordination is needed for replacement of satellites notified prior to 1 November 1996, provided that its power flux-density does not exceed -125 dB(W/m^2/4 kHz) at the Earth's surface and such changes do not increase the interference to or from, as appropriate, the assignments of other administrations. These provisions shall apply from 21 November 1997.

Reasons: To indicate the more stringent power flux-density level for coordination to those administrations with AMS(OR) systems operating in accordance with S5.204 and S5.206 and to guarantee the application of the old power flux-density level in case of replacement of satellites, provided that the new situation does not increase the interference environment. These agreements were reached during the CPM-97 meeting.

ANNEX 2 TO RESOLUTION 46 (Rev.WRC-95)

IAP/40/217
MOD **A2.1.1** *Below 1 GHz*

In the bands 137 - 138 MHz and 400.15 - 401 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services is required only if the power flux-density produced by the station exceeds –125 dB(W/m^2/4 kHz) at the Earth's surface. In the band 137 - 138 MHz, coordination of a space station of the MSS (space-to-Earth), for which coordination information was communicated to the Bureau after 1 November 1996, is required with the aeronautical mobile (OR) service only if the power flux-density produced by the station exceeds -140 dB(W/m^2/4 kHz) at the Earth's surface in those Administrations with AMS(OR) systems operating in accordance with No. **S5.204** and No. **S5.206** as of 1 November 1996. In the band 137 - 138 MHz no coordination is needed for replacement of satellites notified prior to 1 November 1996, provided that its power flux-density does not exceed -125 dB(W/m^2/4 kHz) at the Earth's surface and such changes do not increase the interference to or from, as appropriate, the assignments of other administrations.

Reasons: To indicate the more stringent pfd level for coordination with those administrations with AMS(OR) systems operating in accordance with **S5.204** and **S5.206**, as of 1 November 1996, and to guarantee the application of the old pfd levels in case of replacement satellites, provided that the new situation does not increase the interference environment. These agreements were reached during the CPM-97 meeting.

NOTE - This proposal has been prepared as a modification to Annex 2 of Resolution **46**. However it is understood that Annex 2 will likely be included in a finalized version of Appendix **S5** at WRC-97.

KEN/70/23
The Administration of Kenya supports the power flux-density threshold value of -140 dB(W/m^2/4 kHz), as given in the CPM-97 Report.

CUB/66/98
MOD

ANNEX 1 TO APPENDIX S5 (Rev.WRC-~~95~~97)

1. Coordination thresholds for sharing between MSS (space-to-Earth) and terrestrial services in the same frequency bands and between non-GSO/MSS feeder links (space-to-Earth) and terrestrial services in the same frequency bands

1.1 Below 1 GHz

In the band~~s 137 - 138 MHz and~~ 400.15 - 401 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services is required only if the power flux-density produced by the station exceeds –125 dB(W/m^2/4 kHz) at the Earth's surface.
In the band 137 - 138 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services is required only if the power flux-density produced by the station at the Earth's surface exceeds:
a) -140 dB(W/m^2/4 kHz) with respect to the aeronautical mobile (OR) service of administrations listed in footnotes S5.204 and S5.206 as of 1 November 1996;
b) -125 dB(W/m^2/4 kHz) for all other cases.
However, space stations of MSS systems for which a coordination request was submitted to BR prior to 1 November 1996, and subsequent replacements of satellites using similar parameters (such that they do not cause increased interference to terrestrial systems) will have to be coordinated only if the power flux-density exceeds -125 dB(W/m^2/4 kHz) at the Earth's surface.

CUB/66/99
MOD

ANNEX 2 TO RESOLUTION 46 (Rev.WRC-~~95~~97)

A2.1 *Coordination thresholds for sharing between MSS (space-to-Earth) and terrestrial services in the same frequency bands and between non-GSO/MSS feeder links (space-to-Earth) and terrestrial services in the same frequency bands*

A2.1.1 *Below 1 GHz*

In the band~~s 137 - 138 MHz and~~ 400.15 - 401 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services is required only if the power flux-density produced by the station exceeds –125 dB(W/m^2/4 kHz) at the Earth's surface.

In the band 137 - 138 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services is required only if the power flux-density produced by the station at the Earth's surface exceeds:

a) -140 dB(W/m^2/4 kHz) with respect to the aeronautical mobile (OR) service of administrations listed in footnotes S5.204 and S5.206 as of 1 November 1996;

b) -125 dB(W/m^2/4 kHz) for all other cases.

However, space stations of MSS systems for which a coordination request was submitted to BR prior to 1 November 1996, and subsequent replacements of satellites using similar parameters (such that they do not cause increased interference to terrestrial systems) will have to be coordinated only if the power flux-density exceeds -125 dB(W/m^2/4 kHz) at the Earth's surface.

Ap.S5/An.1/1.1.1 Res. 46/An.2/A2.1.1.1	ADD	EUR/5/259

EUR/5/259
ADD **A2.1.1.1*** **and** **1.1.1**** In the bands 137 - 138 MHz and 400.15 - 401 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to terrestrial services (except the aeronautical mobile (OR) service) is required only if the power flux-density produced by the station exceeds -125 dB (W/m^2/4 kHz) at the Earth's surface

...

Ap.S5/An.1/1.1.2 Res. 46/An.2/A2.1.1.2	ADD	EUR/5/260

EUR/5/260
ADD **A2.1.1.2*** **and** **1.1.2**** In the band 137 - 138 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to the aeronautical mobile (OR) service is required only if the power flux-density produced by the station at the Earth's surface exceeds:

- -125 dB(W/m^2/4 kHz) for systems on which coordination request has been received by the Bureau before the date 1 November 1996, and for replacement of satellites of such systems for which coordination request is received by the Bureau after this date if the new characteristics do not increase the interference effect;
- -140 dB(W/m^2/4 kHz) for systems on which coordination request has been received by the Bureau after the date 1 November 1996, and for systems on which coordination request received before this date has been modified due to replacement of satellites if these modifications increase the interference effect.

This provision shall apply from 21 November 1997.

Reasons: The more stringent coordination trigger level of -140 dB(W/m^2/4 kHz) is required to protect the aeronautical mobile (OR) service from harmful interference.

Ap.S5/Table-1	MOD	USA/30/291

TABLE 1
Earth stations operating at frequencies below 1 GHz

	Frequency Sharing Situation		Coordination Distance (In sharing situations involving services allocated with equal rights)
	Frequency band and earth station for which coordination area is determined	Other service or station (station in terrestrial service)	
USA/ 30/291 MOD	148.0 - 149.9 MHz ground-based (mobile) 149.9 - 150.05 MHz ground-based (mobile)	ground-based stations	As determined using Equation (1) and Figure 1 of Recommendation ITU-R M.1185 In this case, the coordination distance is calculated by the administration of the earth~~terrestrial~~ station using the parameters of its earth~~terrestrial~~ stations and the relevant parameters taken from the advance publication for the earth station.
	400.15 - 401 MHz ground-based	meteorological aids (radiosonde)	582 km

Reasons: No terrestrial service is allocated to 149.9 - 150.05 MHz.

Res. 214(WRC-95)		ASP/14/146,147 SEN/9/23-27 KEN/UGA/TZA/47/33 AFS/71/9E KEN/70/23,26 UZB/59/15 TZA/80/23

ASP/14/146
The APT proposes NOC to the allocations below 1 GHz for additional allocations to the MSS.

ASP/14/147
The APT Member countries believe that the broad allocation concept discussed in the CPM Report (Section 4.1.1.15) should not be considered at WRC-97, because the concept has not been studied in the ITU-R.

SEN/9/23
Sharing between non-GSO MSS below 1 GHz Earth-to-space links and the fixed service
We are not in favour of an additional allocation, although the use of techniques such as DCAAS (dynamic channel activity assignment system) by MSS satellites could be recommended in order to facilitate sharing between the non-GSO MSS and the terrestrial fixed services below 1 GHz in the Earth-to-space direction.

SEN/9/24
As this band is used a great deal for terrestrial services (including rural telephony), we are not in favour of its being allocated to non-GSO MSS feeder links below 1 GHz.

SEN/9/25
Sharing between the radionavigation-satellite service (RNSS) and the MSS in the frequency bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz
We consider that sharing between the RNSS and the MSS should be facilitated. To that end, the power flux-density limits set out below should be applied to space stations in the MSS:
- -153 dB(W/m^2/4 kHz) in the frequency band 149.9 - 150.05 MHz;
- -156 dB(W/m^2/4 kHz) in the frequency band 399.9 - 400.05 MHz.

SEN/9/26
Sharing between meteorological aids and non-GSO MSS in the band 401 - 406 MHz
We support the proposal for segmentation of the band, in so far as this method entails no increase in the cost of operating networks in the meteorological aids service.

SEN/9/27
It is proposed that the MSS downlink power flux-density should not exceed -177 dB(W/m^2/4 kHz), and that the MSS ground station must accept interference from MetAids.

KEN/UGA/TZA/47/33
4.5 Resolution 214 (WRC-95) - Sharing studies relating to consideration of the allocation of bands below 1 GHz to the non-geostationary mobile-satellite service

The Administrations submitting this document propose that ITU-R should:
a) complete all sharing studies;
b) identify and notify concerned administrations before allocation of the band is effected.

KEN/70/26
The Administration of Kenya proposes that the ITU should complete all the sharing studies and identify and notify all the concerned administrations before the allocation of the band is effected.

UZB/59/15
The Republic of Uzbekistan supports the results of the work done by CPM-97 with respect to protection of the fixed and land services using the band 148 - 149.9 MHz from the non-GSO MSS and with respect to the use of frequencies. Sharing between the MSS and COSPAS-SARSAT in the band 406 - 406.1 MHz, and with the fixed service in the band 450 - 470 MHz, requires further study.
Studies need to be carried out on sharing between the MSS and television in the bands 470 - 582 MHz and 582 - 960 MHz, since in many countries analogue television broadcasting will continue for many years to come.

TZA/80/23
Tanzania in principle supports sharing between non-GSO/MSS below 1 GHz on the condition that the operation and quality of the existing terrestrial service will not be affected and that sharing studies conducted by ITU-R study groups are completed.

Res. 714(WRC-95)	SUP SUP SUP SUP 	ASP/14/148 CAN/35/4 B/49/23 SEN/9/28,29 KEN/UGA/TZA/47/30 IRN/44/3 IAP/40/218 UZB/59/16 TZA/80/23

ASP/14/148
SUP

RESOLUTION 714 (WRC-95)

The APT notes that consequential amendments will need to be made to footnote **S5.208** and Annex 1 to Appendix **S5**.

CAN/35/4		"Power Flux-Density Level Applicable in the Frequency Band 137-
SUP	**(WRC-95)**	138 MHz Shared by the Mobile-Satellite Service and Terrestrial
	RES714	Services"

Reason: Due to the completion of the urgent studies, this Resolution is no longer required and should be suppressed as supported by the CPM-97 Report.

SEN/9/28
It is proposed that the power flux-density level of -125 dB(W/m^2/4 kHz) authorized for satellites in the meteorological-satellite service should be taken as the threshold value used to trigger coordination.

SEN/9/29
General allocations
We are in favour of any effort to find new solutions which would facilitate the development of new technologies for efficient use of the spectrum; however, before giving consideration to allocations on this basis, ITU-R should carry out additional studies on the subject.

KEN/UGA/TZA/47/30
4.2 Resolution 714 (WRC-95) - Power flux-density level applicable in the frequency band 137 - 138 MHz shared by the mobile-satellite service and terrestrial services

The power flux-density threshold value of -140 dBW/m^2 per 4 kHz as given in the CPM-97 Report is acceptable.

IRN/44/3
3 Resolution 714

The Islamic Republic of Iran supports Section 4.1.3.2 of the CPM Report.

B/49/23
SUP RESOLUTION 714 (WRC-95)
Power Flux-Density Level Applicable in the Frequency Band 137 - 138 MHz Shared by the Mobile-Satellite Service and Terrestrial Services

Reasons: Consequential to proposals B/49/21 and B/49/22A and completion of the required studies.

IAP/40/218
SUP RESOLUTION 714 (WRC-95)
POWER FLUX-DENSITY LEVEL APPLICABLE IN THE FREQUENCY BAND 137 - 138 MHz SHARED BY THE MOBILE-SATELLITE SERVICE AND TERRESTRIAL SERVICES

Reasons: Due to the completion of the urgent studies, this Resolution is no longer required and should be suppressed as supported by the CPM-97 Report.

UZB/59/16
The Republic of Uzbekistan considers that in the case of the aeronautical mobile (OR) service further studies are required to evaluate the compatibility of such systems and space service systems, which have an allocation in the band 137 - 138 MHz.

Res. 715(WRC-95)		KEN/70/27 UZB/59/17

KEN/70/27
The Administration of Kenya proposes that the already developed sharing criteria be maintained.

UZB/59/17
The Republic of Uzbekistan is of the view that these bands may be used for MSS systems only after sharing studies have been carried out on the basis of the information received from administrations intending to introduce MSS in these bands.

Draft Res. [CAN-1]	ADD	CAN/35/7

CAN/35/7
ADD

Resolution [CAN-1]

The World Radiocommunication Conference (WRC-97)

considering

a) that No. **S5.221** was drafted at WARC-92 prior to the operation of LEO MSS systems in the 148-149.9 MHz band;

b) that MSS systems operating in the 148-149.9 MHz band will utilize interference mitigation techniques such as dynamic channel activity assignment or CDMA techniques to avoid causing interference to fixed and mobile systems operating in this band;

c) that Recommendation ITU-R M.1039-1 provides statistical methods for evaluating the sharing between MSS earth stations and mobile services operating in bands below 1 GHz, and describes one type of dynamic channel assignment technique;

c) that there may be other interference mitigation techniques available to minimize the probability or reduce the level of interference to the fixed and mobile systems operating in the 148-149.9 MHz band;

d) that many of the mobile systems operating in this band are paging or trunk type mobile radio systems;

e) that sharing is feasible between the terrestrial mobile services and the satellite services operating in this band;

f) that the procedures in the Radio Regulations under No. **S9.11** bis requests administrations to coordinate with the fixed, mobile and space operations services under No. **S5.219,**

invites ITU-R

to develop Recommendations on the technical and operational means that can be used by the MSS to ensure the use of the band 148-149.9 MHz by the mobile and fixed services is not constrained by the operation of stations in the MSS.

resolves

that administrations operating LEO MSS systems in these bands should implement interference mitigation techniques developed by the ITU-R to ensure harmful interference is not caused to fixed and mobile services operating in the band 148-149.9 MHz.

Draft Res. [CAN-3]	ADD	CAN/35/129

CAN/35/129
ADD

DRAFT RESOLUTION [CAN-3]
USE OF THE BAND 405 - 406 MHz BY THE METEOROLOGICAL AIDS SERVICE AND THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the World Meteorological Organization (WMO) coordinates the collection and distribution of synoptic upper air data worldwide;

b) that the WMO held a Special Expert Meeting on Radiosonde RF Requirements in February 1997;

c) that the meeting concluded that the band 401 - 406 MHz is required for meteorological aids operations in portions of the world for some time into the future;

d) that development of more spectrum efficient meteorological aids systems is continuing in order to minimize the bandwidth required by these systems, as outlined in Recommendation **SA.1165**;

e) that improvements in radiocommunications characteristics and development of more spectrum efficient radiosondes are needed to accommodate other interests of radio spectrum users;

f) that there is a significant shortfall of spectrum for the non-geostationary orbit (NGSO) MSS below 1 GHz, and there is an urgent need to make additional spectrum available on a worldwide basis for such NGSO MSS systems;

g) that the CPM-97 Report for WRC-97 states "that the Radiocommunication Bureau (BR) has identified 23 NGSO MSS networks, at frequencies below 1 GHz, at some state of coordination under (Resolution **46**) **S9.11A**", and that several administrations have indicated in their information submitted to the BR that they plan on implementing these NGSO MSS systems by the year 2002 or earlier;

h) that the CPM-97 Report for WRC-97 also states that, "it appears many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum to allow the development of all of these systems in an economically viable manner";

i) that sharing studies to date have shown that co-channel sharing between currently proposed NGSO MSS systems and meteorological aids in the band 401 - 406 MHz is not generally feasible, and an appropriate period of time is required for the transition of meteorological operations out of the band allocated to NGSO MSS;

j) that WRC-97 allocated the band 405 - 406 MHz for NGSO MSS in the space-to-Earth direction with the operation of this service to come into effect at the appropriate transition date;

k) that the appropriate transition time for meteorological aids is dependent on the budgetary support which must be provided for the transition,

considering further

l) that the WMO must encourage its Members to use more spectrum efficient systems in the future;

m) that the WMO is in the best position to determine its Members' needs on a global basis;

n) that WMO is regarded as being in a position to advise ITU-R, prior to the next competent world radiocommunication conference, as to what parts of the world the band 405 - 406 MHz is currently available for MSS use,

resolves to invite ITU-R

1 as a matter of urgency, with the participation of the WMO, to establish the necessary steps for the transition of the meteorological aids service out of the 405 - 406 MHz band which would minimize the impact on the meteorological aids service, while taking into account the stated requirements for the implementation of NGSO MSS by the year 2002 as indicated in *considering* g);

2 to develop this transition plan, including a transition date for meteorological aids out of the 405 - 406 MHz band,

resolves to invite members of ITU-R

to assist in the development of the transition plan, with administrations, either individually or on a subregional or regional basis, notifying the WMO and ITU-R that the band is no longer needed for meteorological aids,

resolves

1 that the meteorological aids service in the band 405 - 406 MHz shall operate on a primary basis until the transition date defined in *resolves to invite ITU-R* 2 above;

2 that the filing of advance publication of information for the NGSO MSS systems in the band 405 - 406 MHz as of 21 November 1997 be permitted;

3 that the use of the band 405 - 406 MHz by the mobile-satellite service is limited to systems using narrow-band modulation techniques until further ITU-R studies conclude that other modulation techniques can protect Cospas-Sarsat (406 - 406.1 MHz) and radio astronomy (406.1 - 410 MHz);

4 that the 1999 World Radiocommunication Conference (WRC-99) be invited to consider the transition plan developed by ITU-R and WMO as referred to in *resolves to invite ITU-R* 1 and 2,

urges administrations

1 to assess their current and future requirements for meteorological aids systems in the band 405 - 406 MHz with a view to transitioning out of the band 405 - 406 MHz;

2 to submit to ITU-R the most up to date information on the date of bringing into use of their NGSO MSS systems communicated to the Radiocommunication Bureau,

instructs the Secretary-General

to draw this Resolution to the attention of the WMO,

recommends

that WRC-99 consider the allocation of the 404 - 405 MHz band to NGSO MSS, as well as the necessary steps to transition meteorological aids operations out of the band.

Reasons: The WMO coordinates the collection and distribution of synoptic upper air data worldwide. Therefore, the WMO is very aware of all the requirements of the Members, and the resources required (including spectrum) to perform the critical mission of routine and severe weather prediction for the protection of life and property. The WMO has already notified members that steps must be taken to reduce spectrum requirements of radiosonde systems. Members have indicated that time is required for the transition, and the amount of time required is largely dependent on funding levels. The exact time is not known at this time. This type of approach would allow the allocation to be made at WRC-97, but allow the current users to have time to transition out of the band. This approach would also allow the mobile-satellite service industry to participate and assist administrations to transition out of the band. MSS industry participation will expedite the transition, providing benefit to both the meteorological community and the MSS industry.

Draft Res. [CAN-4]	ADD	CAN/35/137

CAN/35/137
ADD

DRAFT RESOLUTION [CAN-4]

STUDIES ON THE USE OF THE NON-GEOSTATIONARY MOBILE-SATELLITE SERVICE ALLOCATIONS WITHIN THE 450 - 470 MHz BAND

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the Conference Preparatory Meeting 1997, in its Report, indicated that in order to meet projected MSS requirements below 1 GHz, a range of an additional 7 to 10 MHz will be required in the near future;

b) that there is an urgent need to make additional spectrum available on a worldwide basis for non-geostationary mobile-satellite service (non-GSO MSS) systems operating below 1 GHz;

c) that the bands below 1 GHz are extensively used, although the extent to which the 450 - 470 MHz band is used by each administration varies throughout the world;

d) that WRC-97 allocated the bands 450 - 451 MHz, 454 - 456 MHz and 459 - 460 MHz to non-GSO MSS (Earth-to-space) on a primary worldwide basis;

e) that the low power, low duty cycle non-GSO MSS systems planning to operate in these bands will provide data only services and at any given time, require access to a limited number of unoccupied channels within the entire 4 MHz Earth-to-space allocation;

f) that in order to satisfy the concerns on the potential for interference into the existing and planned services within these bands, WRC-97 adopted footnote **S5.286D** which imposes constraints on the operation of non-GSO MSS mobile earth stations (MESs);

g) that according to **S5.286D**, the duration of any single transmission from an individual MSS MES shall not exceed 450 ms, and consecutive transmissions from an individual MSS MES operating on the same frequency in the bands 450 - 451 MHz, 454 - 456 MHz and 459 - 460 MHz shall be separated by at least 1 minute;

h) that interference mitigating techniques, such as the dynamic channel activity assignment system described in Recommendation **ITU-R M.1039-1,** may be used by non-GSO MSS systems below 1 GHz to promote compatibility with terrestrial systems when operating in the same frequency band in the Earth-to-space direction,

resolves to invite the ITU-R,

1 as a matter of urgency, to carry out studies in preparation for the Conference Preparatory Meeting of the next competent Conference (WRC-99), with a view to reviewing the appropriate values for the operating constraints given in No. **S5.286D** necessary to protect the existing and planned development of all of the services to which the 450 - 470 MHz band is allocated, taking note of *considering* h);

2 as a matter of urgency, to carry out studies in preparation for the Conference Preparatory Meeting of the next competent Conference (WRC-99), to review the necessity for the operating constraints given in Nos. **S5.286B, S5.286C** and **S5.286D**;

3 as a matter of urgency, to carry out studies in preparation for the Conference Preparatory Meeting of the next competent Conference (WRC-99), with respect to interference mitigating techniques, such as the dynamic channel activity assignment system described in Recommendation **ITU-R M.1039-1**, necessary to permit the continued development in this band of all of the services to which it is allocated;

4 to bring the results of these studies and analyses to the attention of WRC-99 and the relevant preparatory meetings,

urges administrations

to participate in such studies, with involvement by both terrestrial and satellite interests, by submitting contributions to ITU-R relating to the above-mentioned studies as soon as possible,

encourages administrations

to consider the use of a type of dynamic channel assignment techniques, such as that described in Recommendation **ITU-R M.1039-1**, within their domestic regulations which could be used by non-GSO MSS systems (narrow-band) operating in MSS allocations below 1 GHz to promote compatibility with terrestrial systems.

Draft Res. [USA-9]	ADD	USA/30/85

USA/30/85
ADD

DRAFT RESOLUTION [USA-9]

The World Radiocommunication Conference (Geneva, 1997),

noting

a) that the World Meteorological Organization (WMO) coordinates the collection and distribution of synoptic upper air data worldwide;

b) that the WMO held a Special Expert meeting on Radiosonde RF Requirements in February 1997,

noting further

a) that the meeting reached several conclusions of interest to ITU Member States;

b) that the band 401 - 406 MHz is required for meteorological aids operations in portions of the world for sometime into the future;

c) that time is required for countries to transition out of any portion of the band allocated to the mobile-satellite service;

d) that the exact time required is difficult to specify since it is largely dependent on the budgetary support which must be provided for the transition,

considering

that the WMO must encourage Members to use more spectrum efficient systems in the future,

considering further

a) that the WMO is in the best position to determine its Members' needs on a global basis;

b) that the WMO divides the world into regions;

c) that WMO is regarded as being in a position to advise the Union, prior to the next competent world radiocommunication conference, as to what parts of the world the band 405 – 406 MHz would be available for MSS use,

resolves

1 that meteorological aids shall enjoy primary status in the band 405 – 406 MHz until such time that the WMO notifies the Union that sufficient time has elapsed to allow meteorological aids operations to transition out of the band;

2 that the notification addressed in *resolves* 1 may be either on a regional or worldwide basis;

3 that the use of the band 405 – 406 MHz by the mobile-satellite service is subject to coordination under No. **S9.11A** with respect to stations enjoying a primary category of service;

4 that the use of the band 405 – 406 MHz by the mobile-satellite service is limited to systems using narrow-band modulation techniques;

5 that administrations may decide, either individually or on a sub-regional or regional basis, to notify the WMO and the ITU-R that the band is no longer needed for meteorological aids operations,

resolves to invite Members of the Union

1 to review their use of the meteorological aids service in the band 405 - 406 MHz with a view to phasing it out;

2 to propose suppression of the allocation to the meteorological aids service in 405 - 406 MHz at a subsequent competent world radiocommunication conference,

instructs the Secretary-General

to draw this Resolution to the attention of the WMO.

Reasons: The WMO coordinates the collection and distribution of synoptic upper air data worldwide. Therefore, the WMO is very aware of all the requirements of the Members, and the resources required (including spectrum) to perform the critical mission of routine and severe weather prediction for the protection of life and property. The WMO has already notified members that steps must be taken to reduce spectrum requirements of radiosonde systems. Members have indicated that time is required for the transition, and the amount of time required is largely dependent on funding levels. The exact time is not known at this

time. This type of approach would allow the allocation action to be made at WRC-97, but allow the current users to have time to transition out of the band. This approach would also allow the mobile-satellite service industry to participate and assist administrations to transition out of the band. MSS industry participation will expedite the transition, providing benefit to both the meteorological community and the MSS industry.

Draft Res. [USA-10]	ADD	USA/30/292

DRAFT RESOLUTION [USA-10]

USA/30/292
ADD

SHARING STUDIES RELATING TO CONSIDERATION OF ALLOCATIONS IN THE BAND 470-960 MHZ TO THE NON-GEOSTATIONARY MOBILE-SATELLITE SERVICES WITH SERVICE LINKS OPERATING BELOW 1 GHZ

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the agenda of this Conference included consideration of the adoption of additional allocations for the Non-Geostationary Mobile-Satellite Services (non-GSO/MSS) as referenced in the CPM Report, WRC-97 Agenda Item 1.9.1 (Resolution 214);

b) that the report of the 1997 Conference Preparatory Meeting (CPM-97) stated that "The Radiocommunication Bureau has identified at least 23 non-GSO MSS networks at frequencies below 1 GHz, at some state of coordination under Resolution 46" (see CPM-97 Report, section 4.1.1.13), and that "many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum" (see CPM-97 Report, section 4.1.1.14).

c) that CPM-97 considered the protection requirements for analogue television in the bands 470-582 MHz and 582-960 MHz against a narrow-band MSS signal in the most sensitive and least sensitive portions of an analogue TV channel and the protection requirements for a digital TV channel, based on existing ITU-R Recommendations (BT.655-4, BT.417-4, and IS.851-1);

d) that CPM-97 stated that the protection ratio for a narrow-band interfering signal in the parts of an analogue TV channel, requiring lower protection, may be 13 to 20 dB below that required in the most sensitive parts of the channel;

e) that CPM-97 stated the region of lower protection requirements and commensurately higher permissible interfering power flux levels as being 100 kHz near the band edges of an analogue TV channel;

f) that CPM-97 stated that the interfering effects of a non-GSO/MSS transmission will depend on its specific characteristics (e.g. duty-cycle, duration, periodicity, etc.), that interference contributions from sources other than MSS (even those from other broadcasting stations have to be taken into account), that slightly lower values of field strength to be protected may need to be assumed in countries where television networks are relatively sparse, that studies on sharing are necessary;

g) that the maximum permissible aggregate interfering power flux-density resulting from these protection requirements, for the most sensitive and the least sensitive portions of an analogue TV channel, may be useful for narrow-band links (space-to-Earth) from non-GSO/MSS transmitters;

h) that these bands are allocated in part to fixed and mobile terrestrial systems and radionavigation systems;

noting

a) that, after appropriate studies, bands now allocated to the broadcasting service between 470 MHz and 960 MHz might be considered suitable for world-wide allocation to non-GSO/MSS space-to-Earth transmissions;

b) that the bandwidth required in these channels is approximately 1-2% of the total spectrum of 470-960 MHz to be shared with the parties noted above;

c) that since the 608-614 MHz band is allocated to the Radio Astronomy Services (RAS), and since line-of-sight sharing between the RAS and active services is difficult, this band is not under consideration for non-GSO/MSS downlink (space-to-Earth) sharing studies in this resolution;

resolves

1. to invite the ITU-R, as a matter or urgency, to carry out studies to determine operational and technical means to facilitate co-frequency sharing between narrow-band non-GSO/MSS (space-to-Earth) transmissions and the services allocated in the band 470-960 MHz, where the broadcasting service is also allocated;

2. to invite the WRC-99 to consider, on the basis of studies referred to in resolves 1, additional allocations on a world-wide basis for the non-GSO/MSS with service links operating below 1 GHz;

urges Administrations

to participate actively in such studies with involvement of interested parties.

Draft Res. [USA-16]	ADD	USA/30/317

RESOLUTION [USA-16]

USA/30/317
ADD

STUDIES ON THE USE OF THE NON-GEOSTATIONARY MOBILE-SATELLITE SERVICE ALLOCATIONS WITHIN THE 450-470 MHZ BAND

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the Conference Preparatory Meeting 1997, in its Report, indicated that in order to meet projected MSS requirements below 1 GHz, a range of an additional 7 to 10 MHz will be required in the near future;

b) that there is an urgent need to make additional spectrum available on a worldwide basis for non-geostationary mobile-satellite service (non-GSO MSS) systems operating below 1 GHz;

c) that the bands below 1 GHz are extensively used, although the extent to which the 450-470 MHz band is used by each administration varies throughout the world;

d) that WRC-97 allocated the bands 454 - 456 MHz and 459 - 460 MHz to non-GSO MSS (Earth-to-space) on a primary worldwide basis;

e) that the low power, low duty cycle non-GSO MSS systems planning to operate in these bands will provide data only services and at any given time, require access to a limited number of unoccupied channels within the entire 3 MHz Earth-to-space allocation;

f) that in order to satisfy the concerns on the potential for interference into the existing and planned services within these bands, WRC-97 adopted footnote **S5.286D** which imposes constraints on the operation of non-GSO MSS mobile earth stations (MESs);

g) that according to **S5.286D**, the duration of any single transmission from an individual MSS MES shall not exceed 450 ms, and consecutive transmissions from an individual MSS MES operating on the same frequency in the bands 454 - 456 MHz and 459 - 460 MHz shall be separated by at least 1 minute;

h) that interference mitigating techniques, such as the dynamic channel activity assignment system described in Recommendation **ITU-R M.1039-1**, may be used by non-GSO MSS systems below 1 GHz to promote compatibility with terrestrial systems when operating in the same frequency band in the Earth-to-space direction;

resolves to invite the ITU-R

1. as a matter of urgency, to carry out studies in preparation for the Conference Preparatory Meeting of the next competent Conference (WRC-99), with a view to reviewing the appropriate values for the operating constraints given in No. **S5.286D** necessary to protect the existing and planned development of all of the services to which the 450 - 470 MHz band is allocated, taking note of *considering h)*;

2. as a matter of urgency, to carry out studies in preparation for the Conference Preparatory Meeting of the next competent Conference (WRC-99), reviewing the necessity for the operating constraints given in Nos. **S5.286B**, **S5.286C,** and **S5.286D**;

3. as a matter of urgency, to carry out studies in preparation for the Conference Preparatory Meeting of the next competent Conference (WRC-99), with respect to interference mitigating techniques, such as the dynamic channel activity assignment system described in Recommendation **ITU-R M.1039-1**, necessary to permit the continued development in this band of all of the services to which it is allocated;

4. to bring the results of these studies and analyses to the attention of WRC-99 and the relevant preparatory meetings;

urges Administrations

to participate in such studies, with involvement by both terrestrial and satellite interests, by submitting contributions to ITU-R relating to the above-mentioned studies as soon as possible;

encourages Administrations

to consider the use of a type of dynamic channel assignment techniques, such as that described in Recommendation **ITU-R M.1039-1**, within their domestic regulations which could be used by non-GSO MSS systems (narrow-band) operating in MSS allocations below 1 GHz to promote compatibility with terrestrial systems.

Draft Res. [IAP-9]	ADD	IAP/40/226

IAP/40/226
ADD

DRAFT RESOLUTION [IAP-9]

USE OF THE BAND 405 - 406 MHz BY THE METEOROLOGICAL AIDS SERVICE AND THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the World Meteorological Organization (WMO) coordinates the collection and distribution of synoptic upper air data worldwide;

b) that the WMO held a Special Expert Meeting on Radiosonde RF Requirements in February 1997;

c) that the meeting concluded that the band 401 - 406 MHz is required for meteorological aids operations in portions of the world for some time into the future;

d) that development of more spectrum efficient meteorological aids systems is continuing in order to minimize the bandwidth required by these systems, as outlined in Recommendation SA.1165;

e) that improvements in radiocommunications characteristics and development of more spectrum efficient radiosondes are needed to accommodate other interests of radio spectrum users;

f) that there is a significant shortfall of spectrum for the non-geostationary orbit (NGSO) MSS below 1 GHz, and there is an urgent need to make additional spectrum available on a worldwide basis for such NGSO MSS systems;

g) that the CPM-97 Report for WRC-97 states "that the Radiocommunication Bureau (BR) has identified 23 NGSO MSS networks, at frequencies below 1 GHz, at some state of coordination under (Resolution 46) **S9.11A**", and that several administrations have indicated in their information submitted to the BR that they plan on implementing these NGSO MSS systems by the year 2002 or earlier;

h) that the CPM-97 Report for WRC-97 also states "it appears many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum to allow the development of all of these systems in an economically viable manner";

i) that sharing studies to date have shown that co-channel sharing between currently proposed NGSO MSS systems and meteorological aids in the band 401 - 406 MHz is not generally feasible, and an appropriate period of time is required for the transition of meteorological operations out of the band allocated to NGSO MSS;

j) that WRC-97 allocated the band 405 - 406 MHz for NGSO MSS in the space-to-Earth direction with the operation of this service to come into effect at the appropriate transition date;

k) that the appropriate transition time for meteorological aids is dependent on the budgetary support which must be provided for the transition,

considering further

a) that the WMO must encourage its Members to use more spectrum efficient systems in the future;

b) that the WMO is in the best position to determine its Members' needs on a global basis;

c) that WMO is regarded as being in a position to advise the ITU-R, prior to the next competent world radiocommunication conference, as to what parts of the world the band 405 - 406 MHz is currently available for MSS use,

resolves to invite ITU-R

1 as a matter of urgency, with the participation of the WMO, to establish the necessary steps for the transition of the meteorological aids service out of the 405 - 406 MHz band which would minimize the impact on the meteorological aids service, while taking into account the stated requirements for the implementation of NGSO MSS by the year 2002 as indicated in *considering* g);

2 to develop this transition plan, including a transition date for meteorological aids out of the 405 - 406 MHz band,

resolves to invite Members of ITU-R

to assist in the development of the transition plan, with administrations, either individually or on a subregional or regional basis, by notifying the WMO and the ITU-R that the band is no longer needed for Meteorological Aids,

resolves

1 that the meteorological aids service in the band 405 - 406 MHz shall operate on a primary basis until the transition date defined in *resolves to invite ITU-R* 2 above;

2 that the filing of advance publication of information for the NGSO MSS systems in the band 405 - 406 MHz as of 21 November 1997 be permitted;

3 that the use of the band 405 - 406 MHz by the mobile-satellite service is limited to systems using narrow-band modulation techniques until further ITU-R studies conclude that other modulation techniques can protect COSPAS-SARSAT (406 - 406.1 MHz) and radio astronomy (406.1 - 410 MHz);

4 that the 1999 World Radiocommunication Conference (WRC-99) be invited to consider the transition plan developed by the ITU-R and WMO as referred to in *resolves to invite ITU-R* 1 and 2,

urges administrations

1 to assess their current and future requirements for meteorological aids systems in the band 405 - 406 MHz with a view to transitioning out of the band 405 - 406 MHz;

2 to submit to the ITU-R the most up-to-date information on the date of bringing into use of their NGSO MSS systems communicated to the Radiocommunication Bureau,

instructs the Secretary-General

to draw this Resolution to the attention of the WMO.

Reasons: The WMO coordinates the collection and distribution of synoptic upper air data worldwide. Therefore, the WMO is very aware of all the requirements of the Members, and the resources required (including spectrum) to perform the critical mission of routine and severe weather prediction for the protection of life and property. The WMO has already notified members that steps must be taken to reduce spectrum requirements of radiosonde systems. Members have indicated that time is required for the transition, and the amount of time required is largely dependent on funding levels. The exact time is not known at this time. This type of approach would allow the allocation to be made at WRC-97, but allow the current users to have time to transition out of the band. This approach would also allow the mobile-satellite service industry to participate and assist administrations to transition out of the band. MSS industry participation will expedite the transition, providing benefit to both the meteorological community and the MSS industry.

Draft Res. [INS-1]	ADD	INS/84/7

INS/84/7
ADD

DRAFT RESOLUTION [INS-1]

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that No. **S5.221** was adopted at WARC-92, prior to the operation of LEO MSS systems in the 148 - 149.9 MHz band;

b) that Recommendation ITU-R M.139 provides statistical methods for evaluating sharing between MSS earth stations and mobile services operating in bands below 1 GHz, and describes one type of dynamic channel assignment technique,

considering also

c) that MSS systems operating below 1 GHz will utilize, *inter alia*, dynamic channel access assignment techniques that prevent channel allocation causing interference to fixed and mobile services operating in this band;

d) that there may be other interference mitigation techniques available to minimize the probability or reduce the level of interference to fixed and mobile systems operating in the 148 - 149.9 MHz band;

e) that many of the mobile systems operating in this band are paging or trunk type mobile radio systems;

f) that sharing is feasible between terrestrial mobile services and the satellite services operating in the band;

g) that the procedures in the Radio Regulations under No. **S9.11bis** request administrations to coordinate with the fixed, mobile and space operation services under No. **S5.219**,

resolves

that administrations operating LEO MSS systems in these bands should implement interference mitigation techniques developed by ITU-R in order to ensure that harmful interference is not caused to fixed and mobile services operating in the band 148 - 149.9 MHz,

invites ITU-R

to develop recommendations on the technical and operational means that can be used by the MSS to ensure that use of the bands 148 - 149.9 MHz by the mobile and fixed services is not constrained by the operation of stations in the MSS.

Other proposals		IRN/44/1,2 UGA/55/10,11 SYR/76/20 ARM/48/5 RUS/15/6 TJK/64/6 UZB/59/14 MDV/81/6 ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKH/ UKR/78/6 INS/84/6

IRN/44/1

1 Broad allocation concept

Considering the CPM-97 Report that ITU-R investigates new approaches that might allow development of new spectrum efficient technology while protecting existing and planned services, one such approach would be a method where a broad allocation may be made to a service, it is proposed that this concept, and any allocation to non-GSO/MSS below 1 GHz based on this concept, should not be considered at WRC-97 and should be further studied by ITU-R.

Reasons: This concept has not been completely studied by ITU-R yet.

IRN/44/2

2 Sharing of MSS with the broadcasting service

Considering the broad use of the bands 45 - 70 MHz, 88 - 108 MHz and 170 - 240 MHz, 470 - 960 MHz for FM and TV broadcasting in the Islamic Republic of Iran and regarding the inadequate studies by ITU-R, it is proposed that sharing with MSS should not be considered.

UGA/55/10

Uganda notes that:

1) the choice of MSS system is the prerogative of the operator, and is a choice that has economic and social implications;
2) MSS operators are aware of the scarcity of the spectrum resource.

Uganda urges that:

1) MSS operators should engage in efforts to agree upon the use of techniques that will respond to the existing pressure for more spectrum;
2) WRC-97 should urge MSS operators to choose and use systems that can easily share.

UGA/55/11

Spectrum requirements for the non-GSO MSS below 1 GHz and associated feeder links

Uganda notes that:

1) the requirement for spectrum by non-GSO MSS will grow, as already shown by the different studies. This growth will continue to be hard to satisfy;
2) of a number of networks that are at some stage of coordination under Resolution 46, not all will be implemented owing to insufficient spectrum;
3) some administrations believe that these applications are being, and will be, provided by other satellite systems (e.g. 1 - 3 MHz MSS) and/or terrestrial systems, and place priority on the provision of these services by these systems, while some place priority on the provision of these services by means of non-GSO MSS;
4) different costs are associated with provision of these services by different technologies;
5) different MSS technologies require different amounts of spectrum;
6) selection of sharing techniques is system specific.

Uganda proposes that:

1) the allocation of spectrum to non-GSO MSS be left as it is until such time as operations begin and operational experience can lead the way;
2) WRC-97 should urge MSS operators to choose only those sharing techniques that result in a balanced need to co-exist with other MSS networks and the need to meet system requirements.

SYR/76/20

NOC to the allocations below 1 GHz for the MSS

ARM/48/5, RUS/15/6, TJK/64/6, UZB/59/14, MDV/81/6, ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKH/UKR/78/6

The ------- considers it extremely important that the Conference should provide the fastest growing and developing new services with sufficient spectrum and work out favourable operating conditions for them. At the same time, the Conference must safeguard conditions for the protection of existing services whose operation is still essential for many administrations. In taking decisions at the Conference, attention must be given to the need to strike a balance between the interests of existing services on the one hand and new or emerging services on the other, and account also has to be taken of differences in the technical and economic capabilities of ITU Member States.

INS/84/6

Broad allocation for non-GSO MSS below 1 GHz

It is proposed that a broad allocation for non-GSO MSS below 1 GHz be applied.

Reasons: One of the main reasons for this proposal is that, due to differences in regional and domestic spectrum allocations and use, it will probably be difficult to allocate common worldwide spectrum to this service. It would also reduce constraints on the limited frequency bands available. Within the broad allocation, specific frequencies may be identified for non-GSO MSS. The frequencies identified could vary according to geographical area, with a view to providing frequencies that could be used by this service, which requires global allocations. The identified frequencies should be such that they would cause minimal impact on existing or planned services. Further, within the broad allocation administrations could identify frequencies that have minimal impact on their existing services. The bands below 1 GHz are intensely used by many administrations. However, it is appropriate to investigate new approaches within ITU-R that might allow new spectrum-efficient technologies to develop while protecting existing and planned services.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/7-E
29 October 1997
Original: English only

WORKING GROUP PL1
OF THE PLENARY

NOTE BY THE CHAIRMAN

Please find attached two annexes containing the issues identified by administrations for items to be included in agendas of future world radiocommunication conferences.

Annex 1 contains those items that have been identified that are not dependant upon the output of Committee 4 or 5.

Annex 2 contains those items which are under discussion in Committee 4 or 5 and therefore will have to await the outcome of their work.

Please also find attached Annex 3 which are the standing items that would be expected to be on any agenda.

I would like to acknowledge the assistance of the delegations of Australia, Canada, Germany, Japan and the United States, and help of Mr. Nalbandian in this work.

Hugh RAILTON
Chairman of Working Group PL1
of the Plenary

ANNEX 1

On the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-97 and with due regard to the requirements of existing and planned services in the bands under consideration, to consider and take appropriate action in respect of the following topics:

EUR/5/351
J/29/77
USA/30/208

1 requests from administrations to delete their country footnotes or to have their country's name deleted from footnotes, if no longer required, taking into account Resolution **26 (WRC-95)**;

EUR/5/351
J/29/77
USA/30/208

2 consideration of Article **S25** concerning the amateur and amateur-satellite services;

EUR/5/351

3.1 examination of the use of the MF and HF frequency allocations by the maritime-mobile, aeronautical-mobile and aeronautical-radionavigation services as follows:

EUR/5/351

3.1.1 review the use of the HF bands by the aeronautical-mobile and maritime-mobile services with a view to reallocating spectrum to meet the changing needs of these services;

EUR/5/351

3.1.2 review the use of the frequency band 415 - 526.5 kHz by the aeronautical-radionavigation and maritime-mobile services with a view to reallocating spectrum to meet the changing needs of these services;

EUR/5/351
USA/30/208
NZL/37/36

4 consideration of the need to realign the allocations to the Amateur, Amateur-Satellite and Broadcasting Services around 7 MHz on a worldwide basis, taking into account Recommendation **718 (WARC-92)**;

EUR/5/351
SEN/9/12
J/29/77
USA/30/208

5 examination of the adequacy of the frequency allocations for HF broadcasting from about 4 MHz to 10 MHz taking into account the seasonal planning procedures adopted by WRC-97;

J/29/77
USA/30/208

6 review of the frequency and channel arrangements in the HF bands allocated on a primary basis to the maritime-mobile service, taking into account the use of new digital technology;

EUR/5/352

7 review of the channel arrangements in the MF, HF and VHF bands for the maritime-mobile service, taking into account the use of new digital technology;

J/29/77
USA/30/208

8 definition of a new category of orbit, namely the quasi-geostationary orbit, to be considered as falling under the regulations applicable to the geostationary orbit or non-geostationary orbits;

EUR/5/351

9 issues related to the International Mobile Telecommunication System (IMT-2000):

9.1 review of the spectrum requirements for the operation of terrestrial IMT-2000 with a view to identifying future expansion bands, and adjustments to the Table of Frequency Allocations as necessary;

9.2 identification of a global radio control channels to facilitate multimode terminal operation and worldwide roaming of IMT-2000;

SEN/9/35
APS/14/
USA/30/208
CHN/38/5K
KEN/47/44
KEN/70/38
TZA/80/40

10 to consider the provision of up to 3 MHz of frequency spectrum for the implementation of telecommand links in the space research and space operation services in the frequency range between 100 MHz and 1 GHz;

11 issues related to the radionavigation-satellite service:

EUR/5/351

11.1 to consider new allocations to the radionavigation-satellite service required to support developments in the range [1 to 10 GHz] [below 6 GHz];

USA/30/208

11.2 to consider the addition of the space-to-space direction to the radionavigation-satellite service allocations in the 1 215 - 1 260 MHz and 1 559 - 1 610 MHz frequency bands;

USA/30/208
ICAO

11.3 to consider the removal of fixed-service allocations (RR S5.355 and S5.359) in the 1 559 - 1 610 MHz band;

CAN/35/123

12 to consider the possible use of the uplink band 1 675 - 1 683 MHz and an associated downlink band for the mobile-satellite service;

EUR/5/351
USA/30/208

13 to review Appendix **S2 [7]** in the Table of Transmitter Frequency Tolerances taking into account frequency tolerance limits specified in Recommendation ITU-R SM.1045;

EUR/5/351

14 to consider allocations to the mobile service in the frequency range around 5 300 MHz to facilitate worldwide use of broadband radio access networks;

EUR/5/351

15 to consider the possibility of using the Meteorological Aid bands 401 - 406 MHz by ultra low power implantable medical devices;

USA/30/208

16 to consider upgrading secondary radiolocation service allocations to primary status in the bands near 3.0 GHz and 5.5 GHz;

J/29/77

17 review of the use of the bands 2 500 - 2 535 and 2 655 - 2 690 MHz as related to the mobile-satellite service;

USA/30/208

18 to consider the addition of the maritime mobile-satellite service to the allocations in the bands 3 700 - 4 200 MHz and 5 925 - 6 425 MHz;

J/29/78

19 to consider the allocation of the frequency band 14.5 - 14.8 GHz to the fixed-satellite service (Earth-to-space) in Region 3 (expansion of FSS to include other than feeder links of the BSS);

MLA/68/5
AFS/71/12

20 review of Resolutions Nos. **527** and **528 (WARC-92)**;

USA/30/209

21 sharing between the FSS and FS in the 19 GHz band when used bidirectionally by the FSS to provide feeder links for non-geostationary satellite systems in the mobile-satellite service, in accordance with Resolution **119 (WRC-95)**;

USA/30/208

22 to examine the adequacy of frequencies available for telemetry, tracking, and control of fixed-satellite service networks operating with service links in higher frequency bands;

USA/30/208

23 to consider the provision within the mobile service of a new worldwide broadband aeronautical telemetering allocation below 30 GHz;

USA/30/208

24 review of allocations in the frequency range 32 - 32.3 GHz with a view to improving the sharing conditions between the space-research service (deep space) (space-to-Earth) and the inter-satellite service;

USA/30/208

25 allocation of frequency bands above 71 GHz to the earth exploration-satellite (passive) and radio astronomy services;

J/29/77

26 to consider the allocation of frequencies above 275 GHz;

EUR/5/352
SEN/9/13

27 to consider the provisions of Chapter IX/Appendix **S13** and Chapter N IX/SVII of the Radio Regulations as stipulated in Resolution **331 (Mob-87)** and appropriate actions on the issues dealt with in Resolution **200 (Rev.Mob-87)**, taking into account the continued transition to the Global Maritime Distress and Safety System (GMDSS).

ANNEX 2

EUR/5/351
USA/30/208

1 to take appropriate action in respect of those urgent issues that were specifically requested by the 1997 World Radiocommunication Conference (WRC-97) in accordance with Resolutions **[EUR-9]** and **[EUR-2]**;

EUR/5/351
EUR/5/353

2 make any necessary changes to the simplified Radio Regulations (Chapter SIII and SIV and the associated Appendices) as a result of any problems reported by the Radio Regulations Board as part of the updating of its Rules of Procedures;

[This agenda item is required on a continuing basis in order to enable future conferences to correct any deficiency found by the RRB in the simplified RR in the course of updating the Rules of Procedure.]

3 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-97 and with due regard to the requirements of existing and planned services in the bands under consideration, to consider and take appropriate action in respect of the following topics:

EUR/5/351

3.1 examination of the use of the MF and HF frequency allocations by the maritime-mobile, aeronautical-mobile and aeronautical-radionavigation services as follows:

EUR/5/351
USA/30/208

3.1.1 consider the use of new digital technology in the band 156 - 174 MHz and consequential revision of Appendix **S18 [18]** taking into account Resolutions **[EUR-5]** and **[USA/30/54]**;

EUR/5/351

3.1.2 consider the protection of HF distress and safety communications in accordance with Resolution **[EUR-2]**;

APS/14/279
APS/14/280

3.2 to review the future technical and operational needs for the existing aeronautical and maritime distress and safety frequencies between 500 kHz and 1 656.5 MHz, the problem of unauthorized usage of HF aeronautical and maritime frequencies, and possible solutions to provide for efficient and effective distress, safety and other communications beyond the year 2000, and make appropriate changes to the Radio Regulations;

EUR/5/351
J/29/77
APS/14/
CAN/35/1

3.3 to finalize remaining issues in the review of Appendix **S3 (App. 8)** to the Radio Regulations taking into account Recommendation **66 (Rev.WARC-92)** and Recommendations **[EUR-B] [CAN-A]** and with a view to extend this appendix with the values of unwanted emissions;

USA/30/208

3.4 to revise the limits for spurious emission for space services (Appendix **S3**) and to consider incorporation of the limits for out-of-band emissions in the Radio Regulations;

CAN/35/149

3.5 review of Appendix **S4** to the Radio Regulations in accordance with Resolution **[CAN-5]**;

EUR/5/351
SEN/9/9
APS/14/
J/29/77
USA/30/208
UGA/55/
ARS/.../76/25
TZA/80/10

3.6 to consider the results of ITU-R studies in respect of Appendix **S7 [28]** on the method for the determination of the coordination area around an earth station in frequency bands shared among space services and terrestrial radiocommunication services and take the appropriate decisions to revise this appendix, including the possible inclusion of the methods contained in Annex 3 of Appendix **S30** and Section 3 of Annex 4 of Appendix **S30A**;

EUR/5/351

3.7 to consider the results of studies in accordance with Resolutions **[EUR-13, EUR-14,** and **EUR-6]** and ensure that the power flux-density levels included in Articles **S21** and **S22** adequately protect terrestrial services against NGSO FSS networks and adopt adequate protection criteria for sharing among NGSO, GSO and terrestrial systems;

USA/30/209
CAN/35/129

3.8 to consider the allocation to the meteorological aids service in the bands 405 - 406 MHz in accordance with Resolutions **[USA/30/85]** and **[CAN-3]**;

CAN/35/137

3.9 to undertake studies on the use of non-geostationary MSS allocations within 450 - 470 MHz band in accordance with Resolution **[CAN-4]**;

USA/30/208

3.10 to consider the results of the studies concerning the operation of GMDSS equipment on and assignment of GMDSS identities to non-compulsory fitted vessels undertaken in accordance with Resolution **[USA/30/35]**;

USA/30/208

3.11 to consider the results of the studies relating to the exhaustion of the maritime-mobile service identity numbering resource undertaken in accordance with Resolution **[USA/30/48]**;

USA/30/208

3.12 to consider the results of the studies concerning frequency provisions for development and future implementation of ship movement telemetry, telecommand and data exchange system undertaken in accordance with Resolution **310 [(Rev.WRC-97) USA/30/55]**;

USA/30/208

3.13 review of Article **S53** of the Radio Regulations and consider the results of studies to make appropriate provisions for giving priority to distress related communications originated from the shore based rescue authorities in accordance with Resolution **[USA/30/56]**;

EUR/5/352
IAP/40/141

3.14 to consider the final date for the cessation of DSB emissions in the HF broadcasting service in accordance with Resolution **517**;

EUR/5/353

3.15 to take appropriate action on Resolution **[EUR-10]** dealing with frequency sharing in the bands 1 610.6 - 1 613.8 MHz and 1 660 - 1 660.5 MHz between the mobile-satellite service and the radio astronomy service;

EUR/5/353

3.16 to take appropriate action on the results of the ITU-R Sector studies in developing suitable protection criteria between the fixed service and the geostationary meteorological-satellite service in the band 7 750 - 7 850 MHz as stipulated in Resolution **[EUR-10]**;

EUR/5/351

3.17 to consider possible extension of the allocation to the mobile-satellite service (Earth-to-space) on a secondary basis in the 14 - 14.5 GHz band to cover aeronautical applications as stipulated in Resolution **[EUR-11]**;

EUR/5/351
CAN/35/51

3.18 to consider results on studies carried out in accordance with Resolutions **[EUR-15]** and **[CAN-3]** concerning the use of the bands 47.2 - 47.5 GHz and 47.9 - 48.2 GHz by systems in the fixed service using high altitude relay platforms and decide on possible changes in the Radio Regulations;

J/29/77
CAN/35/51
CHN/38/17

3.19 to consider issues concerning existing and possible additional frequency allocations and regulatory aspects as related to the services using high altitude relay platforms;

ARS/.../76/29

3.20 definition of the stratosphere applications for radiocommunications;

EUR/5/353

3.21 to take appropriate action on a report of the ITU-R Sector on frequency adaptive systems in the MF/HF bands in accordance with Resolution **[EUR-1]**;

EUR/5/351
B/49/68

3.22 Resolution **18 (Kyoto, 1994)** (appropriate agenda items need to be developed if required);

J/29/78

to improve ITU's satellite coordination procedures, considering the merge of advance publication of information and coordination information, and to consider the financial due diligence taking into account Resolution **[ASP-5]** (see Document CMR97/14, proposal ASP/14/279).

ANNEX 3

EUR/5/351

- to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations which have been communicated by the associated radiocommunication assembly in accordance with Resolution **28 (WRC-95)** and decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the annex to Resolution **27 (WRC-95)**;
- to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decision of the Conference;
- in accordance with Resolution No. **94 (WARC-92)**, to review those resolutions and recommendations of world administrative radio conferences and world radiocommunication conferences which are relevant to agenda items [1 and 2] above, with a view to their possible revision, replacement or abrogation;
- to review, and take appropriate action on, the report from the Radiocommunication Assembly submitted in accordance with Nos. **135** and **136** of the Convention of the ITU (Geneva, 1992);
- to identify those items requiring urgent action by the radiocommunication study groups;
- in accordance with Article **7** of the Convention of the ITU (Geneva, 1992):
  - to consider and approve the report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since the last conference;
  - to recommend to the Council items for inclusion in the agenda for the 2001 World Radiocommunication Conference,
  - to give its views on the preliminary agenda for the 2003 Conference; and
  - to give its views on possible agenda items for future conferences.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/7(Rev.1)-E
31 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP PL1
OF THE PLENARY

NOTE BY THE CHAIRMAN

Please find attached two annexes containing the issues identified by administrations for items to be included in agendas of future world radiocommunication conferences.

Annex 1 contains those items that have been identified that are not dependant upon the output of Committee 4 or 5.

Annex 2 contains those items which are under discussion in Committee 4 or 5 and therefore will have to await the outcome of their work.

Please also find attached Annex 3 which are the standing items that would be expected to be on any agenda.

I would like to acknowledge the assistance of the delegations of Australia, Canada, Germany, Japan and the United States, and help of Mr. Nalbandian in this work.

Hugh RAILTON
Chairman of Working Group PL1
of the Plenary

ANNEX 1

On the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-97 and with due regard to the requirements of existing and planned services in the bands under consideration, to consider and take appropriate action in respect of the following topics:

EUR/5/351
J/29/77
USA/30/208

2 consideration of Article **S25** concerning the amateur and amateur-satellite services;

EUR/5/351

3.1 examination of the use of the MF and HF frequency allocations by the maritime-mobile, aeronautical-mobile and aeronautical-radionavigation services as follows:

EUR/5/351

3.1.1 review the use of the HF bands by the aeronautical-mobile and maritime-mobile services with a view to reallocating spectrum to meet the changing needs of these services;

EUR/5/351

3.1.2 review the use of the frequency band 415 - 526.5 kHz by the aeronautical-radionavigation and maritime-mobile services with a view to reallocating spectrum to meet the changing needs of these services;

EUR/5/351
USA/30/208
NZL/37/36

4 consideration of the need to realign the allocations to the Amateur, Amateur-Satellite and Broadcasting Services around 7 MHz on a worldwide basis, taking into account Recommendation **718 (WARC-92)**;

EUR/5/351
SEN/9/12
J/29/77
USA/30/208

5 examination of the adequacy of the frequency allocations for HF broadcasting from about 4 MHz to 10 MHz taking into account the seasonal planning procedures adopted by WRC-97;

J/29/77
USA/30/208

6 review of the frequency and channel arrangements in the HF bands allocated on a primary basis to the maritime-mobile service, taking into account the use of new digital technology;

EUR/5/352

7 review of the channel arrangements in the MF, HF and VHF bands for the maritime-mobile service, taking into account the use of new digital technology;

J/29/77
USA/30/208

8 definition of a new category of orbit, namely the quasi-geostationary orbit, to be considered as falling under the regulations applicable to the geostationary orbit or non-geostationary orbits;

EUR/5/351

9 issues related to the International Mobile Telecommunication System (IMT-2000):

9.1 review of the spectrum requirements for the operation of terrestrial IMT-2000 with a view to identifying future expansion bands, and adjustments to the Table of Frequency Allocations as necessary;

9.2 identification of a global radio control channels to facilitate multimode terminal operation and worldwide roaming of IMT-2000;

SEN/9/35
APS/14/
USA/30/208
CHN/38/5
KEN/47/44
KEN/70/38
TZA/80/40

10 to consider the provision of up to 3 MHz of frequency spectrum for the implementation of telecommand links in the space research and space operation services in the frequency range between 100 MHz and 1 GHz;

11 issues related to the radionavigation-satellite service:

EUR/5/351

11.1 to consider new allocations to the radionavigation-satellite service required to support developments in the range [1 to 10 GHz] [below 6 GHz];

USA/30/208

11.2 to consider the addition of the space-to-space direction to the radionavigation-satellite service allocations in the 1 215 - 1 260 MHz and 1 559 - 1 610 MHz frequency bands;

USA/30/208
ICAO

11.3 to consider the removal of fixed-service allocations (RR S5.355 and S5.359) in the 1 559 - 1 610 MHz band;

EUR/5/351
USA/30/208

13 to review Appendix **S2 [7]** in the Table of Transmitter Frequency Tolerances taking into account frequency tolerance limits specified in Recommendation ITU-R SM.1045;

EUR/5/351

14 to consider allocations to the mobile service in the frequency range around 5 300 MHz to facilitate worldwide use of broadband radio access networks;

EUR/5/351

15 to consider the possibility of using the Meteorological Aid bands 401 - 406 MHz by ultra low power implantable medical devices;

USA/30/208

16 to consider upgrading secondary radiolocation service allocations to primary status in the bands near 3.0 GHz and 5.5 GHz;

USA/30/208

18 to consider the addition of the maritime mobile-satellite service to the allocations in the bands 3 700 - 4 200 MHz and 5 925 - 6 425 MHz;

J/29/78

19 to consider the allocation of the frequency band 14.5 - 14.8 GHz to the fixed-satellite service (Earth-to-space) in Region 3 (expansion of FSS to include other than feeder links of the BSS);

MLA/68/5
AFS/71/12

20 review of Resolutions Nos. **527** and **528 (WARC-92)**;

USA/30/209

21 sharing between the FSS and FS in the 19 GHz band when used bidirectionally by the FSS to provide feeder links for non-geostationary satellite systems in the mobile-satellite service, in accordance with Resolution **119 (WRC-95)**;

USA/30/208

22 to examine the adequacy of frequencies available for telemetry, tracking, and control of fixed-satellite service networks operating with service links in higher frequency bands;

USA/30/208

23 to consider the provision within the mobile service of a new worldwide broadband aeronautical telemetering allocation below 30 GHz;

USA/30/208

24 review of allocations in the frequency range 32 - 32.3 GHz with a view to improving the sharing conditions between the space-research service (deep space) (space-to-Earth) and the inter-satellite service;

USA/30/208

25 allocation of frequency bands above 71 GHz to the earth exploration-satellite (passive) and radio astronomy services;

J/29/77

26 to consider the allocation of frequencies above 275 GHz;

EUR/5/352
SEN/9/13

27 to consider the provisions of Chapter IX/Appendix **S13** and Chapter N IX/SVII of the Radio Regulations as stipulated in Resolution **331 (Mob-87)** and appropriate actions on the issues dealt with in Resolution **200 (Rev.Mob-87)**, taking into account the continued transition to the Global Maritime Distress and Safety System (GMDSS);

J/29/77

28 examination of provision of up to 200 MHz of frequency spectrum around 4 300 MHz for use by space-based passive earth sensors;

CHN/38/17

29 Consideration of the worldwide allocation of the bands 1 610 - 1 626.5 MHz and 2 483.5 - 2 500 MHz to the radiodetermination-satellite service (Earth-to-space and space-to-Earth) on a primary basis.

ANNEX 2

EUR/5/351
USA/30/208

1 to take appropriate action in respect of those urgent issues that were specifically requested by the 1997 World Radiocommunication Conference (WRC-97) in accordance with Resolutions **[EUR-9]** and **[EUR-2]**;

EUR/5/351
EUR/5/353

2 make any necessary changes to the simplified Radio Regulations (Chapter SIII and SIV and the associated Appendices) as a result of any problems reported by the Radio Regulations Board as part of the updating of its Rules of Procedures;

[This agenda item is required on a continuing basis in order to enable future conferences to correct any deficiency found by the RRB in the simplified RR in the course of updating the Rules of Procedure.]

3 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-97 and with due regard to the requirements of existing and planned services in the bands under consideration, to consider and take appropriate action in respect of the following topics:

EUR/5/351

3.1 examination of the use of the MF and HF frequency allocations by the maritime-mobile, aeronautical-mobile and aeronautical-radionavigation services as follows:

EUR/5/351
USA/30/208

3.1.1 consider the use of new digital technology in the band 156 - 174 MHz and consequential revision of Appendix **S18 [18]** taking into account Resolutions **[EUR-5]** and **[USA/30/54]**;

EUR/5/351

3.1.2 consider the protection of HF distress and safety communications in accordance with Resolution **[EUR-2]**;

APS/14/279
APS/14/280

3.2 to review the future technical and operational needs for the existing aeronautical and maritime distress and safety frequencies between 500 kHz and 1 656.5 MHz, the problem of unauthorized usage of HF aeronautical and maritime frequencies, and possible solutions to provide for efficient and effective distress, safety and other communications beyond the year 2000, and make appropriate changes to the Radio Regulations;

EUR/5/351
J/29/77
APS/14/
CAN/35/1

3.3 to finalize remaining issues in the review of Appendix **S3 (App. 8)** to the Radio Regulations taking into account Recommendation **66 (Rev.WARC-92)** and Recommendations **[EUR-B] [CAN-A]** and with a view to extend this appendix with the values of unwanted emissions;

USA/30/208

3.4 to revise the limits for spurious emission for space services (Appendix **S3**) and to consider incorporation of the limits for out-of-band emissions in the Radio Regulations;

CAN/35/149

3.5 review of Appendix **S4** to the Radio Regulations in accordance with Resolution **[CAN-5]**;

EUR/5/351
SEN/9/9
APS/14/
J/29/77
USA/30/208
UGA/55/
ARS/.../76/25
TZA/80/10

3.6 to consider the results of ITU-R studies in respect of Appendix **S7 [28]** on the method for the determination of the coordination area around an earth station in frequency bands shared among space services and terrestrial radiocommunication services and take the appropriate decisions to revise this appendix, including the possible inclusion of the methods contained in Annex 3 of Appendix **S30** and Section 3 of Annex 4 of Appendix **S30A**;

EUR/5/351

3.7 to consider the results of studies in accordance with Resolutions **[EUR-13, EUR-14,** and **EUR-6]** and ensure that the power flux-density levels included in Articles **S21** and **S22** adequately protect terrestrial services against NGSO FSS networks and adopt adequate protection criteria for sharing among NGSO, GSO and terrestrial systems;

USA/30/209
CAN/35/129

3.8 to consider the allocation to the meteorological aids service in the bands 405 - 406 MHz in accordance with Resolutions **[USA/30/85]** and **[CAN-3]**;

CAN/35/137

3.9 to undertake studies on the use of non-geostationary MSS allocations within 450 - 470 MHz band in accordance with Resolution **[CAN-4]**;

USA/30/208

3.10 to consider the results of the studies concerning the operation of GMDSS equipment on and assignment of GMDSS identities to non-compulsory fitted vessels undertaken in accordance with Resolution **[USA/30/35]**;

USA/30/208

3.11 to consider the results of the studies relating to the exhaustion of the maritime-mobile service identity numbering resource undertaken in accordance with Resolution **[USA/30/48]**;

USA/30/208

3.12 to consider the results of the studies concerning frequency provisions for development and future implementation of ship movement telemetry, telecommand and data exchange system undertaken in accordance with Resolution **310 [(Rev.WRC-97) USA/30/55]**;

USA/30/208

3.13 review of Article **S53** of the Radio Regulations and consider the results of studies to make appropriate provisions for giving priority to distress related communications originated from the shore based rescue authorities in accordance with Resolution **[USA/30/56]**;

EUR/5/352
IAP/40/141

3.14 to consider the final date for the cessation of DSB emissions in the HF broadcasting service in accordance with Resolution **517**;

EUR/5/353

3.15 to take appropriate action on Resolution **[EUR-10]** dealing with frequency sharing in the bands 1 610.6 - 1 613.8 MHz and 1 660 - 1 660.5 MHz between the mobile-satellite service and the radio astronomy service;

EUR/5/353

3.16 to take appropriate action on the results of the ITU-R Sector studies in developing suitable protection criteria between the fixed service and the geostationary meteorological-satellite service in the band 7 750 - 7 850 MHz as stipulated in Resolution **[EUR-10]**;

EUR/5/351

3.17 to consider possible extension of the allocation to the mobile-satellite service (Earth-to-space) on a secondary basis in the 14 - 14.5 GHz band to cover aeronautical applications as stipulated in Resolution **[EUR-11]**;

EUR/5/351
CAN/35/51

3.18 to consider results on studies carried out in accordance with Resolutions **[EUR-15]** and **[CAN-3]** concerning the use of the bands 47.2 - 47.5 GHz and 47.9 - 48.2 GHz by systems in the fixed service using high altitude relay platforms and decide on possible changes in the Radio Regulations;

J/29/77
CAN/35/51
CHN/38/17

3.19 to consider issues concerning existing and possible additional frequency allocations and regulatory aspects as related to the services using high altitude relay platforms;

ARS/.../76/29

3.20 definition of the stratosphere applications for radiocommunications;

EUR/5/353

3.21 to take appropriate action on a report of the ITU-R Sector on frequency adaptive systems in the MF/HF bands in accordance with Resolution **[EUR-1]**;

EUR/5/351
B/49/68

3.22 Resolution **18 (Kyoto, 1994)** (appropriate agenda items need to be developed if required);

J/29/78

to improve ITU's satellite coordination procedures, considering the merge of advance publication of information and coordination information, and to consider the financial due diligence taking into account Resolution **[ASP-5]** (see Document CMR97/14, proposal ASP/14/279);

CAN/35/123

12 to consider the possible use of the uplink band 1 675 - 1 683 MHz and an associated downlink band for the mobile-satellite service;

J/29/77

17 review of the use of the bands 2 500 - 2 535 and 2 655 - 2 690 MHz as related to the mobile-satellite service.

ANNEX 3

EUR/5/351
J/29/77
USA/30/208

1 requests from administrations to delete their country footnotes or to have their country's name deleted from footnotes, if no longer required, taking into account Resolution **26 (WRC-95)**;

EUR/5/351

- to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations which have been communicated by the associated radiocommunication assembly in accordance with Resolution **28 (WRC-95)** and decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the annex to Resolution **27 (WRC-95)**;
- to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decision of the Conference;
- in accordance with Resolution No. **94 (WARC-92)**, to review those resolutions and recommendations of world administrative radio conferences and world radiocommunication conferences which are relevant to agenda items [1 and 2] above, with a view to their possible revision, replacement or abrogation;
- to review, and take appropriate action on, the report from the Radiocommunication Assembly submitted in accordance with Nos. **135** and **136** of the Convention of the ITU (Geneva, 1992);
- to identify those items requiring urgent action by the radiocommunication study groups;
- in accordance with Article **7** of the Convention of the ITU (Geneva, 1992):
  - to consider and approve the report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since the last conference;
  - to recommend to the Council items for inclusion in the agenda for the 2001 World Radiocommunication Conference,
  - to give its views on the preliminary agenda for the 2003 Conference; and
  - to give its views on possible agenda items for future conferences.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Corrigendum 1 to
Document DL/7(Rev.1)-E
3 November 1997
Original: English only

WORKING GROUP PL1
OF THE PLENARY

Note by the Chairman

Add to the end of Annex 2:

Revision and updating of Appendices 30 and 30A based on the proposals contained in Chapter 6.

Review the possibility of combining the direct-to-home transmission services by satellite and satellite broadcasting services in the planned and non-planned bands and its implication on the relevant Articles of the Radio Regulations.

Stipulate the levels of unwanted emissions for radio equipment not covered by either ISM or by ITU-categories of equipment.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/9-F/E/S
31 October 1997

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

NOTE FROM THE CHAIRMAN OF THE CONFERENCE TO MEMBERS OF THE STEERING COMMITTEE (COM 1)

I have decided to convene a meeting of COM 1 on Monday, 3 November at 1745h, in order to consider the need for night and weekend meetings and whether there is a need for a Plenary meeting in the first half of the week.

NOTE DU PRESIDENT DE LA CONFERENCE AUX MEMBRES DE LA COMMISSION DE DIRECTION (COM 1)

J'ai décidé de convoquer une réunion de la COM 1, lundi 3 novembre à 17 h 45, pour envisager la nécessité d'organiser des séances de nuit et de weekend et s'il faut prévoir une séance plénière au début de la semaine prochaine.

NOTA DEL PRESIDENTE DE LA CONFERENCIA A LOS MIEMBROS DE LA COMISIÓN DE DIRECCIÓN (COM 1)

He decidido convocar una reunión de la COM 1, el lunes 3 de noviembre a las 17.45 horas, para examinar si es necesario organizar sesiones nocturnas y de fin de semana, y además si se debe prever una sesión plenaria a principios de la semana próxima.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/10-E
31 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

AD HOC 1 OF THE WORKING GROUP PL1 OF THE PLENARY

Ref.: Document 27 (Annex 1)

DRAFT

AD HOC 1 OF WG PL1

GENERAL REVIEW OF WARC/WRC RESOLUTIONS AND RECOMMENDATIONS

Ad hoc 1 of WG PL1 was tasked to review WARC/WRC Resolutions and Recommendations (except for those explicitly placed on the agenda of WRC-97 and closely related texts) based on Annex 1 to Document 27 (Report of the Director, BR) which gave a list of WARC/WRC Resolutions and Recommendations and action taken. As an exception, Resolution 94 (WARC-92) was taken up by ad hoc 1 of WG PL1. Annex 1 to this document is a reproduction of Annex 1 to Document 27. The last column "Proposed action" was added by ad hoc 1 of WG PL1. As a result, the following two documents are submitted to WG PL1 for consideration:

- Document DL/11: Draft new Resolution for abrogation of certain texts
- Document DL/12: Editorial amendments to certain WARC/WRC Resolutions and Recommendations

In addition, the following draft new Resolution is also submitted so that this kind of housekeeping work will be undertaken at each future WRC, by which WARC/WRC Resolutions and Recommendations will be kept under constant review.

- Document DL/13: Draft new Resolution for general review of WARC/WRC Resolutions and Recommendations

The Chairman of WG PL1 is invited to include this draft new Resolution in the agendas of the 1999 and 2001 Conferences.

Lastly, ad hoc 1 of WG PL1 proposes that Resolution 94 (WARC-92) be deleted. As a consequence, it is proposed that in item 5 of the WRC-97 preliminary agenda, the words "in accordance with Resolution 94 (WARC-92)" be deleted.

M. MUROTANI
Chairman, ad hoc 1 of WG PL1

ANNEX 1

List of WARC/WRC Resolutions and Recommendations and action taken

Res. No. *	Subject	Remark	CPM Report §	WRC-97 agenda item for possible review/Notes	Proposed action
1	Notification of frequency assignments	Still relevant		-/1	(MOD)
2	Equitable use of GSO and frequency bands for space services	Still relevant		-/1	(MOD)
4	**Period of validity of GSO space systems**	**Pending consideration by WRC-97**		**7/2**	
5	Technical cooperation - propagation in tropical areas	Still relevant		-/1	(MOD)
7	National radio-frequency management	Some actions completed		-/-	(MOD)
8	**Transfer procedures/changes in HF-FX**	**Actions completed except Section V of Part II to Annex A**		**1.4/2**	
10	Frequencies for Red Cross	Still relevant		-/-	
13	Formation of call signs	Still relevant, without real problems		-/-	
14	Transfer of technology	Still relevant		-/-	(MOD)
15	Cooperation in space radiocommunications	Still relevant		-/-	(MOD)
16	Telecommunications for rural development	Obsolete in view of BDT activities		-/3	SUP
17	Conference structure	Obsolete in view of the ITU Convention		-/3	SUP
18	Identification/non-parties in an armed conflict	Still relevant		-/1	(MOD)
19	Regional Conferences	Obsolete, PP-89 acted		4(1.2)/3	SUP
20	Technical cooperation - aeronautical service	Still relevant		-/-	
21	Transfer of HF-FX in 2007	Still relevant		-/-	
22	Changes in allocations/assistance	Obsolete in view of the BDT activities		-/3	SUP
23	Suspension of provisions for TEX in HF	Still relevant		-/-	

24	Review of Constitution/provisional application	Still relevant		-/-	
25	Operation of Global Satellite Systems	Still relevant		-/-	
26	**Review of footnotes**	**Still relevant**		**1.1/-**	
27	**Incorporation by reference/principles**	**Still relevant, for consideration by WRC-97**	**1.9**	**2/-**	
28	**Revision of references to ITU-R Recommendations**	**Still relevant, for consideration by WRC-97**	**1.9**	**2/-**	
32	**Use of frequencies in the 12 GHz bands**	**Obsolete (matter governed by AP30)**	**6**	**1.10/2, 3**	
33	Procedure for BSS (pre-planned)	Parts are still relevant	1 and 6	1.2/2	
34	**Planning the band 12.5 - 12.75 GHz in R3**	**Not relevant any longer**	**6**	**4(1.10)/3**	
37	Automated Frequency Management	Implemented		4/3	SUP
38	Reassignment of frequencies in 2 MHz (R1)	Obsolete, all actions completed on 1 April 1992		1.6/3	SUP
39	Decisions of WARCs and use of monitoring facilities	Partly implemented		1.4, 1.6/2, 3	SUP
42	Interim systems in R2 (BSS and FSS) in AP30/30A bands	Matters governed by Simplified RR, matter related to WRC-97	6	1.2/2	
44	Compatibility of equipment in MSS	Obsolete in view of current situation	4	1.6/2, 3	SUP
45	Improved accuracy of MIFR, IFL, List VIIIA	Still relevant		1.2, 7/2, 3	(MOD)
46	Coordination/notification procedures in NGSO bands	Still relevant, related matter for consideration by WRC-97		1.2/2	
47	Immediate application of RS46 in some bands	Obsolete (from 1.1.97)		1.2/3	SUP
48	**Re-commencement of API procedure**	**Still relevant, pending consideration by WRC-97**	**1.8**	**1.2, 1.9.1/2, 3**	
60	**Revision of AP28**	**Obsolete, action completed**	**7.1**	**1.3/3**	
61	Division of the World into Climatic Zones	Obsolete, action completed		4/3	SUP
63	Protection from ISM Equipment	Obsolete, action completed		4/3	SUP
65	Cross-referencing of ITU-R Recommendations in RR	Obsolete (subject matter is covered in RS27/RS28)		2/3	SUP
69	Simplified methods for interference assessment	Overtaken by events		1.2, 1.9.1/2, 3	SUP

70	Standards for LEO	Obsolete in view of current situation		1.9.1/2, 3	SUP
71	**Identification of stations (Art25/S19)**	**Still relevant, report to WRC-97**	**1.10**	**1.2/2, 3**	
93	Treatment of Res/Rec	Redundant (summary of decisions)		4/3	SUP
94	**Review of Res/Rec**	**Obsolete (in view of WRC working methods), for consideration by WRC-97**	**7.6.1**	**4/3**	SUP
104	Application of RR1550	Obsolete (transitional measure)		4(1.2)/3	SUP
105	Improvements in AP30B	Still relevant		-/1	(MOD)
106	Provisional application of AP30A	Obsolete (transitional measure)		4(1.10)/3	SUP
107	Existing networks AP30B	Obsolete (action completed)	1.7.1	4(1.2)/3	SUP
109	AP30A in MIFR	Obsolete (action completed)		4(1.10)/3	SUP
110	**Multilateral Planning Meetings**	**Obsolete, elimination of MPM from Simplified RR**	**1.7.2**	**4(1.2)/3**	
111	FSS in 18/20/30 GHz	Still relevant (ongoing studies)		-/1	(MOD)
113	Adjustment to FX in 1 - 3 GHz	Still relevant		-/1	SUP
114	FSS (feeder links for MSS) in 5 GHz	Still relevant		-/-	
115	**pfd calculations in 7 GHz**	**Ongoing studies, Report to WRC-97**	**4.3.1**	**1.9.1/2, 3**	
116	**FSS in 15.4 - 15.7 GHz (Space-to-Earth)**	**Ongoing studies, Report to WRC-97**	**4.3.2**	**1.9.1/2, 3**	
117	**FSS in 15.45 - 15.65 GHz (Earth-to-Space)**	**Ongoing studies, Report to WRC-97**	**4.3.3**	**1.9.1/2, 3**	
118	**NGSO FSS in 19/29 GHz**	**Ongoing studies, Report to WRC-97**	**4.4.1**	**1.9.1/2, 3**	
119	**Sharing FX/FSS in 19 GHz**	**Ongoing studies, Report to WRC-97**	**4.3.4**	**1.9.1/2, 3**	
120	**NGSO/MSS in 19.3 - 19.7/ 29.1 - 29.5 GHz**	**Pending consideration by WRC-97**	**4.3.6**	**1.9.1/2, 3**	
121	**Coordination criteria feeder links in 19/29 GHz**	**Ongoing studies, Report to WRC-97**	**4.3.5**	**1.9.1/2, 3**	
200	**Class of emission on 2 182 kHz**	**For consideration by WRC-97**	**3.1.1.4**	**1.6.1/3**	
205	Protection of MSS in 406 - 406.1 MHz	Still relevant		-/1	(MOD)
207	Monitor MMS/AM(R)S	Still relevant		-/1	(MOD)

208	Extension of MS/MSS in 1.5 GHz	Obsolete		4(1.9.1)/3	SUP
209	Enlarging the scope of GMDSS	Not relevant any longer		4(1.6.1)/3	SUP
210	**Reducing the guardband around 500 kHz**	**For consideration by WRC-97**	**3.1.1.5**	**1.6.1/2, 3**	
211	**Terrestrial/space sharing in 2 GHz**	**For consideration by WRC-97**	**5.1**	**1.9.2/2, 3**	
212	Implementation of IMT2000/FPLMTS	Still relevant	4.2.7	-/1	
213	**Use of 1.7 GHz by MSS**	**Ongoing studies, Report to WRC-97**	**4.2.3**	**1.9.1/2, 3**	
214	**Use of bands below 1 GHz by MSS**	**For consideration by WRC-97**	**4.1.1**	**1.9.1/2, 3**	
215	**Coordination among NGSO MSS**	**For consideration by WRC-97**	**4.2.1**	**1.9.1/2, 3**	
300	Paired frequencies for NBDPT in HF/MMS	Still relevant		-/-	(MOD)
310	**Ship movement telemetry**	**For consideration by WRC-97**	**3.1.2.1**	**1.6.2/2, 3**	
312	Group channels for Morse telegraphy	Still relevant; need for update (political changes)		-/1	(MOD)
314	Collection of data for oceanography	Never implemented in its entirety		1.6/3	SUP
315	Abolition of mobile station charges	Obsolete		1.6/3	SUP
316	Technical cooperation in maritime service	Obsolete in view of activities of BDT (BAAP)		1.6/3	SUP
319	General review in 4/8 MHz (MMS/FX)	Studies completed		-/-	(SUP)
322	Watch keeping on GMDSS frequencies	Pending consideration by WRC-97		1.6.1/2, 3	
323	**Use of 156.525 MHz for DSC**	**Obsolete (transitional measure)**		**1.6.1/3**	
330	**Frequencies for RTF calling around 3 MHz**	**For consideration by WRC-97**	**3.1.1.6**	**1.6.1/2, 3**	
331	**Entry into force of the GMDSS provisions**	**For consideration by WRC-97**	**3.1.1.1**	**1.6.1/2, 3**	
333	Use of HF for MSI	Studies completed, may be considered by WRC-97		1.6/2, 3	
335	Non-paired frequencies, NBDP, ships	Partly obsolete, partly incorporated in RR (S)		1.6/3	SUP
336	DSC on maritime HF	Obsolete (transitional measure)		1.6/3	SUP

338	Provisional application of Article 56	Obsolete (transitional measure)		1.6.1/3	SUP
339	**Coordination of NAVTEX**	**Ongoing activities, report to WRC-97**	**3.1.4.1**	**1.6.4/2, 3**	
403	Aeronautical frequencies (3 023 kHz and 5 680 kHz)	Obsolete (adequately covered in AP27)		1.2/3	SUP
405	Frequencies for AM(R)	Still relevant		-/1	(MOD)
406	Use of bands other than HF for AM(R) and AMS(R)	Obsolete (technological improvements, current use)		1.8/3	SUP
408	**136 - 137 MHz for services other than AM(R)**	**For consideration by WRC-97**	**3.2**	**1.8/2, 3**	
409	Aeronautical public correspondence	Partly obsolete (some actions completed)		4/3	SUP
410	Development of AP26 Plan	Obsolete (all actions completed)		4/3	SUP
411	Implementation of new provisions for AM(OR)	Partly obsolete		-/-	(MOD)
412	Transfer arrangement	Still relevant		-/-	(MOD)
500	New carrier for LFBC in R1	Partly obsolete		-/1	(MOD)
505	BSS (sound) in 1.5 GHz	Obsolete (covered by Resolutions 522 and 528)		4/3	SUP
506	GSO only in BSS bands (12 GHz)	Still relevant, may be revisited by WRC-97	6	1.10/2, 3	
507	Agreements/Plans for BSS	Obsolete		1.10/3	SUP
508	**WRC for HFBC**	**Obsolete, for consideration by WRC-97**	**2.2.4**	**1.4/3**	
511	**Planning system for HFBC**	**May be revisited by WRC-97**	**2.3.1.1**	**1.4/2, 3**	
512	**HF transmitters in bands governed by RR531**	**May be revisited by WRC-97**	**2**	**1.4/2, 3**	
513	**Harmful interference in HFBC bands**	**Still relevant, may be revisited by WRC-97**	**2**	**1.4/2, 3**	
514	**Technical standards for HFBC**	**Obsolete, RR (S), may be revisited by WRC-97**	**2**	**1.4/2, 3**	
515	**HFBC Planning System/consultation procedure**	**Obsolete, pending consideration by WRC-97**	**2.1**	**1.4/2, 3**	
516	**Antennas in HFBC**	**May be revisited by WRC-97**	**2**	**1.4/2, 3**	
517	**Transition from DSB to SSB in HFBC**	**May be revisited by WRC-97**	**2.2.4**	**1.4/2, 3**	
518	Area/Country symbols in AP30/30A	May be revisited by WRC-97		1.10/2, 3	
519	**Provisions for Interim systems**	**May be revisited by WRC-97**	**6**	**1.10/2, 3**	

522	ITU-R work concerning BSS	Still relevant		-/1	(MOD)
523	**Planning for HFBC**	**Pending consideration by WRC-97**	**2.3.1.1**	**1.4/2, 3**	
524	**Revision of AP30/30A**	**For consideration by WRC-97**	**6.1.1**	**1.10/2, 3**	
525	Introduction of HDTV in 22 GHz	Still relevant		-/1	(MOD)
526	Additional provisions for HDTV	Still relevant		-/1	(MOD)
527	Terrestrial VHF DAB	Still relevant		-/1	(MOD)
528	BSS(sound) in 1.5 GHz	Still relevant		-/1	(MOD)
529	**HFBC**	**Pending consideration by WRC-97**	**2.4.3**	**1.4/2, 3**	
530	**Application of AR17**	**For consideration by WRC-97**	**2.1**	**1.4/2, 3**	
531	**Review of AP30/30A**	**For consideration by WRC-97**	**6.1.1**	**1.10/2, 3**	
601	Standards for EPIRBs on 121.5 MHz/243 MHz	Not relevant any longer (standards are observed)		-/1	(MOD)
602	Differential data correction on maritime radiobeacons	Still relevant, partly obsolete		-/1	(MOD)
640	Disaster communications	Still relevant		-/1	(MOD)
641	Use of the band 7 000 - 7 100 kHz	Still relevant		-/-	
642	Earth stations in the Amateur sat. Service	Still relevant		-/1	(MOD)
643	**Inter-satellite links in 50 - 70 GHz**	**Pending consideration by WRC-97**	**5.10**	**1.9.4.3/3**	
702	RARC for VHF/UHF bands in R3	Not relevant any longer		4/3	SUP
703	Interference criteria for the shared bands	Still relevant		-/1	(MOD)
704	Planning of MMS/Aero.nav in LF/MF	Partly obsolete (GE85-MM-R1)		4/2, 3	(SUP)
705	Protection of services in 70 - 130 kHz	Still relevant		-/1	(MOD)
706	Operation of FX/MOB in 90 - 110 kHz	Still relevant		-/1	(MOD)
710	**Satellite services/requirements in 400 MHz**	**For consideration by WRC-97**	**5.2**	**1.9.2/3**	
711	Relocation of space missions	Still relevant	5 and 7	-/1	(MOD)
712	**Allocation to space services**	**For consideration by WRC-97**	**5.7**	**1.3, 1.9.2/2**	
713	**Operational matters of AMS and MMS**	**Ongoing studies, report to WRC-97**		**8.1/2**	

714	**pfd limits in 137 - 138 MHz**	**For consideration by WRC-97**	**4.1.3**	**1.9.1/2, 3**	
715	**Sharing in 150 MHz and 400 MHz**	**For consideration by WRC-97**	**4.1.1.4**	**1.9.1/2, 3**	
716	**Use of bands around 2 GHz**	**Still relevant, progress report to WRC-97**	**4.2.4**	**1.9.1, 8.1/2**	
717	**Review of allocations in 2 GHz**	**For consideration by WRC-97**	**4.2.7**	**1.9.1/2, 3**	
718	**Agenda for the WRC-97**	**Will become obsolete after WRC-97**		**4/3**	
719	**Urgent studies for WRC-97**	**Will become obsolete after WRC-97**		**4/3**	
720	**Preliminary agenda for WRC-99**	**For consideration by WRC-97**		**8.2/2**	

Rec. No. *	**Subject**	**Remark**	**CPM Report §**	**WRC-97 agenda item for possible review/Notes**	**Proposed action**
1	Use of space systems in disasters ...	Still relevant		-/1	(MOD)
2	**Spectrum occupation by space services**	**May be revisited by WRC-97**		**7/2**	
4	National and International Circuits in HF	Obsolete		1.5/3	SUP
5	Reducing the congestion in HF	Obsolete		1.5/3	SUP
6	Assistance to developing countries	Obsolete, covered by CV166, CV225 and RR (S)		1.2/3	SUP
7	**Standard forms for licences**	**Still relevant**	**3.1.1.7**	**1.6/2**	
8	Automatic identification	Still relevant, ongoing studies		-/1	(MOD)
9	Operation of BC stations on board ships/aircraft	Still relevant		-/1	(MOD)
10	Presentation of draft amendments to RR	Obsolete in view of the new ITU Convention		4/3	SUP
11	Marginal numbering of the RR	Obsolete in view of the new Convention, RR (S)		1.2/3	SUP
13	WARC for partial revision of RR	Obsolete (WRC-95 has performed such a revision)		1.2/3	SUP
14	Identification of special vessels	Still relevant, ongoing studies		-/1	(MOD)
15	Review of Article 14 of the RR	Obsolete in view of the new Convention, RR (S)		1.2/3	SUP

30	International monitoring	Still relevant		-/1	(MOD)
31	Handbook on Frequency Management	Obsolete (implemented)		4/3	SUP
32	Space monitoring	Still relevant		-/1	(MOD)
34	Principles for allocation of frequency bands	Still relevant, ongoing studies		-/-	
35	**Procedure for modification of a Plan**	**For consideration by WRC-97**	**6.1**	**1.10/2, 3**	
60	Technical standards of the IFRB	Obsolete in view of the new ITU structure, RR (S)		1.2/3	SUP
61	Interference assessment above 28 MHz, standards	Still relevant, ongoing studies		-/1	(MOD)
62	Classification of emissions	Still relevant (in the new context)		-/1	(MOD)
63	Calculation of necessary bandwidth	Still relevant (in the new context)		-/1	(MOD)
64	Protection ratios and E_{min}	Still relevant (in the new context)		-/1	(MOD)
65	Spectrum sharing	Still relevant (in the new context)		-/1	(MOD)
66	**Max. Level for spurious emissions**	**For consideration by WRC-97**	**7.3**	**1.7/2, 3**	
68	Studies on propagation and noise	Still relevant, ongoing studies		-/1	(MOD)
69	Frequency tolerances	Still relevant (in the new context)		-/1	(MOD)
71	Type approval	Still relevant		-/1	(MOD)
72	Terminology	Obsolete (in view of activities)		1.2/3	SUP
73	Use of term "channel"	Obsolete (in view of activities)		1.2/3	SUP
74	Use of SI	Obsolete (implemented)		1.2/3	SUP
100	**Bands for troposcatter**	**Still relevant, ongoing studies**		**8.1/2, 3**	
103	Energy dispersal in FSS systems	Obsolete (overtaken by technological advances)		4/3	SUP
104	pfd and e.i.r.p. limits	Still relevant, ongoing studies	4.3.7	-/2	
105	**Coordination area**	**Still relevant, ongoing studies**	**7**	**1.3/2, 3**	
302	Improved use of HF in MMS	De facto suppressed (by virtue of Res. 337)		1.6/3	SUP
303	Use of 4 125 kHz and 6 215 kHz for distress and safety	Non-GMDSS (pending consideration by WRC-97)		1.6/3	SUP
304	Frequencies in Appendix 16, Section B	Obsolete (widely implemented)		1.6.5/3	SUP

305	**Use of CH15 and CH17 of AP18**	**For consideration by WRC-97**		**1.6.2/2, 3**	
306	**Watch on 156.8 MHz**	**For consideration by WRC-97**		**1.6.1, 1.6.2/2, 3**	
310	Automated UHF MM	Obsolete (covered by ITU-R Recommendations)		1.6/3	SUP
312	Interconnection of MM in PSTN	De facto suppressed (by virtue of Res. 337)		1.6/3	SUP
316	Use of SES within harbours	Obsolete (INMARSAT MoU)		1.6/3	SUP
317	Priority Indicator Signal (MMS)	Still relevant (pending consideration by WRC-97)		1.6.3/2, 3	
318	**Improved AP18**	**For consideration by WRC-97**		**1.6.2/2, 3**	
319	Adjacent channel interference in HF-MMS	Still relevant		-/1	(MOD)
401	Use of worldwide frequencies in AP27	Still relevant		-/1	
402	Coordinated use of WW frequencies in AP27	Still relevant		-/1	(MOD)
403	Congestion in HF - AM(R)S	Obsolete		4/3	SUP
405	Utilization of AMSS (R)	Obsolete, in view of current practices		4/3	SUP
406	Revision of AP26	Obsolete (after WARC-92 revision performed)		4/3	SUP
407	Definition of sub-area 5B in AP27	Not relevant any longer (no developments)		4/3	SUP
502	Specification of low-cost TV receivers	Obsolete (not relevant any longer)		4/3	SUP
503	**HFBC**	**Obsolete (implemented, observed by adm.)**		**1.4/3**	
505	Propagation studies in 12 GHZ, BSS	Ongoing studies		-/1	(MOD)
506	Harmonics in BSS	Still relevant		-/1	(MOD)
507	Spurious emissions in BSS	Ongoing studies		-/1	(MOD)
508	BSS transmitting antennae	Obsolete (ITU-R Rec. formulated)		1.10/3	SUP
509	**Experts in HFBC**	**Obsolete**	**2**	**1.4/3**	
510	**Planning parameters for HFBC**	**Obsolete (for WRC-97 consideration)**	**2**	**1.4/3**	
512	**Propagation prediction method for HFBC**	**obsolete (applied)**	**2**	**1.4/3**	

513	**National coverage in HFBC**	**For consideration by WRC-97**		**1.4/2, 3**	
514	**Propagation prediction method for HFBC**	**obsolete (ITU-R Rec. formulated)**		**1.4/3**	
515	**DSB/SSB in HFBC**	**For consideration by WRC-97**		**1.4/2, 3**	
516	**Synchronized transmitters in HFBC**	**Obsolete (ITU-R Rec. formulated, BS 702)**		**1.4/3**	
517	**SSB PR in HFBC**	**Still relevant, ongoing studies**		**1.4/2**	
518	**HFBC receivers**	**Obsolete in view of current practices**		**1.4/2**	
519	**Introduction of SSB**	**For consideration by WRC-97**		**1.4/2**	
520	**Elimination of out-of-band HFBC emissions**	**Still relevant (for WRC-97 consideration)**		**1.4/2**	
521	**Technical parameters for revision of AP30/30A**	**For consideration by WRC-97**	**6.3.1.1**	**1.10/3**	
601	Frequency band for collision avoidance system	Not relevant any longer		4/3	SUP
603	Maritime radiobeacons in the African area	Not relevant (not suitable for tropical areas)		4/3	SUP
604	Characteristics of EPIRBs	Still relevant (matter under study)		-/1	(MOD)
605	Shipborne transponders	Still relevant (matter under study)		-/1	(MOD)
606	Radionav in 4 200 - 4 400 MHz	Still relevant, ongoing studies		-/1	(MOD)
607	Requirements for MLS in 5 GHz	Obsolete (requirements assessed)		4/3	SUP
620	Meteo Aids in 27 MHz	Not relevant any longer (in view of current practices)		4/3	SUP
621	**Wind profiler radars**	**For consideration by WRC-97**	**7.4**	**1.9.3/2, 3**	
700	Sharing of bands allocated to space services	Still relevant, may be revisited by WRC-97		7/2	
701	Use of 1.3 GHz by Radioastronomy	Still relevant		-/-	(MOD)
702	Intentional emissions of extraterrestrial origin	Still relevant		-/1	(MOD)
704	Sharing BC/Radionav. at VHF	Obsolete (ITU-R Rec. formulated)		4/3	SUP
705	Sharing BC/BSS in 700 MHz	Still relevant, ongoing studies		-/1	(MOD)
706	**Passive sensors in 18 GHz**	**For consideration WRC-97 (resolves 4 of RES712)**		**1.9.2/3**	

707	Sharing in 32 - 33 GHz	Still relevant, ongoing studies		-/1	(MOD)
709	Sharing AMS and Inter-satellite above 54 GHz	Still relevant, ongoing studies		-/1	(MOD)
710	Use of airborne radars in shared bands	Still relevant, ongoing studies		-/1	(MOD)
711	**Coordination of Earth stations**	**Studies completed, for consideration by WRC-97**		**1.3/3**	
712	Design characteristics for BSS	Studies completed		1.10/3	SUP
714	Compatibility BC/AM(R)S in VHF	Obsolete (ITU-R Rec. formulated)		4/3	SUP
715	Multiservice satellites in GSO	May be revisited by WRC-97		7/2	(MOD)
717	**Sharing criteria MSS/Terrestrial**	**Still relevant, for consideration by WRC-97**	**4.2.2**	**1.9.1/2, 3**	
718	Alignment of allocations in 7 MHz	Still relevant		-/-	(MOD)
719	Multiservice satellites in GSO	May be revisited by WRC-97		7/2	(MOD)
720	**Adaptive systems at MF/HF**	**For consideration by WRC-97**	**7.2**	**1.5/2, 3**	
721	Sharing MSS/Radio astronomy in 1.6 GHz	Still relevant, ongoing studies		-/-	

Notes:

* Resolutions/Recommendations printed in **bold** are explicitly on the agenda of WRC-97 or the issues treated by this Resolution/Recommendation are interrelated with other issues that are explicitly on the agenda of WRC-97.

1 This Resolution/Recommendation may be considered for editorial amendments.

2 This Resolution/Recommendation may be considered for revision.

3 This Resolution/Recommendation may be considered for abrogation.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/11-E
31 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

AD HOC 1 OF THE WORKING GROUP PL1 OF THE PLENARY

Ref: Document 27 (Annex 1)

Ad hoc 1 of WG PL1

DRAFT NEW RESOLUTION [GTPLEN1-...]

ABROGATION OF CERTAIN RESOLUTIONS AND RECOMMENDATIONS OF THE WORLD ADMINISTRATIVE RADIO CONFERENCES (1979-1992) AND THE WORLD RADIOCOMMUNICATION CONFERENCE (1995)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that owing to the action taken at this Conference and that resulting from decisions adopted at the above-mentioned Conferences, there is a need to review to existing Resolutions and Recommendations to ensure their appropriate consistency;

b) that the following Resolutions and Recommendations of the above-mentioned Conferences either have been implemented or do not require further action:

[List of Resolutions and Recommendations to be abrogated],

resolves

that the Resolutions and Recommendations of WARCs (1979-1992) and WRC-95 listed under b) above shall be abrogated.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/12-E
31 October 1997
English only

AD HOC 1 OF THE WORKING GROUP PL1 OF THE PLENARY

Ref.: Documents 2 (Part 3) and 27 (Annex 1)

Ad hoc 1 of WG PL1

EDITORIAL AMENDMENTS TO CERTAIN WARC/WRC RESOLUTIONS AND RECOMMENDATIONS

Based on Annex 1 to Document 27 (Report of the Director, BR) and Part 3 of Document 2, Ad hoc 1 of WG PL1 prepared the attached editorial amendments to the following Resolutions and Recommendations of the past conferences:

Resolutions 1, 2, 5, 7, 14, 15, 18, 45, 94, 105, 111, 205, 207, 300, 312, 405, 411, 412, 500, 522, 525, 526, 527, 528, 601, 602, 640, 642, 703, 705, 706, 711

Recommendations 1, 8, 9, 14, 30, 32, 61, 62, 63, 64, 65, 68, 69, 71, 319, 402, 505, 506, 507, 604, 605, 606, 701, 702, 705, 707, 709, 710, 715, 718, 719

The editorial amendments are intended to reflect the recent ITU structural changes (WARC to WRC, CCIR to ITU-R, IFRB to Bureau, etc.) and renumbering of RR provisions resulting from RR simplification.

If the attached editorial amendments are accepted by WP PL1, the following course of approval process is suggested:

- WG PL1 will send the document to the Editorial Committee (and to Committees 4 and 5 for information and possible review);
- the Editorial Committee will submit the document to the Plenary as a white document;
- if the above white document is approved by the Plenary, the document will be directly sent to the Secretariat for incorporation into the future publication of the resolutions and recommendations;
- as a result, the document will not be included in the Final Acts of this Conference.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/13-E
31 October 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

AD HOC 1 OF THE WORKING GROUP PL1 OF THE PLENARY

Ad hoc 1 of WG PL1

DRAFT NEW RESOLUTION [GTPLEN1-...]

GENERAL REVIEW OF THE RESOLUTIONS AND RECOMMENDATIONS OF WORLD ADMINISTRATIVE RADIO CONFERENCES AND WORLD RADIOCOMMUNICATION CONFERENCES

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that it is important to keep the resolutions and recommendations of the past world administrative radio conferences and world radiocommunication conferences under constant review in order to make them up to date;

b) that the report of the Director of the Radiocommunication Bureau submitted to this Conference provided a useful basis for a general review of the resolutions and recommendations of the past conferences which was conducted by this Conference,

instructs the Director of the Radiocommunication Bureau

to conduct a general review of the resolutions and recommendations of the past conferences with a view to their possible revision or abrogation and submit a report (accompanied by draft revised texts) to each future world radiocommunication conference after consultation with the Radiocommunication Advisory Group and the Chairmen of the relevant Radiocommunication Study Groups,

invites each future world radiocommunication conference

to take an appropriate action on the report submitted from the Director of the Radiocommunication Bureau.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/14-E
3 November 1997
Original: English

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 4B

EUR/5/23
ADD S1.109A

Frequency Adaptive System: A radiocommunication system ~~operating in the medium or high frequency bands~~ using an automatic frequency selection procedure during each transmission session including calling, link establishment, link maintenance during information transfer and link disconnection.

EUR/5/26
MOD

ITEM 8B – Radiated power (dBW)

The radiated power expressed in dBW in one of the forms described in Nos. **S1.161** to **S1.163**. In the case of ~~frequency adaptive~~ systems where automatic power control is applied, the maximum power value should be notified.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/15-E
3 November 1997
Original: English

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

DRAFTING GROUP 5C1

Coordinator of Drafting Group 5C1

Drafting Group 5C1 identified the following item, consequential to work on agenda item 1.7, for consideration by GTPLEN-1.

"Review of Appendix S3 to the Radio Regulations, with regard to space services, taking into account the decisions by WRC-97 on adoption of new values of spurious emission limits taking effect at a future time."

Reasons: To consider updates to Appendix S3 related to spurious emission limits for all space services.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/16-E
3 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

DRAFTING GROUP 5C1

Coordinator of Drafting Group 5C1

The attached document represents the work of Drafting Group 5C1 regarding the revision of Recommendation 66. The text is primarily derived from USA/30/172.

RECOMMENDATION No. 66 (Rev.~~WARC-92~~WRC-97)

STUDIES OF THE MAXIMUM PERMITTED LEVELS OF ~~SPURIOUS~~UNWANTED EMISSIONS

The World ~~Administrative~~ Radiocommunication Conference ~~for Dealing with Frequency Allocations in Certain Parts of the Spectrum~~ (~~Malaga-Torremolinos~~Geneva, ~~1992~~1997),

considering

a) that Appendix ~~8~~S3 to the Radio Regulations specifies the maximum permitted levels of spurious emissions, in terms of the mean power level of any spurious component supplied by a transmitter to the antenna transmission line~~, for the frequency bands below 17.7 GHz~~;

b) that the principal objective of Appendix ~~8~~S3 is to specify the maximum permitted levels of spurious emissions that, while being achievable, provide protection against harmful interference;

c) that while out-of-band emissions can also give rise to harmful interference, the Radio Regulations do not provide general limits for these emissions;

~~*c*~~*d)* that excessive levels of spurious emissions may give rise to harmful interference;

~~*d*~~*e)* that while Appendix ~~8~~S3 applies ~~only~~generally to the mean power of ~~the~~a transmitter and ~~the~~its spurious emissions, ~~there are a~~it also accounts for the variety of emissions where the interpretation of the term "mean power" and its consequential measurement ~~are~~would be difficult, particularly in the cases of digital modulation, pulsed modulation, and narrow-band high power transmitters;

~~*e*~~*f)* that ~~whilst the CCIR is studying this problem, it has not yet furnished adequate Recommendations pertaining to Appendix 8 for frequency bands above 960 MHz~~while Appendix S3 covers spurious emissions for all radio service, those listed for space services are included only as design objectives;

~~*f*~~*g)* that ~~spurious~~unwanted emissions from transmitters operating in space stations may cause harmful interference, particularly in regard to ~~intermodulation components~~emission characteristics from wide-band amplifiers which cannot be adjusted after launch;

~~*g*~~*h)* that ~~spurious~~unwanted emissions may cause harmful interference to ~~passive services, including the radio astronomy service in bands above 17.7 GHz~~safety and radio astronomy and space services using passive sensors;

~~*h*~~*i)* that ~~spurious emissions from earth stations also require particular study;~~, for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix **S3** may be required to protect specific services, such as safety services and passive services in specific bands;

~~*i) that no information is available from the CCIR regarding spurious emissions from stations employing digital modulation techniques;~~

~~*j) that transmitters operating in space stations are increasingly employing spread-spectrum and other wideband digital modulation techniques that can produce out-of-band and spurious emissions at frequencies far removed from the carrier frequency;~~

j) that broadband digital modulation may cause unwanted emissions on frequencies far from the carrier frequency,

and noting

1. that the safety and passive services are in many cases allocated frequencies adjacent or close to those services employing high power transmitters;

2. that some administrations have adopted more stringent limits for spurious emissions than those specified in Appendix **S3**,

recommends that ~~the CCIR~~ITU-R

1. study as a matter of urgency the question of spurious emissions resulting from space services transmissions, and, on the basis of those studies, develop Recommendations for maximum permitted levels of spurious emissions in terms of mean power of spurious components supplied by the transmitter to the antenna transmission line;

~~5~~2. submit a report to ~~the next competent conference~~[WRC-99] on the results of its studies with a view to reviewing and including spurious ~~and out-of-band~~ emission limits for space services in Appendix ~~8~~**S3** of the Radio Regulations~~, principally for the protection of the radio astronomy and other passive services.~~;

~~2~~3. continue the study of spurious emission levels in all frequency bands, emphasizing the study of those frequency bands, services and modulation techniques not presently covered by Appendix ~~8~~**S3**;

~~4. study the categorizing of emissions and spurious emissions in terms of "mean power" and develop appropriate Recommendations to facilitate the interpretation and measurement of "mean power" as it applies to the various classes of emissions;~~

4. study the question of unwanted emissions resulting from transmitters of all services and all modulation methods, and on the basis of those studies, develop a recommendation(s) for maximum permitted levels of spurious emissions and out-of-band emissions;

~~3~~5. establish appropriate measurement techniques for ~~spurious~~unwanted emissions, where those techniques do not currently exist, including the determination of reference levels for wideband transmissions as well as the applicability of reference measurement bandwidths;

6. study the reasonable boundary of spurious emissions and out-of-band emissions with a view to defining such a boundary in S1;

7. study those frequency bands and instances where for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix **S3** may be required to protect safety services, and passive services such as radio astronomy, and the impact on all concerned services of implementing or not implementing such limits;

8. study those frequency bands and instances where for technical or operational reasons, out-of-band limits may be required to protect safety services, and passive services such as radio astronomy, and the impact on all concerned of implementing or not implementing such limits;

9. report the results of studies, under *recommends* 6, 7 and 8 above, to a competent conference(s).

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/17-E
3 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

DRAFTING GROUP 5C1

Coordinator of Drafting Group 5C1

The attached document represents the work of Drafting Group 5C1 regarding spurious emissions. The text is derived primarily from EUR/5/329 and EUR/5/330. The text, with indicated modifications, represents our outcome regarding the revision of Appendix S3.

APPENDIX S3

Table Of Maximum Permitted Spurious Emission Power Levels

(See Article S3)

1. The following ~~table~~sections indicates the maximum permitted levels of spurious emissions, ~~in terms of the mean power level~~in terms of power as indicated in the tables, of any spurious component supplied by a transmitter to the antenna transmission line. Section 1 is applicable until 1 January 2012 to transmitters installed on or before 1 January 2003; Section 2 is applicable to transmitters installed after 1 January 2003 and to all transmitters after 1 January 2012. This Appendix does not cover out-of-band emissions. Out-of-band emissions are dealt with in Section 4.5.

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

3. These levels shall not, however, apply to emergency position-indicating radiobeacon (EPIRB) stations, emergency locator transmitters, ships' emergency transmitters, lifeboat transmitters, survival craft stations or maritime transmitters when used in emergency situations.

4. For technical or operational reasons, ~~specific services may demand~~ more stringent levels than those specified ~~in the table~~may be applied to protect specific services in certain frequency bands. The levels applied to protect these services shall be those agreed upon by the appropriate world radiocommunication conference. More stringent levels may also be fixed by specific agreement between the administrations concerned. Additionally, special consideration of transmitter spurious emissions may be required for the protection of safety services, radio astronomy and space services using passive services. Information on the levels of interference detrimental to radio astronomy is given in the most recent version of ITU-R Recommendation SM.329.

5. ~~For radiodetermination stations, until acceptable methods of measurement exist, the lowest practicable power of spurious emission should be achieved.~~Spurious emission limits for combined radiocommunication and information technology equipment are those for the radiocommunications transmitters.

Section I. Spurious Emission Limits for Transmitters Installed on or before 1 January 2003 (valid until 1 January 2012)

6. The measurement methods for radar systems should be guided by Recommendation ITU-R M.1177. For those radar systems for which acceptable methods of measurement do not exist the lowest practicable power of spurious emission should be achieved.

TABLE I

Attenuation values and absolute mean power levels used to calculate maximum permitted spurious emission power levels for use with radio equipment

Frequency Band Containing the Assignment (lower limit exclusive, upper limit inclusive)	For any spurious component the attenuation (mean power within the necessary bandwidth relative to the mean power of the spurious component concerned) shall be at least that specified below and the absolute mean power levels given shall not be exceeded (Note 1)
	~~Levels applicable to transmitters installed after 1 January 1985 and to all transmitters after 1 January 1994~~
9 kHz to 30 MHz	40 decibels 50 milliwatts (Notes 4<u>2</u>, ~~7~~<u>3</u> and ~~8~~<u>4</u>)
30 MHz to 235 MHz	
- mean power above 25 watts	60 decibels 1 milliwatts (Note ~~9~~<u>5</u>)
- mean power 25 watts or less	40 decibels 25 microwatts
235 MHz to 960 MHz	
- mean power above 25 watts	60 decibels 20 milliwatts (Notes ~~10~~<u>6</u> and ~~11~~<u>7</u>)
- mean power 25 watts or less	40 decibels 25 microwatts (Notes ~~10~~<u>6</u>, ~~11~~<u>7</u>)
960 MHz to 17.7 GHz	
- mean power above 10 watts	50 decibels 100 milliwatts (Notes ~~10~~<u>6</u>, ~~11~~<u>7</u>, ~~12~~<u>8</u> and ~~13~~<u>9</u>)
- mean power 10 watts or less	100 microwatts (Notes ~~10~~<u>6</u>, ~~11~~<u>7</u>, ~~12~~<u>8</u> and ~~13~~<u>9</u>)
Above 17.7 GHz	~~Due to the diverse nature of technologies employed by services operating above 17.7 GHz, further study by the ITU-R is required prior to the specification of levels. To the extent possible, the values to be observed should be those shown in appropriate ITU-R Recommendations. Until suitable Recommendations have been adopted, t~~<u>T</u>he lowest possible values achievable shall be employed (see Recommendation **66** **(Rev.WRC-[97])**).

Notes ~~in the~~ Table I ~~of Maximum Permitted Spurious Emission Power Levels~~

1) When checking compliance with the provisions of the table, it shall be verified that the bandwidth of the measuring equipment is sufficiently wide to accept all significant components of the spurious emission concerned.

~~2) For transmitters of mean power exceeding 50 kilowatts and which operate below 30 MHz over a frequency range approaching an octave or more, a reduction below 50 milliwatts is not mandatory, but a minimum attenuation of 60 decibels shall be provided and every effort should be made to comply with the level of 50 milliwatts.~~

~~3) For hand-portable equipment of mean power less than 5 watts which operates below 30 MHz, the attenuation shall be at least 30 decibels, but every effort should be made to attain 40 decibels attenuation.~~

42) For mobile transmitters which operate below 30 MHz any spurious component shall have an attenuation of at least 40 decibels without exceeding the value of 200 milliwatts, but every effort should be made to comply with the level of 50 milliwatts wherever practicable.

~~5) For frequency modulated maritime mobile radiotelephone equipment which operates above 30 MHz, the mean power of any spurious emission falling in any other international maritime mobile channel, due to products of modulation, shall not exceed a level of 10 microwatts and the mean power of any other spurious emission on any discrete frequency within the international maritime mobile band shall not exceed a level of 2.5 microwatts. Where, exceptionally, transmitters of mean power above 20 watts are employed, these levels may be increased in proportion to the mean power of the transmitter.~~

~~6) For transmitters having a mean power of less than 100 milliwatts, it is not mandatory to comply with an attenuation of 40 decibels provided that the mean power level does not exceed 10 microwatts.~~

73) For transmitters of a mean power exceeding 50 kilowatts which can operate on two or more frequencies covering a frequency range approaching an octave or more, while a reduction below 50 milliwatts is not mandatory, a minimum attenuation of 60 decibels shall be provided.

84) For hand-portable equipment of mean power less than 5 watts, the attenuation shall be 30 decibels, but every practicable effort should be made to attain 40 decibels attenuation.

95) Administrations may adopt a level of 10 milliwatts provided that harmful interference is not caused.

~~10~~6) Where several transmitters feed a common antenna or closely spaced antennae on neighbouring frequencies, every practicable effort should be made to comply with the levels specified.

~~11~~7) Since these levels may not provide adequate protection for receiving stations in the radio astronomy and space services, more stringent levels might be considered in each individual case in the light of the geographical position of the stations concerned.

~~12~~8) These levels are not applicable to systems using digital modulation techniques, but may be used as a guide. Values for these systems may be provided by the relevant ITU-R Recommendations, when available (see Recommendation **66 (Rev.WRC-[97])**).

~~1)~~2) These levels are not applicable to stations in the space services, but the levels of their spurious emissions should be reduced to the lowest possible values compatible with the technical and economic constraints to which the equipment is subject. Values for these systems may be provided by the relevant ITU-R Recommendations, when available (see Recommendation **66 (Rev.WRC-[97])**).

Reasons: The notes originally numbered 2), 3), 5) and 6) are proposed for suppression because although they were included in Appendix **S3** of the Final Acts of WRC-95, the references to them were removed from the table of spurious emission limits when it was revised from the previous Appendix **8**. Their proposed deletion is therefore editorial in nature.

EUR/5/330
ADD

Section II. Spurious Emission Limits for Transmitters Installed after 1 January 2003 and to all transmitters after 1 January 2012

Application of these Limits

7. The frequency range of the measurement of spurious emissions is from 9 kHz to 110 GHz or the second harmonic if higher.

8. Guidance regarding the methods of measuring spurious emissions is given in the most recent version of Recommendation ITU-R SM.329. The e.i.r.p. method specified in that Recommendation should be used when it is not possible to measure the power supplied to the antenna transmission line. Guidance regarding the methods of measuring spurious emissions from radar systems is given in the most recent version of Recommendation ITU-R M.1177. For those radar systems for which acceptable methods of measurement do not exist, the lowest practicable power of spurious emission should be achieved.

9. The spurious emission levels are specified in the following reference bandwidths:

- 1 kHz between 9 and 150 kHz
- 10 kHz between 150 kHz and 30 MHz
- 100 kHz between 30 MHz and 1 GHz
- 1 MHz above 1 GHz

As a special case, the reference bandwidth of all space service spurious emissions should be 4 kHz.

10. The reference bandwidths required for proper measurement of radar spurious emissions should be calculated for each particular radar system. Thus, for the three general types of radar pulse modulation utilized for radionavigation, radiolocation, acquisition, tracking and other radiodetermination functions, the reference bandwidth values should be:

- for fixed frequency or non-pulse-coded radar, one over the radar pulse length, in seconds (e.g. if the radar pulse length is 1 microsecond, then the reference bandwidth is 1/1μs = 1 MHz);
- for fixed frequency, phase coded pulsed radar, one over the phase chip length, in seconds (e.g. if the phase coded chip is 2 microseconds long, then the reference bandwidth is 1/2μs = 500 kHz);

– for Frequency Modulated (FM) or chirped radar, the square root of the quantity obtained by dividing the radar bandwidth in MHz by the pulse length, in seconds (e.g. if the FM is from 1 250 to 1 280 MHz or 30 MHz during the pulse of 10 microseconds, then the reference bandwidth is $(30 \text{ MHz}/10\mu\text{s})^{1/2} = 1.73$ MHz).

11. For the purpose of setting limits, all emissions, including harmonic emissions, intermodulation products, conversion products and parasitic emissions, which fall at frequencies separated from the centre frequency of the emission by 250% or more of the necessary bandwidth of the emission will generally be considered as spurious emissions. However, this frequency separation may be dependent on the type of modulation used, the maximum bit rate in the case of digital modulation, the type of transmitter, and frequency coordination factors. For example, in the case of digital (including digital broadcasting) or pulsed modulation systems and narrow-band high power transmitters, the frequency separation may need to differ from the ±250% factor. For multichannel or multicarrier transmitters/transponders, where several carriers may be transmitted simultaneously from a final output amplifier or an active antenna, the centre frequency of the emission is taken to be the centre of the -3 dB bandwidth of the transmitter or transponder.

12. Examples of applying 43 + 10log(P) to calculate attenuation requirements

Where specified in relation to mean power, spurious emissions are to be at least x dB down from the total mean power P, i.e. -x dBc. The power P (in Watts) is to be measured in a bandwidth wide enough to include the total mean power. The spurious emissions are to be measured in the reference bandwidths given in the Recommendation. The measurement of the spurious emission power is independent of the value of necessary bandwidth. Because the absolute emission power limit, derived from 43 + 10log(P), can become too stringent for high power transmitters, alternative relative powers are also provided in Table II.

Example 1

A land mobile transmitter, with any value of necessary bandwidth, must meet a spurious emission attenuation of 43 + 10log(P), or 70 dBc, whichever is less stringent. To measure spurious emissions in the frequency range between 30 and 1 000 MHz, Recommendation ITU-R **SM.329-7** *recommends* 4.1 indicates the use of a reference bandwidth of 100 kHz. For other frequency ranges, the measurement must use the appropriate reference bandwidths given in *recommends* 4.1.

With a measured total mean power of 10 Watts:

– Attenuation relative to total mean power = 43 + 10log(10) = 53 dB.

– The 53 dBc is less stringent than 70 dBc, so the 53 dBc value is used.

– Therefore: Spurious emissions must not exceed 53 dBc in a 100 kHz bandwidth, or converting to an absolute level, spurious emissions must not exceed 10 dBW - 53 dBc = -43 dBW in a 100 kHz reference bandwidth.

With a measured total mean power of 1 000 Watts:

– Attenuation relative to total mean power = 43 + 10log(1 000) = 73 dB.

– The 73 dBc is more stringent than 70 dBc limit, so the 70 dBc value is used.

– Therefore: Spurious emissions must not exceed 70 dBc in a 100 kHz bandwidth, or converting to an absolute level, spurious emissions must not exceed 30 dBW - 70 dBc = -40 dBW in a 100 kHz reference bandwidth.

Example 2

A space services transmitter, with any value of necessary bandwidth, must meet a spurious emission attenuation of 43 + 10log(P), or 60 dBc, whichever is less stringent. To measure spurious emissions at any frequency, Note 1 of Table II indicates using a reference bandwidth of 4 kHz.

With a measured total mean power of 20 Watts:

- Attenuation relative to total mean power = 43 + 10log(20) = 56 dB.
- The 56 dBc is less stringent than the 60 dBc limit, so the 56 dBc value is used.
- Therefore: Spurious emissions must not exceed 56 dBc in a 4 kHz reference bandwidth, or converting to an absolute level, spurious emissions must not exceed 13 dBW - 56 dBc = -43 dBW in a 4 kHz reference bandwidth.

TABLE II

Attenuation values used to calculate maximum permitted spurious emission power levels for use with radio equipment

Service category in accordance with Article S1, or equipment type (Note 15)	Attenuation (dB) below the power supplied to the antenna transmission line (Note 16)
All services except those services quoted below:	43 + 10 log(P), or 70 dBc, whichever is less stringent
Space services (earth stations) (Notes 10 and 14)	43 + 10 log(P), or 60 dBc, whichever is less stringent
Space services (space stations) (Notes 10 and 14)	43 + 10 log(P), or 60 dBc, whichever is less stringent
Radiodetermination	43 + 10 log(PEP), or 60 dB, whichever is less stringent
Broadcast television (Note 11)	46 + 10 log(P), or 60 dB, whichever is less stringent, without exceeding the absolute mean power level of 1 mW for VHF stations or 12 mW for UHF stations. However greater attenuation may be necessary on a case by case basis.
Broadcast FM	46 + 10 log(P), or 70 dBc, whichever is less stringent; the absolute mean power level of 1 mW should not be exceeded
Broadcasting at MF/HF	50 dBc and the absolute mean power level of 50 mW should not be exceeded
SSB from mobile stations (Note 12)	43 dB below PEP
Amateur services operating below 30 MHz (including with SSB) (Note 12)	43 + 10 log(PEP), or 50 dB, whichever is less stringent

Service category in accordance with Article **S1**, or equipment type (Note 15)	Attenuation (dB) below the power supplied to the antenna transmission line (Note 16)
Services operating below 30 MHz, except space, radiodetermination, broadcast, those using SSB from mobile stations, and amateur (Note 12)	43 + 10 log(X), or 60 dBc, whichever is less stringent, where X = PEP for SSB modulation, and X = P for other modulation
Low power device radio equipment (Note 13)	56 + 10 log(P) or 40 dBc, whichever is less stringent
Emergency position-indicating radio beacon, Emergency locator transmitter, Personal location beacon, Search and rescue transponder, Ship emergency, lifeboat, and survival craft transmitters; and Land, aeronautical or maritime transmitters when used in emergency	No limit

P: mean power in Watts at the antenna transmission line, in accordance with No. **S1.158**. When burst transmission is used, the mean power P and the mean power of any spurious emissions are measured using power averaging over the burst duration.

PEP: peak envelope power in Watts at the antenna transmission line, in accordance with No. **S1.157**.

dBc: decibels relative to the unmodulated carrier power of the emission. In the cases which do not have a carrier, for example in some digital modulation schemes where the carrier is not accessible for measurement, the reference level equivalent to dBc is decibels relative to the mean power P.

Notes in Table II

[10] Spurious emission limits for all space services is stated in a 4 kHz reference bandwidth.

[11] For analogue television transmissions, the mean power level is defined with a specified video signal modulation. This video signal has to be chosen in such a way that the maximum mean power level (e.g., at the video signal blanking level for negatively modulated television systems) is provided to the antenna transmission line.

[12] All classes of emission using SSB are included in the category "SSB".

[13] Low power radio devices having a maximum output power of less then 100 mW and intended for short range communication or control purposes; Such equipment is in general exempt from individual licensing.

[14] These values are "design objectives". If not decided otherwise by WRC-99, this note will not be applicable after 31 December 1999.

[15] In some cases of digital modulation (including digital broadcasting), pulsed modulation and narrow-band high power transmitters for all categories of services, there may be difficulties in meeting limits close to ±250% of the necessary bandwidth.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/19-E
3 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SUB-WORKING GROUP 5B-2

COMPOSITE PROPOSALS

AGENDA ITEM 1.9.1 - MSS IN THE 1 - 3 GHz RANGE

1525 - 1559 MHz	MOD	ASP/14/157,158,161
	MOD	USA/30/86,88,90,91
	MOD	EUR/5/276,277,280,281
	MOD	UAE/52/2,3,4
	MOD	INS/84/9,10,11,13

ASP/14/157
MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530	**1 525 – 1 530**	**1 525 – 1 530**
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)
FIXED	MOBILE-SATELLITE (space-to-Earth)	FIXED
~~MARITIME~~-MOBILE-SATELLITE (space-to-Earth)	Earth Exploration-Satellite	MOBILE-SATELLITE (space-to-Earth)
Earth Exploration-Satellite	Fixed	Earth Exploration-Satellite
Mobile except aeronautical mobile S5.349	Mobile S5.343	Mobile S5.349
~~Land Mobile-Satellite (space-to-Earth) S5.352~~		
S5.341 S5.342 S5.350 S5.351 S5.354	S5.341 S5.351 S5.354	S5.341 S5.351 S5.354

ASP/14/158
MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.354	**1 530 – 1 533** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 ~~S5.353~~ S5.354	
1 533 – 1 535 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 Earth Exploration-Satellite Fixed Mobile except aeronautical mobile ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.351 S5.354	**1 533 – 1 535** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 Earth Exploration-Satellite Fixed Mobile S5.343 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ S5.354	

ASP/14/161
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355	
1 544 – 1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545 – 1 555	AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 S5.358 S5.359	
1 555 – 1 559	~~LAND~~ MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361~~ S5.362	

USA/30/86
MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530 SPACE OPERATION (space-to-Earth) FIXED ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Mobile except aeronautical mobile S5.349 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.350 S5.351 S5.354	**1 525 – 1 530** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 S5.354	**1 525 – 1 530** SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Mobile S5.349 S5.341 S5.351 S5.354

Reasons: This modification provides an allocation to the mobile-satellite service instead of the current limitation to maritime and land mobile-satellite services. The allocation changes will facilitate the introduction of mobile-satellite services globally. This is in accordance with the VGE recommendation that spectrum be allocated to the most broadly defined services for the purpose of providing maximum flexibility to administrations.

USA/30/88
MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533	**1 530 – 1 533**	
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353	
~~LAND MOBILE-SATELLITE (space-to-Earth)~~	~~LAND MOBILE-SATELLITE (space-to-Earth)~~	
Earth Exploration-Satellite	Earth Exploration-Satellite	
Fixed	Fixed	
Mobile except aeronautical mobile	Mobile S5.343	
S5.341 S5.342 S5.351 S5.354	S5.341 S5.351 ~~S5.353~~ S5.354	

Reasons: This modification provides an allocation to the mobile-satellite service instead of the current limitation to maritime and land mobile-satellite services. The allocation changes will facilitate the introduction of mobile-satellite services globally. This is in accordance with the VGE recommendation that spectrum be allocated to the most broadly defined services for the purpose of providing maximum flexibility to administrations.

USA/30/90
MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 533 – 1 535	**1 533 – 1 535**	
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353	
Earth Exploration-Satellite	Earth Exploration-Satellite	
Fixed	Fixed	
Mobile except aeronautical mobile	Mobile S5.343	
~~Land Mobile-Satellite (space-to-Earth) S5.352~~	~~Land Mobile-Satellite (space-to-Earth) S5.352~~	
S5.341 S5.342 S5.351 S5.354	S5.341 S5.351 ~~S5.353~~ S5.354	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. The priority access and immediate availability for maritime distress and safety communications is indicated in the proposed modification to S5.353. Under the mobile satellite allocation, the secondary land mobile satellite allocation is unnecessary, as is S5.352.

USA/30/91
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth)	
	~~Land Mobile-Satellite (space-to-Earth) S5.352~~	
	S5.341 S5.351 MOD S5.353 S5.354 S5.355	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. The priority access and immediate availability for maritime distress and safety communications is indicated in the proposed modification to S5.353. Under the mobile-satellite allocation, the secondary land mobile satellite allocation is unnecessary, as is S5.352.

EUR/5/276
MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530 SPACE OPERATION (space-to-Earth) FIXED ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.352A Earth Exploration-Satellite Mobile except aeronautical mobile S5.349 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.350 S5.351 S5.354	**1 525 – 1 530** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 S5.354	**1 525 – 1 530** SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Mobile S5.349 S5.341 S5.351 S5.354

EUR/5/277
MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.354	**1 530 – 1 533** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile ~~S5.343~~ S5.341 S5.351 ~~S5.353~~ S5.354	

ARTICLE S5

EUR/5/280
MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 533 – 1 535 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile except aeronautical mobile ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.351 S5.354	**1 533 – 1 535** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile S5.343 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ S5.354	

EUR/5/281
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ ADD S5.353A S5.354 S5.355	
1 544 – 1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545 – 1 555	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 MOD S5.358 S5.359 ADD S5.362A	
1 555 – 1 559	~~LAND~~ MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~	

UAE/52/2
MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530	**1 525 – 1 530**	**1 525 – 1 530**
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)
FIXED	MOBILE-SATELLITE (space-to-Earth)	FIXED
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth)	Earth Exploration-Satellite	MOBILE-SATELLITE (space-to-Earth)
Earth Exploration-Satellite	Fixed	Earth Exploration-Satellite
Mobile except aeronautical mobile S5.349	Mobile S5.343	Mobile S5.349
~~Land Mobile-Satellite (space-to-Earth) S5.352~~		
S5.341 S5.342 S5.350 S5.351 S5.352A S5.354	S5.341 S5.351 S5.354	S5.341 S5.351 S5.352A S5.354

UAE/52/3
MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.353A S5.354	**1 530 – 1 533** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 ~~S5.353~~S5.353A S5.354	
1 533 – 1 535 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile except aeronautical mobile ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.351 S5.353A S5.354	**1 533 – 1 535** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile S5.343 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~S5.353A S5.354	

UAE/52/4
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~S5.353A S5.354 S5.355	

INS/84/9
MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530 SPACE OPERATION (space-to-Earth) FIXED ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Mobile except aeronautical mobile S5.349 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.350 S5.351 S5.354	**1 525 – 1 530** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 S5.354	**1 525 – 1 530** SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Mobile S5.349 S5.341 S5.351 S5.354

INS/84/10
MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.354	**1 530 – 1 533** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 ~~S5.353~~ S5.354	
1 533 – 1 535 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 Earth Exploration-Satellite Fixed Mobile except aeronautical mobile ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.351 S5.354	**1 533 – 1 535** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) MOD S5.353 Earth Exploration-Satellite Fixed Mobile S5.343 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ S5.354	

INS/84/13
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355	
1 544 – 1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545 – 1 555	~~AERONAUTICAL~~ MOBILE-SATELLITE (R) (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 MOD S5.358 S5.359 ADD S5.362A	
1 555 – 1 559	~~LAND~~ MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~	

1 559 - 1 610 MHz	ADD ADD NOC	ASP/14/168 EUR/5/274 USA/30/294

ASP/14/168
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 559 – ~~1 610~~1 567	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.341 S5.341A S5.355 S5.359 S5.363	
~~1 559~~1 567 – 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363	

EUR/5/274
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 559 - ~~1 610~~1 567	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.341 ADD S5.354A S5.355 S5.359 S5.363	
~~1 559~~1 567 - 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363	

USA/30/294
NOC

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 559 – 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363	

Reasons: The current allocation, 1 559 - 1 610 MHz, is required for radionavigation services, including critical aeronautical safety applications, on a worldwide basis. Sharing in this band with other services is not possible. Efforts to phase out the remaining fixed service stations operating by footnote are under way.

1 610 - 1 610.6 MHz		USA/30/103

USA/30/103
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 610 – 1 610.6	**1 610 – 1 610.6**	**1 610 – 1 610.6**
MOBILE-SATELLITE (Earth-to-space) S5.373	MOBILE-SATELLITE (Earth-to-space) S5.373	MOBILE-SATELLITE (Earth-to-space) S5.373
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
	RADIODETERMINATION-SATELLITE (Earth-to-space)	Radiodetermination-Satellite (Earth-to-space)
S5.341 S5.355 S5.359 S5.363 S5.364 S5.366 S5.367 S5.368 S5.369 S5.371 S5.372	S5.341 S5.364 S5.366 S5.367 S5.368 S5.370 S5.372	S5.341 S5.355 S5.359 S5.364 S5.366 S5.367 S5.368 S5.369 S5.372

1 610.6 - 1 613.8 MHz 1 610.6 - 1 626.5 MHz		EUR/5/294 USA/30/104

ARTICLE S5

EUR/5/294
MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 610.6 - 1 613.8	**1 610.6 - 1 613.8**	**1 610.6 - 1 613.8**
MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)
RADIO ASTRONOMY	RADIO ASTRONOMY	RADIO ASTRONOMY
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
	RADIODETERMINATION-SATELLITE (Earth-to-space)	Radiodetermination-Satellite (Earth-to-space)
S5.149 S5.341 S5.355 S5.359 S5.363 S5.364 S5.366 S5.367 S5.368 S5.369 S5.371 S5.372 ADD S5.372A	S5.149 S5.341 S5.364 S5.366 S5.367 S5.368 S5.370 S5.372 ADD S5.372A	S5.149 S5.341 S5.355 S5.359 S5.364 S5.366 S5.367 S5.368 S5.369 S5.372 ADD 372A

USA/30/104
MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 610.6 – 1 613.8 MOBILE-SATELLITE (Earth-to-space) S5.373 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION S5.149 S5.341 S5.355 S5.359 S5.363 S5.364 S5.366 S5.367 S5.368 S5.369 S5.371 S5.372	**1 610.6 – 1 613.8** MOBILE-SATELLITE (Earth-to-space) S5.373 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) S5.149 S5.341 S5.364 S5.366 S5.367 S5.368 S5.370 S5.372	**1 610.6 – 1 613.8** MOBILE-SATELLITE (Earth-to-space) S5.373 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-Satellite (Earth-to-space) S5.149 S5.341 S5.355 S5.359 S5.364 S5.366 S5.367 S5.368 S5.369 S5.372
1 613.8 – 1 626.5 MOBILE-SATELLITE (Earth-to-space) S5.373 AERONAUTICAL RADIONAVIGATION Mobile-Satellite (space-to-Earth) S5.341 S5.355 S5.359 S5.363 S5.364 S5.365 S5.366 S5.367 S5.368 S5.369 S5.371 S5.372	**1 613.8 – 1 626.5** MOBILE-SATELLITE (Earth-to-space) S5.373 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-Satellite (space-to-Earth) S5.341 S5.364 S5.365 S5.366 S5.367 S5.368 S5.370 S5.372	**1 613.8 – 1 626.5** MOBILE-SATELLITE (Earth-to-space) S5.373 AERONAUTICAL RADIONAVIGATION Mobile-Satellite (space-to-Earth) Radiodetermination-Satellite (Earth-to-space) S5.341 S5.355 S5.359 S5.364 S5.365 S5.366 S5.367 S5.368 S5.369 S5.372

1 626.5 - 1 660.5 MHz	MOD	USA/30/97,98,100,101,102
	MOD	ASP/14/162,163
	MOD	EUR/5/289,290,295
	MOD	UAE/52/10,11
	MOD	INS/84/15,16

USA/30/97
MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 MOD S5.353 S5.354 S5.355 ~~S5.359~~	S5.341 S5.351 MOD S5.353 S5.354 S5.355 S5.359 S5.373A	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. The priority access and immediate availability for maritime distress and safety communications is indicated in the proposed modification to S5.353. Under the mobile satellite allocation, the secondary land mobile satellite allocation is unnecessary, as is S5.352.

USA/30/98
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – 1 634.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355 S5.359 ~~S5.374~~	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. The priority access and immediate availability for maritime distress and safety communications is indicated in the proposed modification to S5.353. Under the mobile satellite allocation, the primary land mobile satellite allocation is unnecessary.

USA/30/100
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 634.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355 S5.359	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. The priority access and immediate availability for maritime distress and safety communications is indicated in the proposed modification to S5.353. Under the mobile satellite allocation, the secondary land mobile satellite allocation is unnecessary, as is S5.352.

USA/30/101
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 646.5 – ~~1 656.5~~1 660	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (Earth-to-space) S5.341 S5.351 S5.354 S5.355 ~~S5.358~~ S5.359 MOD S5.362 S5.376	
~~**1 656.5 – 1 660**~~	~~LAND MOBILE-SATELLITE (Earth-to-space)~~ ~~S5.341 S5.351 S5.354 S5.355 S5.359 S5.360 S5.361 S5.362 S5.374~~	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. By allocating this band to the MSS and applying of S5.362, the frequencies available for priority access and immediate availability for aeronautical mobile (R) communications is increased.

ARTICLE S5

EUR/5/289
MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 S5.354 S5.355 S5.359	S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 S5.373A	

EUR/5/290
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – ~~1 634.5~~1 636.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 MOD S5.374 ADD S5.353A	
~~1 634.5~~1 636.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 ~~S5.353~~ADD S5.353A S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (Earth-to-space) ADD S5.362A S5.341 S5.351 S5.354 S5.355 MOD S5.358 S5.359 S5.376	
1 656.5 – 1 660	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~ MOD S5.374	
1 660 – 1 660.5	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361 S5.362~~ ADD S5.376A	

ASP/14/162
MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 S5.354 S5.355 S5.359	S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 S5.373A	

Note that S5.353 was not relevant to this band.

ASP/14/163
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – 1 634.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355 S5.359 S5.374	
1 634.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) S5.341 S5.351 S5.354 S5.355 ~~S5.358~~ S5.359 S5.376	
1 656.5 – 1 660	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360~~ S5.361 S5.362 S5.374	
1 660 – 1 660.5	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361~~ S5.362	

USA/30/92
MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 545 – ~~1 555~~1 559	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 ~~S5.358~~ S5.359 MOD S5.362	
~~1 555 – 1 559~~	~~LAND MOBILE-SATELLITE (space-to-Earth)~~ ~~S5.341 S5.351 S5.354 S5.355 S5.359 S5.360 S5.361 S5.362~~	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. By allocating this band to the MSS and applying of S5.362, the frequencies available for priority access and immediate availability for aeronautical mobile-satellite (R) communications is increased.

USA/30/102
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 660 – 1 660.5	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) MOD S5.362 RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361 S5.362~~	

Reasons: To harmonize allocations for the mobile-satellite service on a worldwide basis. Allocation of smaller bands of frequencies to individual mobile-satellite services restricts the efficient use of these frequencies. See VGE recommendations 1/7 and 1/8. By allocating this band to the MSS and applying of S5.362, the frequencies available for priority access and immediate availability for aeronautical mobile (R) communications is increased.

UAE/52/10
MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 S5.354 S5.355 S5.359	S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 S5.373A	

UAE/52/11
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – 1 634.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 S5.374	
1 634.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.358 S5.359 S5.376	
1 656.5 – 1 660	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360~~ ~~S5.361~~ S5.362 S5.374	
1 660 – 1 660.5	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361~~ S5.362	

INS/84/15
MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 S5.354 S5.355 S5.359	S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 S5.373A	

Reasons: No. S5.353 was not relevant to this band.

INS/84/16
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – 1 634.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355 S5.359 S5.374	
1 634.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 MOD S5.353 S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	~~AERONAUTICAL~~ MOBILE-SATELLITE (R) (Earth-to-space) S5.341 S5.351 S5.354 S5.355 MOD S5.358 S5.359 S5.376 ADD S5.362A	
1 656.5 – 1 660	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~ MOD S5.374	
1 660 – 1 660.5	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361 S5.362~~ ADD S5.376A	

ARTICLE S5

EUR/5/295
MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 660 - 1 660.5	LAND MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 S5.360 S5.361 S5.362 ADD S5.372A	

1 675 - 1 700 MHz	NOC MOD MOD MOD	CHN/38/3 CAN/35/118 ASP/14/171 EUR/5/269

CHN/38/3

Agenda item 1.9.1

Proposal: No change to the existing allocation at 1 675 - 1 710 MHz.

Reasons: In view of the results of the ITU-R feasibility study on frequency sharing between MSS, MetAids and MetSat, it is not feasible at all for the three services to share the spectrum in the band 1 675 - 1 710 MHz.

At 1 675 - 1 690 MHz, it is not feasible to have co-frequency sharing of MSS and MetAids. At 1 690 - 1 710 MHz, it is not feasible to have co-frequency sharing of MSS and MetSat either.

Band segmentation is the only feasible way to achieve co-frequency sharing of MSS, MetSat and MetAids. However, this will reduce, to a large extent, the frequency spectrum available for the meteorological radio-sondage service, thus leading to a drastic increase of the operational cost of radio-sondes and earth sondage radar systems and seriously affecting the healthy development and normal operation of the meteorological sondage service.

Therefore, we opposed WRC-97 to allocate 1 675 - 1 710 MHz to MSS. We believe that the existing allocation should not be changed.

CAN/35/118
MOD

MHz
1 670 – 1 700

Allocation to Services		
Region 1	Region 2	Region 3
1 675 – ~~1 690~~1 683 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) ADD S5.377B S5.341 MOD S5.377 ADD S5.377A	**1 675 – ~~1 690~~1 683** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) S5.341 MOD S5.377 ADD S5.377A	**1 675 – ~~1 690~~1 683** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) ADD S5.377B S5.341 MOD S5.377 ADD S5.377A
~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341	**~~1 675~~1 683 – 1 690** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile ~~MOBILE-SATELLITE (Earth-to-space)~~ S5.341 ~~S5.377~~	**~~1 675~~1 683 – 1 690** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341

Allocation to Services		
Region 1	Region 2	Region 3
1 690 – 1 700	**1 690 – 1 700**	**1 690 – 1 700**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
Fixed	~~MOBILE-SATELLITE (Earth-to-space)~~	
Mobile except aeronautical mobile		
S5.289 S5.341 S5.382	S5.289 S5.341 ~~S5.377~~ S5.381	S5.289 S5.341 S5.381

ASP/14/171
MOD

MHz
1 670 – 1 700

Allocation to Services		
Region 1	Region 2	Region 3
1 675 – ~~1 690~~1 683 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) S5.341 S5.377	**1 675 – ~~1 690~~1 683** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) S5.341 S5.377	**1 675 – ~~1 690~~1 683** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) S5.341 S5.377
~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341	**~~1 675~~1 683 – 1 690** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile ~~MOBILE-SATELLITE (Earth-to-space)~~ S5.341 ~~S5.377~~	**~~1 675~~1 683 – 1 690** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341
1 690 – 1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile S5.289 S5.341 S5.382	**1 690 – 1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) ~~MOBILE-SATELLITE (Earth-to-space)~~ S5.289 S5.341 ~~S5.377~~ S5.381	**1 690 – 1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) S5.289 S5.341 S5.381

ARTICLE S5

EUR/5/269
MOD

MHz
1 670 – 1 700

Allocation to Services		
Region 1	Region 2	Region 3
1 675 - 1690~~83~~ METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE- SATELLITE (Earth-to-space) ADD S5.377B S5.341 S5.377 ADD S5.377A	**1 675 - 1690~~83~~** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE- SATELLITE (Earth-to-space) S5.341 S5.377 ADD 5.377A	**1 675 - 1690~~83~~** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE- SATELLITE (Earth-to-space) ADD S5.377B S5.341 S5.377 ADD S5.377A
1 6~~75~~83 - 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341	**1 6~~75~~83 - 1 690** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile ~~MOBILE- SATELLITE (Earth-to-space)~~ S5.341~~- S5.377~~	**1 6~~75~~83 - 1 690** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341
1 690 - 1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile S5.289 S5.341 S5.382	**1 690 - 1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) ~~MOBILE- SATELLITE (Earth-to-space)~~ S5.289 S5.341~~- S5.377~~ S5.381	**1 690 - 1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) S5.289 S5.341 S5.381

1 700 - 1 710 MHz	NOC MOD MOD	CHN/38/4 CAN/35/119 ASP/14/172 EUR/5/270

CHN/38/4

Agenda item 1.9.2

Resolution 712, *resolves* 1 - Provision of up to 3 MHz of spectrum for telecommand links between 100 MHz and 1 GHz

It is proposed that this matter should be deferred until WRC-99.

Reasons: The CPM-97 Report, Section 5.3.2, recommends that it may be advantageous before taking action to permit studies to be completed. In this event, WRC-97 may consider it appropriate to defer consideration of this agenda item to WRC-99, by which time all relevant studies should be complete.

CAN/35/119
MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 700 – 1 710	**1 700 – 1 710**	**1 700 – 1 710**
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile ~~MOBILE-SATELLITE (Earth-to-space)~~	MOBILE except aeronautical mobile
S5.289 S5.341	S5.289 S5.341 ~~S5.377~~	S5.289 S5.341 S5.384

ASP/14/172
MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 700 – 1 710	**1 700 – 1 710**	**1 700 – 1 710**
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	~~MOBILE-SATELLITE (Earth-to-space)~~	
S5.289 S5.341	S5.289 S5.341 ~~S5.377~~	S5.289 S5.341 S5.384

EUR/5/270
MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 700 - 1 710	**1 700 - 1 710**	**1 700 - 1 710**
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	~~MOBILE-SATELLITE (Earth-to-space)~~	
S5.289 S5.341	S5.289 S5.341 ~~S5.377~~	S5.289 S5.341 S5.384

1 710 - 2 010 MHz	NOC	J/29/13

J/29/13
NOC

1 710 - 2 450 MHz	NOC	EUR/5/268

EUR/5/268

Reasons: No change should be made to the allocations made to the mobile-satellite service in the bands 1 710 - 2 450 MHz.

1 980 - 2 025Hz		USA/30/107
	NOC	ASP/14/174
	NOC	CUB/66/96
	NOC	NZL/37/15
	MOD	CAN/35/138,139

USA/30/107
MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 980 – 2 010	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.388 MOD S5.389A S5.389B S5.389F	

ASP/14/174

The above-mentioned administrations propose **NOC** to the existing MSS allocations for the bands 1 980 - 2 010 MHz and 2 170 - 2 200 MHz and no extensions of these bands.

CUB/66/96
NOC

NZL/37/15
NOC

Reasons: Modifications to the Table of Frequency Allocations in any band concerning global services such as MSS should result in common worldwide allocations where possible. Localized services can also benefit from worldwide allocations through economies of scale. The principle of harmonization is therefore strongly supported. New Zealand recognizes, however, that harmonization of the 1 980 - 2 025 MHz and 2 160 - 2 200 MHz allocations for MSS is difficult to achieve at this time.

The many existing and potential future uses of the bands around 2 GHz must be taken into account in any future modifications to this band. This is to ensure that adequate protection is afforded to existing and planned services.

CAN/35/138
MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 980 – ~~2 010~~1 990	**1 980 – ~~2 010~~1 990**	**1 980 – ~~2 010~~1 990**
FIXED	FIXED	FIXED
MOBILE	MOBILE	MOBILE
MOBILE-SATELLITE (Earth-to-space)	~~MOBILE-SATELLITE~~ Mobile-satellite (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)
S5.388 S5.389A ~~S5.389B~~ S5.389F	S5.388 S5.389A ~~S5.389B~~ ~~S5.389F~~	S5.388 S5.389A ~~S5.389B~~ ~~S5.389F~~

CAN/35/139
MOD

MHz
2 010 – 2 170

Allocation to Services		
Region 1	Region 2	Region 3
~~2 010~~1 990 – 2 025	**~~2 010~~1 990 – 2 025**	**~~2 010~~1 990 – 2 025**
FIXED	FIXED	FIXED
MOBILE	MOBILE	MOBILE
MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)
S5.388 S5.389A MOD S5.389C ADD S5.289CA S5.389D S5.389F	S5.388 MOD S5.389C ADD S5.289CA S5.389D ~~S5.389E~~S5.389F	S5.388 S5.389A MOD S5.389C ADD S5.289CA S5.389D S5.389F

2 010 - 2 170 MHz	MOD	USA/30/08,109
	MOD	CAN/35/139 (see above)
	NOC	J/29/14
	NOC	NZL/37/16

USA/30/108
MOD

MHz
2 010 – 2 170

Allocation to Services		
Region 1	Region 2	Region 3
2 010 – 2 025	**2 010 – 2 025**	**2 010 – 2 025**
FIXED	FIXED	FIXED
MOBILE	MOBILE	MOBILE
MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)
S5.388 MOD S5.389A	S5.388 MOD S5.389A ~~S5.389C S5.389D S5.389E~~	S5.388 MOD S5.389A

USA/30/109
MOD

MHz
2 010 – 2 170

Allocation to Services		
Region 1	Region 2	Region 3
2 160 – 2 170	**2 160 – 2 170**	**2 160 – 2 170**
FIXED	FIXED	FIXED
MOBILE	MOBILE	MOBILE
MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE (space-to-Earth)
S5.388 MOD S5.389A S5.392A	S5.388 MOD S5.389A ~~S5.389C S5.389D S5.389E~~ ADD S5.392A	S5.388 MOD S5.389A ADD S5.392A

J/29/14
NOC

NZL/37/16
NOC

2 170 - 2 200 MHz		USA/30/110
	NOC	ASP/14/174
	NOC	J/29/15
	NOC	CUB/66/67
	NOC	NZL/37/17
	MOD	CAN/35/145

USA/30/110
MOD

MHz
2 170 – 2 450

Allocation to Services		
Region 1	Region 2	Region 3
2 170 – 2 200	FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) S5.388 MOD S5.389A S5.389F S5.392A	

ASP/14/174

The above-mentioned administrations propose **NOC** to the existing MSS allocations for the bands 1 980 - 2 010 MHz and 2 170 - 2 200 MHz and no extensions of these bands.

J/29/15
NOC

CUB/66/97
NOC

NZL/37/17
NOC

CAN/35/145
MOD

MHz
2 170 – 2 450

Allocation to Services		
Region 1	Region 2	Region 3
2 160 – ~~2 170~~2 200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) S5.388 S5.392A MOD S5.389C ADD S5.389CA S5.389D S5.389E S5.389F	**2 160 – ~~2 170~~2 200** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) S5.388 MOD S5.389C ADD S5.389CA S5.389D ~~S5.389E~~S5.389F S5.392A	**2 160 – ~~2 170~~2 200** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) S5.388 MOD S5.389C ADD S5.389CA S5.389D S5.389E S5.389F S5.392A

Reasons: ITU Recommendation 34 (WRC-95) recommends that future WRCs should, wherever possible, allocate frequency bands on a worldwide basis. The harmonization of the 2 GHz MSS allocations would facilitate the introduction of global systems, the coordination between such systems and the development of compatible equipment.

2 483.5 - 2 500 MHz		USA/30/105

USA/30/105
MOD

MHz
2 450 – 2 520

Allocation to Services		
Region 1	Region 2	Region 3
2 483.5 – 2 500	**2 483.5 – 2 500**	**2 483.5 – 2 500**
FIXED	FIXED	FIXED
MOBILE	MOBILE	MOBILE
MOBILE-SATELLITE (space-to-Earth) S5.373	MOBILE-SATELLITE (space-to-Earth) S5.373	MOBILE-SATELLITE (space-to-Earth) S5.373
Radiolocation	RADIOLOCATION	RADIOLOCATION
	RADIODETERMINATION-SATELLITE (space-to-Earth) S5.398	Radiodetermination-Satellite (space-to-Earth) S5.398
S5.150 S5.371 S5.397 S5.398 S5.399 S5.400 S5.402	S5.150 S5.402	S5.150 S5.400 S5.402

2 500 - 2 520 MHz	NOC	NZL/37/28,29
2 520 - 2 670 MHz	NOC	KOR/79/4A,B
	MOD	J/29/19,23

NZL/37/28, 29
NOC

Reasons: New Zealand does not support changes that provide for enhanced access to these bands by MSS at the expense of existing fixed services.

KOR/79/4A, B
NOC

J/29/19
MOD

MHz
2 450 – 2 520

Allocation to Services		
Region 1	Region 2	Region 3
2 500 – 2 520	**2 500 – 2 520**	**2 500 – 2 520**
FIXED S5.409 S5.410 S5.411	FIXED S5.409 S5.411	FIXED S5.409 S5.411
MOBILE except aeronautical mobile	FIXED-SATELLITE (space-to-Earth) S5.415	FIXED-SATELLITE (space-to-Earth) S5.415
MOBILE-SATELLITE (space-to-Earth)	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE (space-to-Earth)
S5.403 S5.405 S5.407 S5.408 S5.412 S5.414	S5.403 S5.404 S5.407 S5.414	5.403 S5.404 S5.407 S5.414 S5.403A

J/29/23
MOD

MHz
2 520 – 2 670

Allocation to Services		
Region 1	Region 2	Region 3
2 520 – 2 655	**2 520 – 2 655**	**2 520 – 2 535**
FIXED S5.409 S5.410 S5.411	FIXED S5.409 S5.411	FIXED S5.409 S5.411
MOBILE except aeronautical mobile	FIXED-SATELLITE (space-to-Earth) S5.415	FIXED-SATELLITE (space-to-Earth) S5.415
BROADCASTING-SATELLITE S5.413 S5.416	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	BROADCASTING-SATELLITE S5.413 S5.416	BROADCASTING-SATELLITE S5.413 S5.416
		S5.403 S5.403A
		2 535 – 2 655
		FIXED S5.409 S5.411
		MOBILE except aeronautical mobile
		BROADCASTING-SATELLITE S5.413 S5.416
S5.339 S5.403 S5.405 S5.408 S5.412 S5.417 S5.418	S5.339 S5.403	S5.339 S5.418

2 670 - 2 690 MHz	NOC NOC MOD	NZL/37/30 KOR/79/4C J/29/24

NZL/37/30
NOC

KOR/79/4C
NOC

J/29/24
MOD

MHz
2 670 – 3 300

Allocation to Services		
Region 1	Region 2	Region 3
2 670 – 2 690	**2 670 – 2 690**	**2 670 – 2 690**
FIXED S5.409 S5.410 S5.411	FIXED S5.409 S5.411	FIXED S5.409 S5.411
MOBILE except aeronautical mobile	FIXED-SATELLITE (Earth-to-space) (space-to-Earth) S5.415	FIXED-SATELLITE (Earth-to-space) S5.415
MOBILE-SATELLITE (Earth-to-space)	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
Earth Exploration-Satellite (passive)	MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)
Radio Astronomy	Earth Exploration-Satellite (passive)	Earth Exploration-Satellite (passive)
Space Research (passive)	Radio Astronomy	Radio Astronomy
	Space Research (passive)	Space Research (passive)
S5.149 S5.419 S5.420	S5.149 S5.419 S5.420	S5.149 S5.419 S5.420 S5.420A

1 - 3 GHz (other)		KEN/UGA/TZA/47/40,41 UGA/55/14 KEN/70/34,35 AFS/71/9B TZA/80/28,29,30

KEN/UGA/TZA/47/40

4.12 Sharing within existing allocations in the bands 1 525 - 1 559 MHz and 1 626.5 - 1 660.5 MHz

The Administrations submitting this document agree with the CPM-97 Report, proposing that WRC-97 calls for a Resolution to be developed to call for studies and evidence to be completed by 1999.

KEN/UGA/TZA/47/41

4.13 Spectrum requirement in the 1 - 3 GHz range

WRC-97 should call for a resolution urging MSS systems to use more spectrum efficient techniques as the immediate solution for lack of accommodation.

UGA/55/14

Uganda therefore shares the opinion that:

1) any re-allocation of current allocations for GMDSS and AMS distress and safety communications to generic MSS allocations must be accompanied by suitable technical, operational and regulatory safeguards. These should be satisfactory to both ICAO and IMO;
2) MSS operators should spearhead discussions on the safeguards as a matter of urgency;
3) no changes should be made before the safeguards are in place.

KEN/70/34

4.14 Sharing within existing allocations in the bands 1 525 - 1 559 MHz and 1 626.5 - 1 660.5 MHz

The Administration of Kenya concurs with the proposal in the CPM-97 Report for a WRC-97 resolution calling for studies on sharing in this band.

KEN/70/35

The Administration of Kenya proposes that WRC-97 develop a resolution urging mobile-satellite service systems operating in the 1 - 3 GHz band to use more spectrum efficient techniques.

AFS/71/9B

With due consideration to the need for additional MSS spectrum between 1 and 3 GHz, and in recognition of this service as one of many tools in achieving Universal Service, South Africa would support the following way forward:

- The allocation of the band 1 675 - 1 683 MHz to MSS (E-s) with an appropriate footnote for the protection of MetSat and MetAids.
- The associated allocation of the band 1 559 - 1 567 MHz to MSS (s-E) on condition that sharing with the Global Navigational Satellite System (GNSS) is feasible.
- That in general allocations within the 1.5/1.6 GHz bands be harmonized in all three Regions with appropriate protection offered to GMDSS and AMS(R)S.

TZA/80/28

Tanzania supports no change in the 2 GHz allocations to the following frequency bands:

i) 1 545 - 1 555 MHz aeronautical-mobile (R) service (s-E). It supports no change to S5.341, S5.351, S5.357, S5.358, S5.359;

ii) 1 646.5 - 1 656.5 MHz aeronautical-mobile (R) service (E-s). It supports no change to S5.341, S5.351, S5.354, S5.358, S5.359, S5.376.

Reasons: In order to protect current terrestrial fixed services including safety of life services while transiting to implement S + DX based satellite technology.

TZA/80/29

Tanzania supports studies on in-band sharing effects between ARNS/RNSS which should be fully examined in close coordination with ICAO in respect of critical safety information and data on aviation.

TZA/80/30

Tanzania supports close collaboration with ICAO and IMO in respect of sharing effects on these services when they are shared on a generic spectrum allocation basis.

Reasons: In order to achieve the required protection to and compatibility with GMDSS and AM(R) services within the band.

S5.341A	ADD	ASP/14/169

ASP/14/169
ADD S5.341A The use of the band 1 559 - 1 567 MHz for the mobile-satellite services (space-to-Earth) is subject to coordination under Resolution **46 (WRC-95)**/No. **S9.11A**. Stations of the mobile-satellite services (space-to-Earth) shall not cause harmful interference to the aeronautical radionavigation or radionavigation-satellite services and their operations will be subject to Resolution [ASP-3].

S5.352	SUP	ASP/14/159
	SUP	USA/30/87
	SUP	EUR/5/278
	SUP	UAE/52/5
	SUP	INS/84/11

ASP/14/159
SUP S5.352

EUR/5/278
SUP S5.352

Reasons: Consequential to the proposed allocation modification.

USA/30/87
SUP S5.352

UAE/52/5
SUP S5.352

Reasons: Related to the addition of footnote S5.352A.

INS/84/11
SUP S5.352

S5.352A	ADD ADD	EUR/5/279 UAE/52/6

EUR/5/279
ADD S5.352A In the band 1 525 - 1 530 MHz, mobile earth stations shall not claim protection from existing stations in the fixed service notified and brought into use prior to 21 November 1997.

Reasons: Together with provision No. S5.354, this provision will give full protection to existing fixed service.

UAE/52/6
ADD S5.352A Stations operating in the mobile-satellite service shall not cause harmful interference to the fixed stations operating in the band 1 525 - 1 530 MHz notified and brought into use before 21 November 1997.

Reasons: To give protection to the existing stations operating in the fixed services.

S5.353	MOD MOD SUP SUP MOD	ASP/14/160 USA/30/89 EUR/5/282 UAE/52/7 INS/84/12

ASP/14/160
MOD S5.353 ~~*Additional allocation:* in Argentina, Australia, Brazil, Canada, the United States, Malaysia and Mexico,~~ In the bands 1 530 - 1 544 MHz ~~is also allocated to the mobile-satellite service (space-to-Earth),~~ and ~~the band~~ 1 631.5 - 1 645.5 MHz ~~is also allocated to the mobile-satellite service (Earth-to-space), on a primary basis subject to the following conditions:~~ maritime mobile-satellite distress and safety communications shall have priority access and immediate availability over all other mobile-satellite communications operating under this provision. Communications of mobile-satellite system stations not participating in the global maritime distress and safety system (GMDSS) shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

Reasons: To give special priority status to stations participating in the GMDSS in order to safeguard access and immediate availability for maritime distress and safety communications on a worldwide basis.

INS/84/12

MOD S5.353 ~~*Additional allocation:* in Argentina, Australia, Brazil, Canada, the United States, Malaysia and Mexico, the band 1 530 - 1 544 MHz is also allocated to the mobile-satellite service (space-to-Earth), and the band 1 631.5 - 1 645.5 MHz is also allocated to the mobile-satellite service (Earth-to-space), on a primary basis subject to the following conditions:~~ In the bands 1 530 - 1 544 MHz and 1 631.5 - 1 645.5 MHz, maritime mobile-satellite distress and safety communications shall have priority access and immediate availability over all other mobile-satellite communications operating within a network under this provision. Communications of mobile-satellite system stations not participating in the global maritime distress and safety system (GMDSS) shall ~~operate on a secondary basis to distress and safety communications of stations operating in~~not cause unacceptable interference to the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

Reasons: Indonesia proposes that the allocation should be modified but special priority status to stations participating in the GMDSS should be given in order to safeguard access and immediate availability for maritime distress and safety communications.

USA/30/89

MOD S5.353 ~~*Additional allocation:* in Argentina, Australia, Brazil, Canada, the United States, Malaysia and Mexico, the band 1 530 - 1 544 MHz is also allocated to the mobile-satellite service (space-to-Earth), and the band 1 631.5 - 1 645.5 MHz is also allocated to the mobile-satellite service (Earth-to-space), on a primary basis subject to the following conditions:~~ In the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz, maritime mobile-satellite distress and safety communications shall have priority access and immediate availability over all other mobile-satellite communications operating within a network under this provision. Communications of mobile-satellite system stations not participating in the global maritime distress and safety system (GMDSS) shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

Reasons: To ensure priority access and immediate availability for maritime distress and safety communication throughout the world while providing the capability to support additional mobile-satellite services.

EUR/5/282

SUP S5.353

UAE/52/7

SUP S5.353

Reasons: Related to the addition of footnote S5.353A.

S5.353A	ADD ADD	EUR/5/283 UAE/52/8

EUR/5/283

ADD S5.353A In applying the procedures of No. **S9.11A** to the mobile-satellite service within the bands 1 530 - 1 544 MHz and 1 631.5 - 1 645.5 MHz, administrations shall give priority to accommodating the spectrum requirements of the Global Maritime Distress and Safety System (GMDSS). Mobile-satellite systems not providing distress and safety communications for the GMDSS shall not cause unacceptable interference to the GMDSS. (See Resolution **[EUR/9] (WRC-97)**.)

Reasons: To establish necessary global safeguards for the spectrum requirements for the GMDSS.

UAE/52/8

ADD S5.353A The band 1 530 - 1 544 MHz is allocated to the mobile-satellite service (space-to-Earth), and the band 1 631.5 - 1 645.5 MHz is allocated to the mobile-satellite service (Earth-to-space), on a primary basis subject to the following conditions: maritime mobile-satellite distress and safety communications shall have priority access and immediate availability over all other mobile-satellite communications operating under this provision. Communications of mobile-satellite system stations not participating in the global maritime distress and safety system (GMDSS) shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS.

Reasons: To give priority and protection to the stations operating GMDSS services.

S5.354A	ADD	EUR/5/274,275

EUR/5/275

ADD S5.354A The use of the band 1 559 - 1 567 MHz for the mobile-satellite service (space-to-Earth) is subject to coordination under Resolution **46 (WRC-95)**/No. **S9.11A**. The power flux-density of mobile-satellite service space stations shall not exceed -112 dBW/m^2/1 MHz for all angles of arrival. This provisional power flux-density limit shall apply until such time as a competent world radiocommunication conference revises it.

Reasons: The pfd limit of -112 dB(W/m^2) in any 1 MHz would ensure adequate protection of existing GNSS systems. However, additional studies are required for future GNSS for which this power flux-density limit may be insufficient.

S5.358	SUP	ASP/14/164
	SUP	USA/30/93
	MOD	EUR/5/284
	MOD	UAE/52/12
	MOD	INS/84/14
	NOC	TZA/80/28

USA/30/93
SUP S5.358

Reasons: Consequential to the proposed allocation modification.

EUR/5/284
MOD S5.358

~~Notwithstanding any other provisions of the Radio Regulations relating to restrictions in the use of the bands allocated to the aeronautical mobile-satellite (R) service for public correspondence, the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz may be authorized by administrations for public correspondence with aircraft earth stations. Such communications must cease immediately, if necessary, to permit transmission of messages with priority 1 to 6 in Article S44.~~A mobile-satellite system providing AMS(R)S must cease immediately all aeronautical public correspondence communications, if necessary, to permit the transmission of messages with priority 1 to 6 in Article **S44** within that system.

Reasons: Consequential to the proposed allocation modification.

UAE/52/12
MOD S5.358

~~Notwithstanding any other provisions of the Radio Regulations relating to restrictions in the use of the bands allocated to the aeronautical mobile-satellite (R) service for p~~Public correspondence~~,~~ transmitted in the mobile-satellite bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz ~~may be authorized by administrations for public correspondence with aircraft earth stations. Such communications~~ must cease immediately, if necessary, to permit transmission of messages with priority 1 to 6 in Article **S44**.

Reasons: To give priority and protection to the stations operating AMS(R)S services.

ASP/14/164
SUP S5.358

INS/84/14
MOD S5.358

~~Notwithstanding any other provisions of the Radio Regulations relating to restrictions in the use of the bands allocated to the aeronautical mobile-satellite (R) service for public correspondence, the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz may be authorized by administrations for public correspondence with aircraft earth stations. Such communications must cease immediately, if necessary, to permit transmission of messages with priority 1 to 6 in Article S44.~~A mobile-satellite system providing the aeronautical mobile-satellite (R) service must cease immediately all

aeronautical public correspondence communications, if necessary, to permit the transmission of messages with priority 1 to 6 in Article **S44** within that system.

Reasons: Consequential to the proposed allocation modification.

S5.360	SUP	ASP/14/165
	SUP	USA/30/94
	SUP	EUR/5/285
	SUP	UAE/52/13
	SUP	INS/84/17

ASP/14/165
SUP S5.360

USA/30/94
SUP S5.360

Reasons: Consequential to the proposed allocation modification.

EUR/5/285
SUP S5.360

Reasons: Consequential to the proposed allocation modification.

UAE/52/13
SUP S5.360

Reasons: The band is generic and therefore the footnote is not necessary.

INS/84/17
SUP S5.360

S5.361	SUP	ASP/14/166
	SUP	USA/30/95
	SUP	EUR/5/286
	SUP	UAE/52/14
	SUP	INS/84/18

ASP/14/166
SUP S5.361

Reasons: Consequential to the proposed allocation modifications.

USA/30/95
SUP S5.361

Reasons: Consequential to the proposed allocation modification.

EUR/5/286
SUP S5.361

Reasons: Consequential to the proposed allocation modification.

UAE/52/14
SUP S5.361

Reasons: The band is generic and therefore the footnote is not necessary.

INS/84/18
SUP S5.361

S5.362	MOD SUP	USA/30/96 EUR/5/287

USA/30/96
MOD S5.362

~~*Alternative allocation:* in Argentina and the United States, the band 1 555 - 1 559 MHz is allocated to the mobile-satellite (space-to-Earth) service, the band 1 656.5 - 1 660 MHz is allocated to the mobile-satellite (Earth-to-space) service, and the band 1 660 - 1 660.5 MHz is allocated to the mobile-satellite (Earth-to-space) and radio astronomy services, on a primary basis subject to the following conditions:~~In the bands 1 545 - 1 559 MHz and 1 646.5 - 1 660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability over all other mobile-satellite communications within a network operating under this provision; mobile-satellite systems shall be interoperable with the aeronautical mobile-satellite (R) service; account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

Reasons: To ensure priority access and immediate availability for aeronautical distress and safety communications throughout the world while providing the capability to support additional mobile services.

EUR/5/287
SUP S5.362

S5.362A	ADD ADD	EUR/5/288 INS/84/19

EUR/5/288
ADD S5.362A

In applying the procedures of No. **S9.11A** to the mobile-satellite service within the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, administrations shall give priority to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service (AMS(R)S) providing transmission of messages with priority 1 to 6 in Article **S44**. Mobile-satellite systems not providing AMS(R)S messages with priority 1 to 6 in Article **S44** shall not cause unacceptable interference to the AMS(R)S. (See Resolution **[EUR/9] (WRC-97)**.)

Reasons: To establish necessary global safeguards for the spectrum requirements for the AMS(R)S systems providing transmission of messages with priority 1 to 6 in Article S44.

INS/84/19

ADD S5.362A In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, administrations shall give priority to the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article **S44**. Mobile-satellite systems not providing aeronautical mobile-satellite (R) service messages with priority 1 to 6 in Article **S44** shall not cause unacceptable interference to the aeronautical mobile-satellite (R) service. (See draft Resolution [INS-2].)

Reasons: Indonesia proposes that the allocation should be modified, however it is necessary to establish necessary global safeguards for the AMS(R)S systems providing transmission of messages with priority 1 to 6 in Article **S44**.

S5.372A	ADD	EUR/5/296

EUR/5/296

ADD S5.372A In the bands 1 610.6 - 1 613.8 MHz and 1 660 - 1 660.5 MHz Recommendation ITU-R M.[8D/XN] shall be used in order to facilitate coordination between mobile earth stations and radio astronomy stations (see Resolution **[EUR/10] (WRC-97)**).

Reasons: This proposal satisfies *invites* 1 of Recommendation 721 (WRC-95) and provides an appropriate methodology to establish appropriate separation distances between mobile earth stations of the mobile-satellite service and radio astronomy stations taking into account *considering a) - g)* of Recommendation 721 (WRC-95).

S5.373	ADD	USA/30/106

USA/30/106

ADD S5.373 Use of the bands 1 610 - 1 626.5 MHz and 2 483.5 - 2 500 MHz by the mobile-satellite service is limited to non-geostationary satellite systems.

Reasons: To ensure that non-geostationary mobile-satellite service will be available on a global basis as a competitive alternative to geostationary mobile-satellite services and terrestrial mobile services.

S5.373A	MOD	UAE/52/15

UAE/52/15

MOD S5.373A In Argentina and the United States, the use of the band 1 626.5 - 1 631.5 MHz by the mobile-satellite service is subject to the conditions of No. **S5.353A**.

Reasons: Related to the deletion of footnote S5.353 and adding footnote S5.353A.

S5.374	SUP MOD MOD MOD	USA/30/99 EUR/5/291 UAE/52/16 INS/84/20

USA/30/99
SUP S5.374

Reasons: This footnote is unnecessary since Resolution 46 provides the notification and coordination procedures that will appropriately handle interference between MSS and fixed services in these bands.

EUR/5/291
MOD S5.374 ~~Land-earth stations and ship~~Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5 - 1 634.5 MHz and 1 656.5 - 1 660 MHz shall not cause harmful interference to the stations in the fixed service operating in the countries listed in No. **S5.359**

Reasons: Consequential to the proposed allocation modification.

UAE/52/16
MOD S5.374 ~~Land~~Mobile earth stations ~~and ship earth stations~~ in the mobile-satellite service operating in the bands 1 631.5 - 1 634.5 MHz and 1 656.5 - 1 660 MHz shall not cause harmful interference to the stations in the fixed service operating in the countries listed in No. **S5.359**.

Reasons: Related to the modifications to the Table of Frequency Allocations.

INS/84/20
MOD S5.374A ~~Land-earth stations and ship~~ Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5 - 1 634.5 MHz and 1 656.5 - 1 660 MHz shall not cause harmful interference to the stations in the fixed service operating in the countries listed in No. **S5.359**.

Reasons: Consequential to the proposed allocation modification.

S5.376	MOD NOC	UAE/52/17 TZA/80/28

UAE/52/17
MOD S5.376 Transmissions in the band 1 646.5 - 1 656.5 MHz from aircraft stations in the ~~aeronautical~~ mobile ~~(R)~~ service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

Reasons: Related to the modifications to the Table of Frequency Allocations.

S5.376A	ADD ADD	EUR/5/292 INS/84/21

EUR/5/292

ADD S5.376A Aircraft earth stations shall not operate in the 1 660.0 - 1 660.5 MHz band.

Reasons: To give protection to the radio astronomy service.

INS/84/21

ADD S5.376A Aircraft earth stations shall not operate in the 1 660.0 - 1 660.5 MHz band.

Reasons: To give protection to the radio astronomy service.

S5.377	MOD MOD MOD MOD	ASP/14/173 EUR/5/271 IRN/44/8 CAN/35/120

ASP/14/173

MOD S5.377 In the band 1 675 - ~~1 710~~1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services (for the meteorological aids services, until 31 December 2006) (see Resolution **213 (Rev.WRC-95)**). ~~and t~~The use of this band by the mobile-satellite service shall be subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. Sharing between the mobile-satellite service and meteorological-satellite service shall be in accordance with Recommendation ITU-R [SA.1158]. Administrations shall take all practicable steps to improve the radio characteristics of station of meteorological aids service prior to 1 January 2010.

Reasons: To provide a worldwide allocation to MSS, while accommodating the requirement of the meteorological-satellite and meteorological aids services.

EUR/5/271

MOD S5.377 In the band 1 675 - ~~1 710~~1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services ~~(see Resolution 213 (Rev. WRC-95))~~ and the use of this band shall be subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. In order to avoid causing harmful interference to the meteorological-satellite service, mobile earth stations shall not operate, except on a narrow-band signalling channel, within the exclusion zones around the meteorological-satellite earth stations defined in Recommendation ITU-R **SA.1158**. The mobile-satellite system shall have position determination capabilities to ensure compliance with this provision.

IRN/44/8

MOD S5.377 In the band 1 675 - ~~1 710~~1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services (see Resolution **213 (Rev.WRC-95)**) and the use of this band shall be subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The use of the bands 1 683 - 1 698 MHz and 1 698 - 1 710 MHz by MSS is not feasible due to the extensive use by MetSat receivers and FS services.

CAN/35/120

MOD S5.377 In the band 1 675 - ~~1 710~~1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services (see Resolution **213**, *resolves* 2, **(Rev.WRC-~~95~~97)**) and the use of this band shall be subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. In order to avoid causing harmful interference to the meteorological-satellite service, mobile earth stations shall not operate, except on a narrow-band signalling channel, within the exclusion zones around the meteorological-satellite earth stations defined in Recommendation ITU-R **SA.1158**. The mobile satellite system shall have position determination capabilities, or other appropriate interference mitigation techniques, to ensure compliance with this provision.

S5.377A	ADD ADD	EUR/5/272 CAN/35/121

EUR/5/272

ADD S5.377A In the band 1 675 - 1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to or claim protection from existing stations in the fixed service notified and brought into use prior to 21 November 1997.

CAN/35/121

ADD S5.377A In the band 1 675 - 1 683 MHz, operations of stations in the mobile-satellite service shall not cause harmful interference to or claim protection from existing stations in the fixed service notified and brought into use prior to 21 November 1997.

S5.377B	ADD ADD	EUR/5/273 CAN/35/122

EUR/5/273

ADD S5.377B The use of the band 1 675 - 1 683 MHz by the mobile-satellite service shall not commence before 1 July 2000.

Reasons:

1 Sharing between meteorological aids, fixed service and the mobile-satellite service is considered not practicable. It is expected that meteorological aids use can be concentrated in the frequency band 1 683 MHz - 1 690 MHz.

2 (Draft modification of) Recommendation ITU-R SA.1158 concludes that sharing between the meteorological-satellite service and the mobile-satellite service is feasible in the band 1 675 - 1 690 MHz if protection of the main stations is guaranteed.

3 (Draft modification of) Recommendation ITU-R SA.1158 concludes that sharing between the meteorological-satellite service and the mobile-satellite service is not feasible in the band 1 690 - 1 710 MHz.

CAN/35/122

ADD S5.377B The use of the band 1 675 - 1 683 MHz by the mobile-satellite service shall not commence before 1 July 2000.

Reasons:

1 Sharing between meteorological aids, fixed service and the mobile-satellite services is not considered practicable. It is expected that meteorological aids use can be concentrated in the band 1 683 MHz - 1 690 MHz.

2 (Draft modification of) Recommendation ITU-R SA.1158 concludes that sharing between the meteorological-satellite service and the mobile-satellite service is feasible in the band 1 675 - 1 690 MHz if protection of the main meteorological stations is guaranteed.

3 (Draft modification of) Recommendation ITU-R SA.1158 concludes that sharing between the meteorological-satellite service and the mobile-satellite service is not feasible in the band 1 690 - 1 710 MHz.

4 The choice of the band 1 675 - 1 683 MHz for MSS is intended to avoid the main impact of the GVAR and V-VISSAR systems of the meteorological-satellite service.

5 The choice of the band 1 675 - 1 683 MHz for MSS avoids coordination with fixed systems commonly deployed in the band 1 700 - 1 710 MHz.

S5.388	NOC	J/29/16

J/29/16

NOC S5.388

S5.389A	MOD NOC	USA/30/111 J/29/17

USA/30/111
MOD S5.389A

The use of the bands 1 980 - ~~2 010~~2 025 MHz and ~~2 170~~2 160 - 2 200 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A** and to the provisions of MOD Resolution **716 (WRC-~~95~~97)**. The use of these bands shall not commence before 1 January 2000~~; however the use of the band 1 980 - 1 990 MHz in Region 2 shall not commence before 1 January 2005~~.

Reasons: By harmonizing the MSS allocations and access dates, efficient use of spectrum and simplified coordination result.

J/29/17
NOC S5.389A

S5.389B	SUP	CAN/35/140

CAN/35/140
SUP S5.389B

S5.389C	MOD SUP MOD	CAN/35/8,141 USA/30/112 IAP/40/272

USA/30/112
SUP S5.389C

Reasons: Consequential to the global MSS allocations and change in access dates.

CAN/35/8
MOD S5.389C

The use of the bands 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2 by the mobile-satellite service shall not commence before 1 January ~~2005~~2000 and is subject to coordination under Resolution **46 (Rev.WRC-~~95~~97)**/No. **S9.11A** and to the provisions of Resolution **716 (WRC-95)**.

CAN/35/141
MOD S5.389B (see also CAN/35/8)

The use of the bands 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2 by the mobile-satellite service shall not commence before 1 January ~~2005~~2000 and is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A** and to the provisions of Resolution **716 (WRC-95)**.

S5.389CA	ADD	CAN/35/143

CAN/35/143
ADD S5.389CA The use of the bands 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Regions 1 and 3 by the mobile-satellite service shall not commence before 1 January 2005, and is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A** and to the provisions of Resolution **716 (WRC-95)**.

S5.389D	SUP SUP	CAN/35/9,142 USA/30/113

CAN/35/9
SUP S5.389D

CAN/35/142
SUP S5.389D
(see also CAN/35/9)

Reasons: At WRC-95 the date for the coming into force of the common MSS allocations was brought forward from 2005 to 2000. However the date for the Region 2 allocations was not altered which creates an obstacle in planning the implementation of mobile-satellite systems serving that Region.

USA/30/113
SUP S5.389D

Reasons: Consequential to the global MSS allocations and change in access dates.

S5.389E	SUP NOC SUP	USA/30/114 J/29/18 CAN/35/144

USA/30/114
SUP S5.389E

Reasons: Consequential to the global MSS allocations and change in access dates.

J/29/18
NOC S5.389E The use of the bands 2 010 - 2 025 MHz and 2 160 - 2 170 MHz by the mobile-satellite service in Region 2 shall not cause harmful interference to or constrain the development of the fixed and mobile services in Regions 1 and 3.

Reasons: Concerning the IMT-2000 (2 GHz) band, at WRC-95 some administrations requested to allocate additional worldwide MSS bands or to shift existing MSS bands. This would require the further transfer of FS stations and a reduction in the width of the frequency band allocated to terrestrial systems of IMT-2000 (FPLMTS). Therefore, Japan considers that it is

inappropriate neither to shift part of the present allocated frequency nor to make additional allocations to MSS in the IMT-2000 band.

CAN/35/144
SUP S5.389E

S5.403	NOC NOC	J/29/20 NZL/37/27

J/29/20
NOC S5.403

NZL/37/27
NOC S5.403

S5.403A	ADD	J/29/21

J/29/21
ADD S5.403A *Additional allocation*: in Japan, subject to agreement obtained under No. S9.21, the band 2 515 - 2 535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within its national boundary from 1 January 2000.

S5.414	NOC NOC	J/29/22 NZL/37/27

J/29/22
NOC S5.414

NZL/37/27
NOC S5.414

S5.419	NOC NOC	J/29/25 NZL/37/27

J/29/25
NOC S5.419

NZL/37/27
NOC S5.419

S5.420	NOC NOC	J/29/26 NZL/37/27

J/29/26
NOC S5.420

NZL/37/27
NOC S5.420

S5.420A	ADD	J/29/24,27

J/29/27
ADD S5.420A *Additional allocation:* in Japan, subject to agreement obtained under No. S9.21, the band 2 670 - 2 690 MHz may also be used for the aeronautical mobile-satellite service (Earth-to-space) for operations limited to within its national boundary from 1 January 2000.

Reasons: These modifications provide an additional allocation to the aeronautical mobile-satellite service in the band 2 515 - 2 535 MHz and 2 670 - 2 690 MHz from 1 January 2000 to 1 January 2005, for operations limited to within the Japanese national boundary, to cope with the demand for the aeronautical mobile-satellite service.

S18.2bis	ADD	CAN/35/146

CAN/35/146
ADD S18.2*bis* [2021*bis*] (2*bis*)To facilitate the circulation of mobile stations and earth stations, a group of two or more administrations may allow exceptions to the provisions of No. **S18.1 [2020]** by concluding a special agreement to mutually recognize the licences issued by the countries which are parties to the special agreement.

Reasons: The GMPCS Arrangement, recently adopted by the GMPCS Group in the ITU, contains provisions for the participants in the Arrangement to recognize the licences of other countries which are also participants in the Arrangement. This arrangement is not consistent with Article S18 [24] as it is now written. This proposal will regularize the situation.

Ap.S5/An.1/1.2.2.2.1	MOD	USA/30/283

USA/30/283
MOD

ANNEX 1 TO APPENDIX S5 (WRC-95)

1. Coordination thresholds for sharing between MSS (space-to-Earth) and terrestrial services in the same frequency bands and between non-GSO/MSS feeder links (space-to-Earth) and terrestrial services in the same frequency bands

1.2.2 General considerations

1.2.2.2 Characteristics of reference systems in the fixed service

The following parameters represent the set of reference parameters of the fixed service.

1.2.2.2.1 Characteristics of reference digital point-to-point systems

Three different digital systems are described in the following table:

- 64 kbit/s capacity used, for example, for outside-plant (individual subscriber connection);
- 2 Mbit/s capacity used, for example, for business subscriber connections for the local part of the inside-plant;
- 45 Mbit/s capacity used, for example, for trunk networks.

Capacity	64 kbit/s	2 Mbit/s	45 Mbit/s
Modulation	4-PSK	8-PSK	64-QAM
Antenna gain (dB)	33	33	33
Transmit power (dBW)	7	7	1
Feeder/multiplexer loss (dB)	2	2	2
e.i.r.p. (dBW)	38	38	32
Receiver IF bandwidth (MHz)	0.032	0.7	10
Receiver noise figure (dB)	4	4.5	4
Receiver input level for a BER of 10^{-3} (dBW)	–137	–120	–106
~~Maximum long-term interference Total power (dBW)~~	~~–165~~	~~–151~~	~~–136~~
Maximum long-term interference Power spectral density ~~(dB(W/4 kHz))~~ (dB/W/MHz) exceeded for no more than 20% of the time	~~–174~~ -150	~~–173~~ -149	~~–170~~ -146

Antenna pattern:

$G(\varphi) = G_{max} - 2.5 \times 10^{-3} \left(\frac{D\varphi}{\lambda}\right)^2$ for $0 < \varphi < \varphi_m$

~~$G(\varphi) = G_1$ for $\varphi_m \leq \varphi < 75.86(\lambda/D)$~~

~~$G(\varphi) = 49 - 10 \log (D/\lambda) - 25 \log \varphi$ for $75.86(\lambda/D) \leq \varphi < 48°$~~

~~$G(\varphi) = 7 - 10 \log (D/\lambda)$ for $48° \leq \varphi$~~

$G(\varphi) = 39 - 5 \log (D/\lambda) - 25 \log \varphi$ for $\varphi_m \leq \varphi < 48°$

$G(\varphi) = -3 - 5 \log (D/\lambda)$ for $48° \leq \varphi \leq 180°$

where:

$G(\varphi)$: gain relative to an isotropic antenna (dBi)

φ: off-axis angle (degree)

D: antenna diameter

λ: wavelength expressed in the same unit as D

G_1: gain of the first side-lobe = 2 + 15 log (D/λ)

(D/λ may be estimated from 20 log $D/\lambda \approx G_{max} - 7.7$)

G_{max}: main lobe antenna gain (dBi)

$\varphi_m = 20 (\lambda/D) \times \sqrt{(G_{max} - G_1)}$ (degrees)

It should be noted that the above antenna radiation pattern corresponds to the average side-lobe pattern and it is recognized that individual side-lobes may exceed it by up to 3 dB.

Ap.S5/An.1/1.2.2.2.2	MOD	USA/30/284

USA/30/284
MOD

1.2.2.2.2 Characteristics of reference analogue point-to-point systems

Reference circuit	12 hops with 50 km distance between stations
Antenna gain (dBi)	33
e.i.r.p. (dBW)	36
Feeder/multiplexer loss (dB)	3
Receiver noise figure (referred to input of receiver) (dB)	8
Maximum short- and long-term interference ~~per link~~ in the reference circuit ~~(20% of time) (dB(W/4 kHz))~~	~~–170~~
• baseband interfering signal power level not to be exceeded for more than 20% of the time	240 pW0p
• baseband interfering signal power level not to be exceeded for more than 0.01% of the time	50 000 pW0p

Antenna pattern: Use antenna pattern of section 1.2.2.2.1.

Ap.S5/An.1/1.2.2.2.3	MOD	USA/30/285

USA/30/285
MOD

1.2.2.2.3 Characteristics of reference point-to-multipoint systems

Parameter	Central station	Outstation
Antenna type	Omni/Sectoral	Dish/Horn
Antenna gain (dBi)	10/13	20 (analogue) 27 (digital)
e.i.r.p. (max) (dBW) analogue digital	 12 24	 21 34
Noise figure (dB)	3.5	3.5
Feeder/multiplexer loss (dB)	2	2
IF bandwidth (MHz)	3.5	3.5
Maximum permissible long-term interference power (20% time) Total (dBW) dB (W/4 kHz) dB (W/MHz)	 –142 –170 –147	 –142 –170 –147

Antenna pattern:

For the outstation antenna pattern, the reference pattern described in section 1.2.2.2.1 ~~has~~is to be used.

The reference radiation pattern for omnidirectional or sectoral antennas is the following:

$$G(\theta) = G_0 - 12\,(\theta/\varphi_3)^2, \text{ dBi} \qquad 0 \le \theta < \varphi_3$$

$$G(\theta) = G_0 - 12 - 10 \log (\theta/\varphi_3), \text{ dBi} \qquad \varphi_3 \le \theta < 90°$$

where:

G_0 = maximum gain in the horizontal plane (dBi)

θ is the radiation angle above the horizontal plane (degrees)

φ_3 (degrees) is given by:

$$\varphi_3 = \frac{1}{\alpha^2 - 0.818} \text{ degrees}$$

where:

$$\alpha = \frac{10^{0.1G_0} + 172.4}{191}$$

~~It should be noted that the above antenna pattern is provisional and that further study is under way in the ITU-R.~~

Reasons: To update the characteristics of reference fixed systems based on ITU-R studies (Recommendations ITU-R M.1143-1) conducted in response to Resolution 717 (WRC-95), as summarized in Section 4.2.2 of the Report of CPM-97.

Ap.S5/An.1/1.2.3.1	MOD	USA/30/286

USA/30/286
MOD

1.2.3 Determination of the need for coordination between MSS space stations (space-to-Earth) and terrestrial stations

1.2.3.1 Method for the determination of the need for coordination between MSS space stations (space-to-Earth) and other terrestrial services sharing the same frequency band in the 1 to 3 GHz range

Coordination of assignments for transmitting space stations of the mobile-satellite service ~~downlink~~ with respect to terrestrial services is not required if the power flux-density produced at the Earth's surface or the fractional degradation in performance (FDP) of a station in the fixed service does not exceed the threshold values shown in the following table.

Frequency band (MHz)	Terrestrial Service to be protected	Coordination threshold values				
		Geostationary space stations		Non-geostationary space stations		
		pfd (per space station) calculation factors (NOTE 2)		pfd (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz) (NOTE 1)
		~~P dB(W/m²) in 4 kHz~~	r dB/deg	~~P dB(W/m²) in 4 kHz~~	r dB/deg	
1 492 - 1 525	analogue ~~FS~~telephony	~~-152~~ -146 dB(W/m²) in 4 kHz	0.5	~~-152~~ -146 dB(W/m²) in 4 kHz	0.5	
	~~digital FS~~other cases (NOTE 4)	~~-152~~ -128 dB(W/m²) in 1 MHz	0.5	-128 dB(W/m²) in 1 MHz	0.5	25
	~~other terrestrial services (NOTE 4)~~	~~-152~~	~~0.5~~	~~-152~~	~~0.5~~	
1 525 - 1 530	analogue ~~FS~~telephony	~~-152~~ -146 dB(W/m²) in 4 kHz	0.5	~~-152~~ -146 dB(W/m²) in 4 kHz	0.5	
	~~digital FS~~other cases	~~-152~~ -128 dB(W/m²) in 1 MHz	0.5	-128 dB(W/m²) in 1 MHz	0.5	25
	~~other terrestrial services (NOTE 4)~~	~~-152~~	~~0.5~~	~~-152~~	~~0.5~~	
2 160 - 2 200 (NOTE 3)	analogue ~~FS~~telephony	~~-152~~ -146 dB(W/m²) in 4 kHz	0.5	~~-147~~ -141 dB(W/m²) in 4 kHz	0.5	
	~~digital FS~~other cases	~~-152~~ -128 dB(W/m²) in 1 MHz	0.5	-123 dB(W/m²) in 1 MHz	0.5	25
	~~other terrestrial services (NOTE 4)~~	~~-152~~	~~0.5~~	~~-147~~	~~0.5~~	

Frequency band (MHz)	Terrestrial Service to be protected	Coordination threshold values				
		Geostationary space stations		Non-geostationary space stations		
		pfd (per space station) calculation factors (NOTE 2)		pfd (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz) (NOTE 1)
		~~P dB(W/m²) in 4 kHz~~	~~r~~ dB/deg	~~P dB(W/m²) in 4 kHz~~	~~r~~ dB/deg	
2 483.5 - 2 500	~~fixed~~all cases	~~-152~~ -128 dB(W/m²) in 1 MHz and -146 dB(W/m²) in 4 kHz	0.5	~~-150~~ -128 dB(W/m²) in 1 MHz and -146 dB(W/m²) in 4 kHz	0.65	
	~~other terrestrial services (NOTE 4)~~	~~-152~~	~~0.5~~	~~-150~~	~~0.65~~	
2 500 - 2 520	analogue ~~FS~~telephony	~~-152~~ -146 dB(W/m²) in 4 kHz	0.5	~~-152~~ -146 dB(W/m²) in 4 kHz	0.5	
	~~digital FS~~other cases	~~-152~~ -128 dB(W/m²) in 1 MHz	0.5	-128 dB(W/m²) in 1 MHz	0.5	25
	~~other terrestrial services (NOTE 4)~~	~~-152~~	~~0.5~~	~~-152~~	~~0.5~~	
2 520 - 2 535	analogue ~~FS~~telephony	~~-160~~ -154 dB(W/m²) in 4 MHz	0.75	~~-152~~ -146 dB(W/m²) in 4 MHz	0.5	
	~~digital FS~~other cases	~~-160~~ -136 dB(W/m²) in 1 MHz	0.75	-128 dB(W/m²) in 1 MHz	0.5	25
	~~other terrestrial services (NOTE 4)~~	~~-160~~	~~0.75~~	~~-152~~	~~0.5~~	

NOTE 1 – The calculation of FDP (fractional degradation in performance) is contained in section 1.2.2.1, using reference FS parameters contained in sections 1.2.2.2.1 and 1.2.2.2.3.

NOTE 2 – The following formula should be used for deriving the coordination threshold in terms of power flux-density:

P ~~dB(W/m²/4 kHz)~~ for $0° \le \delta \le 5°$

$P + r(\delta - 5)$ ~~dB(W/m²/4 kHz)~~ for $5° < \delta \le 25°$

$P + 20r$ ~~dB(W/m²/4 kHz)~~ for $25° < \delta \leq 90°$

where δ is the angle of arrival (degrees).

The threshold values are obtained under assumed free-space propagation conditions.

NOTE 3 – The coordination threshold in the band 2 160 - 2 270 MHz (Region 2) and 2 170 - 2 200 MHz (all regions) to protect other terrestrial services does not apply to the terrestrial component of the Future Public Land Mobile Telecommunication Systems (FPLMTS), as the satellite and the terrestrial components are not intended to operate in the same area or on common frequencies within these bands.

~~NOTE 4 – The coordination threshold factors applicable to other terrestrial services may be reviewed at a future conference, as necessary.~~

NOTE 4 - Exceptions for the band 1 492 - 1 525 MHz are as follows:

4.1 For the land mobile service on the territory of Japan (No. **S5.348A**): -150 dB(W/m²) in 4 kHz.

4.2 For the aeronautical mobile service for telemetry (No. **S5.343**), the requirement for coordination is determined by frequency overlap (No. **S5.348**).

Reasons: To update the coordination thresholds based on ITU-R studies (Recommendations ITU-R M.1141-1 and M.1142-1) conducted in response to Resolution 717 (WRC-95), as summarized in Section 4.2.2 of the Report of CPM-97.

Res. 208 (Mob-87)	SUP SUP	EUR/5/298 J/29/29

EUR/5/298
SUP

RESOLUTION No. 208 (Mob-87)

Reasons: Europe considers that Resolution 208 should be suppressed for the reasons indicated in the relevant ECP to WRC-95 (EUR/5/73), namely:

1 Since Mob-87 there have been a great number of GSO (and NGSO) mobile-satellite service satellite networks planned to provide regional or worldwide service within the above bands (currently over 150 Advance Publications). In the 1.5/1.6 GHz worldwide mobile-satellite service allocation, where worldwide and regional mobile-satellite service systems already provide or will provide valuable AMS(R)S, AMSS, MMSS, GDMSS and LSS services, the *de facto* utilization is for extra-national mobile-satellite service. The LMSS service is increasingly of a worldwide nature and the restriction to national service is again questionable. Therefore the restriction to national service is no longer relevant or indeed practical.

2 The 2.5/2.6 GHz mobile-satellite service allocations, since WARC-92, are already subject to a limitation to mobile-satellite service systems providing national service. Extending such a precedence to national service in the 1.5/1.6 GHz mobile-satellite service bands is unnecessary and unrealistic.

3 The coordination provisions of Article 11 and, since WARC-92, Resolution 46, already provide the necessary and complete regulatory framework to obtain the agreement of concerned and affected administrations.

Furthermore, the suppression of Resolution 208 is a consequential modification arising from the proposal to suppress S5.360 given in EUR/5/285.

J/29/29
SUP

RESOLUTION No. 208 (Mob-87)

EXTENSION OF THE FREQUENCY BANDS ALLOCATED TO THE MOBILE-SATELLITE AND MOBILE SERVICES AND THEIR CONDITIONS OF USE

Reasons: Japan considers that Resolution 208 should be suppressed because the worldwide allocation on generic use basis have been strongly required in the 1.5/1.6 GHz mobile-satellite service allocation, where worldwide and regional mobile-satellite service systems already provide or will provide various categories of service.

Res. 213 (Rev.WRC-95)		SEN/9/21 KEN/UGA/TZA/47/37 UZB/59/19 CAN/35/123 KEN/70/31

SEN/9/21

Given the general difficulties of sharing between MSS and FS, and the use of the band 1 492 - 1 525 MHz for the fixed and mobile services by many administrations, we are not in favour of the use of a portion of the band for MSS downlink operations.

KEN/UGA/TZA/47/37

4.9 Resolution 213 (Rev.WRC-95) - Sharing studies concerning possible use of the band 1 675 - 1 710 MHz by the mobile-satellite service

ITU-R should consider the studies already done and give appropriate recommendations before sharing can be considered in this band.

UZB/59/19

Uzbekistan supports the results of the studies carried out by CPM-97 on the feasibility of sharing between MSS and MetSat services in the band 1 675 - 1 690 MHz and its unfeasibility in the bands 1 690 - 1 698 MHz and 1 698 - 1 710 MHz, on condition that MSS stations operating in the band 1 675 - 1 690 MHz must not cause harmful interference to MetSat earth stations.

With respect to the identification of downlink bands for the MSS, account must be taken of the fact that Uzbekistan is planning to develop the FS in the band 1 492 - 1 525 MHz.

We consider that primary use of the band 1 559 - 1 567 MHz must be for the radionavigation service and GNSS (GPS and GLONASS).

We are of the view that further studies must be carried out in this connection.

CAN/35/123
MOD

RESOLUTION 213 (Rev.WRC-~~95~~97)

SHARING STUDIES CONCERNING POSSIBLE USE OF THE UPLINK BAND 1 675 - ~~1 710~~1 683 MHz AND ASSOCIATED DOWNLINK BAND BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, ~~1995~~1997),

considering

a) that the agenda of this Conference requested the consideration~~, *inter alia*, of a review of the technical constraints associated with the allocation to the mobile-satellite service (MSS)~~ of Resolution 213 (WRC-95);

~~*b) that the frequency band 1 675 - 1 710 MHz is already allocated to the MSS (Earth-to-space) on a primary basis in Region 2;*~~

~~*c)*~~*b)* that this Conference ~~considered proposals for reducing the technical constraints on the MSS for part of the frequency band 1 675 - 1 710 MHz, but concluded that the required studies were incomplete~~allocated the band 1 675 - 1 683 MHz, on a worldwide basis, to the mobile-satellite service in the Earth-to-space direction, in addition to other services;

~~*d) that the band 1 675 - 1 710 MHz is mainly used by the meteorological-satellite and meteorological aids services, and studies indicate that parts of this band are used by the meteorological-satellite service in a way which may allow sharing with the MSS, but that there are currently more than 5 400 meteorological-satellite receiving terminals in the band 1 690 - 1 710 MHz registered with the World Meteorological Organization (WMO);*~~

~~*e) that there are few main meteorological earth stations in the 1 675 - 1 690 MHz band, but these are the main control and operating stations for meteorological-satellite systems and must therefore receive adequate protection;*~~

~~*f) that studies to date and the conclusions of the 1995 Conference Preparatory Meeting indicate that sharing of part of the band 1 675 - 1 710 MHz between the meteorological-satellite and the mobile-satellite services may be feasible, taking into account Recommendation ITU-R SA.1158 and the results of other sharing studies still to be completed;*~~

~~*g) that parts of the frequency band 1 675 - 1 710 MHz are also allocated to the fixed and mobile services;*~~

~~*h)*~~*c)* that improvements in some of the radiocommunication characteristics of meteorological aids in the band 1 670 - 1 700 MHz are technically possible, and that these may improve sharing possibilities involving these systems;

~~*i)*~~*d)* that the cost impact of improving the radiocommunication characteristics of meteorological aids may reduce their usage in large areas of the world (see Recommendation ITU-R **SA.1165**);

~~*j) that there is a need to determine the operational and technical means of preventing harmful interference to the services referred to in d) above,*~~

e) that the use of large numbers of earth stations at unspecified locations by some meteorological-satellite systems limits the ability of such systems to share spectrum with mobile-satellite systems operating in the Earth-to-space direction;

f) that the limitation indicated in *e)* could be alleviated if future generations of meteorological-satellite links to GVAR and V-VISSAR earth stations could be relocated at other frequencies within the band 1 670 - 1 710 MHz when follow-on geostationary satellites are brought into service;

g) that Resolution **213 (WRC-95)** invited the ITU-R to investigate a potentially suitable downlink band to be used in conjunction with use of the band 1 675 - 1 683 MHz in the uplink direction;

h) that one such possible band is the band 1 559 - 1 567 MHz;

j) that further studies are required to determine the feasibility of the sharing of spectrum between a downlink of the mobile-satellite service and other services, particularly the radionavigation-satellite service, in this band,

resolves to invite ITU-R

1. as a matter of urgency, and in time for the ~~1997~~1999 World Radiocommunication Conference (WRC-~~97~~99), to complete the technical and operational studies on the feasibility of sharing of the band concerned between the services referred to in ~~*d) and g)*~~*j)* above and the MSS, and on the required means for preventing harmful interference~~,~~;

2. as a matter of urgency, in time for the 1999 World Radiocommunications Conference (WRC-99), and in consultation with the WMO, to determine an appropriate transition plan for the relocation of meteorological aids stations outside of the band 1 675 - 1 683 MHz taking into account the requirements of the meteorological aids and mobile-satellite services,

further invites

1. administrations and interested parties (e.g. WMO and ICAO) to participate actively in such studies, by submitting relevant contributions;

2. ITU-R to continue to investigate a potentially suitable downlink band that may assist in meeting the spectrum requirements of the MSS,

instructs the Secretary-General

to bring this Resolution to the notice of WMO and ICAO.

Reasons: This proposed modification to Resolution 213 is intended to focus ITU-R studies on implementing MSS in the band 1 675 - 1 683 MHz and as well determining the feasibility of implementing MSS in the band 1 559 - 1 567 MHz, taking into account the characteristics and operations of the existing and planned systems of the other services currently allocated in the band.

KEN/70/31

4.11 Resolution 213 (Rev.WRC-95) - Sharing studies concerning possible use of the band 1 675 - 1 710 MHz by the mobile-satellite service

The Administration of Kenya proposes that the ITU should consider the studies already done and give appropriate recommendations before the sharing can be considered in this band.

Res. 215 (WRC-95)		KEN/UGA/TZA/47/35 UGA/55/12 UZB/59/20 KEN/70/29 IAP/40/227 TZA/80/24

KEN/UGA/TZA/47/35

4.7 Resolution 215 (WRC-95) - Coordination process among non-geostationary mobile-satellite systems

WRC-97 should study the developed Recommendations with a view to facilitating sharing and coordination.

UGA/55/12

1) WRC-97 should urge the non-GSO MSS to examine further the different band-sharing possibilities with the aim of adopting technologies that are capable of sharing.

2) Studies should be urgently carried out under ITU and pursuant to Resolution 215 to define coordination techniques in order to reduce uncertainties during satellite design.

3) Further allocations of spectrum for MSS should be prioritized, giving preference to what is generally considered to be a spectrum - efficient frequency - access scheme.

UZB/59/20

For the purposes of effecting coordination among non-GSO MSS systems the Appendix 29 criteria should be used, as indicated in the corresponding ITU-R M-series Recommendations.

KEN/70/29

4.9 Resolution 215 (WRC-95) - Coordination process among non-geostationary mobile-satellite systems

The Administration of Kenya proposes that WRC-97 should study the developed recommendations with a view to facilitating sharing and coordination.

IAP/40/227
MOD

RESOLUTION 215 (~~WRC-95~~WRC-97)

COORDINATION PROCESS AMONG NON-GEOSTATIONARY MOBILE-SATELLITE SYSTEMS

The World Radiocommunication Conference (Geneva, ~~1995~~1997),

considering

a) that space-to-Earth transmissions of non-geostationary (non-GSO) mobile-satellite systems are constrained to limit their power flux-density over areas where the frequency band is shared with terrestrial systems;

b) that a number of proposed non-GSO mobile-satellite systems can provide a good service to users within the power flux-density limits given in Annex 2 of Resolution **46 (Rev.WRC-95)**/Annex 1 to Appendix **S5**;

c) that when maximum communication capacity is achieved by non-GSO systems in the mobile-satellite service a major portion of the interference into each of these systems will come from the other mobile-satellite systems sharing the frequency band, and, consequently, if one system starts to transmit at higher power, all others need to do the same in order to overcome mutual interference;

d) that the ITU-R is studying the efficient use of the radio spectrum and frequency sharing within the mobile-satellite service, that Recommendations ITU-R M.1186 and M.1187 are a basis for further study, and that additional preliminary texts are available or can be provided by administrations on this matter~~,~~;

e) that capacities in a codirectional, co-frequency and co-coverage sharing environment of systems using spread-spectrum multiple access techniques are affected by technical and operational characteristics of other mobile-satellite service systems using similar multiple access techniques,

recognizing

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

1. criteria to be established by the ITU-R to be used in determining the need to coordinate between mobile-satellite systems; and

2. detailed methods of interference calculation to be used by administrations in the coordination process~~,~~;

3. ITU-R studies that should not impede the timely deployment of any mobile-satellite service systems,

resolves to invite ITU-R

to continue its studies on this subject and develop, as a matter of urgency, criteria for determining the need to coordinate and calculation methods for determining levels of interference, as well as the required protection ratios between networks in the mobile-satellite service,

further resolves

to focus the ITU studies on the technical and operational characteristics of systems using multiple access techniques that can allow co-frequency, co-coverage, codirectional sharing but which involve the cooperation among systems' operators to maximize the efficient use of spectrum by multiple mobile-satellite service systems using such access techniques,

invites the Council

to include this Resolution in the agenda of ~~WRC-97~~WRC-99 in order that that Conference consider the results of these studies and take such action as may be appropriate with a view to achieving an efficient use of the spectrum.

TZA/80/24

Tanzania takes note of the process on sharing among non-GSO MSS networks under these Resolutions and supports the views of the CPM-97 Report on ITU-R developing new recommendations to satisfy methods of sharing among the services.

Res. 716 (WRC-95)	MOD	SEN/9/30 USA/30/115 KEN/UGA/TZA/47/38 AFS/71/9A KEN/70/32 TZA/80/27,28,29,30

SEN/9/30

With regard to coordination between the MSS and the fixed service, we approve the implementation of a standard computation program to enable administrations to determine the need for coordination of non-GSO MSS (space-to-Earth) systems with the fixed service.

USA/30/115
MOD

RESOLUTION 716 (Rev.WRC-~~95~~97)

USE OF THE FREQUENCY BANDS 1 980 - ~~2 010~~2 025 MHz AND ~~2 170~~2 160 - 2 200 MHz ~~IN ALL THREE REGIONS AND 2 010 - 2 025 MHz AND 2 160 - 2 170 MHz IN REGION 2~~ BY THE FIXED AND MOBILE-SATELLITE SERVICES AND ASSOCIATED TRANSITION ARRANGEMENTS

The World Radiocommunication Conference (Geneva, ~~1995~~1997),

considering

a) that the 1992 World Administrative Radio Conference (WARC-92) allocated the bands 1 980 - 2 010 MHz and 2 170 - 2 200 MHz for the mobile-satellite service with a date of entry into force of 1 January 2005, these allocations being co-primary with fixed and mobile service allocations;

b) that the use of the frequency bands 1 980 - ~~2 010~~2 025 MHz and ~~2 170~~2 160 - 2 200 MHz ~~in all three Regions and 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2~~ by the mobile-satellite

service (MSS) is subject to a date of entry into force of 1 January 2000 ~~or 1 January 2005~~, in accordance with the provisions of Nos. MOD **S5.389A**, ~~**S5.389C and S5.389D**~~ of the Radio Regulations, as adopted by this Conference;

c) that these bands are shared with the fixed and mobile[1] services on a primary basis and that they are widely used by the fixed service in many countries;

d) that the studies made have shown that, while sharing of the MSS with the fixed service in the short to medium term would be generally feasible, in the long term sharing will be complex and difficult in both bands, so that it would be advisable to transfer the fixed service stations operating in the bands in question to other segments of the spectrum;

e) that for many developing countries, the use of the 2 GHz band offers a substantial advantage for their radiocommunication networks and that it is not attractive to transfer these systems to higher frequency bands because of the economic consequences that this would entail;

f) that in response to Resolution **113 (WARC-92)** the ITU-R has developed a new frequency plan for the fixed service in the 2 GHz band, set out in Recommendation ITU-R F.1098 which will facilitate the introduction of new fixed service systems in band segments that do not overlap with the above-mentioned MSS allocations at 2 GHz;

g) that sharing between fixed service systems using tropospheric scatter and Earth-to-space links in the MSS in the same frequency band segments is generally not feasible;

h) that some countries utilize these bands in application of Article 48 of the Constitution of the International Telecommunication Union (Geneva, 1992),

recognizing

a) that WARC-92 identified the bands 1 885 - 2 025 MHz and 2 110 -2 200 MHz for worldwide use by FPLMTS, that the satellite component ~~being limited to~~ of FPLMTS was expected to be necessary by the year 2010 and implemented using the frequencies 1 980 - 2 010 MHz and 2 170 - 2 200 MHz, and that the development of FPLMTS can offer great potential in helping the developing countries develop more rapidly their telecommunications infrastructure;

b) that in Resolution **22 (WARC-92)**, "Assistance to the Developing Countries to Facilitate the Implementation of Changes in Frequency Band Allocations Which Necessitate the Transfer of Existing Assignments", WARC-92 resolved to request the Telecommunication Development Bureau (BDT), when formulating its immediate plans for assistance to the developing countries, to consider the introduction of specific modifications in the radiocommunication networks of the developing countries and that a future world development conference should examine the needs of developing countries and should assist them with the resources needed to implement the required modifications to their radiocommunication networks,

---

[1] This Resolution does not apply to the mobile service. In this respect, the use of these bands by the mobile-satellite service is subject to coordination with the mobile service under the provisions of Resolution **46 (Rev.WRC-95)**/No. **S9.11A**.

resolves

1. to request administrations to notify to the Radiocommunication Bureau the basic characteristics of frequency assignments to existing or planned fixed stations requiring protection, or those typical[1] of existing and planned fixed stations brought into use before 1 January 2000 in the frequency bands 1 980 - ~~2 010~~2 025 MHz and ~~2 170~~2 160 - 2 200 MHz ~~in all three Regions and 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2~~;

2. that administrations proposing to bring an MSS system into service must take account of the fact that, when coordinating their system with administrations having terrestrial services, such administrations may have existing or planned installations covered by Article 48 of the Constitution;

3. that in the application of No. **S9.11A**/Resolution **46(Rev.WRC-97)**, with respect ~~of~~to stations of the fixed service ~~taken into account in the application of Resolution 46 (Rev.WRC-95)~~, administrations responsible for MSS networks operating in the bands 1 980 - ~~2 010~~2 025 MHz and ~~2 170~~2 160 - 2 200 MHz ~~in all three Regions and 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2 shall~~will be able to ensure that unacceptable interference is not caused to fixed service stations notified and brought into use before 1 January 2000;

4. that to facilitate the introduction and future use of the 2 GHz bands by the MSS:

4.1 administrations are urged to ensure that frequency assignments to new fixed service systems, to be brought into operation after 1 January 2000, do not overlap with the 1 980 - ~~2 010~~2 025 MHz and ~~2 170~~2 160 - 2 200 MHz ~~in all three Regions and 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2~~ MSS allocations, for example by using the channel plans of Recommendation ITU-R F.1098;

4.2 administrations are urged to take all practicable steps to phase out troposcatter systems operating in the band 1 980 - ~~2 010~~2 025 MHz ~~in all three Regions and 2 010 - 2 025 MHz in Region 2~~ by 1 January 2000. New troposcatter systems shall not be brought into operation in these bands;

4.3 administrations are encouraged, where practicable, to draw up plans for the gradual transfer of the frequency assignments to their fixed service stations in the bands 1 980 - ~~2 010~~2 025 MHz and ~~2 170~~2 160 - 2 200 MHz ~~in all three Regions and 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2~~ to non-overlapping bands, giving priority to the transfer of their frequency assignments in the band 1 980 - ~~2 010~~2 025 MHz ~~in all three Regions and 2 010 - 2 025 MHz in Region 2~~, considering the technical, operational and economical aspects;

5. that administrations responsible for the introduction of mobile-satellite systems should take into account and address the concerns of affected countries, especially developing countries, to minimize the possible ~~economic~~ impact of transition measures in respect to existing systems;

6. to invite the Radiocommunication Bureau to provide assistance to developing countries requesting it for the introduction of specific modifications to their radiocommunication networks that will facilitate their access to the new technologies being developed in the 2 GHz band as well as in all coordination activities;

---

[1] With respect to the notification of frequency assignments to stations in the fixed and mobile services, the characteristics of typical stations may be notified in accordance with No. ~~1223~~ ~~(~~**S11.17**~~)~~ without restriction up until 1 January 2000.

7. that administrations responsible for the introduction of mobile-satellite systems urge their mobile-satellite system operators to participate in the protection of terrestrial fixed services especially in the least developed countries,

requests

1. the ITU-R to conduct, as a matter of urgency, further studies, in conjunction with the Radiocommunication Bureau, to:

1.1 develop and provide to administrations the necessary tools in a timely manner to assess the impact of interference in the detailed coordination of mobile-satellite systems;

1.2 develop the necessary planning tools as soon as possible to assist those administrations considering a replanning of their terrestrial fixed networks in the 2 GHz range;

2. the Telecommunication Development Sector to evaluate, as a matter of urgency, the financial and economic impact on the developing countries of the transfer of fixed services, and to present its results to a future competent WRC and/or WDC,

instructs the Director of the Radiocommunication Bureau

to submit a report on the implementation of this Resolution to world radiocommunication conferences.

Reasons: Consequential to global MSS allocations and access dates.

KEN/UGA/TZA/47/38

4.10 Resolution 716 (WRC-95) - Use of the frequency bands 1 980 - 2 010 MHz and 2 170 - 2 200 MHz in all three Regions and 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2 by the fixed and mobile-satellite services and associated transition arrangements

The Administrations submitting this document propose that:

- new Recommendations should include transitional planning tools to provide protection to fixed terrestrial services;
- ITU-R continue the ongoing studies and include examination of the effect of interference due to reflections from the Earth's surface.

AFS/71/9A

Resolutions 716 and 717 (WRC-95)

South Africa supports the earlier entry into force for MSS services and accordingly with respect to Resolution 716 has instituted plans to accommodate Fixed Services (FS) in bands adjacent to the MSS bands as allocated for Region 1. As a result, South Africa has effectively made secure provision for 2 GHz FS operators and is concerned about possible changes to ITU-R Recommendation F.1098 due to possible changes to the 1 980 - 2 010/2 170 - 2 200 MHz allocations to conform with proposals by Region 2.

South Africa is using a phased approach for the migration of terrestrial users from the current 2 GHz plans to ITU-R Recommendation F.1098 and has serious concerns with regard to the possibility of any increase or change in the 2 GHz allocations for MSS. Any such increase or change to the 2 GHz MSS allocation would cause difficulties due to requirements for protection of existing terrestrial FS,

as well as advanced plans for the introduction of MSS and new terrestrial FS within this area of the frequency spectrum that form a cardinal part of achieving Universal Service. As a result South Africa cannot support any change in the 2 GHz MSS allocations.

Due to the complexity of the South African solutions within this area of the band South Africa has a keen interest in the applicability of the tools and techniques being made available to reduce the impact of replanning this area of the band.

KEN/70/32

The Administration of Kenya proposes that:

1) new recommendations should include transitional planning tools to provide protection to fixed services;

2) ITU-R continues the ongoing studies and includes the examination of the effect of interference due to reflections from the Earth's surface.

TZA/80/27

Early entry should not start until the relevant ITU-R ongoing studies are completed.

TZA/80/28

Resolution 716 (Rev.WRC-95) - Review of allocations to the mobile-satellite service in the 2 GHz range

Tanzania supports no change in the 2 GHz allocations to the following frequency bands:

i) 1 545 - 1 555 MHz aeronautical-mobile (R) service (s-E). It supports no change to S5.341, S5.351, S5.357, S5.358, S5.359;

ii) 1 646.5 - 1 656.5 MHz aeronautical-mobile (R) service (E-s). It supports no change to S5.341, S5.351, S5.354, S5.358, S5.359, S5.376.

Reasons: In order to protect current terrestrial fixed services including safety of life services while transiting to implement S + DX based satellite technology.

TZA/80/29

Sharing with the radionavigation-satellite service

Tanzania supports studies on in-band sharing effects between ARNS/RNSS which should be fully examined in close coordination with ICAO in respect of critical safety information and data on aviation.

TZA/80/30

Sharing within existing allocations in the bands 1 525 - 1 559 MHz and 1 626.5 - 1 660.5 MHz

Tanzania supports close collaboration with ICAO and IMO in respect of sharing effects on these services when they are shared on a generic spectrum allocation basis.

Reasons: In order to achieve the required protection to and compatibility with GMDSS and AM(R) services within the band.

Rec. 717 (Rev.WRC-95)		SEN/9/31 KEN/UGA/TZA/47/36 KEN/70/30 UZB/59/21

SEN/9/31

We propose that WRC-97 maintain the exclusive allocation to the aeronautical mobile-satellite (R) service of the frequency bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, for as long as the results of the compatibility studies are not known.

KEN/UGA/TZA/47/36

4.8 Recommendation 717 (Rev.WRC-95) - Frequency sharing in bands shared by the mobile-satellite service and the fixed, mobile and other terrestrial services below 3 GHz

The footnotes S5.221 and S5.359 should be respected.

KEN/70/30

The Administration of Kenya proposes that footnotes S5.221 and S5.359 be respected.

UZB/59/21

We consider that the matter of increased access to the spectrum for the MSS should be addressed within the context of agenda item 1.9.1 as a whole.

The matter of frequency sharing with the radio astronomy and radionavigation services requires further study.

Rec. 721 (WRC-95)	MOD	EUR/5/297 UZB/59/22

EUR/5/297
MOD

~~RECOMMENDATION 721 (WRC-95)~~RESOLUTION [EUR-10] (WRC-97) (721 MOD)

FREQUENCY SHARING IN THE BANDS 1 610.6 - 1 613.8 MHz AND 1 660 - 1 660.5 MHz BETWEEN THE MOBILE-SATELLITE SERVICE AND THE RADIO ASTRONOMY SERVICE

The World Radiocommunication Conference (Geneva 199~~5~~7),

with a view

to ~~facilitating the~~allow the most efficient use of frequency bands allocated to the mobile-satellite service (MSS) and the radio astronomy service by these services, and with due regard to ~~existing~~the other services to which those bands are also allocated,

considering

a) that the band 1 610.6 - 1 613.8 MHz is allocated to the radio astronomy service and the mobile-satellite service (Earth-to-space) on a shared, primary basis, and that the band 1 660 - 1 660.5 MHz is allocated to the radio astronomy service and the land mobile satellite service (Earth-to-space) on a shared, primary basis;

b) that No. **[733E] S5.372** of the Radio Regulations states that "harmful interference shall not be caused to stations of the radio astronomy service using the band 1 610.6 - 1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services ([No. **2904**] **S29.13** applies)"; and that Article **[36] S29** also points out that emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service;

c) that the nature of objects studied by the radio astronomy service in the bands 1 610.6 - 1613.8 MHz and 1 660 - 1 660.5 MHz demands maximum flexibility in the planning of ~~observatory frequency selection~~observation frequencies;

d) that in the bands 1 610.6 - 1 613.8 MHz and 1 660 - 1 660.5 MHz, which are shared between the radio astronomy service and the mobile-satellite service, operational constraints are necessary for mobile earth stations of the mobile-satellite service;

e) that Recommendation ITU-R M.829-1, which relates to sharing between the mobile-satellite service and the radio astronomy service in the band 1 660 - 1 660.5 MHz, notes that further studies are required, particularly in the areas of propagation models and assumptions used for the determination of separation distances;

~~*f)* that other studies are currently being conducted within ITU-R on sharing between mobile earth stations of the mobile-satellite service and the radio astronomy service in the band 1 610.6 - 1 613.8 MHz;~~

f) that Recommendation ITU-R M.[8D/XN] shall, according to No. **S5.372A**, be used in order to facilitate coordination between the mobile earth stations and radio astronomy stations in the bands 1 610.6 - 1 613.8 and 1 660 - 1 660.5 MHz;

g) that no experience could be gained up to now with the use of the Recommendation mentioned in *considering f)*;

~~*g*~~*h)* that the threshold levels of interference detrimental to the radio astronomy service are given in Recommendation ITU-R RA.769,

resolves

that a future competent conference shall evaluate the frequency sharing in the bands 1 610.6 - 1 613.8 MHz and 1 660 - 1 660.5 MHz between the mobile-satellite service (MSS) and the radio astronomy service, based upon the experience gained with the use of S5.372A and the relevant ITU-R Recommendations,

invites ITU-R

~~1. to conclude its studies on propagation mechanisms, including those necessary for maritime and aeronautical environments, in order to establish appropriate separation distances between mobile earth stations of the mobile-satellite service and radio astronomy stations;~~

~~2. to conclude its studies on technical means to be adopted by stations of the mobile-satellite service, including blockage of emissions and the use of directional antennas where feasible, when mobile earth stations operate within the separation distances referred to in *invites* 1 above;~~

~~3. to report on the outcome of those studies in time for consideration by a competent conference,~~

to submit a report to such a future conference on evaluating the effectiveness of recommendations aiming to facilitate sharing between the mobile-satellite service and the radio astronomy service,

urges administrations

to participate actively in ~~those studies~~this evaluation.

UZB/59/22

Protection of the RAS from harmful interference from the MSS must be continued.

Furthermore, the Republic of Uzbekistan considers that when allocating spectrum to the MSS as a whole, WRC-97 must take into account the fact that the bands 1.5/1.6 GHz are allocated and are used by a number of countries (including Uzbekistan) on the basis of the existing allocation of frequencies. Therefore, when any decision is taken, priority must be accorded to the maritime and aeronautical mobile services as safety-related services.

Draft Res. [ASP-2]	ADD	ASP/14/167

ASP/14/167
ADD

DRAFT RESOLUTION [ASP-2]

USE OF THE 1.5/1.6 GHz BANDS BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the conversion of certain bands to generic MSS allocation would facilitate introduction of MSS networks;

b) that the bands 1 525 - 1 544 MHz and 1 626.5 - 1 645.5 MHz have been allocated on a generic basis to MSS to facilitate flexible use of this spectrum by multiple MSS systems;

c) that this Conference has reviewed the use of the bands 1 530 - 1 544/1 631.5 - 1 645.5 MHz for MSS stations participating in the GMDSS in order to provide spectrum to fulfil the global maritime service requirements while providing protection for GMDSS pursuant to No. [**MOD S5.353**];

d) that the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz are currently allocated exclusively to the AMS(R)S on a worldwide basis;

e) that WRC-95, through Recommendation **34 (WRC-95)**, recommended that spectrum should be allocated on worldwide basis to the most broadly defined services,

recognizing

a) that subject to further study and validation by ITU-R and IMO it may be feasible and desirable to relax the constraints on MSS in the bands included in No. **[MOD S5.353]** at a future WRC in order to further facilitate flexible use of this spectrum by multiple MSS systems, while providing full protection for GMDSS distress and safety requirements and taking into account anticipated spectrum requirements for these services;

b) that subject to further study by ITU-R and ICAO it may be feasible to allocate the 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz bands to generic MSS with appropriate protection for distress and safety communications,

resolves

that WRC-99 review the constraints on the MSS allocations and establish how to protect the AMS(R)S,

invites ITU-R

1 as a matter of urgency to:

i) study the technical, operational and economic feasibility of relaxing the constraints to MSS allocations in all or parts of the bands referred to in *considering* a);

ii) study the feasibility of allocating the exclusive AMS(R)S bands referred to in *considering* d) to the generic MSS taking into account the need for protection of safety related communications;

iii) complete these studies and report the results to WRC-99;

2 to invite administrations and ICAO and IMO to participate actively in these studies.

Draft Res. [ASP-3]	ADD	ASP/14/170

ASP/14/170
ADD

DRAFT RESOLUTION [ASP-3]

USE OF THE BAND 1 559 - 1 567 MHz BY THE MOBILE-SATELLITE SERVICE (SPACE-TO-EARTH)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559 - 1 567 MHz is currently allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that the WRC-97 has made an allocation of this band to the mobile-satellite service (space-to-Earth) subject to an appropriate protection of the aeronautical radionavigation and radionavigation-satellite services;

c) that the use of this band involves services which are safety of life services;

d) that there is a shortage of frequency spectrum for the mobile-satellite services,

resolves

1 that the WRC-99 establish sharing criteria including the appropriate value of power flux-density of mobile-satellite service space stations to protect the aeronautical radionavigation and radionavigation-satellite services;

2 that the use of this band by the MSS shall be subject to the establishment of appropriate sharing criteria,

invites ITU-R

to complete, as a matter of urgency, the necessary study to recommend sharing criteria including the appropriate value of power flux-density of mobile-satellite service space stations to protect the aeronautical radionavigation and radionavigation-satellite services, taking into account the studies already carried out,

further invites administrations and concerned organizations

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

Reasons: To provide a worldwide allocation to MSS, while ensuring the protection of GNSS through No. S5.341A and the Resolution [ASP-3].

Draft Res. [EUR-9]	ADD	EUR/5/293

EUR/5/293
ADD

DRAFT RESOLUTION [EUR-9]

USE OF THE BANDS 1 525 - 1 559 MHz AND 1 626.5 - 1 660.5 MHz BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that WRC-97 allocated the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to mobile-satellite systems in the most flexible manner practicable;

b) that Appendix **S15.2** identifies the bands 1 530 - 1 544 MHz (s-E) and 1 626.5 - 1 645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes;

c) that prior to WRC-97 No. **S5.353** provided for an additional allocation in some countries for the use of the bands 1 530 - 1 544 MHz and 1 631.5 - 1 645.5 MHz by the mobile-satellite service on the condition that maritime mobile-satellite distress and safety communications have priority access over all other communications;

d) that prior to WRC-97 No. **S5.362** provided for an alternative allocation in some countries for the use of the bands 1 555 - 1 559 MHz and 1 656.5 - 1 660 MHz by the mobile-satellite service on the conditions that:

- the aeronautical mobile-satellite (R) service have priority access and immediate availability over all other communications within a network and that mobile-satellite systems should be interoperable with the aeronautical mobile-satellite (R) service, and that
- in the band 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz public correspondence with aircraft must cease immediately if necessary to permit the transmission of messages with priorities 1 to 6 of Article **S44**;

e) that there is one global mobile-satellite system that provides global maritime mobile-satellite distress and safety communications according to Article **S53** and global AMS(R)S communications with priorities 1 to 6 of Article **S44** in accordance with ICAO and IMO requirements;

f) that technical considerations for sharing satellite network resources between MSS (other than AMS(R)S) and AMS(R)S have been developed by the ITU-R (see Recommendation ITU-R **M.[8/17]**),

further considering

a) that stations of the AMS(R)S shall be designed to the internationally agreed Standards and Recommended Practices and Procedures for Air Navigation Services to the Convention on International Civil Aviation (ICAO SARPS, Annex 10, Vol. 3, Chapter 4);

b) that ICAO has developed a global Air Traffic Management system (ATM) which requires the interoperability of mobile-satellite systems providing AMS(R)S communications with the priority message structure of Article **S44**;

c) that IMO may also place similar requirements of interoperability of mobile-satellite systems providing GMDSS communications with the priority message structure of Article **S51**;

d) that global and regional mobile-satellite systems are being coordinated in the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (E-s) and that the ITU Radio Regulations provide the international legal framework for multilateral agreements for the coordination of assignments to be utilized by these satellite networks (see No. **S9.11A** except No. **S9.13**);

e) that, prior to WRC-97, the procedure for the coordination of mobile-satellite systems (No. **S9.11A**) did not give priority access to global assignments for mobile-satellite systems providing global maritime mobile-satellite distress and safety communications according to Article S53 and/or global AMS(R)S communications with priorities 1 to 6 of Article **S44**;

f) that the coordination of geostationary MSS systems providing either global or regional communications may result in segmentation of spectrum between various systems for co-coverage operations,

noting

a) that ICAO has estimated the spectrum requirement to satisfy AMS(R)S needs up to the year 2010 to be 10 MHz in each direction;

b) that the IMO COMSAR Committee has repeatedly indicated to ITU that, to meet the long-term requirements of GMDSS, IMO would need to have continued access to the entire frequency band 1 530 - 1 544/1 631.5 - 1 645.5 MHz,

resolves

that in the detailed frequency coordination of mobile-satellite systems, while every effort shall be made to satisfy the spectrum requirements of mobile-satellite systems, the global provision of the GMDSS and the global provision of AMS(R)S providing the transmissions of messages with priority 1 to 6 in Article **S44** shall not be constrained,

requests the ITU-R

1 to study, as a matter of urgency, the MSS spectrum requirements for GMDSS and AMS(R)S;

2 to study as a matter of urgency, the feasibility of prioritization and pre-emption between different mobile-satellite systems for GMDSS and AMS(R)S, in order to achieve the most flexible practicable use of generic allocations;

3 to submit a report on the results of the studies mentioned above to the CPM-99,

requests the WRC-99

to take into account the outcome of the ITU-R studies and take appropriate action on this subject,

urges administrations

to ensure that the mobile-satellite systems for which they are responsible guarantee with continuity the priorities required by **S5.353A** and **S5.362A** in any detailed frequency coordination,

invites

the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to participate in the studies mentioned above,

instructs the Secretary-General

to communicate this Resolution to the ICAO and IMO.

Draft Res. [J-1]	ADD	J/29/28,28 cor.1

J/29/28
ADD

DRAFT RESOLUTION [J-1]

USE OF THE BANDS 2 500 - 2 535 MHz/2 655 - 2 690 MHz BY THE AERONAUTICAL MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the World Radiocommunication Conference allocated the bands 2 515 - 2 535 MHz to the aeronautical mobile-satellite service (space-to-Earth) for operations limited to within a national boundary;

b) that the World Radiocommunication Conference also allocated the bands 2 670 - 2 690 MHz to the aeronautical mobile-satellite service (Earth-to-space) for operation limited to within a national boundary;

c) that the Report of the Conference Preparatory Meeting (CPM) to this Conference recognized that further study is needed with respect to the coordination area for aeronautical mobile-satellite service earth stations in the band 2 655 - 2 690 MHz,

considering further

d) that the band 2 520 - 2 535 MHz is also allocated to the broadcasting-satellite service and other services;

e) that the band 2 655 - 2 690 MHz is also allocated to radio astronomy on a secondary basis,

resolves

1 to invite ITU-R, as a matter of urgency, to carry out studies in preparation for the Conference Preparatory Meeting of the next competent conference (WRC-99), with respect to sharing criteria and coordination areas between the aeronautical mobile-satellite service and other services which are allocated to these bands;

2 to recommend that WRC-99 review the results of the above studies and take appropriate action, including amendment of related provisions of the Radio Regulations,

invites administrations

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

instructs the Director of the Radiocommunication Bureau

to report on the progress of these studies to WRC-99.

Draft Res. [UAE-1]	ADD	UAE/52/1

UAE/52/1
ADD

DRAFT RESOLUTION [UAE-1]

THE USE OF THE BANDS 1 626.5 - 1 645.5 MHz/1 646.5 - 1 660.5 MHz (EARTH-TO-SPACE) AND 1 525 - 1 544 MHz/1 545 - 1 559 MHz (SPACE-TO-EARTH) BY THE MOBILE-SATELLITE SERVICE (MSS)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the agenda of this Conference included the consideration of allocating the bands 1 525 - 1 559 MHz (space-to-Earth) and 1 626.5 - 1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to use the spectrum efficiently;

b) that the Conference Preparatory Meeting (CPM-97), in its Report, addressed the coordination difficulties in Regions 1 and 3 due to the large number of MSS networks coordinating the bands 1 525 - 1 559/1 626.5 - 1 660.5 MHz;

c) that Table **S15.2** of Appendix **S15** recognized the use of the bands 1 530 - 1 544 MHz (space-to-Earth) and 1 626.6 - 1 645.5 MHz (Earth-to-space) for routine non-safety purposes in addition to its use for distress and safety in the maritime mobile-satellite service;

d) that the frequency spectrum allocated to the mobile-satellite services (MSS) in the 1 - 3 GHz range should be used efficiently as per Recommendation ITU-R M.1038,

further considering

e) that **S5.353** and **S5.362** allocate the bands 1 530 - 1 544 MHz, 1 631.5 - 1 645.5 MHz, 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz to the mobile-satellite service (MSS) as an additional allocation for some countries subject to the conditions that maritime mobile-satellite distress and safety communications and the aeronautical mobile-satellite (R) service shall have access and immediate availability over all other mobile-satellite communications;

f) that [draft new] Recommendation ITU-R M.[Document 8/17] sets the coordination considerations for sharing satellite network resources between MSS systems (other than AMS(R)S) and AMS(R)S;

g) that Annex **2** of Recommendation ITU-R M.1089 sets the guidelines for sharing the spectrum between AMS(R)S systems,

noting

a) that ICAO has estimated the future spectrum requirement for AMS(R)S to be about 10 MHz in each direction of transmission;

b) that the IMO has stated that, to meet the long-term requirements of GMDSS, mariners need priority access to the frequency bands 1 530 - 1 544 MHz and 1 631.5 - 1 645.5 MHz,

resolves

to allocate the bands 1 525 - 1 544 MHz, 1 545 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 646.5 - 1 660.5 MHz to the mobile-satellite services whilst ensuring the priority and protection of the aeronautical mobile-satellite (en-route) service (AMS(R)S) and global maritime distress and safety service (GMDSS) and the cessation of public correspondence when necessary,

invites ITU-R

to study, as a matter of urgency before WRC-99, the changes in spectrum requirements for, and the changes in the robustness of, the GMDSS and AMS(R)S resulting from the use of high power mobile-satellites with multibeam antenna technology that will, in addition, provide the satellite personal communications service,

further invites

the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO), other interested international organizations and other organizations nominated by their administrations to participate in this study,

instructs the Secretary-General

1 to bring this Resolution to the attention of IMO and ICAO;

2 to report on the results of these studies to WRC-99.

Draft Res. [INS-2]	ADD	INS/84/22

INS/84/22
ADD

RESOLUTION [INS-2]

USE OF THE 1.5/1.6 GHz BANDS BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that conversion of existing service-related bands to generic MSS allocations would facilitate efficient use of spectrum;

b) that the bands 1 525 - 1 544 MHz and 1 626.5 - 1 660.5 MHz have been allocated on a generic basis to the MSS, in order to facilitate flexible use of this spectrum by multiple MSS systems;

c) that this Conference has reviewed the use of the bands 1 530 - 1 544/1 631.5 - 1 645.5 MHz for MSS stations participating in the GMDSS in order to provide spectrum to meet global maritime service requirements while providing protection for GMDSS pursuant to No. **[MOD S5.353]**;

d) that the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz are currently allocated exclusively to the aeronautical mobile-satellite (R) service (AMS(R)S) on a worldwide basis;

e) that WRC-95, through Recommendation 34 (WRC-95), recommended that spectrum should be allocated on a worldwide basis to the most broadly defined services,

recognizing

a) that, subject to further study and validation by ITU-R and IMO, it may be feasible and desirable to relax the constraints on the MSS in the bands included in No. **[MOD S5.353]** at a future WRC in order to further facilitate flexible use of this spectrum by multiple MSS systems, while providing full protection for GMDSS distress and safety requirements;

b) that several planned MSS systems will operate generically and some existing generic MSS systems are operating in existing allocations on the basis of certain footnotes,

resolves

that the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz should be allocated for the generic mobile-satellite service, with appropriate protection for distress and safety communications;

invites ITU-R

1 as a matter of urgency, to:

i) study the technical, operational and economic feasibility of relaxing the constraints on MSS allocations in all or parts of the bands referred to in *considering* a);

ii) complete these studies and report the results to WRC-99;

2 to invite administrations and ICAO and IMO to participate actively in these studies.

Reasons: Consequential to the proposed allocation modification whilst ensuring that this generic allocation will not deprive safety services.

Draft Res. [USA-12]	ADD	USA/30/295

USA/30/295
ADD

DRAFT RESOLUTION [USA-12]

EFFICIENT USE OF ALLOCATIONS TO THE MOBILE-SATELLITE SERVICE IN THE 2 GHz RANGE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the 1992 World Administrative Radio Conference (WARC-92) and the 1995 World Radiocommunication Conference (WRC-95) made several decisions related to mobile-satellite service allocations and associated dates of entry into force of these allocations;

b) that during preparatory activities for WRC-97, a number of administrations have expressed the view that there should be no changes to the existing 2 GHz MSS allocations (1 980 - 2 025 and 2 160 - 2 200 MHz);

c) that ITU-R is studying the efficient use of the radio spectrum and frequency sharing within the mobile-satellite service and between the mobile-satellite service and the fixed service;

d) that the efficient use of the 2 GHz MSS bands by multiple MSS systems during the gradual introduction of MSS systems into the band, and the associated transition of the FS and MSS from the band, is consistent with the output of the World Telecommunications Policy Forum (WTPF) on Global Mobile Personal Communications Services (GMPCS) and the recently completed World Trade Organization (WTO) agreements on reducing barriers to telecommunications access;

e) that global and regional MSS systems use different access schemes and orbits that must be taken into account when administrations are planning the use of the 2 GHz MSS allocations by multiple MSS systems;

f) that there are current ITU-R and WRC Recommendations on sharing with terrestrial services in the 2 GHz MSS bands which mention accommodation of multiple MSS systems in sharing arrangements with these terrestrial services but which have not addressed this issue;

g) that there are MSS systems needing to commence commercial operations using the coordination procedures of Resolution 46 (WRC-95) which reference the ITU-R recommendations in *considering* "f)" above, and that it is desirable for the development of new ITU-R recommendation(s) to address multiple system use of the 2 GHz MSS allocations while not impeding the timely implementation of any MSS system in the bands,

resolves to invite ITU-R

to expedite the development of recommendation(s) on sharing arrangements between MSS systems that could be used in conjunction with existing recommendations on sharing between the MSS and FS, that would not impede timely implementation of MSS systems in the bands and that would facilitate access to the 2 GHz bands by multiple MSS systems while minimizing the impact to existing terrestrial systems,

urges administrations

to consider that multiple MSS systems will be using the 2 GHz MSS allocations worldwide and that sharing arrangements between MSS systems, when considered in conjunction with sharing arrangements between the MSS and FS, should accommodate multiple MSS systems.

Reasons: A methodical and orderly introduction of MSS systems into the globally available MSS spectrum at 2 GHz, as the transition of the FS from these bands is occurring benefits all ITU member administrations and increases competition among service providers. This result is consistent with the GMPCS and WTO principles of reducing barriers to market access and competition among service providers and ultimately benefits all MSS consumers.

Other proposals		ASP/14/153,154,155,156 UGA/55/15 ARM/48/5 RUS/15/6 TJK/64/6 UZB/59/14 MDA/81/6 ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKH/ UKR/78/6

ASP/14/153

Conversion of certain MSS bands to generic allocations would:

a) facilitate the introduction of international and national MSS networks;

b) obtain more effective use of mobile-satellite service allocations on a worldwide basis and thus minimize the impact on other services by limiting any additional spectrum that may be required to provide for growth of the MSS; and

c) provide greater flexibility to administrations and satellite operators in response to the rapid growth in the number of planned MSS networks operating in a competitive environment.

The following bands are proposed for conversion to generic MSS:

1 525 - 1 530 MHz	(MMSS)	– in Region 1 to align with existing generic allocations in Regions 2 and 3
1 530 - 1 544 MHz	(MMSS)	– modifying RR **S5.353** to apply worldwide to protect maritime mobile-satellite distress and safety communications
1 555 - 1 559 MHz	(LMSS)	

1 626.5 - 1 631.5 MHz	(MMSS)	– in Region 1 to align with existing generic allocations in Regions 2 and 3
1 631.5 - 1 645.5 MHz	(MMSS)	– modifying RR **S5.353** to apply worldwide to protect maritime mobile-satellite distress and safety communications
1 656.5 - 1 660.5 MHz	(LMSS)	

Under the draft Resolution [ASP-2], the possibility of the conversion of the AMS(R)S bands to generic MSS will be studied

ASP/14/154

Proposal regarding generic allocations for the mobile-satellite service at 1.5/1.6 GHz

WRC-95, through Recommendation **34 (WRC-95)**, recommended that spectrum should be allocated to the most broadly defined services to provide maximum flexibility and that spectrum should be allocated on a worldwide basis. Recognizing those principles and that the 1.5/1.6 GHz MSS bands already are used on a generic basis by a number of administrations and furthermore recognizing that the MSS service is of ten of a global nature, it is proposed to allocate those bands for generic MSS use on a worldwide basis.

In the long term the capacity available for safety related traffic will be enhanced and secured as more spectrally efficient systems will be deployed using a mix of global and regional beams. In the short term, the proposed special regulatory and operational provisions will safeguard the GMDSS and AMS(R)S distress and safety requirements.

ASP/14/155

Allocate in all Regions the bands 1 525 - 1 544 MHz, 1 555 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 656.5 - 1 660.5 MHz for generic MSS (i.e., LMSS, MMSS and AMSS) with special regulatory and operational provisions in order to safeguard priority for GMDSS in accordance with the following proposed amendments to Article **S5** (see below).

ASP/14/156

Adopt the Resolution [ASP-2] to study further the special requirements for GMDSS and AMS(R)S and the way in which spectrum should be made available to these services. These studies should aim at minimizing constraints to future generic MSS allocations consistent with the required protection for distress and safety related communications.

Reasons:

Consideration of generic allocations in the exclusive AMS(R)S bands are in accordance with Recommendation 34 (WRC-95), that spectrum should be allocated to the most broadly defined services for the purpose of providing maximum flexibility to administrations.

Allocation of spectrum to generic MSS at WRC-97 recognizes that the 1.5/1.6 GHz bands are allocated and being used on a generic basis by a number of administrations. It also recognizes that frequency coordination of MSS networks in these bands could accommodate generic MSS usage in parts of these bands.

UGA/55/15

Uganda has noted that:

1) as in the case of MSS requirements below 1 GHz, there is a large number of Advanced Publications for MSS satellite networks, of both the GSO and non-GSO type, in the 1 - 3 GHz range;

2) severe coordination difficulties have resulted from the fact that the greatest number of MSS networks are in coordination at 1 525 - 1 559/1 626.5 - 1 660.5 MHz, especially in Regions 1 and 3;

3) the study done for WRC-97 estimates the MSS requirement at around 2 x 250 MHz of spectrum at the year 2010 in the 1 - 3 GHz band, the current allocation providing 2 x 100 MHz in Regions 1 and 3, and 2 x 140 MHz in Region 2 as of the year 2000.

Again, Uganda proposes that:

1) MSS systems should be strongly urged by WRC-97 to use more spectrum-efficient techniques;

2) no more allocations should be made to MSS until a concrete study has been done on utilization of the allocated spectrum, the number of people being served and the existing and future demand for MSS services.

Reasons: Once the MSS becomes fully operational, valuable experience will be gained that will be useful in guiding future conferences with respect to the actual needs of the MSS.

ARM/48/5, RUS/15/6, TJK/64/6, UZB/59/14, MDA/81/6, ARM/AZE/BLR/GEO/KAZ/UZB/KGZ/RUS/TJK/TKH/UKR/78/6

The ------- considers it extremely important that the Conference should provide the fastest growing and developing new services with sufficient spectrum and work out favourable operating conditions for them. At the same time, the Conference must safeguard conditions for the protection of existing services whose operation is still essential for many administrations. In taking decisions at the Conference, attention must be given to the need to strike a balance between the interests of existing services on the one hand and new or emerging services on the other, and account also has to be taken of differences in the technical and economic capabilities of ITU Member States.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/20-E
4 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

5B-AH3-1/1

AGENDA

OF THE

FIRST MEETING OF

AD HOC 3 OF WORKING GROUP 5B

Tuesday, 4 November 1997, at 1610 hours

(Room A, ITU Tower)

		Documents
1	Opening of the meeting	-
2	Approval of the agenda	-
3	Confirmation of terms of reference (see NOTE 1)	-
4	Presentation of proposals EUR/5/309, 310, 311 and any other relevant proposals	-
5	Discussion and possible conclusions	-
6	Any other business	-

NOTE 1 - Agenda item 1.9.1, Resolution 118 (WRC-95) power flux-density limits for non-GSO FSS at around 19 GHz.

M. MUROTANI
Chairman, ad hoc 3 of Working Group 5B

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/21-E
4 November 1997
English only

WORKING GROUP 2 OF THE PLENARY

REPORT OF THE DRAFTING GROUP OF WORKING GROUP 2 OF THE PLENARY RELATING TO DUE DILIGENCE

DRAFT RESOLUTION

ADMINISTRATIVE DUE DILIGENCE AS APPLICABLE TO THE ASSIGNMENT OF FREQUENCIES TO SATELLITE NETWORKS

The World Radiocommunication Conference (Geneva, 1997),

considering

a)

b)

c)

d)

e)

f)

considering further

a)

b)

taking into account

resolves

1

2

3

instructs the Director

ANNEX 1 TO RESOLUTION

ADDITIONAL REGULATORY PROVISIONS FOR GEOSTATIONARY SATELLITE NETWORKS IN THE FIXED-SATELLITE SERVICE: IMPLEMENTATION/PROGRESS DEMONSTRATION

Section I. The Implementation/Progress Demonstration

(a) With respect to the coordination of a geostationary satellite network in the fixed-satellite service to which these regulatory provisions apply, the Bureau shall publish the complete Appendix **S4** information in a Weekly Circular in accordance with No. **S9.38 [1044]**. However, if the complete Construction Implementation/Progress Demonstration (Construction I/P Demonstration) with respect to a space station of that network is not regarded as having been received by the Bureau by the time that the Weekly Circular is published, the special section shall be published without an expiration date under No. **MOD S9.51** or **S9.52 [1084]** for a decision on coordination.

(b) For any special section published in accordance with No. **I(a)** above without an expiration date, no administration shall be required to comply with No. **S9.50**, **MOD S9.51** or **S9.52 [1084]**.

(c) In any case where in accordance with No. **I(a)** above the special section has been published without an expiration date for a decision on coordination, upon receipt of the complete Construction I/P Demonstration the Bureau shall publish a modification to the coordination special section indicating the date of receipt of the complete Construction I/P Demonstration and including an expiration date for a decision on coordination pursuant to No. **S9.50**, **MOD S9.51** and **S9.52 [1084]**.

(d) Upon publication of a modified special section in accordance with No. **I(c)** above, the provisions of No. **S9.50**, **MOD S9.51** and **S9.52 [1084]** shall apply based upon the date of publication of the modified special section.

(e) An Administration that has requested coordination on behalf of a geostationary satellite network in the fixed-satellite service to which these regulatory provisions apply may not invoke the provisions of No. **S9.53 [1085A]** in respect to an administration affected by the request unless a special section having an expiration date for a decision on coordination for that network has been published by the Bureau in accordance with either Section I(a) or I(c) above.

(f) An Administration that has requested coordination on behalf of a geostationary satellite network in the fixed-satellite service to which these regulatory provisions apply, and for which a complete Construction I/P Demonstration has not been received by the Bureau, may not invoke the provisions of No. **S9.53 [1085A]** in respect to another administration that is requesting coordination of a fixed-satellite service satellite network:

(1) to which these regulatory provisions apply, and

(2) for which a complete Construction I/P Demonstration is considered as having been received by the Bureau.

(g) A complete Construction I/P Demonstration with respect to a geostationary fixed-satellite service satellite network to which these regulatory provisions apply shall be one that includes all of the following information:

(1) Identity of the Satellite Network:

(i) Identity of the satellite network;

(ii) Name of the administration;

(iii) Country symbol;

(iv) Date of advance publication; and

(v) Date of receipt by Bureau of request for coordination (or date of submission of request for coordination if submitted concurrently with the Construction I/P Demonstration);

(vi) Frequency band(s)

(vii) Name of the operator;

(viii) Orbital Characteristics.

(2) Spacecraft Manufacturer:

(i) [Name of the spacecraft manufacturer;]

(ii) Date of the execurion of the contract;

(iii) [Contractual [date]["window"] of delivery;]

(iv) Number of satellites procured.

(3) Signature of an authorized official of the notifying Administration (or of an Administration that is acting on behalf of a group of named Administrations).

(h) A notifying Administration may not request an extension of the bringing into use deadline of any assignment to a space station of a geostationary fixed-satellite service satellite network to which these regulatory provisions apply unless

(1) a complete Construction I/P Demonstration for that space station is considered as having been received by the Bureau; and

(2) the notifying Administration has submitted, either prior to or at the same time as the extension request, a complete Launch I/P Demonstration.

(i) A complete Launch I/P Demonstration with respect to a geostationary fixed-satellite service satellite network to which these regulatory provisions apply shall be one that includes all of the following information:

(1) Identity of the Satellite Network:

(i) Identity of the satellite network;

(ii) Name of the administration;

(iii) Country symbol;

(iv) Date of advance publication; and

(v) Date of receipt by Bureau of request for coordination (or date of submission of request for coordination if submitted concurrently with the Construction I/P Demonstration);

(vi) Frequency band(s)

(vii) Name of the operator;

(viii) Orbital Characteristics

(2) Launch Services Provider:

(i) Name of the launch services provider,

(ii) Date of the execution of the contract;

(iii) Anticipated date of launch;

(iv) Name of the launch vehicle;

Name and location of the launch facility;

(3) Signature of an authorized official of the notifying Administration (or of an Administration that is acting on behalf of a group of named Administrations).

(j) The Bureau's review of any Construction I/P Demonstration or Launch I/P Demonstration under this Section shall be limited to a determination by the Bureau of whether all required information has been supplied.

Section II: Application of the Construction Implementation/Progress Demonstration Requirement to Geostationary Fixed-Satellite Service Networks for which Requests for Coordination are Pending

(a) For any geostationary fixed-satellite service satellite network to which these regulatory provisions apply, and for which complete request for coordination is considered as having been received by the Bureau before 23 November 1997, Section I above shall not become effective until 23 November 1999.

(b) For any geostationary fixed-satellite service satellite network to which these regulatory provisions apply, for which a complete request for coordination is considered as not having been received by the Bureau before 23 November 1997, and for which a complete Construction I/P Demonstration is not considered as having been received by the Bureau before 23 November 1999, no later than 23

March 2000 the Bureau shall publish a Circular-letter identifying this provision and listing every such network.

(c) An administration that has requested coordination on behalf of a geostationary satellite network in the fixed-satellite service that is included in the list described in No. **II(b)** above may not invoke the provisions of No. **S9.53** [1085A] in respect to an administration affected by the request until such time as a complete Construction I/P Demonstration for the network has been received by the Bureau and acknowledgment of receipt has been published in the Weekly Circular.

(d) An administration that has requested coordination on behalf of a geostationary satellite network in the fixed-satellite service that is included in the list described in No II(b) above may not invoke the provisions of No. **S9.53** [1085A] in respect to another administration:

(1) that is requesting coordination of a fixed-satellite service network to which these regulatory provisions apply, and

(2) for which a complete Construction I/P Demonstration has been received by the Bureau

until such time as a complete Construction I/P Demonstration for the network has been received by the Bureau and acknowledgement of receipt has been published in the Weekly Circular.

(e) Upon receipt of a complete Construction I/P Demonstration in either of the cases described in Nos. **II(c)** or **II(d)** above, the Bureau shall publish an acknowledgement of receipt in the Weekly Circular. The publication shall be made as promptly as possible, but in no event shall publication occur later than 30 days after the receipt of the Construction I/P Demonstration.

Section III: I/P Demonstrations for Geostationary Fixed-Satellite Service Satellite Networks Whose Provisional Frequency Assignments are Recorded in the Master International Frequency Register (Master Register), but that Have Never Been Brought into Use

(a) Administrations shall, on or before 23 May 1998, inform the Bureau, with respect to each of their provisional frequency assignments to geostationary fixed-satellite service satellite networks to which these regulatory provisions apply that are recorded in the Master Register whether the notified assignment for a particular space station in the geostationary fixed-satellite service has been brought into use.

(b) No later than 23 August 1998 the Bureau shall publish a list based on the communications received pursuant to No. **III(a)** above, that:

(1) identifies the space stations and frequency assignments; and

(2) indicates whether the notified assignments have been brought into use;

(c) Any provisional frequency assignment to a space station in a geostationary fixed-satellite service satellite network to which these regulatory provisions apply that is not included on the list referred to in No. **III(b)** above need not be taken into account by Administrations requesting coordination of later-published satellite networks[, and the Bureau shall promptly cancel the assignment from the Master Register without consulting the administration concerned].

(d) For any provisional frequency assignment to a space station in a geostationary fixed-satellite service satellite network to which these regulatory provisions apply that is included on the list referred to in No. **III(b)** above, but identified there as not having been brought into use, a complete Construction I/P Demonstration and a complete Launch I/P Demonstration must be communicated to the Bureau on or before 23 November 1999.

(e) If an Administration fails to communicate a complete Construction I/P Demonstration and a complete Launch I/P Demonstration on or before 23 November 1999 with respect to any frequency assignment to a space station in a geostationary fixed-satellite service satellite network to which these regulatory provisions apply that is included on the list referred to in No. **III(b)** above as not having been brought into use, the Bureau shall promptly consult with the Administration concerned, prior to canceling the frequency assignment(s).

ANNEX 2 TO RESOLUTION

Administrative due diligence

1 The administration requesting coordination for a satellite network shall send to the Bureau, not later than [two years] before the date of bringing into use the satellite network, the due diligence information listed relating to the spacecraft manufacturer.

A **Identity of the satellite network**

a) Identity of the satellite network

b) Name of the administration

c) Country symbol

d) Reference to the API

e) Reference to the request for coordination

f) Frequency band(s)

g) Name of the operator

h) Name of the satellite

i) Orbital characteristics

B **Spacecraft manufacturer**

[a) Name of the spacecraft manufacturer]

b) Date of the execution of the contract

c) Contractual [date] ["window"] of delivery

d) Number of satellites procured

2 The administration requesting coordination for a satellite network shall send to the Bureau, not later than [two years] before the date of bringing into use the satellite network, the due diligence information listed relating to the launch services provider.

A **Identity of the satellite network**

a) Identity of the satellite network

b) Name of the administration

c) Country symbol

d) Reference to the API

e) Reference to the request for coordination

f) Frequency band(s)

g) Name of the operator

h) Name of the satellite

i) Orbital characteristics

B Launch services provider

a) Name of the launch vehicle provider

b) Date of the execution of the contract

c) Anticipated date of launch

d) Name of the launch vehicle

e) Name and location of the launch facility

[3 NOTE - The issue of in-orbit delivery has not been discussed in detail and has to be considered further.]

[4 If the information under 1, 2 and 3 has not reached the Bureau 30 days before the time-limit, the Bureau shall request the administration concerned to submit the information.]

[5 NOTE - The issue of failure to supply the information has not been discussed in detail and has to be considered further.]

6 The Bureau shall publish the due diligence information in a [weekly circular].

[7 The Bureau shall examine the due diligence information for completeness. If the information is found to be incomplete the Bureau shall immediately request the administration to submit the information not provided.]

8 Before requesting an extension provided for in S11.44 [1550] the administration shall have submitted the complete information under 1.

[9 NOTE - The issue of an administration challenging the information provided by another administration has to be considered further.]

10 The information to be submitted in accordance with 1, 2 and 3 shall be signed by an authorized official of the notifying administration (or of an administration that is acting on behalf of a group of named administrations.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER - 21 NOVEMBER 1997

Document DL/22-E
5 November 1997
Original: English only

WORKING GROUP 2
OF THE PLENARY

Informal Group of GT PLEN 2

Meeting to Discuss the Application of the New Extension Period For Bringing Into Use of a Satellite Network

I was asked by the group to act as moderator and to report on its discussion.

1. **API First Received by the BR After 21 November 1997.**

It was agreed that the new rules should apply:
- Extension of 2 years maximum;
- Conditions apply.

2. **API First Received by the BR Before 21 November 1997, and Extension Requested after 21 November 1997.**

A number of options were identified as follows:

a) Automatic 3 year extension. (No change).

10 of 25 participants were in favour. A number were opposed to this option on the basis that it did not address the problem of excess filings.

b) Full application of the new rules ie 2 year extension, conditions apply.
Some supported, some opposed.

c) Automatic 2 years extension.

5 participants were in favour. Only one or two opposed. All would consult with their delegations.

This option was discussed as a possible compromise as some reduction in the period would result in some (small) reduction in excess filings, and the reduction to 2 years should not significantly disadvantage any administration.

d) 3 years extension, conditions apply.

Some participants were in favour. Some opposed.

e) Automatic 3 years extension for API received before PP94 (Kyoto adoption of Resolution 18), and 2 years extension, conditions apply, for API received after PP94.

There was no time available for further discussion. Participants will discuss with their delegations and informally to facilitate further discussion in GT PLEN 2.

NOTE: Applications for 3 years extension received by the BR before 21 November 1997 should be granted automatically.

David Hartley

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/23-E
5 November 1997
Original: English only

AD HOC3 OF
WORKING GROUP 5B

Note by the Chairman of Ad Hoc 3 of Working Group 5B

POINTS FOR DISCUSSION ON THE EUROPEAN PROPOSAL (19 GHZ)

1) Pfd limits derived from a constellation of 840 satellites are proposed for the application to any satellite constellation above 100. This may give an unnecessarily stringent constraint on satellite systems of 110 or 120 satellites.

2) Calculations were probably carried out under free space propagation conditions. If atmospheric absorption is taken into account, interference will be reduced to some extent (see an information document).

3) Interference assessment based on a pfd mask always leads to overestimation (see Annex 2 to Rec. ITU-R SF.358). For a realistic assessment, it may be useful to compare the result based on a pfd mask with results based on other approaches (for example, based on planned satellite antenna patterns).

4) "Number of satellites in a system" is a new regulatory concept. Therefore, it may create new difficulties in implementation of the regulation. We should be careful in introducing such a new concept.

M. MUROTANI
Chairman, Ad Hoc 3 of Working Group 5B

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked • to bring their copies to the meeting since no others can be made available.

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/24-E
5 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SUB-WORKING GROUP 5B1

SUB-WORKING GROUP 5B1A (RESOLUTION 714)

There are three proposals based on discussions at the First Meeting. There are a package:

1 S5.208 - The use of the band 137-138 MHz by the Mobile-Satellite Service is subject to coordination under Resolution 46 (Rev. WRC-95)/No. 59.IIA. (Suppress the remainder of the text)

2 Annex 2 to Resolution 46 (Rev. WRC-95) and

Annex 2 to Appendix S5

Replace A2.1.1/1.1I* with the following:

a)	A2.1.1.1 and 1.1.1	In the bands 137-138 MHz and 400.15-401 MHz, coordination of a space station of the Mobile-Satellite Service (space-to-Earth) with respect to terrestrial services (except the Aeronautical Mobile (OR) Service operating in those administrations in footnotes S5.204 and S5.206 as of 1 November 1996) is required only if the power flux density produced by the stations exceeds -125 dB (W/m^2/4 kHz) at the Earth's surface
b)	A2.1.1.2 and 1.1.2	In the band 137-138 MHz, coordination of a space station of the Mobile-Satellite Service (space-to-Earth) with respect to the Aeronautical Mobile (OR) Service is required only if the power flux density produced by the space station at the Earth's surface exceeds: -125 dB (W/m^2/4 kHz) for networks for which coordination information has been received by the Bureau before the date 1 November 1996. - 140 dB (W/m^2/4 kHz) for systems for which coordination information has been received by the Bureau after the date 1 November 1996 in those administrations referred in A2.1.1.1/1.1.1 above.

* Note: The provisions of this regulation do not apply to the Meteorological Satellite Service

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked • to bring their copies to the meeting since no others can be made available.

c) A2.1.1.3 and 1.1.3 In the band 137-138 MHz coordination is also required for replacement of satellites of the MSS for those networks for which coordination information has been received prior to 1 November 1996 and the pfd exceeds

-125 dB (W/m^2/4 kHz) at the Earth's surface in those administrations referred in A2.1.1.1/1.1.1 above.

3 Suppress Resolution 714

D. JANSKY

Chairman of Sub-Working Group 5B1 A

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/25-E
5 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SWG 5B-1

S5.208A

The following proposal for modification of RR S5.208A has been unanimously agreed by the delegations participating in the informal group on this subject.

MOD S5.208A In making assignments to space stations in the mobile-satellite service in the bands 137 - 138 MHz, 387 - 390 MHz and 400.15 - 401 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05 - 153 MHz, 322 - 328.6 MHz, 406.1 - 410 MHz and 608 - 614 MHz from harmful interference from unwanted emissions. ~~For information, t~~The threshold levels of interference detrimental to the radio astronomy service ~~to be protected~~ are shown in Table 1 of Recommendation ITU-R RA.769-1.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/27-E
5 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 4D

COMPARISON OF RST-1, RST-2, RST-3 AND RST-5 ARTICLE 4 DATA WITH DATA INCLUDED FOR RUSSIAN FEDERATION BEAMS IN STEP 2 "BASELINE" AND "NATIONAL PREFERENCES" OPTIONS.*

Following the request made to the Bureau to provide details of the RST networks and Russian Beams in the Step 2 options the following data is provided.

1. Downlink beam data

Parameter	RST-1 (Part A: AP30/E/31 and Part B: AP30/E/85)		Russian Federation beam parameters in Step 2 "baseline" option (RUS00100)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA1-)	
orbital position	36E		36E		36E	
channels	25-40		26,28,30,32,34		25-40	
test point	lat	long	lat	long	lat	long
TP1	59.39	28.00	43.50	45.00	43.50	45.00
2	56.13	27.91	43.50	41.59	43.50	41.59
3	53.28	31.35	46.40	48.90	46.40	48.90
4	49.28	40.13	51.60	55.00	51.60	55.00
5	43.12	41.59	54.40	22.70	54.40	22.70
6	41.20	47.82	54.70	22.00	54.70	22.00
7	46.40	48.90	59.10	28.00	59.10	28.00
8	51.60	50.80	60.00	51.00	60.00	51.00

* The RST-4 network is still under coordination. Data for RUS00400 (Baseline) and RUSRSA4 (National Preference) beams may be found in Doc 56 Addendum 4.

9	60.00	51.00	68.00	50.00	68.00	50.00
10	68.20	50.00	68.92	29.00	68.92	29.00
11	68.64	43.28				
12	70.00	32.00				
13	68.92	28.30				
14	54.33	22.88				
15	55.07	22.74				
16	55.11	20.78				
17	54.44	20.00				
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
power	15.3 dBW		23.1 dBW		20.1 dBW	
Downlink space station antenna gain	37.7dBi		35.82 dBi		34.9 dBi	
EIRP	53.0 dBW		58.92 dBW		55.0 dBW	
downlink space station antenna pattern	Fig.9 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	2.2° x 2.2		3.46° x 2.11°		3° x 3°	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

Parameter	RST-2 (Part A: AP30/E/32 and Part B: AP30/E/86)		Russian Federation beam parameters in Step 2 "baseline" option (RUS00200)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA2-)	
orbital position	56E		56E		56E	
channels	25-40		26,28,30,32,34		25-40	
test point	lat	long	lat	long	lat	long
TP1	51.60	50.80	51.00	55.80	51.00	55.80
2	60.00	51.00	51.60	50.00	51.60	50.00
3	68.20	50.00	54.23	75.77	54.23	75.77
4	67.14	52.04	60.00	51.00	60.00	51.00
5	70.00	64.97	64.10	86.15	64.10	86.15
6	68.64	69.53	68.00	50.00	68.00	50.00
7	73.00	69.53	72.40	78.00	72.40	78.00

8	72.40	78.00				
9	69.42	82.31				
10	64.10	86.15				
11	60.88	77.00				
12	54.23	75.77				
13	55.07	69.12				
14	54.33	61.00				
15	50.50	55.85				
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
power	17.3 dBW		21.5 dBW		20.1 dBW	
Downlink space station antenna gain	37.7dBi		37.38 dBi		34.9 dBi	
EIRP	53.0 dBW		58.88 dBW		55.0 dBW	
downlink space station antenna pattern	fast roll off antenna Fig. 11 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	2.2° x 2.2°		3.41° x 1.49°		3° x 3°	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

Parameter	RST-3 (Part A: AP30/E/33 and Part B: AP30/E/87)		Russian Federation beam parameters in Step 2 "baseline" option (RUS00300)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA3-)	
orbital position	86E		86E		86E	
channels	25-40		26,28,30,32,34		25-40	
test point	lat	long	lat	long	lat	long
TP1	72.40	78.00	49.22	87.30	49.22	87.30
2	69.42	82.31	51.00	104.00	51.00	104.00
3	64.10	86.15	54.00	79.50	54.00	79.50
4	60.88	77.00	59.00	114.50	59.00	114.50
5	54.23	75.77	60.88	77.00	60.88	77.00
6	49.22	87.30	72.40	78.00	72.40	78.00

7	52.15	98.91	73.00	110.00	73.00	110.00
8	50.60	107.50	73.28	96.00	73.28	96.00
9	53.00	114.00				
10	59.00	116.00				
11	63.50	108.00				
12	74.00	110.00				
13	73.28	96.00				
14	72.00	84.00				
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
power	17.30 dBW		22.20 dBW		20.10 dBi	
Downlink space station antenna gain	37.7dBi		36.7 dBi		34.9 dBi	
EIRP	55.0 dBW		58.9 dBW		55.0 dBW	
downlink space station antenna pattern	Fig.9 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	2.2°x2.2°		3.41°x1.75°		3° x 3°	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

Parameter	RST-5 (Part A: AP30/E/35)		Russian Federation beam parameters in Step 2 "baseline" option (RUS00500)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA5-)	
orbital position	140E		140E		140E	
channels	25-40		4,8,12,16,20		25-40	
test point	lat	long	lat	long	lat	long
TP1	63.85	145.64	43.93	145.56	43.93	145.56
2	61.86	146.34	46.02	143.42	46.02	143.42
3	43.60	145.48	46.85	151.86	46.85	151.86
4	46.85	151.86	50.77	156.02	50.77	156.02
5	50.87	156.69	54.50	168.08	54.50	168.08
6	54.43	168.18	62.68	179.50	62.68	179.50
7	59.86	170.30	63.85	145.64	63.85	145.64
8	62.68	179.50	66.10	-170.00	66.10	-170.00
9	65.50	-179.25	69.62	162.46	69.62	162.46

10	66.00	-170.00	70.01	168.31	70.01	168.31
11	70.01	168.31				
12	69.62	162.46				
13	67.80	158.16				
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
power	17.3 dBW		22.7 dBW		20.1 dBW	
Downlink space station antenna gain	37.7 dBi		36.18 dBi		34.9 dBi	
EIRP	55.0 dBW		58.88 dBW		55.0 dBW	
downlink space station antenna pattern	Fig.9 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30		Fig.9 of Annex 5 of Appendix 30	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	2.2° x 2.2°		3.31° x 2.03°		3.0° x 3.0°	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

Feeder-link beam data

Selected Parameters	RST-1 (Part A: AP30A/E/28 + corr.1 and Part B: AP30A/E/81)		Russian Federation beam parameters in Step 2 "baseline" option (RUS00100)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA1-)	
orbital position	36E		36E		36E	
channels	25-40		26,28,30,32,34		25-40	
test point	lat	long	lat	long	lat	long
TP1	57.50	35.00	41.40	47.82	41.40	47.82
2	49.28	40.13	49.00	40.05	49.00	40.05
3	50.50	55.85	51.00	55.80	51.00	55.80
4	54.23	75.77	54.23	75.77	54.23	75.77
5	64.10	86.15	54.44	20.00	54.44	20.00
6	72.40	78.00	59.10	28.00	59.10	28.00
7	67.14	52.04	64.10	86.15	64.10	86.15
8			67.14	52.04	67.14	52.04
9			68.92	29.00	68.92	29.00

10			72.40	78.00	72.40	78.00
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
up-link transmitting earth station power	27dBW		27 dBW		27 dBW	
uplink transmitting earth station antenna gain	57 dBi		57 dBi		57 dBi	
uplink transmitting earth station EIRP	84 dBW		84 dBW		84 dBi	
Feeder-link receiving space station antenna gain	38.4 dBi		33.49 dBi		38.4 dBi	
Feeder-link receiving space station antenna pattern	shaped beam		Fig.B of Annex 3 of Appendix 30A		shaped beam	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	n/a		5.16° x 2.41°		n/a	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

Selected Parameters	RST-2 (Part A: AP30A/E/29 + corr.1 and Part B: AP30A/E/82)		Russian Federation beam parameters in Step 2 "baseline" option (RUS00200)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA2-)	
orbital position	56E		56E		56E	
channels	25-40		26,28,30,32,34		25-40	
test point	lat	long	lat	long	lat	long
TP1	57.50	35.00	41.40	47.82	41.40	47.82
2	49.28	40.13	49.00	40.05	49.00	40.05
3	50.50	55.85	49.22	87.30	49.22	87.30
4	54.23	75.77	50.60	107.50	50.60	107.50
5	49.22	87.30	51.00	55.80	51.00	55.80
6	50.60	107.50	54.23	75.77	54.23	75.77
7	59.00	116.00	54.44	20.00	54.44	20.00
8	71.20	112.00	59.00	116.00	59.00	116.00

9	72.40	78.00	68.92	29.00	68.92	29.00
10	67.14	52.04	71.20	112.00	71.20	112.00
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
up-link transmitting earth station power	27dBW		27 dBW		27 dBW	
uplink transmitting earth station antenna gain	57 dBi		57 dBi		57 dBi	
uplink transmitting earth station EIRP	84 dBW		84 dBW		84 dBW	
Feeder-link receiving space station antenna gain	38.4 dBi		31.43 dBi		38.4 dBi	
Feeder-link receiving space station antenna pattern	shaped beam		Fig.B of Annex 3 of Appendix 30A		shaped beam	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	n/a		7.93° x 2.52°		n/a	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

Selected Parameters	RST-3 (Part A: AP30A/E/30 + corr.1 and Part B: AP30A/E/83)		Russian Federation beam parameters in Step 2 "baseline" option (RUS00300)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA3-)	
orbital position	86E		86E		86E	
channels	25-40		26,28,30,32,34		25-40	
test point	lat	long	lat	long	lat	long
TP1	57.50	35.00	41.40	47.82	41.40	47.82
2	49.28	40.13	49.00	40.05	49.00	40.05
3	50.50	55.85	49.22	87.30	49.22	87.30
4	54.23	75.77	50.60	107.50	50.60	107.50
5	49.22	87.30	51.00	55.80	51.00	55.80
6	50.60	107.50	54.23	75.77	54.23	75.77
7	59.00	116.00	54.44	20.00	54.44	20.00
8	71.20	112.00	59.00	116.00	59.00	116.00

9	72.40	78.00	68.92	29.00	68.92	29.00
10	67.14	52.04	71.20	112.00	71.20	112.00
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
up-link transmitting earth station power	27dBW		27 dBW		27 dBW	
uplink transmitting earth station antenna gain	57 dBi		57 dBi		57 dBi	
uplink transmitting earth station EIRP	84 dBW		84 dBi		84 dBi	
Feeder-link receiving space station antenna gain	38.4 dBi		31.42 dBi		38.4 dBi	
Feeder-link receiving space station antenna pattern	shaped beam		Fig.B of Annex 3 of Appendix 30A		shaped beam	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	n/a		8.06° x 2.49°		n/a	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

Selected Parameters	RST-5 (Part A: AP30A/E/32 + corr.1		Russian Federation beam parameters in Step 2 "baseline" option (RUS00500)		Russian Federation beam parameters in Step 2 "National Preferences" option (RUSRSA5-)	
orbital position	140E		140E		140E	
channels	25-40		4, 8, 12,16,20		25-40	
test point	lat	long	lat	long	lat	long
TP1	60.88	77.00	42.42	130.62	42.42	130.62
2	49.22	87.30	43.93	145.56	43.93	145.56
3	50.60	107.50	49.22	87.30	49.22	87.30
4	50.80	137.60	50.60	107.50	50.60	107.50
5	43.60	145.48	54.50	168.08	54.50	168.08
6	54.43	168.18	60.88	77.00	60.88	77.00
7	62.68	179.50	62.68	179.50	62.68	179.50
8	66.00	-170.00	66.10	-170.00	66.10	-170.00

9	69.62	162.46	69.62	162.46	69.62	162.46
10	73.29	128.40	73.29	128.00	73.29	128.00
bandwidth	27 MHz		27 MHz		27 MHz	
emission types	analogue/digital		analogue		analogue	
up-link transmitting earth station power	27 dBW		27 dBW		27 dBW	
uplink transmitting earth station antenna gain	57 dBi		57 dBi		57 dBi	
uplink transmitting earth station EIRP	84 dBi		84 dBi		84 dBi	
Feeder-link receiving space station antenna gain	38.4 dBi		31.8 dBi		38.4 dBi	
Feeder-link receiving space station antenna pattern	shaped beam		Fig.B of Annex 3 of Appendix 30A		shaped beam	
pointing accuracy	±0.1°		±0.1°		±0.1°	
polarisation	circular		circular		circular	
half power beamwidth	n/a		7.92° x 2.32°		n/a	
station keeping accuracy	±0.1°		±0.1°		±0.1°	

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/28-E
5 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SUB-WORKING GROUP 5B1

SUB-WORKING GROUP 5B1A (RESOLUTION 714)

1 **MOD S5.208 as follows**

The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under Resolution 46 (Rev. WRC-95)/No. S9.11A. (Suppress the remainder of the text).

2 Annex 2 to Resolution 46 (Rev. WRC-95) and

Annex 2 to Appendix S5

Replace A2.1.1/1.1* with the following:

a) A2.1.1.1* and 1.1.1 In the bands 137-138 MHz and 400.15-401 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to terrestrial services (except the aeronautical mobile (OR) service networks operating in those administrations listed in numbers S5.204 and S5.206 as of 1 November 1996) is required only if the power flux density produced by this space station exceeds -125 dB (W/m^2/4 kHz) at the Earth's surface.

b) A2.1.1.2 and 1.1.2 In the band 137-138 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to the aeronautical mobile (OR) service is required only if the power flux density produced by this space station at the Earth's surface exceeds:

-125 dB (W/m^2/4 kHz) for networks for which complete information pertaining to a coordination request has been received by the Bureau before 1 November 1996.

- 140 dB (W/m^2/4 kHz) for systems for which coordination information has been received by the Bureau after 1 November 1996 in those administrations referred to in A2.1.1.1/1.1.1 above.

* These provisions do not apply to the meteorological satellite service.

c) A2.1.1.3 and 1.1.3 In the band 137-138 MHz coordination is also required for replacement of satellites of an MSS network for which complete information pertaining to a coordination request has been received by the Bureau prior to 1 November 1996 and the pfd exceeds -125 dB (W/m^2/4 kHz) at the Earth's surface in those administrations referred in A2.1.1.1/1.1.1 above.

3 Suppress Resolution 714.

D. JANSKY

Chairman of Sub-Working Group 5B1 A

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/29-E
6 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SWG 5B2

NOTE BY THE COORDINATOR OF THE INFORMAL SWG 5B2A ON GENERIC ALLOCATIONS FOR THE MOBILE-SATELLITE SERVICE AT 1.5/1.6 GHz

After three meetings in the informal discussion group agreement has been reached on converting the segmented MSS allocation in the 1.5/1.6 GHz bands into a generic type allocation in the bands:

- 1 525 - 1 544 MHz and 1 555 - 1 559 MHz (space-to-Earth);
- 1 626.5 - 1 645.5 MHz and 1 656.5 - 1 660.5 MHz (Earth-to-space);

while stipulating special provisions to safeguard the safety related traffic.

Concerning the bands 1 545 -1 555 MHz and 1 646.5 - 1 656.5 MHz an agreement could not be settled at this point in time. However, a substantial majority was in favour for generic allocation also in those bands. Hence, the output from the informal discussion group is at this point in time split in two options. The attached text giving proposals for modification of Article S5 shall be interpreted as:

Option 1: Modifications proposed as outlined, except that square brackets indicate NOC to allocations and relevant footnotes in those bands.

Option 2: Modifications proposed as outlined, including modifications to allocations and relevant footnotes in those bands within square brackets.

The available time did not permit to consider proposals by administrations to modify footnotes S5.374 and S5.376.

Furthermore there was a considerable consensus that the introduction of the special footnotes to safeguard the safety related traffic should be followed by a resolution calling for studies to resolve the possibility to use the bands in a more flexible way. However, time did not permit to consolidate those proposals.

ARTICLE S5

MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530	**1 525 – 1 530**	**1 525 – 1 530**
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)
FIXED	MOBILE-SATELLITE (space-to-Earth)	FIXED
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.352A	Earth Exploration-Satellite	MOBILE-SATELLITE (space-to-Earth)
Earth Exploration-Satellite	Fixed	Earth Exploration-Satellite
Mobile except aeronautical mobile S5.349	Mobile S5.343	Mobile S5.349
~~Land Mobile-Satellite (space-to-Earth) S5.352~~		
S5.341 S5.342 S5.350 S5.351 S5.354	S5.341 S5.351 S5.354	S5.341 S5.351 S5.354

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533	**1 530 – 1 533**	
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A	
~~LAND MOBILE-SATELLITE (space-to-Earth)~~	~~LAND MOBILE-SATELLITE (space-to-Earth)~~	
Earth Exploration-Satellite	Earth Exploration-Satellite	
Fixed	Fixed	
Mobile except aeronautical mobile	Mobile ~~S5.343~~	
S5.341 S5.342 S5.351 S5.354	S5.341 S5.351 ~~S5.353~~ S5.354	

SUP S5.352

Reasons: Consequential to the proposed allocation modification.

ADD S5.352A In France [and the United Kingdom], in the band 1 525 - 1 530 MHz, mobile earth stations shall not claim protection from existing stations in the fixed service prior to 1 April 1998.

Reasons: Together with provision No. S5.354, this provision will give full protection to existing fixed service.

ARTICLE S5

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 533 – 1 535 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile except aeronautical mobile ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.351 S5.354	**1 533 – 1 535** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile S5.343 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ S5.354	

MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ ADD S5.353A S5.354 S5.355	
1 544 – 1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545 – 1 555	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 MOD S5.358 S5.359 ADD S5.362A	
1 555 – 1 559	~~LAND~~ MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~	

SUP **S5.353**

Reasons: Consequential to the proposed allocation modification.

ADD **S5.353A** In the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz, the allocation to the mobile-satellite service is subject to agreement reached under **No S9.11A.** Priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the global maritime distress and safety system (GMDSS). Maritime mobile distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile satellite systems shall not cause unacceptable interference to nor claim protection from distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety related communications in the other mobile-satellite services.

Reasons: To give priority and protection to the stations operating GMDSS services.

NOC **S5.356**

SUP **S5.358**

Reasons: Consequential to the proposed allocation modification.

SUP **S5.360**

Reasons: Consequential to the proposed allocation modification.

SUP **S5.361**

Reasons: Consequential to the proposed allocation modification.

NOTE - Administrations agreed to delay action on the proposals to suppress S5.361 pending the outcome of the generic allocations at WRC-97.

SUP **S5.362**

ADD **S5.362A** In the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, the allocation to the mobile-satellite service is subject to agreement reached under No. **S9.11A.** Priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service (AMS(R)S), providing transmission of messages with priority 1 to 6 in Article **S44.** AMS(R)S communications with priority 1 to 6 in Article **S44** shall have priority access and immediate availability by pre-emption if necessary over all other mobile satellite communications operating within a network. Mobile satellite systems shall not cause unacceptable interference to nor claim

protection from AMS(R)S communications with priority 1 to 6 in Article **S44**. Account shall be taken of the priority of safety related communications in the other mobile-satellite services.

The Sub-Drafting Group agreed that it may be necessary to add the following element to a possible draft resolution on the generic use of the 1.5/1.6 GHz band by the MSS:

Within a network, mobile satellite systems shall be capable of being interoperable with the AMS(R)S service.

ARTICLE S5

MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 S5.354 S5.355 S5.359	S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 S5.373A	

MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – ~~1 634.5~~1 636.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 MOD S5.374 ADD S5.353A	
~~1 634.5~~1 636.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 ~~S5.353~~ADD S5.353A S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (Earth-to-space) ADD S5.362A S5.341 S5.351 S5.354 S5.355 MOD S5.358 S5.359 S5.376	

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 656.5 – 1 660	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~ MOD S5.374	
1 660 – 1 660.5	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361 S5.362~~ ADD S5.376A	

[**SUP** **S5.373A**

Reasons: Consequential to the proposed allocation modification.]

S5.374 Not yet considered.

NOC **S5.375**

S5.376A Not yet considered.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/29(Rev.1)-E
8 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SWG 5B2

RESULTS FROM THE INFORMAL SWG 5B2A ON GENERIC ALLOCATIONS FOR THE MOBILE-SATELLITE SERVICE AT 1.5/1.6 GHz

The attached text gives proposals for:

1) modification of Article S5 and relevant footnotes;
2) Resolution [5B2A-1] to be considered for generic allocation throughout the bands;
3) Resolution [5B2A-2] to be considered for a limited generic allocation (NOC the bands within square brackets).

ARTICLE S5

MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530	**1 525 – 1 530**	**1 525 – 1 530**
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)
FIXED	MOBILE-SATELLITE (space-to-Earth)	FIXED
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.352A	Earth Exploration-Satellite	MOBILE-SATELLITE (space-to-Earth)
Earth Exploration-Satellite	Fixed	Earth Exploration-Satellite
Mobile except aeronautical mobile S5.349	Mobile S5.343	Mobile S5.349
~~Land Mobile-Satellite (space-to-Earth) S5.352~~		
S5.341 S5.342 S5.350 S5.351 S5.354	S5.341 S5.351 S5.354	S5.341 S5.351 S5.354

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533	**1 530 – 1 533**	
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A	
~~LAND MOBILE-SATELLITE (space-to-Earth)~~	~~LAND MOBILE-SATELLITE (space-to-Earth)~~	
Earth Exploration-Satellite	Earth Exploration-Satellite	
Fixed	Fixed	
Mobile except aeronautical mobile	Mobile S5.343	
S5.341 S5.342 S5.351 S5.354	S5.341 S5.351 ~~S5.353~~ S5.354	

SUP S5.352

Reasons: Consequential to the proposed allocation modification.

ADD S5.352A In France [and the United Kingdom], in the band 1 525 - 1 530 MHz, mobile earth stations shall not claim protection from stations of the fixed service notified prior to 1 April 1998.

Reasons: Together with provision No. S5.354, this provision will give full protection to existing fixed service.

ARTICLE S5

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 533 – 1 535	**1 533 – 1 535**	
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A	
Earth Exploration-Satellite	Earth Exploration-Satellite	
Fixed	Fixed	
Mobile except aeronautical mobile	Mobile S5.343	
~~Land Mobile-Satellite (space-to-Earth) S5.352~~	~~Land Mobile-Satellite (space-to-Earth) S5.352~~	
S5.341 S5.342 S5.351 S5.354	S5.341 S5.351 ~~S5.353~~ S5.354	

MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ ADD S5.353A S5.354 S5.355	
1 544 – 1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545 – 1 555	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 [~~S5.358~~] S5.359 ADD S5.362A	
1 555 – 1 559	~~LAND~~ MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360~~ [~~S5.361 S5.362~~]	

SUP S5.353

Reasons: Consequential to the proposed allocation modification.

ADD S5.353A In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz, priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to nor claim protection from distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety related communications in the other mobile-satellite services.

Reasons: To give priority and protection to the stations operating GMDSS services.

NOC S5.356

[**SUP S5.358**

Reasons: Consequential to the proposed allocation modification.]

SUP S5.360

Reasons: Consequential to the proposed allocation modification.

[**SUP S5.361**

Reasons: Consequential to the proposed allocation modification.

SUP S5.362

ADD S5.362A In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service (AMS(R)S), providing transmission of messages with priority 1 to 6 in Article **S44.** AMS(R)S communications with priority 1 to 6 in Article **S44** shall have priority access and immediate availability by pre-emption if necessary over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to nor claim protection from AMS(R)S communications with priority 1 to 6 in Article **S44.** Account shall be taken of the priority of safety related communications in the other mobile-satellite services.]

ARTICLE S5

MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 S5.354 S5.355 S5.359	S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 ~~S5.373A~~	

MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – ~~1 634.5~~1 636.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 MOD S5.374 ADD S5.353A	
~~1 634.5~~1 636.5 – **1 645.5**	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 ~~S5.353~~ADD S5.353A S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (Earth-to-space) ADD S5.362A S5.341 S5.351 S5.354 S5.355 MOD S5.358 S5.359 S5.376	

Allocation to Services		
Region 1	Region 2	Region 3
1 656.5 – 1 660	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~ MOD S5.374	
1 660 – 1 660.5	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361 S5.362~~ ADD S5.376A	

SUP S5.373A

Reasons: Consequential to the proposed allocation modification.

MOD S5.374 ~~Land earth stations and ship~~Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5 - 1 634.5 MHz and 1 656.5 - 1 660 MHz shall not cause harmful interference to the stations in the fixed service operating in the countries listed in No. **S5.359**.

Reasons: Consequential to the proposed allocation modification.

NOC S5.375

ADD S5.376A Mobile earth stations operating in the 1 660.0 - 1 660.5 MHz band shall not cause harmful interference to stations operating in the radio astronomy service.

Reasons: To give protection to the radio astronomy service.

DRAFT RESOLUTION [5B2A-1]

USE OF THE BANDS 1 525 - 1 559 MHz AND 1 626.5 - 1 660.5 MHz BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that WRC-97 allocated the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to multiple mobile-satellite systems in a flexible and efficient manner;

b) that prior to WRC-97 there was a generic allocation by footnote provisions in some countries for the use of the bands 1 530 - 1 544 MHz and 1 631.5 - 1 645.5 MHz by the mobile-satellite service on the condition that maritime mobile-satellite distress and safety communications have priority access over all other communications;

c) that prior to WRC-97, there was a generic allocation by two footnotes for the use of the bands 1 555 - 1 559 MHz and 1 656.5 - 1 660.5 MHz by the mobile-satellite service, where in one of these footnotes in two countries the following conditions applied:

- the aeronautical mobile-satellite (R) service has priority access and immediate availability over all other communications within;
- network and mobile-satellite systems should be interoperable with the aeronautical mobile-satellite (R) service;
- account shall be taken of the priority of safety-related communications in the other mobile-satellite services;

d) that there is at least one global mobile-satellite system that is capable of providing global maritime mobile-satellite distress and safety communications according to Article **S53** and global AMS(R)S communications with priorities 1 to 6 of Article **S44** in accordance with IMO and ICAO requirements;

e) that technical considerations for sharing satellite network resources between MSS (other than AMS(R)S) and AMS(R)S have been developed by the ITU-R (see Recommendation ITU-R **M.[8/17]**);

f) that global and regional mobile-satellite systems are being multilaterally coordinated in the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (E-s) and that the ITU Radio Regulations provide the international legal framework for multilateral agreements;

g) that in Nos. **S5.362A** and **S5.353A** priority has been given to accommodating the spectrum requirements urgency, distress and safety communications of GMDSS and AMS(R)S communications with priorities 1 to 6 of Article **S44** of AMS(R)S. See No. **S9.11A**, [except No. **S9.13**],

further considering

a) that the Convention on International Civil Aviation (ICAO SARPS) requires that stations of the AMS(R)S shall be in compliance with the internationally agreed Standards and Recommended Practices and Procedures for Air Navigation Services;

b) that ICAO has developed a global Air Traffic Management system (ATM) which requires the interoperability of those mobile-satellite systems providing AMS(R)S communications with the priority message structure of Article **S44**;

c) that IMO may also place similar requirements of interoperability of those mobile-satellite systems providing GMDSS communications with the priority message structure of Article **S51**,

recognizing

that Appendix **S15.2** identifies the bands 1 530 - 1 544 MHz (s-E) and 1 626.5 - 1 645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes,

noting

that for mobile-satellite systems that are already operating on a generic basis in the bands 1 525 - 1 544 MHz, 1 545 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 646.5 - 1 660.5 MHz, administrations may continue to limit the use of these bands to the national mobile-satellite service or, where agreements of administrations concerned are in place, to provide multinational service,

resolves

1 that the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by mobile satellite and AMS(R)S communications with priority 1 to 6 of Article **S44** should be based on internationally agreed assumptions and methodologies and information on GMDSS and AMS(R)S communication traffic usage and growth;

2 that the feasibility of prioritization and real time pre-emptive access between different mobile-satellite systems for GMDSS and AMS(R)S, in order to achieve the most flexible and practical use of the generic allocations, should be determined,

requests ITU-R

1 to develop the assumptions and methodologies and information on GMDSS and AMS(R)S communication traffic usage and growth to determine the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by mobile satellite and AMS(R)S communications with priority 1 to 6 of Article **S44**;

2 to determine the feasibility of prioritization and real time pre-emptive access between different mobile-satellite systems for GMDSS and AMS(R)S, in order to achieve the most flexible and practical use of the generic allocations,

requests the next competent WRC

to take into account the outcome of the ITU-R studies and take appropriate action on this subject,

invites

ICAO, IMO, IALA, administrations and other concerned organizations to participate in the studies identified in *requests ITU-R* 1 and 2 above.

DRAFT RESOLUTION [5B2A-2]

USE OF THE 1.5/1.6 GHz BANDS BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the conversion of certain bands to generic MSS allocation would facilitate introduction of MSS networks;

b) that the bands 1 525 - 1 544 MHz, 1 555 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 656.5 - 1 660.5 MHz have been allocated on a generic basis to MSS to facilitate flexible use of this spectrum by multiple MSS systems;

c) that this Conference has reviewed the use of the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz for MSS stations participating in the GMDSS in order to provide spectrum to fulfil the global maritime service requirements while providing protection for GMDSS pursuant to No. [**ADD S5.353A**];

d) that the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz are currently allocated exclusively to the AMS(R)S on a worldwide basis;

e) that WRC-95, through Recommendation **34 (WRC-95)**, recommended that spectrum should be allocated on a worldwide basis to the most broadly defined services,

recognizing

a) that subject to further study and validation by ITU-R it may be feasible and desirable to relax the constraints on MSS in the bands included in No. [**ADD S5.353A**] at a future WRC in order to further facilitate flexible use of this spectrum by multiple MSS systems, while providing full protection for GMDSS distress and safety requirements and taking into account anticipated spectrum requirements for these services;

b) that subject to further study and validation by ITU-R it may be feasible to allocate the 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz bands to generic MSS with appropriate protection for distress and safety communications,

resolves

that WRC-99 review the constraints on the MSS allocations and establish how to protect the AMS(R)S,

invites ITU-R

as a matter of urgency to:

i) study the technical, operational and economic feasibility of relaxing the constraints to MSS allocations in all or parts of the bands referred to in *considering c*);

ii) study the feasibility of allocating the exclusive AMS(R)S bands referred to in *considering* d) to the generic MSS taking into account the need for protection of safety related communications;

iii) complete these studies and report the results to WRC-99,

invites

ICAO, IMO, IALA, administrations and other concerned organizations to participate in the studies identified in *invites ITU-R* above.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/30-E
6 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

SUB-WORKING GROUP 5B2

REPORT FO THE INFORMAL DISCUSSION GROUP 5B2-C

TERMS OF REFERENCE: FREQUENCY ALLOCATIONS IN THE 1 675 - 1 710 MHz BAND AND ASSOCIATED FOOTNOTES

Sub-Working Group 5B2-C held one meeting. The proposals for the 1 675 - 1 710 MHz band were discussed.

The majority of the countries made proposals for modifications to frequency allocations in the 1 675 - 1 710 MHz band and these proposals reflect the band segmentation approach for accommodating the MSS allocation in this part of the spectrum and protection of meteorological services as discussed in the Report of the Conference Preparatory Meeting (CPM-97). These proposals support allocation of the subband 1 675 - 1 683 MHz for MSS on a worldwide basis and deletion of existing Region 2 MSS allocations in the remaining band, i.e. 1 683 - 1 710 MHz. These proposals also include the following provisions:

- new Region 1 and 3 MSS allocations will come into effect only from 1 July 2000;
- MSS to protect meteorological satellite and meteorological aid services;
- compliance with ITU-R Recommendation ITU-R SA.1158-1 on meteorological-satellite earth station characteristics;
- adoption of suitable resolution to include transitional plans for meteorological aid stations, specification of time-frame for removing frequency sharing constraints between MetAids and the MSS.

Many administrations and national and international meteorological agencies accept the above approach as they consider this approach will limit frequency sharing and readjustment problems to only the subband 1 675 - 1 683 MHz and the other portion of the band will be available for use for meteorological applications without any constraint of sharing the spectrum with the MSS. This approach in a way forms a solution to the problem of finding spectrum for the MSS and protection of existing and future meteorological services.

In the 5B2-C, two administrations indicated difficulties with the above proposals as explained below:

- one administration belonging to Region 2 objected to the deletion of MSS allocations in Region 2 from 1 683 - 1 710 MHz and also expressed the view that the approach of the transitional plan is unacceptable when the MSS proposes to take over the band 1 675 - 1 683 MHz currently available to radiosondes as transition is impractical for that country;
- one administration belonging to Region 3 expressed concern regarding problems in frequency sharing between the meteorological-satellite and meteorological aids service and MSS in view of the proposed MSS allocation in the 1 675 - 1 683 MHz.

In the Sub-Working Group, it was decided that concerns expressed by the two administrations should be brought to the attention of the Working Group 5B2.

Since the majority of the proposals were in favour of modifications to the allocations in the band 1 675 - 1 710 MHz and MSS allocation on a worldwide basis by applying band segmentation approach as indicated above and at the same time ensuring protection to the interests of meteorological services, the Informal Discussion Group considered these proposals in detail and developed the enclosed Table of Frequency Allocations and Footnotes for further consideration and approval by Working Group 5B2. While considering the enclosed proposal, it may also be necessary to take into account the following points:

- The proposed footnote ADD S5.377A indicating that MSS would not cause harmful interference to or claim protection from existing fixed stations and another footnote ADD S5.377B indicating that MSS in the band 1 675 - 1 683 MHz would not commence before 1 July 2000 in Regions 1 and 3 form a part of the majority of the proposals. But the explicit agreement of the Sub-Working Group 5B2-C for these footnotes was not obtained but there was no opposition to these proposals. These footnotes are shown in square brackets. The inclusion of these footnotes is considered a must from the fixed and meteorological services point of view.
- Resolution 213 referred in the proposed footnote MOD S5.377 needs to be revised to address some of the aspects like transitional plan arrangements, need for sharing studies, etc. In this respect, the Canadian proposal CAN/35/123 could form a good starting point.

ARTICLE S5

CAN/35/118
MOD

MHz
1 670 – 1 700

Allocation to Services		
Region 1	Region 2	Region 3
1 675 – ~~1 690~~1 683	**1 675 – ~~1 690~~1 683**	**1 675 – ~~1 690~~1 683**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
MOBILE-SATELLITE (Earth-to-space) ADD S5.377B	MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space) ADD S5.377B
S5.341 MOD S5.377 ADD S5.377A	S5.341 MOD S5.377 ADD S5.377A	S5.341 MOD S5.377 ADD S5.377A
~~1 675~~1 683 – 1 690	**~~1 675~~1 683 – 1 690**	**~~1 675~~1 683 – 1 690**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	~~MOBILE-SATELLITE (Earth-to-space)~~	
S5.341	S5.341 ~~S5.377~~	S5.341

Allocation to Services		
Region 1	Region 2	Region 3
1 690 – 1 700	**1 690 – 1 700**	**1 690 – 1 700**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
Fixed	~~MOBILE-SATELLITE (Earth-to-space)~~	
Mobile except aeronautical mobile		
S5.289 S5.341 S5.382	S5.289 S5.341 ~~S5.377~~ S5.381	S5.289 S5.341 S5.381

CAN/35/119
MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 700 – 1 710	**1 700 – 1 710**	**1 700 – 1 710**
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	~~MOBILE-SATELLITE (Earth-to-space)~~	
S5.289 S5.341	S5.289 S5.341 ~~S5.377~~	S5.289 S5.341 S5.384

EUR/5/271

MOD S5.377 In the band 1 675 - ~~1 710~~1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services [~~(see Resolution 213 (Rev. WRC-95))~~] and the use of this band shall be subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. In order to avoid causing harmful interference to the meteorological-satellite service, mobile earth stations shall not operate, except on a narrow-band signalling channel, within the exclusion zones around the meteorological-satellite earth stations defined in Recommendation ITU-R **SA.1158**. The mobile-satellite system shall have position determination capabilities to ensure compliance with this provision.

[EUR/5/272

ADD S5.377A In the band 1 675 - 1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to or claim protection from existing stations in the fixed service notified and brought into use prior to 21 November 1997.]

[EUR/5/273

ADD S5.377B The use of the band 1 675 - 1 683 MHz by the mobile-satellite service shall not commence before 1 July 2000.]

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/32-E
7 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 1 OF THE PLENARY

Ref.: Documents 2 (Part 3) and 27 (Annex 1)

NOTE BY THE CHAIRMAN OF AD HOC 1 OF WG PL 1

REVISED WARC/WRC RESOLUTIONS AND RECOMMENDATIONS INCORPORATING EDITORIAL AMENDMENTS

Resolutions: 1, 2, 5, 7, 14, 15, 18, 105, 111, 205, 207, 300, 312, 405, 411, 412, 522, 525, 526, 527, 528, 602, 703, 705, 706 and 711

Recommendations: 9, 14, 32, 61, 63, 64, 319, 402, 506, 507, 604, 605, 606, 701, 702, 705, 707, 709, 710, 715, 718 and 719

RESOLUTION No. 1

RELATING TO NOTIFICATION OF FREQUENCY ASSIGNMENTS[1]

The World Administrative Radio Conference, Geneva, 1979,

referring to

– the Preamble of the ~~Convention*~~ Constitution,

– Article ~~31~~42 of the ~~Convention*~~ Constitution (Special Arrangements),

– Article ~~7~~**S6** of the Radio Regulations (Special Agreements),

~~– Article **12** of the Radio Regulations (Notification and Recording in the Master International Frequency Register of Frequency Assignments to Terrestrial Radiocommunication Stations),~~

~~– Article **13** of the Radio Regulations (Notification and Recording in the Master International Frequency Register of Frequency Assignments to Radio Astronomy and Space Radiocommunication Stations Except Stations in the Broadcasting-Satellite Service),~~

- Article **S11** of the Radio Regulations (Notification and Recording of Frequency Assignments),

~~– Article **17** of the Radio Regulations (Procedure for the Bands Allocated Exclusively to the Broadcasting Service Between 5 950 kHz and 26 100 kHz);~~

- Article **S12A** of the Radio Regulations (Planning and Procedures for the Bands Allocated Exclusively to the Broadcasting Service Between 5 950 kHz and 26 100 kHz),

resolves

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

---

[1] ~~Replaces Resolution No. 5 of the Administrative Radio Conference, Geneva, 1959.~~ WRC-97 made editorial amendments to this Resolution.

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

RESOLUTION No. 2

RELATING TO THE EQUITABLE USE, BY ALL COUNTRIES, WITH EQUAL RIGHTS, OF THE GEOSTATIONARY-SATELLITE ORBIT AND OF FREQUENCY BANDS FOR SPACE RADIOCOMMUNICATION SERVICES[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

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

taking into account

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

having in mind

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

resolves

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

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

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

---

[1] ~~Replaces Resolution No. Spa2 – 1 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.~~ WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 5

RELATING TO TECHNICAL COOPERATION WITH THE DEVELOPING COUNTRIES IN THE STUDY OF PROPAGATION IN TROPICAL AREAS[1]

The World Administrative Radio Conference, Geneva, 1979,

having noted

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

being aware

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

b) of the importance of propagation in radiocommunications;

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

considering

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

b) the scarcity of resources available in these countries;

resolves to invite the Secretary-General

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

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

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

---

[1] WRC-97 made editorial amendments to this Resolution.

urges administrations

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

invites the ~~Administrative~~ Council

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

RESOLUTION No. 7

RELATING TO THE DEVELOPMENT OF NATIONAL RADIO FREQUENCY MANAGEMENT[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

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

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

noting

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

noting further

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

recommends

that the administrations of such countries take appropriate action;

resolves

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

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

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

[1] WRC-97 made editorial amendments to this Resolution.

recommends

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

invites the ~~Administrative~~ Council

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

instructs the Secretary-General

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

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

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

draws the attention of the next Plenipotentiary Conference to

1. the particular problems identified in this Resolution;

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

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

RESOLUTION No. 14

RELATING TO THE TRANSFER OF TECHNOLOGY[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

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

noting

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

aware

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

also aware

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

resolves to urge

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

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

---

[1] WRC-97 made editorial amendments to this Resolution.

resolves to instruct the Secretary-General

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

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

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

invites the ~~Administrative~~ Council

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

RESOLUTION No. 15

RELATING TO INTERNATIONAL COOPERATION AND TECHNICAL ASSISTANCE IN THE FIELD OF SPACE RADIOCOMMUNICATIONS[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

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

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

recognizing

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

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

resolves to invite the ~~Administrative~~ Council

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

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

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

4. to consider in what way the work of the ~~Consultative Committees~~ ITU-T, ITU-R and ITU-D and other organs in the structure of the Union may be utilized in the most effective way for the information and assistance of administrations of Member ~~countries~~ States of the Union in the development of space radiocommunications.

---

[1] ~~Replaces Resolution No. Spa 4 of the Extraordinary Administrative Radio Conference, Geneva, 1963.~~ WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 18 (Mob-83)

RELATING TO THE PROCEDURE FOR IDENTIFYING AND ANNOUNCING THE POSITION OF SHIPS AND AIRCRAFT OF STATES NOT PARTIES TO AN ARMED CONFLICT[1]

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

considering

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

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

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

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

resolves

1. that the frequencies for urgency signal and messages specified in ~~No. 3201~~Appendix **S13** [No. **3201**] of the Radio Regulations may be used by ships and aircraft of States not parties to an armed conflict for self-identification and establishing communications. The transmission will consist of the urgency or safety signals, as appropriate, described in ~~Article 40~~ Appendix **S13** [Article **40**] followed by the addition of the single group "NNN" in radiotelegraphy and by the addition of the single word "NEUTRAL" pronounced as in French "neutral" in radiotelephony. As soon as practicable, communications shall be transferred to an appropriate working frequency;

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

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

b) position of such ship or aircraft;

c) number and type of such ships or aircraft;

d) intended route;

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

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

---

[1] WRC-97 made editorial amendments to this Resolution.

3. that the provisions of ~~Sections I and III of Article 40~~ Appendix **S13** [Article **40**] relating to Urgency and Safety Transmissions, and Medical Transports shall apply as appropriate to the use of the urgency and safety signals, respectively, by such ship or aircraft;

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

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

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

requests the Secretary-General

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

requests ~~the CCIR~~ITU-R

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

RESOLUTION No. 105 (Orb-88)

IMPROVEMENT OF THE QUALITY OF CERTAIN ALLOTMENTS IN PART A OF THE FIXED-SATELLITE SERVICE PLAN[1]

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

considering

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

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

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

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

noting

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

noting further

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

recognizing

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

believing

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

resolves

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

---

[1] WRC-97 made editorial amendments to this Resolution.

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

invites administrations

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

calls upon

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

RESOLUTION No. 111 (Orb-88)

PLANNING OF THE FIXED-SATELLITE SERVICE IN THE BANDS 18.1 - 18.3 GHz, 18.3 - 20.2 GHz AND 27 - 30 GHz[1]

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

considering

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

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

recognizing

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

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

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

resolves

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

invites ~~the CCIR~~ ITU-R

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

[1] WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 205 (Rev.Mob-87)

PROTECTION OF THE BAND 406 - 406.1 MHz ALLOCATED TO THE MOBILE-SATELLITE SERVICE[1]

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

considering

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

b) that Nos. ~~649~~ **S5.266 [649]** and ~~649A~~ **S5.267 [649A]** of the Radio Regulations limit the use of the band 406 - 406.1 MHz to low-power satellite emergency position-indicating radiobeacons (EPIRBs);

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

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

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

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

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

considering further

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

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

j) that observations of the use of frequencies in the band 406 - 406.1 MHz show that they are being used by stations other than those authorized by No. ~~649~~ **S5.266 [649]** of the Radio Regulations, and that these stations have caused harmful interference to the mobile-satellite service, and particularly to the reception of satellite EPIRB signals by the COSPAS-SARSAT system;

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

---

[1] WRC-97 made editorial amendments to this Resolution.

recognizing

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

resolves

to instruct the ~~IFRB~~ Radiocommunication Bureau

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

to urge administrations

1. to take part in monitoring programmes requested by the ~~IFRB~~ Radiocommunication Bureau in accordance with No. ~~1874~~ **S16.5 [1874]** of the Radio Regulations, in the band 406 - 406.1 MHz, with a view to identifying and locating stations of services other than those authorized in the band;

2. to ensure that stations other than those operated under No. ~~649~~ **S5.266 [649]** abstain from using frequencies in the band 406 - 406.1 MHz;

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

invites ~~the CCIR~~ ITU-R

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

RESOLUTION No. 207 (Mob-87)

UNAUTHORIZED USE OF FREQUENCIES IN THE BANDS ALLOCATED TO THE MARITIME MOBILE SERVICE[1] AND TO THE AERONAUTICAL MOBILE (R) SERVICE[2][1]

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

considering

a) that monitoring observations of the use of frequencies in the band 2 170 - 2 194 kHz and in the bands allocated exclusively to the maritime mobile service between 4 063 kHz and 27 500 kHz and to the aeronautical mobile (R) service between 2 850 kHz and 22 000 kHz show that a number of frequencies in these bands are still being used by stations of other services, some of which are operating in contravention of No. ~~2665~~ **S23.2 [2665]** of the Radio Regulations;

b) that these stations are causing harmful interference to the maritime mobile and aeronautical mobile (R) services;

c) that radio is the sole means of communication for the maritime mobile service and that certain frequencies in the bands mentioned in *considering a)* are reserved for distress and safety purposes;

d) that radio is the sole means of communication for the aeronautical mobile (R) service and that this is a safety service;

considering in particular

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

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

resolves

to urge administrations

1. to ensure that stations of services other than the maritime mobile service abstain from using frequencies in distress and safety channels and their guard bands and in the bands allocated exclusively to that service, except under the conditions expressly specified in Nos. ~~342~~**S4.4 [342]**, ~~518~~**S5.128 [518]**, ~~519~~**S5.129 [519]**, ~~522~~ **S5.137 [522]** and ~~956~~ **S4.13 [956]** to ~~958~~ **S4.15 [958]** of the Radio Regulations; and to ensure that stations of services other than the aeronautical mobile (R) service refrain from using frequencies allocated to that service except under the conditions expressly specified in Nos. ~~342~~ **S4.4 [342]** and ~~956~~ **S4.13 [956]** of the Radio Regulations;

~~[1] Replace Resolution 309 of the WARC, Geneva, 1979.~~

~~[2] Replaces Resolution 407 of the WARC, Geneva, 1979.~~

[1] WRC-97 made editorial amendments to this Resolution.

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

3. to participate in the monitoring programmes that the ~~IFRB~~ Radiocommunication Bureau may organize pursuant to this Resolution;

4. to make every effort to ensure that such emissions are made in appropriate bands allocated to services other than the maritime mobile service or the aeronautical mobile (R) service;

5. to request their competent authorities to take, within their respective jurisdiction, such legislative or regulatory measures which they consider necessary or appropriate in order to prevent stations from operating in contravention of No. ~~2665~~ **S23.2 [2665]** of the Radio Regulations;

to invite the ~~IFRB~~ Radiocommunication Bureau

1. to continue to organize monitoring programmes, at regular intervals, in the maritime distress and safety channels and their guard bands and in the bands allocated exclusively to the maritime mobile service between 4 063 kHz and 27 500 kHz and to the aeronautical mobile (R) service between 2 850 kHz and 22 000 kHz, with a view to identifying the stations of other services operating on these channels or in these bands;

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

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

requests administrations

to take all necessary steps in such cases to ensure the cessation of any transmissions contravening the provisions of the Radio Regulations on the frequencies or in the bands referred to in this Resolution.

RESOLUTION No. 300 (Rev.Mob-87)

USE AND NOTIFICATION OF THE PAIRED FREQUENCIES RESERVED FOR NARROW-BAND DIRECT-PRINTING TELEGRAPHY AND DATA TRANSMISSION SYSTEMS IN THE HF BANDS ALLOCATED ON AN EXCLUSIVE BASIS TO THE MARITIME MOBILE SERVICE[1]

(see Appendix ~~32~~S17 (Part B, Section II))

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

considering

a) that certain sections of the HF bands allocated to the maritime mobile service have been reserved for narrow-band direct-printing telegraphy and data transmission systems for use on a paired frequency basis only;

b) that Appendix ~~32~~ S17 [32] (Part B, Section II) of the Radio Regulations contains a channelling arrangement in the maritime mobile HF bands for narrow-band direct-printing telegraphy and data systems (paired frequencies);

c) that this Conference has made available an increased number of paired frequencies reserved for narrow-band direct-printing telegraphy and data transmission systems for use on a paired basis only, and has modified Appendix ~~32~~ S17 [32] (Part B, Section II) accordingly;

d) that the World Maritime Administrative Radio Conference (WMARC, Geneva, 1974), established interim measures for the orderly bringing into use of the paired frequencies;

e) that the WMARC 1974 established a provisional procedure for the use and notification of paired frequencies for narrow-band direct-printing telegraphy and that the application of this procedure by administrations and by the ~~IFRB~~ Radiocommunication Bureau was satisfactory;

resolves

1. that paired frequencies in the HF bands reserved for narrow-band direct-printing telegraphy between coast stations and ship stations shall be used by these stations, notified to the ~~IFRB~~ Radiocommunication Bureau and recorded in the Master International Frequency Register in the following manner:

1.1 assignments of pairs of frequencies for transmission and reception shall be made solely to coast stations. Ship stations of any nationality shall use by right for their transmissions the receiving frequencies of the coast stations with which they exchange traffic;

1.2 each administration shall choose the pairs of frequencies for its requirements, if necessary with the assistance of the ~~IFRB~~Radiocommunication Bureau;

1.3 the assignments thus selected shall be notified to the ~~IFRB~~ Radiocommunication Bureau in notices as shown in Appendix ~~1~~ S4 [1] to the Radio Regulations and administrations shall supply the basic characteristics listed in Section A or B of that Appendix, as appropriate;

---

[1] WRC-97 made editorial amendments to this Resolution.

1.4 whenever practicable, each notice should reach the ~~Board~~ Radiocommunication Bureau before the date on which the assignment is brought into use. It must reach the ~~Board~~ Radiocommunication Bureau not earlier than one year before the date on which it is to be brought into use but in any case not later than 30 days after it is actually brought into use;

1.5 assignments which are in conformity with the Radio Regulations, and in particular Appendix ~~32~~**S17 [32]** (Part B, Section II), shall be examined by the ~~Board~~ Radiocommunication Bureau from the viewpoint of the probability of harmful interference to be caused by or to other existing or proposed uses. The ~~Board~~ Radiocommunication Bureau shall inform the administration concerned of the results of its examination and shall record the notified assignment with reference to this Resolution and without any date in Column 2. The date of receipt of the notice by the ~~Board~~ Radiocommunication Bureau and the date of putting into use of the assignment shall be entered in the Remarks Column. In cases where the ~~Board~~ Radiocommunication Bureau identifies incompatibilities, it shall make suggestions with a view to resolving them;

1.6 any notice not in conformity with the Radio Regulations shall be returned to the notifying administration by the ~~IFRB~~ Radiocommunication Bureau, together with any suggestion which the ~~Board~~ Radiocommunication Bureau may be able to submit in this respect;

1.7 should difficulties arise between administrations using the same channel, or adjacent channels, the matter shall be settled by agreement between the administrations concerned taking into account the information published by the ~~IFRB~~ Radiocommunication Bureau;

2. that a future competent conference be invited to review this Resolution and examine any difficulties which may have arisen in its application;

3. that the entries made in the Master Register under this Resolution shall in no way prejudge any decisions which may be taken by the aforementioned conference;

invites the ~~Administrative~~ Council

to place this Resolution on the agenda of the next competent conference in order to examine any difficulties which may have arisen in its application.

RESOLUTION No. 312 (Rev.Mob-87)

CALLING PROCEDURES FOR HF A1A AND A1B MORSE TELEGRAPHY[1]

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

considering

a) that there is a need for more effective utilization of the radio frequency spectrum and of the time of operational personnel on board ships;

b) that it is desirable to continue to improve the effectiveness of calling in the HF A1A and A1B Morse telegraphy bands;

c) that the World Maritime Administrative Radio Conference, Geneva, 1974, adopted a new calling procedure for the HF A1A Morse telegraphy bands (Article ~~60~~ **S52 [60]** and Appendix ~~34~~**S17 [34]** (Part B, Section IV));

d) that the effectiveness of the new calling procedure requires agreement between administrations with respect to the groups specified in Appendix ~~34~~ **S17 [34]** (Part B, Section IV) in accordance with a planned distribution of coast stations on a regional and traffic basis;

e) that the administrations at the 1974 Conference agreed to the Distribution Plan of Coast Stations (annexed to this Resolution) arranged by countries and areas into four groups to ensure a better distribution of calls;

invites

administrations which are providing an international public correspondence service to indicate for publication in the List of Coast Stations the periods of service during which watch will be maintained on the common, and if necessary the group, channel or channels;

invites further

administrations which wish to enter into a group in the Distribution Plan, or administrations included in the Plan wishing to make a modification in the Plan, to coordinate as far as possible their proposed changes with other interested and affected administrations which are designated in the group concerned. An administration which has decided to enter into a group or change from a designated group in the Distribution Plan shall inform the Secretary-General of its decision and it shall be published in the Annex to the List of Coast Stations;

instructs the Secretary-General

to update, as necessary, the Distribution Plan annexed to the List of Coast Stations.

---

[1] WRC-97 made editorial amendments to this Resolution.

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87)

Distribution Plan for Group Channels HF A1A Morse Coast Stations by Countries and Areas

Group 1*
Azores
Angola (~~People's~~ Republic of)
Bahamas (Commonwealth of the)
Bahrain (State of)
Bangladesh ((People's Republic of)
Bermuda
Brazil (Federative Republic of)
Canada (West Coast and Western Arctic)
Chile
~~Ivory Coast~~Côte d'Ivoire (Republic of the)
Djibouti (Republic of)
Ecuador
Spain (Canary Islands)
United States of America (East Coast)
Ethiopia (Federal Democratic Republic of)
France
India (Republic of) (West)
Ireland
Israel (State of)
Kenya (Republic of)
Liberia (Republic of)
Madagascar (~~Democratic~~ Republic of)
Martinique (French Department of)
Mauritius (Republic of)
New Caledonia ~~and Dependencies~~
~~New Hebrides~~Vanuatu (Republic of)
Oman (Sultanate of)
Philippines (Republic of the)
French Polynesia
Puerto Rico
Reunion (French Department of)
Roumania ~~(Socialist Republic of)~~
United Kingdom of Great Britain and Northern Ireland
Sao Tome and Principe (Democratic Republic of)
Singapore (Republic of)
Switzerland (Confederation of)
[Union of Soviet Socialist Republics (Ukraine and South Asia)]**

* *Note by the Secretariat:* In January 1981, the Administration of Nicaragua requested to be included in Group 1 of the Plan.

** *Note by the Secretariat:* Changes of a geopolitical nature having occurred since the adoption of this Annex by the WARC Mob-87, the Administrations of States which are today part of this geographic Zones should coordinate their inclusion in this Annex.

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87) (CONT.)

Group 2
Algeria (~~Algerian~~ People's Democratic and Popular Republic of)
Netherlands Antilles
Saudi Arabia (Kingdom of) (West)
Barbados
Belgium
Benin (~~People's~~ Republic of)
Cameroon (~~United~~ Republic of)
Cape Verde (Republic of)
Christmas Islands (Indian Ocean)
Cyprus (Republic of)
Colombia (Republic of)
Congo ((~~People's~~ Republic of the)
Cook Islands
Costa Rica
Cuba
Dominican Republic
Egypt (Arab Republic of)
United States of America (Gulf Coast)
Falkland Islands ~~and Dependencies~~ (Malvinas)
France
Gabonese Republic
Gambia (Republic of the)
Greece
HongKong
Hungar~~ian~~y ~~People's~~ (Republic of)
Italy
~~Democratic Kampuchea~~Cambodia (Kingdom of)
Lebanon
Martinique (French Department of)
Mexico
New Caledonia ~~and Dependencies~~
~~New Hebrides~~Vanuatu (Republic of)
Panama (Republic of)
Paraguay (Republic of)
Netherlands (Kingdom of the)
Peru
Poland (~~People's~~ Republic of)
French Polynesia
~~Republic of~~ Korea (Republic of)
Reunion (French Department of)
United Kingdom of Great Britain and Northern Ireland (22 MHz only)
Sudan (~~Democratic~~ Republic of the)
Sri Lanka (Democratic Socialist Republic of))
[Czechoslovak Socialist Republic] **
Thailand

** *Note by the Secretariat:* Changes of a geopolitical nature having occurred since the adoption of this Annex by the WARC Mob-87, the Administrations of States which are today part of this geographic Zones should coordinate their inclusion in this Annex.

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87) (CONT.)

Group 2 *(cont.)*
[Union of Soviet Socialist Republics (North West and Far East)]**
Yemen ~~Arab~~ (Republic of)

Group 3
Alaska (State of)
Argentine Republic
~~Burma (Socialist Republic of the Union of)~~Myanmar (Union of)
Canada (East Coast and Eastern Arctic)
China (People's Republic of)
Denmark
United States of America (West Coast)
Finland
Ghana
Guam
Guinea-Bissau (Republic of)
Guinea (~~Revolutionary People's~~ Republic of)
Guyana
Hawaii (State of)
Iran (Islamic Republic of)
Iceland
Jamaica
Libya (Socialist People's Libyan Arab Jamahiriya)
Madeira
~~Mariana Islands~~Northern Mariana Island (Commonwealth of the)
Morocco (Kingdom of)
Mozambique (~~People's~~ Republic of)
Nauru (Republic of)
Nigeria (Federal Republic of)
Norway
Pakistan (Islamic Republic of)
~~German Democratic Republic~~Germany (Federal Republic of)
Sweden
Trinidad and Tobago
Turkey
[Union of Soviet Socialist Republics (Far East and European Area)]**
Venezuela (Republic of)
[Yugoslavia (Socialist Federal Republic of)]**

** *Note by the Secretariat:* Changes of a geopolitical nature having occurred since the adoption of this Annex by the WARC Mob-87, the Administrations of States which are today part of this geographic Zones should coordinate their inclusion in this Annex.

ANNEX TO RESOLUTION No. 312 (Rev.Mob-87) (CONT.)

Group 4
Albania (~~Socialist People's~~ Republic of)
Germany (Federal Republic of)
Saudi Arabia (Kingdom of) (East)
Australia
Bulgaria (~~People's~~ Republic of)
China (People's Republic of) (Province of Taiwan)
Spain (except the Canary Islands)
Fiji (Republic of)
Equatorial Guinea (Republic of)
India (Republic of) (East)
Indonesia (Republic of)
Iraq (Republic of)
Japan
Jordan (Hashemite Kingdom of)
Kuwait (State of)
Malaysia
Malta ~~(Republic of)~~
Mauritania (Islamic Republic of)
New Zealand
Papua New Guinea
Pitcairn Island
Portugal
Syrian Arab Republic
Solomon Islands
American Samoa
Senegal (Republic of the)
Seychelles (Republic of)
Sierra Leone
South Africa (Republic of)
Suriname (Republic of)
Togolese Republic
Tunisia
[Union of Soviet Socialist Republics (European Area and Arctic)]**
Uruguay (~~Oriental~~ Eastern Republic of)
Viet Nam (Socialist Republic of)
Yemen (~~People's Democratic~~ Republic of)
Zaire (Republic of)

** *Note by the Secretariat:* Changes of a geopolitical nature having occurred since the adoption of this Annex by the WARC Mob-87, the Administrations of States which are today part of this geographic Zones should coordinate their inclusion in this Annex.

RESOLUTION No. 405

RELATING TO THE USE OF FREQUENCIES OF THE AERONAUTICAL MOBILE (R) SERVICE[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978, adopted and developed a new Frequency Allotment Plan for the use of HF channels for the aeronautical mobile (R) service (Appendix ~~**27 Aer2**~~ **S27 [27 Aer2]** to the Radio Regulations);

b) that air operations are subject to continuous changes;

c) that these changes require attention by the administrations concerned; but

d) that, in seeking to satisfy new communication requirements, no decision should be taken that will prevent or handicap the coordinated utilization of those high frequency aeronautical mobile (R) band allotments as prescribed in the Plan;

e) that the families of frequencies allotted to the Major World Air Route Areas (MWARAs), Regional and Domestic Air Route Areas (RDARAs) and Sub-Areas and VOLMET areas have been chosen considering propagation conditions which allow for the selection of the most suitable frequencies for the distances involved;

f) that specific steps should be taken to ensure that the correct order of frequency is used;

g) that it is essential to distribute the communication traffic load as uniformly as possible over the frequencies available;

h) that frequencies have been allotted for worldwide use;

resolves

that administrations, individually or in collaboration, take the necessary steps:

1. to make as great a use as possible of higher frequencies in order to lessen the load on the HF aeronautical mobile (R) bands;

2. to make as great a use as possible of antennae of appropriate directivity and efficiency in order to minimize the possibilities of mutual interference within an area or between areas;

---

[1] ~~Replaces Resolution No. **Aer2** – 7 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.~~ WRC-97 made editorial amendments to this Resolution.

3. to coordinate the use of families of frequencies necessary for a given route segment in accordance with the technical principles in Appendix ~~27 Aer2~~S27 [27 Aer2] and in the light of the propagation data available, to ensure that the most appropriate frequencies are used with an aircraft at a given distance from the aeronautical station providing service over the route segment concerned;

4. to improve operating techniques and procedures and to use equipment which will make it possible to attain the highest possible efficiency in handling air-ground HF communications;

5. to collect precise data on the operation of their HF communication systems, particularly data having a bearing on technical and operating standards, so as to facilitate re-examination of the Plan;

6. to establish, through regional arrangements, the best method of providing the communications required for any new long-distance international or regional air operation which is not or cannot be accommodated within the system of MWARA and RDARA, in such a manner as not to cause harmful interference to the utilization of frequencies as prescribed in the Plan.

RESOLUTION No. 411 (WARC-92)

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[1]

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 **412 (WARC-92)** adopted by this Conference;

resolves

1. that the provisions of Appendix ~~**26(Rev.)**~~**S26 [26(Rev.)]**, as well as the relevant provisions of Article ~~**12**~~ **S11 [12]** of the Radio Regulations, as modified by this Conference, shall apply to any new frequency assignment, as from 0001 UTC on 12 October 1993;

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.)**~~ **S26 [26(Rev.)]** by not permitting the installation of new equipment whose emissions occupy a necessary bandwidth exceeding 2 800 Hz;

---

[1] WRC-97 made editorial amendments to this Resolution.

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.)**~~**S26 [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 No. 412 (WARC-92)

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[1]

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.)~~**S26 [26(Rev.)]**, and to notify such transfers, where appropriate, to the ~~Board~~Radiocommunication Bureau;

resolves

1. that, at an appropriate date, the ~~Board~~ Radiocommunication Bureau 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~~ Radiocommunication Bureau shall indicate, for each frequency assignment, a replacement frequency(-ies) which fulfil(s) the provisions of Appendix ~~26(Rev.)~~**S26 [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.)~~**S26 [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~~ Radiocommunication Bureau 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~~ Radiocommunication Bureau under the relevant provisions of ~~Sub-Section IIC and Section III of~~ Article ~~12~~ **S11 [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.)~~**S26 [26(Rev.)]** shall be treated as follows:

5.1 within 60 days from 15 December 1997, the ~~Board~~ Radiocommunication Bureau 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.)~~**S26 [26(Rev.)]**;

5.2 if an administration fails to notify the ~~Board~~ Radiocommunication Bureau 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.

---

[1] WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 522 (WARC-92)

FURTHER WORK BY THE ~~CCIR~~ ITU-R CONCERNING THE BROADCASTING-SATELLITE SERVICE (SOUND)[1]

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 frequency allocations for the broadcasting-satellite service (sound) (BSS (sound)) down links and the complementary terrestrial service in the bands specified in Article ~~8~~ **S5 [8]**, with an interim procedure to govern the introduction of this service;

b) that further technical development is necessary for the introduction of BSS (sound);

c) that BSS (sound) systems could employ satellites in the geostationary-satellite orbit (GSO) or in non-geostationary-satellite orbits (non-GSO);

d) that the most urgent guidance required will relate to the means to be employed for coordinating and avoiding mutual harmful interference between non-GSO systems, between GSO and non-GSO systems of the broadcasting-satellite service (sound), and between BSS (sound) systems and the systems of other services;

noting

the provisions of No. ~~2674~~ **S23.13 [2674]** of the Radio Regulations;

resolves

1. that the ~~CCIR~~ ITU-R should study this subject as a matter of urgency;

2. that ~~CCIR~~ ITU-R studies should focus in particular on:

i) the characteristics of GSO and non-GSO BSS (sound) systems compatible with No. ~~2674~~ **S23.13 [2674]** of the Radio Regulations,

ii) the appropriate sharing criteria;

3. to invite administrations and the ~~IFRB~~ Radiocommunication Bureau to participate in the work of the ~~CCIR~~ ITU-R Study Groups on this subject;

4. to invite administrations which introduce BSS (sound) systems to publish reports on their experience of such systems;

invites the ~~Administrative~~ Council

to take account of the urgent need for regulatory provisions including measures to ensure frequency sharing between the BSS (sound) and other services in the same frequency bands, and to place this matter on the agenda of the next competent ~~administrative radio~~ radiocommunication conference,

instructs the Secretary-General

to bring this Resolution to the notice of the ~~Administrative~~ Council.

---

[1] WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 525 (WARC-92)

INTRODUCTION OF HIGH-DEFINITION TELEVISION (HDTV) SYSTEMS OF THE BROADCASTING-SATELLITE SERVICE (BSS) IN THE BAND 21.4 - 22.0 GHz IN REGIONS 1 AND 3[1]

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 reallocated the band 21.4 - 22.0 GHz in Regions 1 and 3 to the broadcasting-satellite service to be implemented after 1 April 2007;

b) that until 1 April 2007 the existing services operating in the band 21.4 - 22.0 GHz in Regions 1 and 3 in accordance with the Table of Frequency Allocations are therefore entitled to continue operating without harmful interference from other services;

c) that it is nevertheless desirable to facilitate the introduction of experimental HDTV systems in this band before 1 April 2007 without affecting the continued operation of existing services;

d) that it also may be possible to introduce operational HDTV systems in this band before 1 April 2007 without affecting the continued operation of existing services;

e) that after 1 April 2007 the introduction of HDTV systems in this band must be regulated in a flexible and equitable manner until such time as a future competent world ~~administrative radio~~ radiocommunication conference has adopted definitive provisions for this purpose in accordance with Resolution **507** ~~(WARC-79)~~;

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

resolves

to adopt the interim procedures contained in the annex hereto with effect from 1 April 1992;

invites all administrations

to comply with the above procedures;

instructs the ~~IFRB~~ Radiocommunication Bureau

to apply the above procedures.

---

[1] WRC-97 made editorial amendments to this Resolution.

ANNEX TO RESOLUTION No. 525 (WARC-92)

Interim Procedures for the Introduction of BSS (HDTV) Systems in the Band 21.4 - 22.0 GHz in Regions 1 and 3

Section I. General Provisions

1. It shall be understood that prior to 1 April 2007 all existing services in the band 21.4 - 22.0 GHz in Regions 1 and 3 operating in accordance with the Table of Frequency Allocations shall be entitled to continue to operate. After that date they may continue to operate, but they shall neither cause harmful interference to BSS (HDTV) systems nor be entitled to claim protection from such systems. It shall be understood that the introduction of an operational BSS (HDTV) system in the band 21.4 - 22.0 GHz in Regions 1 and 3 should be regulated by an interim procedure in a flexible and equitable manner until the date to be decided by a future competent conference.

Section II. Interim Procedure Relating to Experimental BSS (HDTV) Systems Introduced Before 1 April 2007

2. For the purpose of introducing experimental BSS (HDTV) systems in the band 21.4 - 22.0 GHz in Regions 1 and 3 before 1 April 2007 under the provisions of Article ~~34~~S27 [34] of the Radio Regulations, the procedures contained in Resolution **33** ~~(WARC-79)~~ shall be applied.

Section III. Interim Procedure Relating to Operational BSS (HDTV) Systems Introduced Before 1 April 2007

3. For the purpose of introducing operational BSS (HDTV) systems in the band 21.4 - 22.0 GHz in Regions 1 and 3 before 1 April 2007, the procedure contained in Resolution **33** ~~(WARC-79)~~ shall be applied, if the power flux-density at the Earth's surface produced by emissions from a space station, on the territory of any other country, exceeds:

- –115 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.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

4. If the power flux-density at the Earth's surface produced by emissions from a space station does not exceed these limits, the procedure in Sections B and C of Resolution **33** ~~(WARC-79)~~ only shall be applied.

Section IV. Interim Procedure Relating to BSS (HDTV) Systems Introduced After 1 April 2007

5. For the purpose of introducing and operating BSS (HDTV) systems in the band 21.4 - 22.0 GHz in Regions 1 and 3 after 1 April 2007, and before a future conference has taken decisions on definitive procedures, the procedure in Sections B and C of Resolution **33** ~~(WARC-79)~~ shall be applied.

6. For the purpose of this Section, BSS (HDTV) systems introduced under provisions of Sections II and III of this Resolution shall be taken into account.

7. Administrations shall, to the maximum extent possible, seek to ensure that operational BSS (HDTV) systems introduced in the band 21.4 - 22.0 GHz in Regions 1 and 3 under Sections III or IV of this Resolution have characteristics which take into account the studies of the ~~CCIR~~ ITU-R for the preparation of a future competent world ~~administrative radio~~ radiocommunication conference.

RESOLUTION No. 526 (WARC-92)

FUTURE ADOPTION OF PROCEDURES TO ENSURE FLEXIBILITY IN THE USE OF THE FREQUENCY BAND ALLOCATED TO THE BROADCASTING-SATELLITE SERVICE (BSS) FOR WIDE RF-BAND HIGH-DEFINITION TELEVISION (HDTV) AND TO THE ASSOCIATED FEEDER LINKS[1]

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 added an allocation to the BSS in the bands 21.4 - 22.0 GHz in Regions 1 and 3 and 17.3 - 17.8 GHz in Region 2 for use by wide RF-band HDTV;

b) that considerable further technological development of wide RF-band HDTV is expected before it can be introduced for general operational use;

c) that this Conference has adopted interim provisions to be applied during the period before 1 April 2007 to regulate the introduction of experimental or operational BSS (HDTV) systems (see Resolution **525 (WARC-92)**);

d) that in the longer term regulatory provisions designed to ensure flexible and equitable use of the BSS (HDTV) and associated feeder-link allocations will be necessary to replace these interim provisions;

resolves to urge all administrations

to study the development of future regulatory provisions for BSS (HDTV) to ensure flexibility in the use of the bands 21.4 - 22.0 GHz in Regions 1 and 3 and 17.3 - 17.8 GHz in Region 2, having regard to the interests of all countries and the state of technical development of this new service;

instructs the Secretary-General

to bring this Resolution to the attention of the ~~Administrative~~ Council with a view to placing an appropriate item on the agenda of a future world ~~administrative radio~~ radiocommunication conference.

[1] WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 527 (WARC-92)

TERRESTRIAL VHF DIGITAL SOUND BROADCASTING[1]

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

considering

a) that advances in technology have made available digital sound broadcasting systems of high quality;

b) that such digital sound broadcasting systems will offer a considerably higher sound quality as well as additional system characteristics which the present FM broadcasting system does not possess;

c) that digital sound broadcasting can, in addition to possessing the properties mentioned above, permit greater spectrum efficiency than conventional FM sound broadcasting;

d) that digital sound broadcasting systems require less effective radiated power;

e) that the bands 87.5 - 108 MHz in Region 1, 88 - 108 MHz in Region 2 and 87 - 108 MHz in Region 3 are generally widely used for high-powered FM sound broadcasting service, except in some countries;

f) that several European countries are considering the implementation of digital sound broadcasting on an interim basis in the VHF bands allocated to the broadcasting service, while ensuring the protection of assignments in the relevant broadcasting Plans in force;

resolves to invite ~~the CCIR~~ITU-R

in order to harmonize the implementation of terrestrial digital sound broadcasting;

1. to undertake, as a matter of urgency, the relevant technical studies associated with the introduction of terrestrial digital sound broadcasting, focusing primarily on the VHF broadcasting bands;

2. in particular, to consider the system characteristics and propagation phenomena in relation to developing compatibility criteria in the same and adjacent bands, including protection of the safety services;

invites ~~the BDT~~ITU-D

to include among its priorities the definition of a project relating to the study by the ~~CCIR~~ ITU-R of exceptional severe propagation phenomena in the regions of concern to developing countries;

instructs the Secretary-General

to bring this Resolution to the attention of the ~~Administrative~~ Council with a view to placing on the agenda of a competent ~~administrative radio~~ radiocommunication conference the subject of terrestrial VHF digital sound broadcasting for Region 1 countries and interested countries in Region 3;

invites administrations

to contribute actively to the relevant ~~CCIR~~ ITU-R studies.

---

[1] WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 528 (WARC-92)

INTRODUCTION OF THE BROADCASTING-SATELLITE SERVICE (SOUND) SYSTEMS AND COMPLEMENTARY TERRESTRIAL BROADCASTING IN THE BANDS ALLOCATED TO THESE SERVICES WITHIN THE RANGE 1 - 3 GHz[1]

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 frequency allocations to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting;

b) that it is necessary to ensure that the introduction of the broadcasting-satellite service (sound) and complementary terrestrial broadcasting proceeds in a flexible and equitable manner;

c) that efficient use of the spectrum will be enhanced by a worldwide allocation;

d) that a worldwide allocation may cause difficulties to some countries in relation to their existing services;

e) that future planning may limit the effect on other services;

resolves

1. that a competent conference should be convened, preferably not later than 1998, for the planning of the broadcasting-satellite service (sound) in the bands allocated to this service in the range 1 - 3 GHz; and the development of procedures for the coordinated use of complementary terrestrial broadcasting;

2. that this Conference should review criteria for sharing with other services;

3. that in the interim period, broadcasting-satellite systems may only be introduced within the upper 25 MHz of the appropriate band in accordance with Resolution **33** ~~(WARC-79)~~. The complementary terrestrial service may be introduced during this interim period subject to coordination with administrations whose services may be affected;

4. that the calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant ~~CCIR~~ ITU-R Recommendations agreed by the administrations concerned as a result of Resolution **703 (Rev.WARC-92)** or otherwise;

invites ~~the CCIR~~ ITU-R

to conduct the necessary studies prior to the Conference;

instructs the Secretary-General

to bring this Resolution to the attention of the ~~Administrative~~ Council to consider including in the agenda of ~~an administrative radio~~ radiocommunication conference to be held preferably not later than the year 1998 the matters addressed above.

---

[1] WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 602 (Mob-87)

DATA TRANSMISSION FROM MARITIME RADIOBEACONS FOR DIFFERENTIAL RADIONAVIGATION SYSTEMS[1]

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

considering

a) that No. ~~466~~ S5.73 [466] of the Radio Regulations provides for the transmission of supplementary navigational information using narrow-band techniques, on condition that the prime function of the beacon is not significantly degraded;

b) that the International Maritime Organization (IMO) has identified a need for data exchange between shore and ship in the case of radionavigation systems (e.g., Omega, GPS, Loran-C) operating in the differential mode;

c) that Resolution **3** of the Regional Administrative Conference for the Planning of the Maritime Radionavigation Service (Radiobeacons) in the European Maritime Area (Geneva, 1985) (EMA) invited this Conference to consider the various aspects of the use of maritime radiobeacons to transmit data to ships using either minimum shift keying (MSK) or frequency shift keying (FSK) techniques, and to choose between these two techniques;

d) that ~~CCIR~~ ITU-R studies have shown that, for continuous data transmission, it is necessary to use a second carrier, offset from the main carrier by 300 Hz or more, to prevent interference to certain types of automatic radio direction finders, regardless of whether MSK or FSK modulation is chosen;

e) that these studies have shown that MSK modulation has advantages over FSK modulation because of its improved spectral efficiency;

f) that the EMA Conference decided that radiobeacons in the European Maritime Area would be channelled in multiples of 500 Hz;

g) that if FSK or MSK modulation with an offset of 300 Hz or more is encoded on to a radiobeacon signal in the European Maritime Area, then the digital modulation signal will be contained partly in the channel adjacent to the radiobeacon channel, particularly in the case of high-speed data transmission;

h) that many administrations prefer the use of MSK modulation;

i) that the satellite system data corrections have to be transmitted on a continuous basis;

resolves

1. that the frequency for continuous data transmission to ships using FSK or MSK modulation on maritime radiobeacons should be offset from the radiobeacon main carrier frequency by an amount sufficient to ensure that no harmful interference is caused to automatic radio direction finders;

---

[1] WRC-97 made editorial amendments to this Resolution.

2. that the ~~CCIR~~ ITU-R should continue to study the technical factors, including a standard coding format, modulation method, necessary bandwidth, protection ratios and frequency offsets, such that the prime function of the radiobeacon is not significantly degraded, and make Recommendations;

3. that channelling plans for maritime radiobeacons should accommodate the transmission of data to ships using frequency offset techniques;

invites the ~~IFRB~~ Radiocommunication Bureau

to consider this Resolution in preparing its technical standards and rules of procedure;

invites

the Member~~s~~ States of the Union in the European Maritime Area to consider convening a competent regional ~~administrative radio~~ radiocommunication conference concerning a possible revision of the Regional Agreement (Geneva, 1985) for the purpose of accommodating continuous data transmission using frequency offset techniques.

RESOLUTION No. 703 (Rev.WARC-92)

CALCULATION METHODS AND INTERFERENCE CRITERIA RECOMMENDED BY THE ~~CCIR~~ ITU-R FOR SHARING FREQUENCY BANDS BETWEEN SPACE RADIOCOMMUNICATION AND TERRESTRIAL RADIOCOMMUNICATION SERVICES OR BETWEEN SPACE RADIOCOMMUNICATION SERVICES[1]

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

considering

a) that, in frequency bands shared with equal rights by space radiocommunication and terrestrial radiocommunication services, it is necessary to impose certain technical limitations and coordination procedures on each of the sharing services for the purpose of limiting mutual interference;

b) that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose coordination procedures for the purpose of limiting mutual interference;

c) that the calculation methods and interference criteria relating to coordination procedures referred to in paragraphs *a)* and *b)* above are based upon ~~CCIR~~ ITU-R Recommendations;

d) that, in recognition of the successful sharing of the frequency bands by space radiocommunication and terrestrial radiocommunication services, and the continuing improvements in space technology and that of the Earth segment, each ~~CCIR Plenary~~ Radiocommunication Assembly ~~subsequent to the Xth Plenary Assembly (Geneva, 1963)~~ has improved upon some of the technical criteria recommended by the preceding ~~Plenary~~ Assembly;

~~*e)* that CCIR Plenary Assemblies are held more frequently and with greater regularity than administrative radio conferences which are competent to modify the Radio Regulations making substantial use of CCIR Recommendations;~~

~~f~~e) that the ~~CCIR~~ ITU Radiocommunication Assembly has ~~adopted~~ approved a procedure for approving Recommendations between ~~Plenary~~ Radiocommunication Assemblies;

~~g~~f) that the International Telecommunication ~~Convention~~ Constitution recognizes the right of ~~Members~~ States of the Union to make special ~~agreements~~ arrangements on telecommunication matters; however, such ~~agreements~~ arrangements shall not be in conflict with the terms of the Constitution, Convention or of the Regulations annexed thereto as far as harmful interference to the radio services of other countries is concerned;

is of the opinion

a) that future decisions of the ~~CCIR~~ ITU-R are likely to make further changes in the recommended calculation methods and interference criteria;

b) that administrations should receive advance information of the drafts of the relevant ~~CCIR~~ ITU-R Recommendations;

c) that the administrations should whenever possible apply the current ~~CCIR~~ ITU-R Recommendations on sharing criteria when planning systems for use in frequency bands shared with equal rights between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services;

---

[1] WRC-97 made editorial amendments to this Resolution.

invites Administrations

to submit contributions to the ~~CCIR~~ ITU-R Study Groups, providing information on practical results and experience of sharing between terrestrial and space radiocommunication services or between space services, which help to bring about significant improvements in coordination procedures, calculation methods and harmful interference thresholds, and thereby to optimize the available orbit/spectrum resources;

resolves

1. that the Director of the ~~CCIR~~ Radiocommunication Bureau, in consultation with Study Group Chairmen, shall prepare a list identifying the relevant parts of new or revised Recommendations approved by the ~~CCIR~~ ITU-R affecting the calculation methods and the interference criteria and also those specific sections of the Radio Regulations to which they are applicable, relating to sharing between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services. ~~The Director of the CCIR shall forward this list to the IFRB~~ This list shall be prepared within thirty days following the approval of these Recommendations;

2. that the ~~IFRB~~ Director shall forward this list and the appropriate texts to all administrations within thirty days, asking them to indicate within four months those ~~CCIR~~ ITU-R Recommendations or specific technical criteria defined in the Recommendations referred to in paragraph 1 above to which they agree for use in the application of the pertinent provisions of the Radio Regulations;

3. that, should an administration, in its reply to the consultation conducted by the ~~IFRB~~ Director under paragraph 2 above, indicate that certain ~~CCIR~~ ITU-R Recommendations or technical criteria defined in those Recommendations are unacceptable, the relevant calculation methods and the interference criteria defined in the Radio Regulations shall continue to apply with respect to cases involving that administration;

4. that the ~~IFRB~~ Radiocommunication Bureau shall publish, for the information of all administrations, a list based on the replies to the enquiry, of the ~~CCIR~~ ITU-R Recommendations or of the relevant calculation methods and the interference criteria defined in those Recommendations, indicating the administrations to which each of those Recommendations or relevant technical criteria are acceptable or are not and the administrations which did not reply;

5. that the administrations which do not reply within four months to the consultation conducted by the ~~IFRB~~ Director under paragraph 2 above should, however, inform the ~~IFRB~~ Director of their decision on the application of these Recommendations under the relevant provisions of the Radio Regulations at a later stage;

6. that the ~~IFRB~~ Radiocommunication Bureau shall take into account:

a) the applicability of the ~~CCIR~~ ITU-R calculation methods and interference criteria when making technical examinations with respect to cases involving only administrations to which such methods and criteria are acceptable;

b) the applicability of the calculation methods and interference criteria defined in the Radio Regulations in accordance with the list referred to in paragraph 4 above, when making technical examinations with respect to cases involving the administrations which did not accept or did not reply to the consultation conducted by the ~~IFRB~~ Radiocommunication Bureau under paragraph 2 above.

RESOLUTION No. 705 (Mob-87)

MUTUAL PROTECTION OF RADIO SERVICES OPERATING IN THE BAND 70 - 130 kHz[1]

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

considering

a) that various radio services, including radionavigation systems used by maritime and aeronautical services, operate in frequency bands between 70 and 130 kHz;

b) that, radionavigation being a safety service, all practical steps consistent with the Radio Regulations should be taken to prevent harmful interference to any radionavigation system;

c) that the ~~CCIR~~ ITU-R has noted that users of phased pulse radionavigation systems in the band 90 - 110 kHz receive no protection outside the band, yet may receive benefit from their signals outside the occupied bandwidth;

noting

that ~~CCIR~~ ITU-R studies show:

- that for CW radionavigation systems in the frequency bands 70 - 90 kHz and 110 - 130 kHz, the protection ratio should be 15 dB within the receiver passband of ± 7 Hz at 3 dB;
- that phased pulse radionavigation systems require a 15 dB protection ratio within the band 90 - 110 kHz;
- that these pulse radionavigation systems would be aided by protection ratios of 5 dB and 0 dB for frequency separations between wanted and interfering signal of 10 - 15 kHz and 15 - 20 kHz, respectively;

further noting

that the ~~CCIR~~ ITU-R has recommended the exchange of information between authorities operating radionavigation systems in the band 90 - 110 kHz and those operating other systems in the band 70 - 130 kHz employing emissions of very high stability;

recognizing

a) that radio services other than radionavigation operating in the bands 70 - 90 kHz and 110 - 130 kHz fulfil essential functions that may be affected;

b) the provisions of Nos. ~~343~~ S4.5 [343], ~~451~~ S5.60 [451], ~~453~~ S5.62 [453] and ~~953~~ S4.10 [953] of the Radio Regulations;

resolves that administrations

1. in assigning frequencies to services in the bands 70 - 90 kHz, 90 - 110 kHz and 110 - 130 kHz, consider the potential mutual impairment to other stations operating in accordance with the Table of Frequency Allocations and apply protective measures;

---

[1] WRC-97 made editorial amendments to this Resolution.

2. use the relevant ~~CCIR~~ ITU-R Recommendations and encourage the exchange of information between authorities operating radionavigation systems in the band 90 - 110 kHz and those operating other systems in the band 70 - 130 kHz employing emissions of very high stability, to assist in preventing potential interference problems;

3. encourage consultation, both nationally and internationally, between operators of radionavigation systems using the band 90 - 110 kHz and of other systems using the band 70 - 130 kHz;

requests ~~*the CCIR*~~ *ITU-R*

to continue studies in this matter, particularly the development of technical criteria and standards to permit compatible operations within the allocated bands and to assist in developing the list of contacts of system operators;

invites

1. the ~~Administrative~~ Council to place this matter on the agenda of the next competent world ~~administrative radio~~ radiocommunication conference, in order to establish technical criteria for the harmonious operation of the services in the bands between 70 - 130 kHz;

2. the International Maritime Organization (IMO), the International Civil Aviation Organization (ICAO), the International Association of Lighthouse Authorities (IALA), the *Bureau* ~~*International de l'heure*~~ (~~BIH~~)* des Pois et des Mesures (BIPM) and national authorities to provide the Union with information pertaining to the potential impairment of systems operating in the bands 70 - 90 kHz, 90 - 110 kHz and 110 - 130 kHz, together with their views and proposals resulting therefrom.

---

* ~~*Note by the General Secretariat:* The 18th General Conference of the "Bureau International des Poids et des Mesures (BIPM)", 12-15 October 1987, adopted a Resolution transferring the responsibility of establishing the International Atomic Time (TAI) from the BIH to the BIPM.~~

RESOLUTION No. 706 (Mob-87)

OPERATION OF THE FIXED AND MARITIME MOBILE SERVICES IN THE BAND 90 - 110 kHz[1]

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

considering

a) the need to protect phased pulse hyperbolic radionavigation systems (Loran-C) operating in the band 90 - 110 kHz used as a safety service for both maritime and aeronautical services;

b) the studies made by the ~~CCIR~~ ITU-R in this band;

c) that harmful interference affecting safety of flight and ship navigation may be caused to this service by the operation of the fixed and maritime mobile services having a secondary allocation in this band;

d) that, notwithstanding No. **~~453A~~ S5.63 [453A]** of the Radio Regulations, this Conference has removed the allocation for the maritime mobile service from this band;

noting

that this Conference is not competent to affect significantly the allocation of the fixed service;

resolves

to invite the next competent conference to review the fixed service allocation in this band, and No. **~~453A~~ S5.63 [453A]** of the Radio Regulations, with a view to their possible deletion;

invites the ~~Administrative~~ Council

to place this matter on the agenda of the next competent world ~~administrative radio~~ radiocommunication conference.

[1] WRC-97 made editorial amendments to this Resolution.

RESOLUTION No. 711 (WARC-92)

POSSIBLE RELOCATION OF FREQUENCY ASSIGNMENTS TO CERTAIN SPACE MISSIONS FROM THE 2 GHz BAND TO BANDS ABOVE 20 GHz[1]

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

considering

a) the changes in the allocations to space services made by this Conference in the bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz;

b) the possibility of technical improvements in the space services concerned which might lead to more efficient usage of the spectrum;

c) the possibility that frequency assignments to some space missions could be relocated in bands above 20 GHz;

resolves

1. that it is desirable to review the present and planned use of the frequency bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz, with the intent, when practicable, of assigning frequencies to some space missions in bands above 20 GHz and possibly reducing the allocations to the space services in the 2 GHz band;

2. that the next competent world ~~administrative radio~~ radiocommunication conference should consider this matter, taking account of the results of the relevant ~~CCIR~~ ITU-R studies, which may make it possible to revise the Radio Regulations, so that no frequency assignments would be permitted in the bands around 2 GHz after a date in the near future to be determined by that conference for those space missions whose frequency assignments might be accommodated in the bands above 20 GHz, and so that, if appropriate, the spectrum needs of the mobile and space services might be equitably accommodated in the 2 GHz band;

invites ~~the CCIR~~ ITU-R

1. to carry out the review mentioned in *resolves* 1 above;

2. to conduct the necessary studies on the evolution of the space research, space operations, Earth exploration-satellite and mobile services in the bands available to each service around 2 GHz and on the compatibility between these services in the 2 GHz band;

3. to report to the next competent conference the spectrum requirement of each service in the bands mentioned in 2. of *invites ~~the CCIR~~* ITU-R and, where necessary, indicate the criteria for sharing between these services;

urges administrations

to participate actively in these studies;

instructs the Secretary-General

to bring this Resolution to the attention of the next ~~Administrative~~ Council with a view to including this subject in the agenda of the next competent conference.

---

[1] WRC-97 made editorial amendments to this Resolution.

RECOMMENDATION No. 9

RELATING TO THE MEASURES TO BE TAKEN TO PREVENT THE OPERATION OF BROADCASTING STATIONS ON BOARD SHIPS OR AIRCRAFT OUTSIDE NATIONAL TERRITORIES[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the operation of broadcasting stations on board ships or aircraft outside national territories is in conflict with the provisions of Nos. ~~2665~~S23.2 [2665] and ~~3603~~ Appendix S13 [No. 3603] of the Radio Regulations;

b) that such operation is contrary to the orderly use of the radio frequency spectrum and may result in chaotic conditions;

c) that the operation of such broadcasting stations may take place outside the jurisdiction of Member ~~countries~~ States, thereby making the direct application of national laws difficult;

d) that a particularly difficult legal situation arises when such broadcasting stations are operated on board ships or aircraft not duly registered in any country;

recommends

1. that administrations ask their governments to study possible means, direct or indirect, to prevent or suspend such operations and, where appropriate, take the necessary action;

2. that administrations inform the Secretary-General of the results of these studies and submit any other information which may be of general interest, so that the Secretary-General can inform Members States accordingly.

---

[1] ~~Replaces Recommendation No. 16 of the Administrative Radio Conference, Geneva, 1959.~~ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 14 (Mob-87)

IDENTIFICATION AND LOCATION OF SPECIAL VESSELS, SUCH AS MEDICAL TRANSPORTS, BY MEANS OF STANDARD MARITIME RADAR TRANSPONDERS[1]

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

considering

a) the desirability of implementing modern techniques in standard maritime radar transponders for the identification and location of vessels at sea;

b) Radio Regulations ~~Nos. 3219A~~ Appendix **S13 [No. 3219A]** and ~~N 3223~~ No. **S33.28 [N 3223]**, which provide that the identification and location of medical transports at sea may be effected by means of appropriate standard maritime radar transponders;

c) that transponders designed to be compatible with radiolocation radars are not necessarily compatible with radars used by the maritime and aeronautical radionavigation services; nor is their coding for identification technically defined;

d) that if maritime radar transponders of the type described in ~~CCIR Report 775-2 and CCIR~~ Recommendations ITU-R M.628 and ITU-R M.630~~, or using the technology described in CCIR Report 774-2~~, were to be encoded for the identification of special vessels such as medical transports, they would probably be incompatible with most radiolocation radars;

invites ~~the CCIR~~ITU-R

to study the question of the identification and location of special vessels such as medical transports by means of standard maritime radar transponders, taking into account also the technical and economic impact of their introduction;

invites administrations

to provide the ~~CCIR~~ ITU-R with information on this question;

requests the ~~Administrative~~ Council

to include this Recommendation in the agenda of the next competent world ~~administrative radio~~ radiocommunication conference for review and, if appropriate, to amend the Radio Regulations.

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 32 (Orb-88)

INTERNATIONAL MONITORING OF EMISSIONS ORIGINATING FROM SPACE STATIONS[1]

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

considering

a) that the geostationary-satellite orbit and the radio-frequency spectrum are limited natural resources and are being increasingly utilized by space services;

b) that it is desirable to ensure efficient and economical use of the radio-frequency spectrum and geostationary-satellite orbit and also to eliminate harmful interference;

c) the provisions of the Radio Regulations, under which the ~~IFRB~~ Radiocommunication Bureau shall review the entries in the Master International Frequency Register with a view to bringing them into conformity, to the maximum extent practicable, with the actual use being made of the radio spectrum;

d) that monitoring information obtained should assist the ~~IFRB~~ Radiocommunication Bureau in discharging that function;

e) Recommendation **2** of the World Administrative Radio Conference, 1979, relating to the examination by world ~~administrative radio~~ radiocommunication conferences of the situation with regard to occupation of the frequency spectrum in space radiocommunications;

f) that facilities for monitoring of emissions originating from space stations may be expensive;

noting

that the ~~CCIR~~ ITU-R is studying the question of monitoring of radio emissions from spacecraft at fixed monitoring stations and ~~CCIR Report 276-5~~ Recommendation ITU-R SM.1054 contains current results of these studies;

invites ~~the CCIR~~ ITU-R

to continue the studies in collaboration with the ~~IFRB~~ Bureau, and to provide technical guidelines concerning the space monitoring facilities;

recommends administrations

1. to participate in the ~~CCIR~~ ITU-R studies concerning the possible development of guidelines for space monitoring facilities;

2. to consider the various aspects of monitoring the emissions originating from space stations to enable the provisions of Article ~~20~~ **S16 [20]** of the Radio Regulations to be applied.

---

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 61

RELATING TO TECHNICAL STANDARDS FOR THE ASSESSMENT OF HARMFUL INTERFERENCE IN THE FREQUENCY BANDS ABOVE 28 MHz[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the definition of harmful interference (No. ~~163~~ S1.169 [163] of the Radio Regulations), being of a qualitative nature, leads to a purely subjective estimation of the nuisance;

[b) that, for the accomplishment of its regulatory tasks, the ~~IFRB~~ Radiocommunication Bureau has adopted in its Technical Standards, for the frequency bands below 28 MHz, values for the ratio between the wanted signal and the interfering signal, below which harmful interference may be expected;]

c) that "harmful interference" implies a considerable degree, or probability, of interference;

d) that, as a consequence, it is desirable to determine the level of interference by which any emission, radiation or induction affects a radiocommunication service beyond specific limits established to ensure the quality and reliability of performance required by the nature of the service;

e) that the assessment of interference levels is related to various factors such as the nature of the services concerned, number of interference sources, percentages of time during which the interfering signal affects the wanted signal;

noting

a) that the ~~IFRB~~ Radiocommunication Bureau has been considering the maximum allowable values of interference given in the pertinent ~~CCIR~~ ITU-R Recommendations to be values which ensure a satisfactory service;

b) that, however, the ~~IFRB~~ Radiocommunication Bureau does not possess data on the extent to which these recommended values and the associated percentages of time may be exceeded without affecting a service beyond the specific limits established to ensure the quality and reliability of performance required by the nature of the service;

invites ~~the CCIR~~ ITU-R

to continue to study this subject and to recommend the technical criteria for the frequency bands above 28 MHz, allocated to space radiocommunication, radio astronomy, and the terrestrial radiocommunication services concerned, in order to enable the ~~IFRB~~ Radiocommunication Bureau and administrations to apply such criteria for these bands.

---

[1] ~~Replaces Recommendation No. Spa2 – 12 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.~~ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 63

RELATING TO THE PROVISION OF FORMULAE AND EXAMPLES FOR THE CALCULATION OF NECESSARY BANDWIDTHS[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that ~~Article 4~~ Appendix **S1,** Section I [Article **4**] of the Radio Regulations requires that the necessary bandwidth be part of the full designation of emissions;

b) that ~~Appendix 6, Part B~~ Recommendation ITU-R SM.1138, gives a partial list of examples and formulae for the calculation of the necessary bandwidth of some typical emissions;

c) that sufficient information is not available for the determination of the K-factors used throughout the table of examples of the necessary bandwidth in Appendix ~~6~~**S1 [6]**;

d) that, especially with regard to the efficient utilization of the radio frequency spectrum, monitoring and the notification of emissions, it is required that necessary bandwidths for the individual classes of emission be known;

e) that for reasons of simplification and international uniformity it is desirable that measurements for determining the necessary bandwidth be made as seldom as possible;

recommends that ~~the CCIR~~ ITU-R

1. provide, from time to time, additional formulae for the determination of necessary bandwidth for common classes of emission, as well as examples to supplement those given in ~~Appendix 6, Part B~~ Recommendation ITU-R M.1138;

2. study and provide values of supplementary K-factors required for the calculation of the necessary bandwidth for common classes of emission;

invites the ~~IFRB~~ Radiocommunication Bureau

to publish examples of such calculations in the Preface to the International Frequency List.

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 64

RELATING TO PROTECTION RATIOS AND MINIMUM FIELD STRENGTHS REQUIRED[1]

The World Administrative Radio Conference, Geneva, 1979,

recognizing

that the available information on protection ratios and minimum field strengths required for each one of the services needs further refinement in order to permit the most efficient planning of the use of the radio frequency spectrum;

invites ~~the CCIR~~ ITU-R

1. to continue to study the protection ratios which define the threshold of harmful interference for the several services;

2. to continue to study the signal-to-noise ratios and the minimum field strengths required for satisfactory reception of the different classes of emission in the several services;

3. to continue the study of fading allowances for the several services;

4. to give particular attention to those studies which will assist in the further refinement of the Technical Standards used by the ~~IFRB~~ Radiocommunication Bureau.

---

[1] ~~Replaces Recommendation No. 3 of the Administrative Radio Conference, Geneva, 1959.~~ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 319 (Mob-87)

THE NEED FOR TECHNICAL IMPROVEMENTS TO MINIMIZE THE RISK OF ADJACENT CHANNEL HARMFUL INTERFERENCE BETWEEN ASSIGNMENTS USED FOR NARROW-BAND DIRECT-PRINTING TELEGRAPHY AND DATA TRANSMISSION SYSTEMS IN ACCORDANCE WITH APPENDIX ~~32~~ S17 AND RESOLUTION 300 (Rev.Mob-87)[1]

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

considering

a) that Appendix ~~32~~ **S17 [32]** of the Radio Regulations contains the channelling arrangement for narrow-band direct-printing telegraphy and data transmission systems (paired frequencies);

b) that the use of these frequency pairs is subject to the provisions of Article ~~60~~ **S52 [60]** of the Radio Regulations and Resolution **300 (Rev.Mob-87)**;

c) that the spacing between the frequencies listed in Appendix ~~32~~ **S17 [32]** is 500 Hz;

d) that the present Conference has decided to adopt No. ~~4321B~~ **S52.104 [4321B]** which specifies the maximum mean powers to be used by coast stations for F1B and J2B emissions in bands exclusively allocated to the maritime mobile service between 4 000 kHz and 27 500 kHz;

recommends

that administrations cooperate to the fullest extent possible in resolving harmful interference from adjacent channels used for narrow-band direct-printing telegraphy and data transmission systems (paired frequencies);

invites ~~the CCIR~~ ITU-R

1. to study the question of technical compatibility between adjacent channels and make appropriate Recommendations;

2. to take into account, in the study, the maximum mean powers for coast radiotelegraph stations employing class F1B or J2B emissions in the bands exclusively allocated to the maritime mobile service between 4 000 kHz and 27 500 kHz (see No. ~~4321B~~ **S52.104 [4321B]**);

3. to present the results of its study to the next competent conference.

---

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 402

RELATING TO COOPERATION IN THE EFFICIENT USE OF WORLDWIDE FREQUENCIES IN THE AERONAUTICAL MOBILE (R) SERVICE[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) the need to make the most efficient use of worldwide frequencies in the aeronautical mobile (R) service;

b) that a Plan has been adopted for the allotment by areas of world- wide frequencies in the aeronautical mobile (R) service;

c) the desirability of coordination between administrations within the areas to which the Allotment Plan applies;

d) the right of an administration to select and notify to the ~~IFRB~~ Radiocommunication Bureau for recording in the Master International Frequency Register any frequency assignment in a channel allotted to the area in which its country is located;

e) the role played by the ~~IFRB~~ Radiocommunication Bureau in regulatory procedures under Article ~~12~~ S11 [12] of the Radio Regulations;

f) the role played by the International Civil Aviation Organization (ICAO) in the field of international aeronautical operations;

invites

1. *administrations within a worldwide allotment area*, as they consider it appropriate, *and the ICAO*, to seek the advice of the ~~IFRB~~ Radiocommunication Bureau in determining the best choice of frequencies from a technical viewpoint in order to make the most efficient use of aeronautical mobile (R) worldwide frequencies;

2. *administrations within a worldwide allotment area*, as they consider it appropriate, to coordinate mutually the use of these frequencies from the viewpoint of aeronautical operations and, in this connection, to bear in mind the benefit that could be gained by obtaining the advice of ICAO in this process;

3. *the ~~IFRB~~ Radiocommunication Bureau* to assist any administration or group of administrations in a worldwide allotment area wishing to coordinate their requirements for worldwide frequencies and to continue its cooperation with ICAO for this purpose;

requests the Secretary-General

to bring this Recommendation to the attention of the International Civil Aviation Organization.

---

[1] ~~Replaces Recommendation No. Aer2 – 3 of the World Administrative Radio Conference on the Aeronautical Mobile (R) Service, Geneva, 1978.~~ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 506

RELATING TO THE HARMONICS OF THE FUNDAMENTAL FREQUENCY OF BROADCASTING-SATELLITE STATIONS[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the frequency band 23.6 - 24 GHz is allocated to the radio astronomy service on a primary basis;

b) that the second harmonic of the fundamental frequency of broadcasting-satellite stations operating within the band 11.8 - 12 GHz may seriously disturb radio astronomy observations in the band 23.6 - 24 GHz if effective steps are not taken to reduce the level of this harmonic;

in view of

the provisions of No. ~~306~~ **S3.8 [306]** of the Radio Regulations;

recommends

that, when defining the characteristics of their space stations operating in the broadcasting-satellite service, particularly within the band 11.8 - 12 GHz, administrations take all necessary steps to reduce the level of the second harmonic below the values indicated in the relevant ~~CCIR~~ ITU-R Recommendations.

---

[1] ~~Replaces Recommendation No. Sat – 2 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.~~ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 507

RELATING TO SPURIOUS EMISSIONS IN THE BROADCASTING-SATELLITE SERVICE[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that space stations in the broadcasting-satellite service operating at high power levels are likely to cause interference to services in adjacent and in harmonically related frequency bands due to spurious emissions;

b) that, in the planning of the broadcasting-satellite service, account must be taken of the need to reduce to acceptable levels the interference to:

– the services operating in the bands adjacent to the lower and upper edges of the 12 GHz band allocated to the broadcasting service;

– the radio astronomy service, which has an allocation at 23.6 - 24 GHz;

c) the studies being pursued by the ~~CCIR~~ ITU-R under the appropriate ~~Study Programme~~ Question;

invites ~~the CCIR~~ ITU-R

to continue, as a matter of urgency, the study of the technical and operational aspects of spurious emissions from space stations in the broadcasting-satellite service.

---

1 ~~Replaces Recommendation No. Sat – 6 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977.~~ WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 604 (Rev.Mob-87)

FUTURE USE AND CHARACTERISTICS OF EMERGENCY POSITION-INDICATING RADIOBEACONS (EPIRBS)[1,2]

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

considering

a) that the essential purpose of EPIRB signals is to help locate survivors in search and rescue operations;

b) that requirements for carriage of EPIRBs operating on the frequen-cies 121.5 and 243 MHz have been included in the 1983 Amendments to the International Convention for the Safety of Life at Sea (1974);

c) that the International Maritime Organization (IMO) has been considering various types of EPIRBs;

d) that the IMO has stressed in its Resolution A.279 (VIII) the urgent need for unification of the characteristics of EPIRBs;

recognizing

a) that there are provisions in the Radio Regulations for EPIRBs on the frequencies 2 182 kHz, 121.5 MHz, 156.525 MHz, 243 MHz, and in the bands 406 - 406.1 MHz and 1 645.5 - 1 646.5 MHz;

b) that ~~Appendix 37A~~ Recommmendation ITU-R M.690-1 [Appendix **37A**] was ~~established~~ approved in order to facilitate the application of a universal standard for EPIRBs operating on the frequencies 121.5 MHz and 243 MHz;

c) that for EPIRBs operating on 121.5 MHz and 243 MHz, there is a need to improve their function of being detected and located by satellite systems;

recommends

1. that, in view of their mutual interest in this matter, IMO and the International Civil Aviation Organization (ICAO) be invited, as a matter of urgency, to review and align their concepts for EPIRBs in regard to search and rescue operations and the safety of life at sea;

2. that the ~~CCIR~~ ITU-R continue to study technical and operating questions for EPIRBs, in consideration of concepts stated by the IMO and ICAO;

3. that the ~~CCIR~~ ITU-R and ICAO study, as a matter of urgency, the technical and operational questions arising from paragraph *d)* of ~~Appendix 37A~~ Annex 1 to Recommmendation ITU-R M.690-1 [Appendix **37A**];

instructs the Secretary-General

to communicate this Recommendation to the IMO and ICAO.

---

[1] For the purpose of this Recommendation, references to EPIRBs include references to satellite EPIRBs as appropriate.

[2] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 605 (Rev.Mob-87)

TECHNICAL CHARACTERISTICS AND FREQUENCIES FOR SHIPBORNE TRANSPONDERS[1,2]

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

considering

a) that merchant ships of the world are increasing in size and speed;

b) that every year a significant number of collisions occur involving merchant vessels with resultant loss of life and property and that collisions have a high potential for endangering the natural environment;

c) that there is a need to correlate radar targets with vessels making VHF radiotelephone transmissions;

d) that studies and experiments have shown that shipborne transponders can enhance and supplement radar target images as compared with normal radar images;

e) that current studies and experimentation relating to shipborne transponders indicate that development of equipment can be expected in the near future which will offer adequate radar image enhancement and target identification and, possibly, data transfer capabilities;

f) that such shipborne transponders may require protection from interference;

g) that the selection of technical characteristics for these transponders should be coordinated with other users of the radio frequency spectrum whose operations might be affected;

requests ~~the CCIR~~ITU-R

to recommend, after consultation with appropriate international organizations, the most suitable order of magnitude of frequencies and bandwidth required for this purpose, and the technical parameters to be met by such devices, taking into account both electromagnetic compatibility with other services having allocations in the same frequency band and the need to ensure that the response of a transponder of the system studied should not be capable of interpretation as being from a radar beacon of whatever type;

invites administrations and the International Maritime Organization (IMO)

to continue to evaluate the operational benefits which could result from the widespread use of transponders on ships and to consider whether there would be advantage in adopting an internationally approved system for future implementation;

recommends

that, pending further technical and operational developments and evaluation, administrations be prepared at the next competent world ~~administrative radio~~ radiocommunication conference to make the necessary provisions for the use of such devices.

---

[1] A receiver-transmitter which emits a signal automatically when it receives the proper interrogation.

[2] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 606 (Mob-87)

THE POSSIBILITY OF REDUCING THE BAND 4 200 - 4 400 MHz USED BY RADIO ALTIMETERS IN THE AERONAUTICAL RADIONAVIGATION SERVICE[1]

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

considering

a) that there is a demand for additional frequency allocations for the mobile service, particularly the land mobile service;

b) that all systems utilizing the radio-frequency spectrum should be efficient in their use of that scarce resource;

c) that the allocation of the band 4 200 - 4 400 MHz to the aeronautical radionavigation service appeared in the Radio Regulations (Atlantic City, 1947) and has not been changed despite technological advances;

d) that it has decided not to change the frequency allocations in that band;

e) that studies carried out by the International Civil Aviation Organization (ICAO) on this question indicate that the operation of the existing radio altimeter equipment necessitates the whole band;

f) that it might be possible to operate radio altimeters in this band with sufficient accuracy with a necessary bandwidth of less than 200 MHz;

g) that the frequency tolerance of such devices might be improved;

recommends

1. that the next competent world ~~administrative~~ radiocommunication conference should consider, if appropriate, a reduction of the band 4 200 - 4 400 MHz allocated to the aeronautical radionavigation service;

2. that any reduction should be based on a detailed technical evaluation of the systems in question, taking into account ICAO reports on the evaluation of future world traffic of aircraft using this band;

3. that the conference mentioned in *recommends* 1 above should consider reallocating to the land mobile service any portion of the band currently available for the aeronautical radionavigation service which is identified as being suitable on the basis of technical considerations;

invites ~~the CCIR~~ ITU-R

to study the necessary bandwidth and frequency tolerance requirements for systems operating in the aeronautical radionavigation service in the frequency band 4 200 - 4 400 MHz;

invites the ~~Administrative~~ Council

to place this Recommendation on the agenda of the next competent world ~~administrative radio~~ radiocommunication conference;

instructs the Secretary-General

to refer this Recommendation to ICAO, inviting it to consider the possibility of reducing the band 4 200 - 4 400 MHz for the aeronautical radionavigation service and to make appropriate recommendations to assist administrations in this matter.

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 701

RELATING TO THE USE OF THE FREQUENCY BAND 1 330 - 1 400 MHz BY THE RADIO ASTRONOMY SERVICE[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the observations of radiations from neutral hydrogen atoms within the band 1 330 - 1 400 MHz are of prime importance in understanding the structure of distant galaxies, and subsequently of the evolution of the universe;

b) that recognition has been given to the radio astronomy service in the band 1 330 - 1 400 MHz within the Table of Frequency Allocations;

c) that the radio astronomy service is devoted to the reception of extremely low-level electromagnetic radiations of extraterrestrial origin, and needs therefore to be protected from radiations of man-made origin, to the maximum degree practicable;

d) that the ability of the radio astronomy service to share frequency bands with other radio services is limited;

recommends that administrations,

1. when preparing for the next competent ~~administrative radio~~ radiocommunication conference, should consider the question of making provisions in the 1 330 - 1 400 MHz band to provide the radio astronomy service with increased protection from services that radiate;

2. when drawing up frequency assignment plans, should bear in mind radio astronomy observations being carried out in the band 1 330 - 1 400 MHz.

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 702

RELATING TO THE USE OF THE FREQUENCY BANDS 1 400 - 1 727 MHz, 101 - 120 GHz AND 197 - 220 GHz FOR SEARCH FOR INTENTIONAL EMISSIONS OF EXTRATERRESTRIAL ORIGIN[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that it is of special importance to mankind to determine the exis- tence of extraterrestrial civilizations;

b) that there is a maximum probability of detecting radiation from extraterrestrial civilizations in the frequency bands 1 400 - 1 727 MHz, 101 - 120 GHz and 197 - 220 GHz because these frequency bands contain the spectral lines of basic physical interest and are related to the universal phenomena;

c) that in the bands mentioned in *considering b)* there is a probability of detecting radiation, with a maximum signal-to-noise ratio, from extra-terrestrial civilizations;

d) that recognition has been given to the search for extraterrestrial civilizations in the bands 1 400 - 1 727 MHz, 101 - 120 GHz and 197 - 220 GHz within the Table of Frequency Allocations;

e) that the attempt to recognize signals from extraterrestrial civilizations requires the reception of extremely low-level radiations and that such reception needs to be protected, to the maximum degree practicable, from radiations of man-made origin;

f) that, for receiving radiations from extraterrestrial civilizations, the possibilities of sharing frequency bands with active radio services are limited;

recommends

that, when preparing for the next competent ~~administrative radio~~ radiocommunication conference, administrations should consider the desirability of making provisions so as to provide a controlled environment suitable for the reception of extraterrestrial radiations in the 1 400 - 1 727 MHz, 101 - 120 GHz and 197 - 220 GHz bands;

invites organizations concerned with the search for extraterrestrial civilizations

to take into account the following:

1. the relevant provisions of the Radio Regulations;

2. the need to maintain close coordination with their national administrations on matters of frequency usage;

3. the need to select, for observations, locations for receiving facilities that are as remote as possible from sources of radio interference;

4. the appropriate ~~Reports and~~ Recommendations of the ~~CCIR~~ITU-R.

---

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 705

RELATING TO THE CRITERIA TO BE APPLIED FOR FREQUENCY SHARING BETWEEN THE BROADCASTING-SATELLITE SERVICE AND THE TERRESTRIAL BROADCASTING SERVICE IN THE BAND 620 - 790 MHz[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that, within the band 620 - 790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service;

b) that it is necessary to have a power flux-density limit which will provide adequate protection to the terrestrial broadcasting service;

taking into account

a) that the conclusions of the Special Joint Meeting of the CCIR, Geneva, 1971, indicated that the following power flux-density limits are necessary to protect the terrestrial broadcasting service:

-121 dB(W/m^2) for $\delta \leq 20°$
$-121 + 0.4\,(\delta - 20)$ dB(W/m^2) for $20° < \delta \leq 60°$
-105 dB(W/m^2) for $60° < \delta \leq 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

b) that additional tests carried out by one administration after the Special Joint Meeting of the CCIR indicated that the following more conservative power flux-density limits may be necessary:

-130 dB(W/m^2) for $\delta \leq 20°$
$-130 + 0.4\,(\delta - 20)$ dB(W/m^2) for $20° < \delta \leq 60°$
-114 dB(W/m^2) for $60° < \delta \leq 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

c) that ~~CCIR~~ CCIR Report 631-1 gives the results of studies carried out up to 1978;

d) that additional information is required on the protection ratio for interference from an FM television signal into a VSB television signal for both the 625- and 525-line systems;

e) that with terrestrial television receiving systems using current technology, the minimum field strength to be protected may in some cases be less than the values included in ~~CCIR~~ Recommendation ITU-R BT.417~~-2~~;

f) that account may have to be taken of ground reflections;

g) that energy dispersal techniques may reduce the required protection ratio and should be used if shown to be effective;

---

[1] ~~Replaces Recommendation No. Spa2 – 10 of the World Administrative Radio Conference for Space Telecommunications, Geneva, 1971.~~ WRC-97 made editorial amendments to this Recommendation.

recommends

1. that in view of the absence of sufficient information on tests under operational conditions and in order to provide sharing criteria, on a provisional basis, the maximum power flux-density produced at the surface of the Earth within the service area of a terrestrial broadcasting station (see ~~CCIR~~ Recommendation ITU-R BT.417~~-2~~) by a space station in the broadcasting- satellite service in the band 620 - 790 MHz should not exceed:

-129 dB(W/m^2) for $\delta \leq 20°$
$-129 + 0.4\ (\delta - 20)$ dB(W/m^2) for $20° < \delta \leq 60°$
-113 dB(W/m^2) for $60° < \delta \leq 90°$

where δ is the angle of arrival above the horizontal plane (in degrees);

2. that these limits be not exceeded on the territory of a country except with the agreement of its administration;

3. that the transmission of unmodulated carriers should be avoided;

4. that the ~~CCIR~~ ITU-R urgently study the sharing criteria to be applied to frequency sharing between the broadcasting-satellite service, and the terrestrial broadcasting service in the band 620 - 790 MHz and prepare a Recommendation on power flux-densities to be used in lieu of the above provisional limits;

5. that in its studies the ~~CCIR~~ ITU-R consider in particular the following aspects:

5.1 the required protection ratio for both 525- and 625-line systems for interference from an FM television signal into a VSB television signal;

5.2 the minimum field strength to be protected for the terrestrial television service taking into account the current state of the art;

5.3 the effect of ground reflections;

5.4 the number of broadcasting satellites that may be visible from a terrestrial broadcasting receiver;

5.5 the effect of polarization discrimination;

5.6 the effect of antenna directivity;

6. that in its studies the ~~CCIR~~ ITU-R should consider the advantages of energy dispersal techniques in the broadcasting-satellite service (television).

RECOMMENDATION No. 707

RELATING TO THE USE OF THE FREQUENCY BAND 32 - 33 GHz SHARED BETWEEN THE INTER-SATELLITE SERVICE AND THE RADIONAVIGATION SERVICE[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the band 32 - 33 GHz is allocated to the inter-satellite service and the radionavigation service;

b) that there are safety aspects associated with the radionavigation service;

c) that No. ~~893~~ S5.548 [893] has been incorporated into Article ~~8~~S5 [8];

recommends

that, as a matter of urgency, studies should be made of the sharing criteria for these two services in the frequency band listed above;

requests ~~the CCIR~~ITU-R

to carry out these studies;

recommends further

that a future competent world ~~administrative radio~~ radiocommunication conference review the ~~CCIR~~ ITU-R Recommendations with a view to the inclusion of such sharing criteria in Article ~~28~~S21 [28].

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 709

RELATING TO SHARING FREQUENCY BANDS BETWEEN THE AERONAUTICAL MOBILE SERVICE AND THE INTER-SATELLITE SERVICE[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the bands 54.25 - 58.2 GHz, 59 - 64 GHz, 116 - 134 GHz, 170 - 182 GHz and 185 - 190 GHz are allocated to the inter-satellite service and the mobile service;

b) that the aforementioned bands are located in parts of the radio frequency spectrum close to peaks of atmospheric absorption;

c) that, nevertheless, the atmospheric absorption alone may not prevent harmful interference to stations of the inter-satellite service from stations on aircraft flying at high altitude;

d) that for this reason aircraft stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. ~~909~~**S5.558 [909]**, the text of which is reproduced below)~~1~~[2];

recommends

that, as a matter of urgency, studies should be made of the sharing criteria for these two services in the frequency bands listed above;

requests ~~the CCIR~~ITU-R

to carry out these studies;

recommends further

that a future competent world ~~administrative radio~~ radiocommunication conference review the allocations of these bands, taking into account the results of the ~~CCIR~~ ITU-R studies.

---

[1] WRC-97 made editorial amendments to this Recommendation.

[2] ~~1~~ ~~909~~**S5.558** In the bands 54.25 - 58.2 GHz, 59 - 64 GHz, 116 - 134 GHz, 170 - 182 GHz and 185 - 190 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. ~~435~~**S5.43**).

RECOMMENDATION No. 710

RELATING TO THE USE OF AIRBORNE RADARS IN THE FREQUENCY BANDS SHARED BETWEEN THE INTER-SATELLITE SERVICE AND THE RADIOLOCATION SERVICE[1]

The World Administrative Radio Conference, Geneva, 1979,

considering

a) that the bands 59 - 64 GHz and 126 - 134 GHz are allocated to the inter-satellite service and the radiolocation service;

b) that the aforementioned bands are located in parts of the radio frequency spectrum close to peaks of atmospheric absorption;

c) that, nevertheless, the atmospheric absorption alone may not prevent harmful interference to stations of the inter-satellite service from radars operating on aircraft flying at high altitude;

d) that for this reason airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. ~~910~~**S5.559 [910]**, the text of which is reproduced below)~~1~~[2];

recommends

that, as a matter of urgency, studies should be made of the sharing criteria for these two services in the frequency bands listed above;

requests ~~the CCIR~~ITU-R

to carry out these studies;

recommends further

that a future competent world ~~administrative radio~~ radiocommunication conference review the allocations of these bands, taking into account the results of the ~~CCIR~~ ITU-R studies.

---

[1] WRC-97 made editorial amendments to this Recommendation.

~~1~~[2] ~~910~~**S5.559** In the bands 59 - 64 GHz and 126 - 134 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. ~~435~~**S5.43**).

RECOMMENDATION No. 715 (Orb-88)

MULTI-BAND AND/OR MULTISERVICE SATELLITE NETWORKS USING THE GEOSTATIONARY-SATELLITE ORBIT[1]

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

considering

a) that, for economic and practical reasons, administrations may find it desirable to utilize multi-band and/or multiservice satellite networks using the geostationary-satellite orbit (for example: fixed-satellite, broadcasting-satellite and mobile-satellite services);

b) that there may be several different regulatory mechanisms covering the services provided by multi-band and/or multiservice satellites and that some of these regulatory mechanisms are associated with plans that include fixed orbital positions;

c) that the need to apply separate regulatory procedures may lead to incompatible results for the different bands or services concerned;

d) that the application of these procedures to bands and services with equal category of allocation shall normally result in equal rights for the networks concerned;

recognizing

a) that an administration having a satellite network subject to more than one procedure will need to apply the procedures independently;

b) that an administration attempting to bring into use a satellite network subject to more than one procedure may find that the process can be difficult to complete but may be facilitated by the sequence in which the coordination procedures are initiated;

c) that additionally there is less flexibility when one of the procedures includes a plan with fixed orbital positions;

d) that, when one or more of these services are planned, it may be practicable to use the modification provisions of those plans as aids in the resolution of difficulties;

e) that it is desirable to simplify the process for bringing into use multi-band and/or multiservice satellite networks;

recommends

1. that administrations should take into account the above *considering* and *recognizing* when planning and implementing multi-band and/or multiservice satellite networks;

2. that administrations cooperate to overcome the particular problems of bringing into use multi-band and/or multiservice satellite networks, subject to multiple procedures;

---

[1] WRC-97 made editorial amendments to this Recommendation.

invites

1. the ~~CCIR~~ ITU-R to continue its technical studies into the efficient use of the geostationary-satellite orbit as it pertains to multi-band and/or multiservice satellite networks;

2. the ~~Administrative~~ Council, in the light of experience with the bringing into use of multi-band and/or multiservice satellites, to place on the agenda of a future competent world ~~administrative radio~~ radiocommunication conference, if necessary, a review of the process for bringing into use multi-band and multiservice satellite networks.

~~*instructs the Secretary-General*~~

~~to bring this Recommendation to the attention of the Plenipotentiary Conference, Nice, 1989, and of the Administrative Council.~~

RECOMMENDATION No. 718 (WARC-92)

ALIGNMENT OF ALLOCATIONS IN THE 7 MHz BAND ALLOCATED TO THE AMATEUR SERVICE[1]

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

considering

a) that it is desirable to have exclusive worldwide allocations to the amateur and broadcasting services in the bands around 7 MHz;

b) that the sharing of frequency bands by these services is undesirable and should therefore be avoided;

c) that a number of administrations have made proposals to this Conference for the alignment of the allocations to the amateur service around 7 MHz;

d) that this Conference was able to give only limited consideration to these proposals;

recommends

that a future competent world ~~administrative radio~~ radiocommunication conference should consider the possibility of aligning the allocations to the amateur service around 7 MHz, with due regard to the requirements of other services;

invites the ~~Administrative~~ Council

to place this Recommendation on the agenda of the next competent world ~~administrative radio~~ radiocommunication conference.

[1] WRC-97 made editorial amendments to this Recommendation.

RECOMMENDATION No. 719 (WARC-92)

MULTISERVICE SATELLITE NETWORKS USING THE GEOSTATIONARY-SATELLITE ORBIT[1]

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

considering

a) that the Conference has allocated, on a primary basis, the bands 19.7 - 20.2 GHz and 29.5 - 30 GHz in Region 2, and 20.1 - 20.2 GHz and 29.9 - 30 GHz in Regions 1 and 3 to the mobile-satellite service;

b) that these bands are also allocated to the fixed-satellite service;

c) that some administrations have expressed interest in developing multiservice satellite networks in these bands;

d) that Recommendation **715 (Orb-88)** calls for simplification of the process for bringing into use satellite networks with different classes of user terminals;

e) that the Voluntary Group of Experts (VGE), among other means of simplifying the Radio Regulations, ~~is studying~~ completed its study or service definitions accommodating a range of services;

recognizing

that the introduction of multiservice satellite networks using, *inter alia*, mobile earth stations, may have an impact on networks operating in the fixed-satellite service;

recommends

that, as a matter of urgency, studies should be carried out on the technical characteristics, including pointing techniques of multiservice satellite networks using the geostationary-satellite networks encompassing mobile-satellite and fixed-satellite applications, and the sharing criteria necessary for compatibility with the fixed-satellite service in the frequency bands referred to above;

invites ~~the CCIR~~ ITU-R

to carry out these studies;

recommends administrations

to participate actively in these studies;

recommends further

a) that a future competent world ~~administrative radio~~ radiocommunication conference review the allocations of these bands, taking into account the results of the ~~CCIR~~ ITU-R studies and the work of the VGE;

---

[1] WRC-97 made editorial amendments to this Recommendation.

b) that a future competent world ~~administrative radio~~ radiocommunication conference consider the requirement for a single service definition encompassing mobile-satellite service and fixed-satellite service applications, and the possible need for additional frequency spectrum to accommodate the growth of these services;

invites the ~~Administrative~~ Council

to place this matter on the agenda of the next competent world ~~administrative radio~~ radiocommunication conference.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/33-E
7 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 4D

NOTE BY THE CHAIRMAN OF SUB-WORKING GROUP 4D-1

EXTRACT OF PROPOSALS

APPROACH TO THE REGULATORY/PROCEDURAL MATTERS RELATED TO THE REVISION OF APPENDICES S30 AND S30A REFERRED TO IN DOCUMENT DT/18(Rev.1)

The following texts are attached for ready reference:

1 Appendix S30 and Appendix S30A: Table of contents.

2 Extracts from proposals contained in documents indicated in DT/18(Rev.1).

DOCUMENT 2(2)-E

APPENDIX S30

Provisions for All Services and Associated Plans for the Broadcasting-Satellite Service in the Frequency Bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2)

(See Article S9)

TABLE OF CONTENTS

Page

Article 1. General Definitions APS30-4

Article 2. Frequency Bands APS30-4

Article 3. Execution of the Provisions and Associated Plans APS30-5

Article 4. Procedure for Modifications to the Plans APS30-5

Article 5. Notification, Examination and Recording in the Master Register of Frequency Assignments to Space Stations in the Broadcasting-Satellite Service APS30-10

Article 6. Coordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments to Terrestrial Stations Affecting Broadcasting Satellite Frequency Assignments in the Frequency Bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2) APS30-13

Section I. Coordination Procedure to Be Applied APS30-13

Section II. Notification Procedure for Frequency Assignments APS30-15

Section III. Procedure for the Examination of Notices and the Recording of Frequency Assignments in the Master Register APS30-16

Article 7. Procedures for Coordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments to Stations in the Fixed-Satellite Service in the Frequency Bands 11.7 - 12.2 GHz (in Region 2), 12.2 - 12.7 GHz (in Region 3) and 12.5 - 12.7 GHz (in Region 1), When Frequency Assignments to Broadcasting-Satellite Stations in Conformity with the Regions 1 and 3 Plan, or the Region 2 Plan, Respectively, Are Involved APS30-20

Section *I.* Procedure for the Advance Publication of Information on Planned Fixed-Satellite Systems APS30-20

Page

Section *II.* Coordination Procedures to Be Applied in Appropriate Cases.....APS30-21

Section *III.* Notification of Frequency Assignments.....APS30-23

Section IV. Procedure for the Examination of Notices and the Recording of Frequency Assignments in the Master Register.....APS30-24

Section *V.* Recording of Findings in the Master Register.....APS30-28

Section VI. Categories of Frequency Assignments.....APS30-28

Section VII. Review of Findings.....APS30-29

Section VIII. Modification, Cancellation and Review of Entries in the Master Register.....APS30-29

Article 8. Miscellaneous Provisions Relating to the Procedures.....APS30-30

Article 9. Power Flux-Density Limits Between 12.2 GHz and 12.7 GHz to Protect Terrestrial Services in Regions 1 and 3 from Interference from Region 2 Broadcasting-Satellite Space Stations.....APS30-30

Article 10. The Plan for the Broadcasting-Satellite Service in the Frequency Band 12.2 - 12.7 GHz in Region 2.....APS30-31

Article 11. The Plan for the Broadcasting-Satellite Service in the Frequency Bands 11.7 - 12.2 GHz in Region 3 and 11.7 - 12.5 GHz in Region 1.....APS30-71

Article 12. Relationship to Resolution **507**.....APS30-90

Article 13. Interference.....APS30-90

Article 14. Period of Validity of the Provisions and Associated Plans.....APS30-90

ANNEXES

Annex 1. Limits for Determining Whether a Service of an Administration is Affected by a Proposed Modification to the Plans or When It is Necessary Under This Appendix to Seek the Agreement of Any Other Administration (See Article 4).....APS30-91

Annex 2. Basic Characteristics to Be Furnished in Notices Relating to Space Stations in the Broadcasting- Satellite Service.....APS30-95

Annex 3. Method for Determining the Limiting Interfering Power Flux-Density at the Edge of a Broadcasting-Satellite Service Area in the Frequency Bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2) and for Calculating the Power Flux-Density Produced There by a Terrestrial Station.....APS30-97

Page

Annex 4. Need for Coordination of a Space Station in the Fixed-Satellite Service: in Region 2 (11.7 - 12.2 GHz) with Respect to the Regions 1 and 3 Plan, in Region 1 (12.5 - 12.7 GHz) and in Region 3 (12.2 - 12.7 GHz) with Respect to the Region 2 Plan (See Article 7) APS30-106

Annex 5. Technical Data Used in Establishing the Provisions and Associated Plans and Which Should Be Used for Their Application APS30-106

Annex 6. Criteria for Sharing Between Services APS30-138

Annex 7. Orbital Position Limitations APS30-143

APPENDIX S30A

Provisions and Associated Plans for Feeder Links for the Broadcasting-Satellite Service (11.7 - 12.5 GHz in Region 1, 12.2 - 12.7 GHz in Region 2 and 11.7 - 12.2 GHz in Region 3) in the Frequency Bands 14.5 - 14.8 GHz[1] and 17.3 - 18.1 GHz in Regions 1 and 3, and 17.3 - 17.8 GHz in Region 2

TABLE OF CONTENTS

		Page
Article 1.	General Definitions	APS30A-3
Article 2.	Frequency Bands	APS30A-3
Article 3.	Execution of the Provisions and Associated Plans	APS30A-4
Article 4.	Procedure for Modifications to the Plans	APS30A-4
Article 5.	Coordination, Notification, Examination and Recording in the Master International Frequency Register of Frequency Assignments to Feeder-Link Transmitting Earth Stations and Receiving Space Stations in the Fixed-Satellite Service	APS30A-9
Article 6.	Procedure Concerning Coordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments to Receiving Terrestrial Stations in Regions 1 and 3 in the Bands 14.5 - 14.8 GHz and 17.7 - 18.1 GHz, and in Region 2 in the Band 17.7 - 17.8 GHz, when Frequency Assignments to Feeder-Link Transmitting Earth Stations for the Broadcasting-Satellite Service in Conformity with the Regions 1 and 3 Plan or the Region 2 Plan are Involved	APS30A-13
Article 7.	Procedures for the Coordination, Notification and Re-cording in the Master International Frequency Register of Frequency Assignments to Stations in the Fixed-Satellite Service (Space-to-Earth) in Regions 1 and 3 in the Band 17.7 - 18.1 GHz and in Region 2 in the Band 17.7 - 17.8 GHz, and to Stations in the Broadcasting-Satellite Service in Region 2 in the Band 17.3 - 17.8 GHz When Frequency Assignments to Feeder Links for Broadcasting-Satellite Stations Appearing in the Regions 1 and 3 Plan or the Region 2 Plan are Involved	APS30A-14
Article 8.	Miscellaneous Provisions Relating to the Procedures	APS30A-15

[1] This use of the band 14.5 - 14.8 GHz is reserved for countries outside Europe.

Page

Article 9. Plan for Feeder Links for the Broadcasting-Satellite Service in the Fixed-Satellite Service in the Frequency Band 17.3 - 17.8 GHz in Region 2 ..... APS30A-16

Article 9A. Plan for Feeder Links for the Broadcasting-Satellite Service in the Fixed-Satellite Service in the Frequency Bands 14.5 - 14.8 GHz and 17.3 - 18.1 GHz in Regions 1 and 3 ..... APS30A-52

Part A APS30A-55

Part B APS30A-59

Article 10. Interference APS30A-77

Article 11. Period of Validity of the Provisions and Associated Plans APS30A-77

ANNEXES

Annex 1. Limits for Determining Whether a Service of an Administration is Considered to be Affected by a Proposed Modification to One of the Regional Plans or when it is Necessary Under this Appendix to Seek the Agreement of any Other Administration APS30A-78

Annex 2. Basic Characteristics to Be Furnished in Notices Relating to Feeder-Link Stations in the Fixed-Satellite Service Operating in the Frequency Bands 14.5 - 14.8 GHz and 17.3 - 18.1 GHz APS30A-80

Annex 3. Technical Data Used in Establishing the Provisions and Associated Plans and which Should be Used for their Application APS30A-83

Annex 4. Criteria for Sharing Between Services APS30A-117

EUR/5/

1 Appendix 30/30A Procedures

Introduction

Under its agenda item 1.10, WRC-97 will "review Appendices **30** and **30A** for Regions 1 and 3 in response to Resolution **524 (WARC-92)**, and taking particular account of *resolves* 2 of that Resolution, in accordance with Resolution **531** and taking into account Recommendation **35**".

Section 6.5 of the CPM Report to WRC-97 contains the results of the comprehensive studies undertaken by the ITU-R in relation to the procedural/regulatory aspects of this agenda item. This report identifies various approaches and solutions to update and improve the existing provisions applying to the services to which these frequency bands are allocated, as regards:

a) the location of the procedures applicable to these services;

b) the scope for the simplification of these procedures;

c) the need for updating and amending these provisions to take into account technological progress, the experience in applying them, and the need for correcting shortcomings and inconsistencies which have been identified.

Concerning the location and the possible simplification of these procedures, and taking into account the extensive work carried out by the VGE and WRC-95 in simplifying the Radio Regulations into a clearer and more consistent set of provisions, the above-mentioned administrations consider that the same approach should be taken by WRC-97 in addressing Appendices **30** and **30A** procedures and completing positively the work which had been requested by the Plenipotentiary Conference (Nice, 1989).

It is therefore proposed that WRC-97, in revising the procedures relating to Appendices **30** and **30A**, adopt the following approach (called "Approach 2" in the CPM Report):

a) The procedures for Appendix **30/30A** Plan modification and notification would appear in a single Article **S10**, addressing only Appendices **30** and **30A**. Section 4 of this Article would contain a simplified version of the current Articles 4 of Appendices **30** and **30A**, as outlined in the CPM Report under Article T4 (see Part D.1, Section 2). The criteria to be used to determine affected administrations, currently contained in Annex 1 of Appendix **30** and Annex 1 of Appendix **30A**, would be located in Appendix **S6**. Section 5 of this Article would contain a simplified version of the current Articles 5 of Appendices **30** and **30A**, as outlined in the CPM Report under Article T5 (see Part D.1, Section 3). As shown in Annexes 1 and 2 to Chapter 6 of the CPM Report, it should be noted that this simplification and relocation does not in any way imply a modification of substance in these procedures.

b) The procedures applicable to other services in respect of the plans would be located in Articles **S9** to **S14,** taking advantage of the fact that over 95% of the text of the procedures currently appearing in Articles 6 and 7 of Appendices **30** and **30A** is copied from the text currently appearing in Articles **11** and **13**, which will be superseded by Articles **S9** to **S14** (see Part D.1, Section 4).

c) The miscellaneous regulatory/procedural provisions currently contained in Articles 1 to 3 of the Appendices **30** and **30A**, and in Article 14 of Appendix **30**/Article 11 of Appendix **30A** respectively would be merged into Sections 1 to 3 and Section 6 respectively of Article **S10** (see Part D.3, Section 3).

FIGURE 1 - STRUCTURE OF THE SIMPLIFIED PROCEDURES UNDER THE PROPOSED APPROACH

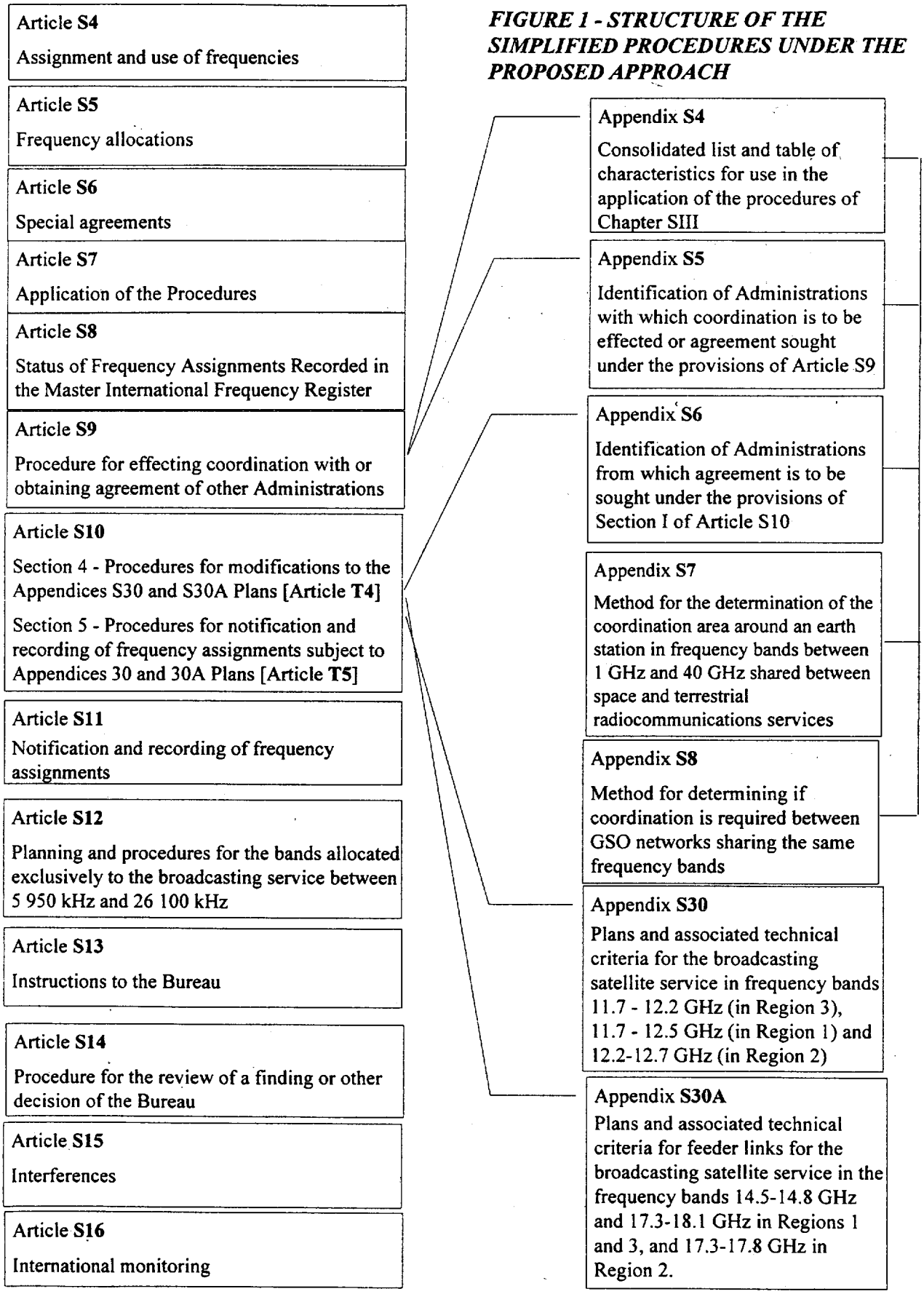


Figure 1 summarizes the relationship between the various Articles and Appendices of the simplified Radio Regulations under this proposed approach.

As outlined in the CPM Report, the basic advantage of this approach is to retain the simplicity and convenience for users of the Radio Regulations of being able to find in a single, readily accessible place - Articles **S9** to **S14** - all the regulatory procedures associated with the coordination and notification of their assignments for all unplanned and planned space and terrestrial services in all frequency bands, including those covered by Appendices **30** and **30A**.

This Approach would also resolve the current difficulty raised by existence of two different notification procedures for unplanned services in the bands covered by Appendix **30**, one under Article **13/S11**, and a second one under Articles 6 or 7 of Appendix **30**, with the associated risks of an assignment being recorded in the MIFR without having undergone all the appropriate processes.

Notwithstanding the decisions that may be taken by WRC-97 in this respect however, the above-mentioned administrations consider it essential that the significant inconsistencies and shortcomings which have been identified in the CPM Report, as well as others, be corrected and that the revised procedures to be applied in the bands covered by Appendices **30** and **30A** take into account the technological progress and the experience gained in the application of these procedures.

SEN/9/40

With regard to the procedure for modification of Appendices **S30** and **S30A** or of any other assignment or allotment plan, it is our view that, in the interests of harmonizing and simplifying the procedures, it is necessary to seek ways and means of introducing and applying a procedure that is universal. In this connection, the modified version of Article **S10** drawn up by WRC-95 and annexed to Recommendation **35** could be considered by WRC-97 with a view to possible adoption.

ASP/14/221

Introduction

The APT recognizes the need for the review of the Appendices 30 and 30A with a view to facilitating the development of broadcasting-satellite services in the planned bands. The Voluntary Group of Experts (VGE) produced a new procedure, Article S10, for the planned bands.

The APT believes that WRC-97, in Article S10, should prescribe procedures exclusively for modification to the plans, notification, examination and recording in the Master Register of Frequency Assignments for broadcasting-satellite systems and associated feeder links in the planned bands.

The following proposals have been developed from the alternative approach, intermediate between Approaches 1 and 2, which is described at the end of Section 6.5.1.2 of the CPM Report.

ASP/14/222

Article **S10** should contain all the procedural provisions related to the BSS Plans comprising the following sections:

- Section **T1**. Definitions (replaces Article 1 of Appendices **S30** and **S30A**);
- Section **T2**. Frequency Bands (from Article 2 of Appendices **S30** and **S30A**);
- Section **T3**. Execution of Provisions and Associated Plans, (from Article 3 of Appendices **S30** and **S30A**);
- Section **T4**. Procedure for Modification to the Plans (from Article 4 of Appendices **S30** and **S30A**);
- Section **T5**. Procedure for Notification, Examination and Recording in the Master Register of Frequency Assignments to Stations subject to the Plans (from Article 5 of Appendices **S30** and **S30A**); and
- Section **T6**. Period of Validity of the Provisions and Associated Plans, (from Article 14 of Appendix **S30** and Article 11 of Appendix **S30A**);

The corresponding Articles in Appendices **30** and **30A** should be suppressed.

Reasons:

1 To make the provisions easy to follow, to make available procedures for one type of service at one place for simplicity and to maintain the status of Planning Procedures with no ambiguity.

2 To address the concerns of broadcasting and other services which share the BSS Plan bands in a way which will assist the understanding and application of all the relevant procedures.

3 To ensure consistency between all the procedures, noting that the procedures applicable to other services in respect of the plans should be incorporated in Articles **S9** and **S11** and Appendix **S5**. Appendix **S6** should contain the associated requirements for identification of administrations from which agreement is to be sought under the provisions of Section **T4** of Article **S10**.

Proposal

The following proposal is presented to WRC-97 on the contents of Article **S10*** and the associated Appendix **S6** and Annexes of Appendix **S30** of the Radio Regulations. The proposed text for Section **T1, T2, T3** and **T6,** respectively Section **T4, T5** and Appendix **S6**, is based on the text currently included in Articles 1, 2, 3 and 6 of the current Appendices 30 and 30A, respectively and on the text appearing in Annexes 1 and 2 of Chapter 6 of the CPM Report. Any modifications from these reference texts are indicated by revision marks.

The modifications proposed from the existing texts under Appendices 30 and 30A relate to avoiding unnecessary duplications of the same text.

The modification proposed from the text of the CPM Report relate to the period of validity to be applied to a modification to the Plan limited to a change in orbital location.

---

* VGE proposal concerning Article **S10** was not approved by WRC-95 (see Appendices **S30** and **S30A**).

USA/30(Add.1)/

1 Introduction

Part 1 of this document presents specific proposals for revising the administrative and procedural provisions associated with the BSS Plans of Article **10** (for Region 2) and Article **11** (for Regions 1 and 3) of Appendix **S30**. Part 2 presents the corresponding United States proposals for the provisions associated with the BSS feeder link Plans of Article **9** (for Region 2) and Article **9A** (for Regions 1 and 3) of Appendix **S30A**.

The proposals presented here are based on "Approach 1" to revising the procedures of Appendices **S30** and **S30A** as described in section 6.5.1.2 of the CPM Report to WRC-97. In this approach, the entire set of procedures currently appearing under Appendices **30/30A** would be kept within these Appendices, as was the case before WRC-95.

The basic advantage of Approach 1 is to retain the simplicity and convenience for users of the Radio Regulations of being able to find in a single, readily accessible place - Appendix **S30** - all the regulatory procedures associated with the use of the frequency range 11.7 - 12.7 GHz by the two space services and four terrestrial services with primary allocations in this range. Likewise, Appendix **S30A** would retain all of the procedures for use of the associated feeder-link bands.

Approach 1 recognizes that the existing procedures have been used for 20 years and no problems have arisen that cannot be corrected under this approach. It is the only approach consistent with the common views of Region 2 countries for maintaining the integrity of the Plans and provisions for that Region as required by Resolution **524** (WARC-92) and Resolution **531** (WRC-95). It also offers the simplest and most certain means for achieving the goals of "no substantial change" or "functional equivalence" stated for Approach 2. Finally, Approach 1 avoids the risk of unintended consequences associated with revising the still-evolving procedures of Articles **S9** and **S11** to make them applicable to the other services with allocations in the Appendices **S30** and **S30A** bands, in respect of the Plans.

The United States' decision to base its proposals on Approach 1 was finalized only after a careful review of the most recent mutations of the alternative "Approach 2". As described in section 6.5.1.2 of the CPM Report, Approach 2 would:

- Consolidate into a new Article **S10** the procedures for modifying the BSS Plans presently contained in Article 4 of Appendix **S30** with those for modifying the feeder link Plans presently contained in Article 4 of Appendix **S30A**.
- Similarly consolidate into Article **S10** the procedures for notifying BSS Plan assignments in Article 5 of Appendix **S30** with those for notifying feeder link Plan assignments in Article 5 of Appendix **S30A**.
- Delete the procedures for coordination and notification of terrestrial and FSS stations with respect to the BSS Plan presently contained in Articles 6 and 7 of Appendix **S30** and revise the coordination procedures of Article **S9** and the notification procedures of Article **S11** to supplant them.
- Likewise, delete the corresponding Articles 6 and 7 of Appendix **S30A** and supplant them with appropriate revisions of Articles **S9** and **S11**.
- Delete Annex 2 in both Appendices **S30** and **S30A** (which specify the basic characteristics of BSS and feeder link stations to be furnished in connection with notices related to the Plans and their modification) and replace them with the omnibus lists of Appendix **S4**.

- Reformat the sharing criteria presently given in Annex 1 of both Appendices **S30** and **S30A** and remove them to a new Appendix **S6**.

The net effect of Approach 2 is thus to deconstruct Appendices **S30** and **S30A**, leaving only the BSS and feeder link Plans, while dispersing the several sets of procedures that govern those Plans to other parts, and even other volumes, of the Radio Regulations. The United States recognizes that the consolidations and deletions of the Articles and Annexes of Appendices **S30** and **S30A** envisioned in Approach 2 would reduce the total amount of text contained in the Radio Regulations. But we must conclude that such "simplifications" are achieved at an unacceptably high cost in ease of understanding and convenience of use of the procedures that govern the uniquely complex combination of planned and unplanned services in the 11.7 - 12.7 GHz, 14.5 - 14.8 GHz and 17.3 - 18.1 GHz bands.

2 Summary of proposed revisions

Specifically, the United States proposes the adoption of Appendix **S30** as outlined in the following section. The procedures for the coordination and notification of unplanned services with respect of the Plans in Articles 6 and 7 are retained in Appendices **S30** and **S30A**. The United States proposes no change to Annexes 1, 2, 4 and 7 of Appendix **S30**. Basically, outdated references are updated and comment time-frames are changed to be consistent with other provisions in the Radio Regulations. Article 4 is updated to require that modifications take into account previously filed modifications for which complete Annex 2 information was received. The beam group concept is clearly defined. A provision is added to ensure the conformity of modifications with the Constitution, the Convention, the Table of Frequency Allocations and the other provisions of the Radio Regulations.

CAN/35/52

Retain the Regulatory/Procedural provisions of Appendices **S30** and **S30A** for Region 2 within the said Appendices, with minimal changes, following Approach 1 as described in Section 6.5.1.2 of the CPM Report. Some examples of minimal change (notably in Articles S9 and S11) are outlined in the CITEL common proposal.

Reasons: This agenda item concerns the review of the BSS Plans for Regions 1 and 3. Any such action should ensure that the Region 2 BSS Plans are not impacted as specified in Resolves 2 of Resolution 524 and in Resolution 531. Sweeping changes are being proposed to the regulatory/procedural aspects for the Plans of Regions 1 and 3 in the course of modernizing and revising them. While it would be useful to have the regulatory/procedural aspects harmonized for all Regions, this is not possible since Region 2 is not part of the Plan revisions. Accordingly, it would be inappropriate to consider changes to the Region 2 regulatory/procedural provisions at this time. However, it is recognized that minor revisions to the text of the regulations/procedures would be necessary to update existing references to other parts of the Radio Regulations as illustrated in the CITEL common proposal. Limited demonstrable improvements to the text which are transparent to the intent could be considered.

IAP Proposal 41 [Part 30] proposes to retain the location of the procedures of Articles **4, 5, 6**, and **7** of Appendices **30** and **30A** in their respective appendices; to guard against the possibility for compromising the integrity of the Region 2 BSS Plan or reducing the protection of Region 2 terrestrial and fixed-satellite service stations against interference from the revised Regions 1 and 3 BSS Plan and its future modifications; and no change to Annex **4**.

IRN/44/21

Administrations and the Bureau have applied various articles of Appendices 30 and 30A during the last 20 years. To date, there have been no complaints, either by administrations or the Bureau, of any serious difficulty arising from these applications. Nevertheless, there are proposals to disintegrate or combine and transfer some of these articles to other parts of the Radio Regulations. Until such time that a well-founded document describing any deficiency or major difficulty arising from the application of the current regime is developed, this Administration strongly supports the status quo and believes that there should be no major modification or disintegration, either in the form of Approach 2 or any other intermediate approach.

However, the application of the present articles of the above-mentioned Appendices have shown that there are areas which require some improvements in order to resolve the inconsistencies. Therefore, this Administration supports that such a review be made within the framework of the current structure of these Appendices. To this end, an Intersessional Group of Experts (IGE) is proposed to be established by WRC-97, with the membership of experts from various administrations with equitable geographical distribution, with a view to reviewing the regulatory procedure resulting from any amendment to Approach 1. This IGE should also benefit from the active participation of the Bureau's experts which have more practical experience in the application of these Appendices. The modality of this IGE should be studied and decided by WRC-97 (see draft Resolution [IRN-1] in Annex 1).

IRN/44(Add.1)

PART 2 - REVIEW OF REGULATORY PROCEDURE RELATING TO APPENDICES 30 AND 30A

Various proposals are submitted to this Conference with respect to the revision of Regions 1 and 3 BSS and feeder-link Plans as contained in Appendices 30 and 30A. Some of the proposals relate to the planning itself and some others relate to the revision of the associated regulatory procedure to the Plans. Proposals relating to the planning itself are also different in scope and nature. Some proposals involve limited revision in terms of application of new parameters as well as assigning frequency and orbital location to "new countries" and those countries having less than a minimum number of channels. Other proposals involve total replanning of entire frequency bands either as a frequency assignment or in the form of an allotment plan. The replanning in either of the two options are proposed to take account, on the one hand, the technological development and the economical viability of the BSS systems for developing countries. Adoption of any of these two approaches or any other approach between the two extremes requires relevant regulatory procedure to be adequately responsive to the approach adopted. The main reason of the proposal for the total replanning is, on the one hand, the unilateral excessive use of the limited 12 GHz frequency band by some countries under a regulatory regime which does not correspond to the real situation and, on the other hand, the needs of various countries in the domain of BSS which are not covered by the present Plans. Moreover, even for the least possible changes, there are three regulatory procedures proposed know as Approaches 1, 2 and intermediate or alternative approach.

It is the strong view of this Administration that before discussion of any regulatory procedure, the Conference should first decide which planning approach among the above-mentioned possible options would favour the support of the majority of the Union's Members.

Once the option is decided, then the associated regulatory procedure which suitably fits that approach should be examined.

The reason is that, a very limited amount of time available to the Conference on the one hand, and a very heavy agenda before the Conference, on the other hand, do not permit to discuss any regulatory regime before deciding on the principles. These limitations necessitate that a very precise and well-calculated strategy be adopted from the very beginning.

It should be noted that there are problems and deficiencies in the approach adopted by WRC-95 in which a partial revision is envisaged. One of the main problems is that the situation has been dramatically changed from that prevailed in 1977. The needs and requirements of many countries have been considerably changed in terms of the number of channels, beam requirements as well as the way in which the band could be economically used. It is a known fact that, the BSS satellite system with five analogue channels are no longer economically viable for any country. No one is ready to spend several hundreds of millions of dollars to operate that type of satellite. There are other approaches which are more economically viable such as hybrid satellite systems using multifrequency and multicharacteristics. If we plan something for the next 15 years (at least) that system should adequately respond to the requirements of the next 15 years. It is an absolute waste of time, money and effort to plan five analogue channels per country and leave the remaining portion of frequency bands to be used by a limited number of other countries.

The ever-increasing usage of the orbit/frequency spectrum in an abused manner such as grouping of various orbital positions, using the concept of non-reply as agreement, non-observance of the very basic provision of RR 2674 are the clear examples of the abused application of the current provisions.

ARS+/76/

2 Revision of S9 and S11 and Appendix S5 (Reference to 1.4, Articles S9 and S11 and Appendix S5 in the CPM Report)

Incorporation in Articles S9 and S11 of the coordination and notification procedures of Appendices 30 and 30A

The important number of procedures and their complexity led previous conferences to consider the simplification of the Radio Regulations as one of the urgent tasks to be undertaken by the ITU. A group of experts, the VGE, was set up for this purpose and the majority of its recommendations were adopted by WRC-95 for inclusion in the Radio Regulations. The signatories of this document recognized the importance of the results of that group for the future of the Union as well as the importance of the work carried out in this respect within the framework of the Special Committee. They consider, however, that the various attempts to modify the VGE Report resulted in a situation that is not clear enough to permit the adoption of further action in simplifying the Radio Regulations.

The VGE recommended, among others, a standard procedure for modification to assignments or allotment plans. WRC-95 did not follow this recommendation and retained these procedures in their respective Appendices. The Conference also considered proposals made by some administrations in relation to Appendices 30 and 30A and was not in position to adopt them. The essence of these proposals were included in Recommendation COM4-B, the signatories of this document do not consider themselves bound by the content of these proposals, even if they appear in a Conference Recommendation.

The VGE recommended, among others, a standard procedure for the coordination and notification of frequency assignments. WRC-95 accepted the recommended standard procedure for the coordination that may replace, among others, those procedures applicable to stations of services sharing frequency bands with the planned BSS. It included also provisions intended to cover the current provisions of Resolution 33.

The signatories of this document have noted that several fora have considered modifications to Articles S9 and S11 and Appendices 30 and 30A. There are so many documents that contain modifications, modifications to modifications and other additions so that it becomes nearly impossible what modification is of what. Moreover some of the identified changes have impact on some principles on the basis of which the bands allocated to the BSS may be used. As an example of this is the approach relating to Resolution 33. ITU allocated frequency bands to the BSS under four conditions:

- The use of the bands shall be subject to planning, see Resolution 507.
- The use of the bands is limited to national coverage, see S23.13.
- The use of the bands is limited to geostationary satellites, see Resolution 506.
- Provisional uses can be made through the procedure of Resolution 33 and the recording of assignments following the successful application of that procedure shall not "prejudge in any way the decisions to be included in the agreements and associated plans referred to in Resolution 507", see paragraph 6.4 of Resolution 33.

Appendices 30 and 30A are to be examined by the Conference from the viewpoint of ensuring equal and equitable access to all ITU Members. Such review may require significant changes to the associated procedures. For these reasons it is proposed:

- to keep Appendices 30 and 30A unchanged except for those changes required as a consequence of other decisions by the Conference (see, for example document [item 1]);
- to keep Resolution 33 in its present form as a transitional measure;
- to keep Resolutions 506 and 507 unchanged.

For the above reasons it is proposed to keep Appendices 30 and 30A and Resolution 33 separate from Articles S9 and S11.

ARS+/76/Chapter 6

CHAPTER 6

WRC-97 agenda item 1.10 - Appendices 30 and 30A

Review of Appendices 30 and 30A

1 Some among the signatories of this document have sponsored Document 38 of WRC-95[2] indicating their views in relation to the review of Appendices 30 and 30A. WRC-97 has to discuss again this matter in the light of the studies carried out in application of Resolution 531 taking account of the actual situation resulting from a huge number of proposed modifications to the Plans.

---

[2] Kingdom of Saudi Arabia, State of Kuwait, Kingdom of Morocco, Syrian Arab Republic.

In addition, the Radio Regulation Board adopted Rules of Procedure which are not considered to be fully in line with the decisions of WRC-95 and, the studies intending to integrate all or part of the procedures of these Appendices in Articles S9 and S11, brought to light a number of problems that require special consideration by the Conference. It becomes therefore necessary for the Conference to review Appendices 30 and 30A in a manner consistent with the planning principles on the basis of which the Plans were established and those adopted by WRC-95.

2 In its Resolution 531, WRC-95 defined planning exercises consisting of three steps which are:

- Step 1: Modify the existing Plan assignments on the basis of the new parameters.
- Step 2: Provide new countries, and those countries having less than the minimum number of channels, an initial capacity equivalent to that which would have been provided to them by the principles adopted for the 1977 BSS Conference.
- Step 3: Take account, as far as possible, of systems which have been communicated to the Bureau under Article 4 of Appendices 30 and 30A.

3 The parameters referred to in Step 1 were adopted by WRC-95 under the understanding that the Plans would remain based on a number of channels per coverage area limited to 5 or 4. They have been introduced by the Bureau in the two Appendices and the Conference will consider the Bureau's report on this matter. These parameters may need to be reviewed in the light of a new approach to planning that the Conference may adopt.

LBN/114/31

The Lebanon is of the view that Annex 7 to Appendix 30 imposes restrictions on the Regions 1 and 3 Plan to protect Region 2 FSS. These restrictions are no longer valid therefore the Lebanon proposes to suppress Annex 7.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/34-E
7 November 1997
Original: English

SUB-WORKING GROUP 5B2

REPORT OF THE INFORMAL GROUP 5B2-B ON CONSIDERATION OF PROPOSALS CONCERNING THE BAND 1 559 - 1 567 MHz

Three meetings were held. A unique consensus was not achieved. Rather, following further direction from SWG 5B2 on 4 November, various options were developed.

These options are described below and detailed texts for options 2 and 3 are attached.

The order of these options has no significance.

Option 1

Allocate the band 1 559 - 1 567 MHz to MSS in the downband direction sharing with the current services.

Adopt a footnote requiring MSS to protect the current services allocated in the band.

Adopt a resolution to study the sharing criteria in the ITU-R in time for consideration at WRC-99.

The service cannot begin until the sharing criteria is agreed.

Option 2 (see detailed text attached)

Adopt a resolution to specifically identify the band 1 559 - 1 567 MHz as a potential downband for study by the ITU-R in time for consideration at WRC-99.

The resolution would request WRC-99 to consider an allocation for MSS in the band, based on the outcome of the ITU-R studies.

Option 3 (see detailed text attached)

Allocate the band 1 559 - 1 567 MHz to MSS in the downband direction sharing with the current services.

Establish a provisional pfd for MSS of -112 dB(W/m^2/1 MHz) to protect the current services in the band subject to review of this limit at WRC-99 (an appropriate mechanism would be established for this review).

The date of entry of MSS shall not be before 1 July 2000.

Any MSS system filing for use of the band 1 559 - 1 567 MHz shall comply with the final pfd limits as adopted by WRC-99.

The use of MSS is subject to coordination under Resolution 46.

MSS shall not cause interference to internationally standardized GNSS.

Option 4

NOC

ATTACHMENT 1

OPTION 2

Sharing studies and further consideration of a downlink band in the mobile-satellite service associated with the [uplink band XXXX]

The World Radiocommunication Conference (Geneva, 1997),

considering

a) [that WRC-97 allocated the band xxxx MHz, on a worldwide basis, to the mobile-satellite (Earth-to-space) service];

b) that Resolution 213 (WRC-95) invited the ITU-R to investigate a potentially suitable related downlink band to assist in meeting the requirements of the mobile-satellite service;

c) that proposals were presented at WRC-97 indicating the band 1 559 - 1 567 MHz as potentially suitable;

d) that further studies are required to determine the feasibility of the sharing of the band 1 559 - 1 567 MHz with the mobile-satellite (space-to-Earth) service and the radionavigation satellite and aeronautical radionavigation services;

e) that the band 1 559 - 1 610 MHz is used by the radionavigation satellite system including components of the ICAO global navigation satellite system (i.e. GPS and GLONASS) for which further ICAO standards are currently being developed;

f) that the global navigation satellite system is an evolutionary system and that future developments also require protection;

g) that RR **S4.10** recognizes that the above radionavigation usage require special measures to ensure freedom from harmful interference,

resolves to invite ITU-R

as a matter of urgency, to complete the technical and operational studies on the feasibility of sharing the band 1 559 - 1 567 MHz between the mobile-satellite service (space-to-Earth) and the radionavigation services mentioned above, including the required means for preventing harmful interference to radionavigation systems and other services as appropriate,

further invites

1 administrations and relevant international organizations to participate actively in such studies;

2 ITU-R to continue to investigate a potentially suitable downlink band that may assist in meeting the spectrum requirements of the mobile-satellite service,

resolves

to review at the 1999 World Radiocommunication Conference (WRC-99), the outcome of these studies and consider the allocation of a suitable downlink band to the mobile-satellite service, including appropriate implementation time-frame, while providing protection for current planned and future radionavigation-satellite service systems,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO and IMO.

ATTACHMENT 2

OPTION 3

MHz

1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 559 – ~~1 610~~1 567	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) ADD S5.354A S5.341 S5.355 S5.359 S5.363	
~~1 559~~1 567 – 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363	

ADD S5.354A The use of the band 1 559 - 1 567 MHz by the mobile-satellite service (space-to-Earth) shall be in accordance with Resolution [XXX] (WRC-97).

DRAFT RESOLUTION [XXX] (WRC-97)

USE OF THE BAND 1 559 - 1 567 MHz BY THE MOBILE-SATELLITE SERVICE (SPACE-TO-EARTH)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559 - 1 567 MHz is currently allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that WRC-97 has made an allocation to the mobile-satellite service in the band 1 559 - 1 567 MHz (s-E) subject to appropriate protection for the aeronautical radionavigation and radionavigation-satellite services;

c) that the aeronautical radionavigation and radionavigation-satellite services are safety services (**S4.10** applies);

d) that safety of life services shall be protected,

considering further

a) that there is a shortage of frequency spectrum for the mobile-satellite services;

b) the need to ensure the effective use of the radio spectrum;

c) that there should be equitable access to the scarce radio frequency spectrum resource to allow for the provision of new services;

d) that studies carried out by some administrations indicate that a power flux-density limit of -112 dB(W/m^2/1 MHz) for all angles of arrival for mobile-satellite service space stations is appropriate for the protection of aeronautical radionavigation and radionavigation-satellite services;

e) that WRC-99 will consider additional allocations to the radionavigation-satellite service,

recognizing

the essential need to protect the international standard GNSS systems of the aeronautical radionavigation and radionavigation-satellite services,

resolves

1 that the allocation in the band 1 559 - 1 567 MHz to the mobile-satellite service (s-E) shall enter into force on 1 July 2000;

2 that such use by the mobile-satellite service shall be subject to coordination under [Resolution **46 (WRC-97)**/No. **S9.11A**];

3 that stations of the mobile-satellite service (space-to-Earth) operating in this band shall not cause harmful interference to international standard GNSS [add reference to ESA systems if necessary] systems of the aeronautical radionavigation and radionavigation-satellite services;

4 that the power flux-density of mobile-satellite service space stations operating in this band shall not exceed the provisional limit of -112 dB(W/m^2/1 MHz) for all angles of arrival; however, this power flux-density limit shall be reviewed by WRC-99 in the light of the studies referred to in the *further resolves* below;

5 that any MSS systems intending to use this band shall comply with the power flux-density limit decided by WRC-99,

further resolves

1 to request the ITU-R to study, as a matter of urgency, the power flux-density limit to be applied to MSS systems operating in this band taking account of the *recognizing* above, with a view to facilitate sharing, and taking account of existing and planned systems and the studies already carried out;

2 to instruct the Director of the Radiocommunication Bureau to ensure, in consultation with the relevant Study Group Chairman, that the results of these studies are available in due time for consideration at WRC-99;

3 to recommend that WRC-99 review the results of these studies with a view to make any necessary adjustment to the power flux-density limit referred to in *resolves* 3 above and any consequential changes to Article **S5**;

4 to urge all administrations and organizations concerned to contribute to these studies and to cooperate to ensure a mutually satisfactory result is presented to WRC-99.

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

CMR-97 CONFÉRENCE MONDIALE DES RADIOCOMMUNICATIONS

Document DL/34-F
7 novembre 1997
Original: anglais

GENÈVE, 27 OCTOBRE – 21 NOVEMBRE 1997

SOUS-GROUPE DE TRAVAIL 5B2

RAPPORT DU GROUPE INFORMEL 5B2-B SUR L'EXAMEN DES PROPOSITIONS CONCERNANT LA BANDE 1 559 - 1 567 MHz

Ce Sous-Groupe a tenu trois réunions et n'a pu aboutir à un consensus. Aussi, suivant les autres directives données par le Sous-Groupe de travail 5B2 le 4 novembre, différentes options ont été élaborées. Ces options sont décrites ci-après et les textes détaillés des options 2 et 3 sont joints. L'ordre de ces options est sans signification.

Option 1

Attribution de la bande 1 559 - 1 567 MHz aux liaisons descendantes du SMS en partage avec les services actuels.

Adoption d'un renvoi exigeant de la part du SMS la protection des services actuels ayant des attributions dans cette bande.

Adoption d'une Résolution demandant à l'UIT-R d'étudier les critères de partage dans les délais pour examen à la CMR-99.

Le service ne peut pas être exploité dans cette bande tant que les critères de partage n'ont pas été adoptés.

Option 2 (voir le texte détaillé ci-joint)

Adoption d'une Résolution visant à identifier spécifiquement la bande 1 559 - 1 567 MHz comme bande possible pour les liaisons de connexion à étudier par l'UIT-R dans les délais pour examen à la CMR-99.

Dans la Résolution il serait demandé à la CMR-99 d'envisager une attribution au SMS dans cette bande sur la base des résultats des études faites par l'UIT-R.

Option 3 (voir le texte détaillé ci-joint)

Attribution de la bande 1 559 - 1 567 MHz aux liaisons descendantes du SMS en partage avec les services actuels.

Fixation d'une limite provisoire de puissance surfacique de -112 dB(W/m^2/1 MHz) pour le SMS afin de protéger les services actuels dans la bande, limite qui serait réexaminée à la CMR-99 (un mécanisme approprié serait mis en place pour ce réexamen).

La mise en service de ces attributions au SMS ne se ferait pas avant le 1er juillet 2000.

Tout système du SMS demandant à utiliser la bande 1 559 - 1 567 MHz devra se conformer aux limites de puissance surfacique définitives adoptées par la CMR-99.

L'utilisation du SMS est soumise à l'application de la procédure de coordination aux termes de la Résolution 46.

Le SMS ne devra pas brouiller le système GNSS normalisé au plan international.

Option 4

NOC

PIÈCE JOINTE 1

OPTION 2

Etudes de partage et poursuite de l'étude concernant l'attribution d'une bande aux liaisons descendantes du service mobile par satellite associé à la [bande XXXX attribuée aux liaisons de connexion]

La Conférence mondiale des radiocommunications (Genève, 1997),

considérant

a) [que la CMR-97 a attribué la bande xxxx MHz, à l'échelle mondiale, au service mobile par satellite (Terre vers espace)];

b) qu'aux termes de la Résolution 213 (CMR-95), l'UIT-R est invitée à désigner une bande de fréquences associée qui pourrait convenir aux liaisons descendantes et qui permettrait de satisfaire les besoins du SMS;

c) que des propositions ont été présentées à la CMR-97 qui indiquent que la bande 1 559 - 1 567 MHz pourrait convenir;

d) qu'il est nécessaire de poursuivre des études pour déterminer les possibilités de partage de la bande 1 559 - 1 567 MHz avec le service mobile par satellite (espace vers Terre) et les services de radionavigation par satellite et de radionavigation aéronautique;

e) que la bande 1 559 - 1 610 MHz est utilisée par le système de radionavigation par satellite qui comporte des composantes du système mondial de radionavigation par satellite de l'OACI (c'est-à-dire GPS et GLONASS) pour lesquelles d'autres normes de l'OACI sont en cours d'élaboration;

f) que le système mondial de navigation aéronautique par satellite (GNSS) est un système évolutif et que les futurs développements doivent également être protégés;

g) qu'aux termes du numéro **S4.10** l'utilisation des systèmes de radionavigation nécessite des mesures spéciales pour garantir qu'ils ne subissent pas de brouillages préjudiciables,

décide d'inviter l'UIT-R

à terminer d'urgence les études techniques et opérationnelles sur les possibilités de partage de la bande 1 559 - 1 567 MHz entre le service mobile par satellite (espace vers Terre) et les services de radionavigation précités, y compris les moyens nécessaires pour empêcher de causer des brouillages préjudiciables aux systèmes de radionavigation et aux autres services le cas échéant,

invite en outre

1 les administrations et les organisations internationales concernées de participer activement à ces études;

2 l'UIT-R à poursuivre sa recherche d'une bande susceptible de convenir pour les liaisons descendantes qui aideraient à satisfaire les besoins en spectre du service mobile par satellite,

décide

d'examiner à la Conférence mondiale des radiocommunications de 1999 (CMR-99), le résultat de ces études et d'envisager l'attribution d'une bande appropriée pour les liaisons descendantes du service mobile par satellite, y compris l'établissement d'un calendrier de mise en oeuvre, tout en assurant la protection des systèmes du service de radionavigation par satellite actuels, en projet et futurs,

charge le Secrétaire général

de porter la présente Résolution à l'attention de l'OACI et de l'OMI.

PIECE JOINTE 2

OPTION 3

MHz
1 535 - 1 610,6

Attribution aux services		
Région 1	Région 2	Région 3
1 559 - ~~1 610~~1 567	RADIONAVIGATION AÉRONAUTIQUE RADIONAVIGATION PAR SATELLITE (espace vers Terre) MOBILE PAR SATELLITE (espace vers Terre) ADD S5.354A S5.341 S5.355 S5.359 S5.363	
~~1 559~~1 567 - 1 610	RADIONAVIGATION AÉRONAUTIQUE RADIONAVIGATION PAR SATELLITE (espace vers Terre) S5.341 S5.355 S5.359 S5.363	

ADD S5.354A L'utilisation de la bande 1 559 - 1 567 MHz par le service mobile par satellite (espace vers Terre) se fera conformément à la Résolution [XXX] (CMR-97).

PROJET DE RESOLUTION [XXX] (CMR-97)

UTILISATION DE LA BANDE 1 559 - 1 567 MHz PAR LE SERVICE MOBILE PAR SATELLITE (ESPACE VERS TERRE)

La Conférence mondiale des radiocommunications (Genève, 1997),

considérant

a) que la bande 1 559 - 1 567 MHz est actuellement attribuée à titre primaire aux services de radionavigation par satellite et de radionavigation aéronautique;

b) que la CMR-97 a fait une attribution au service mobile par satellite dans la bande 1 559 - 1 567 MHz (espace vers Terre) sous réserve d'offrir une protection appropriée aux services de radionavigation par satellite et de radionavigation aéronautique;

c) que les services de radionavigation par satellite et de radionavigation aéronautique sont des services de sécurité (pour lesquels le numéro **S4.10** s'applique);

d) que les services relatifs à la sécurité de la vie humaine doivent être protégés,

considérant en outre

a) que les besoins des services mobiles par satellite ne peuvent être satisfaits faute de spectre;

b) qu'il est nécessaire d'assurer une utilisation efficace du spectre radioélectrique;

c) qu'il faudrait assurer un accès équitable à la ressource de spectre radiofréquence qui est une ressource rare, pour permettre la fourniture de nouveaux services;

d) que les études effectuées par certaines administrations montrent qu'une limite de puissance surfacique de -112 dB(W/m^2/1 MHz) pour tous les angles d'arrivée pour les stations spatiales du service mobile par satellite permet de protéger les services de radionavigation aéronautique et de radionavigation par satellite;

e) que la CMR-99 examinera l'octroi d'attributions additionnelles au service de radionavigation par satellite,

reconnaissant

qu'il est essentiel de protéger les systèmes GNSS normalisés au plan international relevant des services de radionavigation par satellite et de radionavigation aéronautique,

décide

1 que l'attribution faite dans la bande 1 559 - 1 567 MHz au service mobile par satellite (espace vers Terre) entrera en vigueur le 1er juillet 2000;

2 une telle utilisation par le service mobile par satellite sera soumise à une coordination au titre de la [Résolution **46 (CMR-97)**/numéro **S9.11A**];

3 que les stations du service mobile par satellite (espace vers Terre) exploitées dans cette bande ne devront pas causer de brouillages préjudiciables aux systèmes GNSS normalisés au plan international [ajouter au besoin une référence aux systèmes de l'ASE] relevant des services de radionavigation par satellite et de radionavigation aéronautique;

4 que la puissance surfacique des stations spatiales du service mobile fonctionnant dans cette bande ne devra pas être supérieure à la limite provisoire de -112 dB(W/m^2/1 MHz) pour tous les angles d'arrivée; toutefois, cette limite de puissance surfacique sera réexaminée par la CMR-99 à la lumière des études mentionnées dans le *décide en outre* ci-après;

5 que tout système envisageant d'utiliser cette bande devra respecter la limite de puissance surfacique décidée par la CMR-99,

décide en outre

1 de demander à l'UIT-R d'étudier d'urgence, la limite de puissance surfacique à appliquer aux systèmes du SMS exploités dans cette bande en tenant compte du *reconnaissant* ci-dessus, en vue de faciliter le partage et en tenant compte des systèmes existants et en projet ainsi que des études déjà effectuées;

2 de charger le Directeur du Bureau des radiocommunications de faire en sorte, qu'en consultation avec les Présidents des commissions d'études concernées, que les résultats de ces études soient disponibles à temps pour pouvoir être examinés à la CMR-99;

3 de recommander que la CMR-99 examine les résultats de ces études afin de procéder aux ajustements éventuellement nécessaires de la limite de puissance surfacique indiquée dans le point 3 du dispositif ci-dessus et d'apporter les modifications à l'article **S5** qui pourraient en découler;

4 de prier instamment toutes les administrations et organisations concernées de contribuer à ces études et de coopérer pour faire en sorte qu'un résultat mutuellement satisfaisant soit présenté à la CMR-99.

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

CMR-97 CONFERENCIA MUNDIAL DE RADIOCOMUNICACIONES

Documento DL/34-S
7 de noviembre de 1997
Original: inglés

GINEBRA, 27 DE OCTUBRE – 21 DE NOVIEMBRE DE 1997

SUBGRUPO
DE TRABAJO 5B2

INFORME DEL GRUPO EXTRAOFICIOSO 5B2-B SOBRE EL EXAMEN DE LAS PROPUESTAS RELATIVAS A LA BANDA 1 559 - 1 567 MHz

Se celebraron tres reuniones. No se llegó a un consenso único. Por el contrario, atendiendo a las nuevas instrucciones del Subgrupo de Trabajo 5B2 del 4 de noviembre, se elaboraron varias opciones.

A continuación se describen éstas y se adjuntan textos detallados de las opciones 2 y 3.

El orden de las opciones no tiene importancia.

Opción 1

Atribuir la banda 1 559 - 1 567 MHz al SMS en el sentido descendente, compartiéndola con los servicios actuales.

Adoptar una nota en la que se exija al SMS la protección de los servicios actuales con atribuciones en la banda.

Adoptar una Resolución para que el UIT-R estudie los criterios de compartición, con antelación suficiente para su examen en la CMR-99.

El servicio no puede iniciarse hasta que se convengan los criterios de compartición.

Opción 2 (véase el texto detallado adjunto)

Adoptar una Resolución que identifique específicamente la banda 1 559 - 1 567 MHz como banda posible para el enlace descendente, que deberá estudiar el UIT-R con antelación suficiente para su examen en la CMR-99.

En la Resolución se pediría a la CMR-99 que considere una atribución al SMS en la banda, basándose en el resultado de los estudios del UIT-R.

Opción 3 (véase el texto detallado adjunto)

Atribuir la banda 1 559 - 1 567 MHz al SMS para el enlace descendente, en compartición con los servicios actuales.

Establecer una dfp provisional para el SMS de -112 dB(W/m^2/1 MHz) a fin de proteger los actuales servicios en la banda, a la espera del examen de este límite por la CMR-99 (se establecería un mecanismo adecuado para dicho examen).

La fecha de entrada en servicio del SMS no sería anterior al 1 de julio de 2000.

Todo sistema del SMS que presente una notificación para utilización de la banda 1 559 - 1 567 MHz deberá ajustarse a los límites de la dfp adoptados por la CMR-99.

La utilización del SMS estaría sujeta a coordinación según la Resolución 46.

El SMS no deberá causar interferencia al GNSS normalizado internacionalmente.

Opción 4

NOC

ADJUNTO 1

OPCIÓN 2

Estudios de compartición y nuevo examen de una banda para el enlace ascendente del servicio móvil por satélite asociada a la [banda del enlace ascendente XXXX]

La Conferencia Mundial de Radiocomunicaciones (Ginebra, 1997),

considerando

a) [que la CMR-97 atribuyó la banda xxxx MHz, con carácter mundial, al servicio móvil por satélite (Tierra-espacio)];

b) que en la Resolución 213 (CMR-95) se invita al UIT-R a investigar una banda de enlace ascendente correspondiente que pueda ser adecuada para atender a los requisitos del servicio móvil por satélite;

c) que en la CMR-97 se presentaron propuestas que indicaban que la banda 1 559 - 1 567 MHz podía ser adecuada;

d) que se necesitan nuevos estudios para determinar la viabilidad de la compartición de la banda 1 559 - 1 567 MHz entre el servicio móvil por satélite (espacio-Tierra) y los servicios de radionavegación por satélite y de radionavegación aeronáutica;

e) que la banda 1 559 - 1 610 MHz la utilizan los sistemas de radionavegación por satélite, incluyendo ciertos componentes del Sistema Mundial de Navegación de Aeronáutica por Satélite de la OACI (es decir, el GPS y el GLONASS) para los que se están desarrollando actualmente nuevas normas de la OACI;

f) que el Sistema Mundial de Navegación de Aeronáutica por Satélite es un sistema en evolución y que sus desarrollos futuros exigirán también protección;

g) que en el número **S4.10** del Reglamento se reconoce que la utilización mencionada por la radionavegación exige medidas especiales que aseguren la ausencia de interferencia perjudicial,

resuelve invitar al UIT-R

a que, con carácter urgente, realice estudios técnicos y operacionales sobre la viabilidad de la compartición de la banda 1 559 - 1 567 MHz entre el servicio móvil por satélite (espacio-Tierra) y los servicios de radionavegación mencionados anteriormente, incluyendo el estudio de los medios necesarios para evitar la interferencia perjudicial en los sistemas de radionavegación y en otros servicios, según el caso,

invita además

1 a las administraciones y a las organizaciones internacionales pertinentes a participar activamente en dichos estudios;

2 al UIT-R a continuar investigando una banda de enlace ascendente que pueda ser adecuada para atender a las necesidades de espectro del servicio móvil por satélite,

resuelve

examinar en la Conferencia Mundial de Radiocomunicaciones de 1999 (CMR-99), el resultado de estos estudios y considerar la atribución de una banda adecuada de enlace descendente al servicio móvil por satélite, incluyendo un periodo de aplicación adecuado, al tiempo que se protegen los sistemas actualmente planificados y futuros del servicio de radionavegación por satélite,

encarga al Secretario General

que señale esta Resolución a la atención de la OACI y la OMI.

ADJUNTO 2

OPCIÓN 3

MHz
1 535 - 1 610,6

Atribución a los servicios		
Región 1	Región 2	Región 3
1 559 – ~~1 610~~1 567	RADIONAVEGACIÓN AERONÁUTICA RADIONAVEGACIÓN POR SATÉLITE (espacio-Tierra) MÓVIL POR SATÉLITE (espacio-Tierra) ADD S5.354A S5.341 S5.355 S5.359 S5.363	
~~1 559~~1 567 – 1 610	RADIONAVEGACIÓN AERONÁUTICA RADIONAVEGACIÓN POR SATÉLITE (espacio-Tierra) S5.341 S5.355 S5.359 S5.363	

ADD S5.354A La utilización de la banda 1 559 - 1 567 MHz por el servicio móvil por satélite (espacio-Tierra) se ajustará a lo dispuesto en la Resolución [XXX] (CMR-97).

PROYECTO DE RESOLUCIÓN [XXX] (CMR-97)

UTILIZACIÓN DE LA BANDA 1 559 - 1 567 MHz POR EL SERVICIO MÓVIL POR SATÉLITE (ESPACIO-TIERRA)

La Conferencia Mundial de Radiocomunicaciones (Ginebra, 1997),

considerando

a) que la banda 1 559 - 1 567 MHz está actualmente atribuida, a título primario, a los servicios de radionavegación aeronáutica y de radionavegación por satélite;

b) que la CMR-97 ha efectuado una atribución al servicio móvil por satélite en la banda 1 559 - 1 567 MHz (espacio-Tierra), sujeta a una protección adecuada de los servicios de radionavegación aeronáutica y de radionavegación por satélite;

c) que los servicios de radionavegación aeronáutica y de radionavegación por satélite son servicios de seguridad (se aplica el **S4.10**);

d) que deben protegerse los servicios de seguridad de la vida humana,

considerando además

a) que escasea el espectro de frecuencias para los servicios móviles por satélite;

b) la necesidad de asegurar una utilización eficaz del espectro radioeléctrico;

c) que el acceso al recurso escaso del espectro radioeléctrico debe ser equitativo para poder disponer de nuevos servicios;

d) que según los estudios efectuados por algunas administraciones, un límite de densidad de flujo de potencia de -112 dB(W/m^2/1 MHz) en todos los ángulos de llegada de las estaciones espaciales del servicio móvil por satélite es adecuado para la protección de los servicios de radionavegación aeronáutica y de radionavegación por satélite;

e) que la CMR-99 considerará atribuciones adicionales al servicio de radionavegación por satélite,

reconociendo

1 la necesidad fundamental de proteger los sistemas de norma internacional GNSS de los servicios de radionavegación aeronáutica y de radionavegación por satélite,

resuelve

1 que la atribución al servicio móvil por satélite (espacio-Tierra) en la banda 1 559 - 1 567 MHz entre en vigor el 1 de julio de 2000;

2 que dicha utilización por el servicio móvil por satélite esté sujeta a la coordinación según [la Resolución **46 (CMR-97)**/el número **S9.11A**];

3 que las estaciones del servicio móvil por satélite (espacio-Tierra) que funcionan en esta banda no causen interferencia perjudicial a los sistemas de norma internacional GNSS [añádase la referencia a los sistemas de la ESA, si es necesario] de los servicios de radionavegación aeronáutica y de radionavegación por satélite;

4 que la densidad de flujo de potencia de las estaciones espaciales del servicio móvil por satélite que funcionan en esta banda no rebasará el límite provisional de -112 dB(W/m^2/1 MHz) para todos los ángulos de llegada; no obstante, este límite de densidad de flujo de potencia se reexaminará en la CMR-99 a la luz de los estudios a los que se hace referencia en el *resuelve además*;

5 que todo sistema del SMS que pretenda utilizar esta banda se ajustará al límite de densidad de flujo de potencia decidido por la CMR-99,

resuelve además

1 pedir al UIT-R que estudie, con carácter urgente, el límite de densidad de flujo de potencia que debe aplicarse a los sistemas del SMS con funcionamiento en esta banda, teniendo presente lo indicado en el *reconociendo* anterior, a fin de facilitar la compartición, y teniendo en cuenta los sistemas actuales y planificados y los estudios ya efectuados;

2 encargar al Director de la Oficina de Radiocomunicaciones que asegure, consultando con el Presidente de la Comisión de Estudio pertinente, la disponibilidad de los resultados de estos estudios con antelación suficiente para su examen en la CMR-99;

3 recomendar que la CMR-99 examine los resultados de estos estudios con miras a efectuar los ajustes necesarios en el límite de densidad de flujo de potencia al que se refiere el punto 3 del *resuelve* y aplicar toda modificación consecuente del artículo **S5**;

4 instar a las administraciones y organizaciones interesadas a contribuir a estos estudios y a aportar su colaboración con el fin de asegurar la presentación en la CMR-99 de un resultado satisfactorio para todos.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/35-E
AD HOC 4/WG 5B-5

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

AD HOC 4 OF WORKING GROUP 5B

AGENDA

OF THE

FIFTH MEETING OF AD HOC 4

OF WORKING GROUP 5B

Monday, 10 November 1997, at 1110 hours

(Room III/IV)

		Documents
1	Approval of the agenda	OJ/101
2	Report from Drafting Group	-
3	Discussion	-
4	Any other business	-

E. HAUCK
Chairman of Ad Hoc 4, WG 5B

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/37-E
10 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WG 5B AD HOC 4

DRAFTING GROUP 1 OF 5B AD HOC 4

REPORT TO 5B AD HOC 4 ON THE REGULATORY PROVISIONS RELATING TO THE OPERATION OF NGSO FSS AND GSO SYSTEMS IN THE 10.7 TO 30 GHz BANDS

This document provides the results of the work of Sub-Drafting Group 1 of Drafting Group 1 of 5B ad hoc Group 4 on the regulatory provisions that would be required in order to enable NGSO FSS systems to be operated in the frequency bands from 10.7 to 30 GHz. These results are presented directly to 5B ad hoc Group 4. The list of participants is provided in Annex 1.

Following the meeting of Drafting Group 1 of 5B ad hoc Group 4, held on Saturday, 8 November 1997 from 1000 hours to 1500 hours, under the chairmanship of Dr. Ito, Sub-Drafting Group 1 of this drafting group met on Saturday 8 November, Sunday 9 November and Monday 10 November in order to prepare possible elements for a regulatory approach to the NGSO FSS issue, along the following three steps, identified in Document CMR97/114(Add.2):

a) Ku-band: establishment of hard limits.

b) Parts of the Ka-band not covered by Resolution 118 or Resolution 120: establishment of hard limits;

c) Parts of the Ka-band covered by Resolution 118: application of Resolution 46.

Section 1 of this report relates to steps a) and b). Section 2 relates to step c).

It should be noted that all these elements should be considered as being in square brackets as the matter needs further discussion and needs to be resolved as a whole. In particular, the exact values of the proposed power limits to be applied to NGSO and to GSO FSS systems, as well as the exact frequency bands in which these limits may apply, still need to be discussed. Similarly, the exact regulatory conditions to determine the relative status of GSO and NGSO systems in the various bands under consideration still need to be discussed.

For completeness, the provisions relating to the protection of Appendices **30** and **30A** are also reproduced. These provisions, as well as Resolution 506 will be addressed by WG 4D. These elements are kept in square brackets pending review by WG 4D. It is suggested that these elements be brought to the attention of WG 4D at the earliest opportunity, in order to facilitate the discussions in this group.

The coordinators:

F. Rancy T. Tycz

1 Regulatory provisions concerning the Ku-band and the parts of Ka-band not covered by Resolution 118 or Resolution 120 (Steps a) and b) of Document CMR97/114(Add.2))

In the frequency bands covered by **S22.2** in Ku- and Ka-bands, the proposed regulatory provisions are intended to ensure protection of GSO FSS and BSS systems and full protection of the Plans and their future modifications. These provisions consists in modifications of Articles **S5** (for the current allocations to FSS and for an additional allocation to FSS) and **S22** and in two Resolutions, addressing respectively the frequency bands which are not subject to a plan and those which are subject to a plan.

Concerning the specific frequency bands that would need to be covered by these provisions, it was agreed that as many as possible of these frequency bands should be the subject of these provisions, in order to retain sufficient flexibility for NGSO operators to design systems that can coexist in all three regions with terrestrial or other services. To ensure such coexistence in all cases, the need for further studies on the possible coexistence between NGSO FSS and terrestrial services in the bands shared between these services, in particular protection of NGSO space stations from radiolocation in the band 17.3 - 17.7 GHz, and from GSO space stations in the 17.3 - 17.8 GHz.

Concerning the level of protection of GSO networks from NGSO systems, USA, CAN and J expressed the view that the derivation of the limit to be applied to NGSO systems for the long-term protection of GSO networks may be based on a more stringent protection level that a 6% noise increase, which currently applies between GSO networks to trigger coordination.

Concerning the protection of GSO systems operating in inclined orbit, simulations on the skybridge system showed that this protection would be ensured at 5° inclination at the same levels as in the case of 0° inclination.

The United States suggested that an alternative approach could consist in placing the proposed limits in an Annex to the Resolution implementing the decisions of WRC-97 in this respect.

1.1 Modifications to Article S5

MOD **S5.441** The use of the bands 4 500 - 4 800 MHz (space-to-Earth), 6 725 - 7 025 MHz (Earth-to-space), by the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7 - 10.95 GHz (space-to-Earth), 11.2 - 11.45 GHz (space-to-Earth) and 12.75 - 13.25 GHz (Earth-to-space) by GSO satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7 - 10.95 GHz (space-to-Earth), 11.2 - 11.45 GHz (space-to-Earth) and 12.75 - 13.25 GHz (Earth-to-space) by NGSO satellite systems in the fixed-satellite service shall be in accordance with the provisions of Resolution [F-1].

MOD

GHz
10.7 – 12.7

Allocation to Services		
Region 1	Region 2	Region 3
11.7 – 12.5 FIXED BROADCASTING BROADCASTING-SATELLITE Mobile except aeronautical mobile	**11.7 – 12.1** FIXED S5.486 FIXED-SATELLITE (space-to-Earth) Mobile except aeronautical mobile S5.485 S5.488	**11.7 – 12.2** FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE
	12.1 – 12.2 FIXED-SATELLITE (space-to-Earth) S5.485 S5.488 S5.489	S5.487 S5.487A
S5.487 S5.487A	**12.2 – 12.7** FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE S5.488 S5.490 S5.492 S5.487A	**12.2 – 12.5** FIXED MOBILE except aeronautical mobile BROADCASTING S5.487 S5.491

[The following two provisions are left in square brackets pending review by WG 4D:

ADD S5.487A *Additional allocation:* in Region 1, the band 11.7 - 12.5 GHz, in Region 2, the band 12.2 - 12.7 GHz and in Region 3 the band 11.7 - 12.2 GHz are also allocated to the fixed-satellite service (space-to-Earth), limited to non-geostationary-satellite systems and subject to the provisions of Resolution [F-1].

MOD S5.516 The use of the band 17.3 - 18.1 GHz by GSO satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. For the use of the band 17.3 - 17.8 GHz in Region 2 by the feeder links for the broadcasting-satellite service in the band 12.2 - 12.7 GHz, see Article ~~S11~~**S10**. The use of the bands 17.3 - 18.1 GHz in Regions 1 and 3 and 17.3 - 17.8 GHz in Region 2 by NGSO satellite systems in the fixed-satellite service is subject to the provisions of Resolution [F-1].]

1.2 Modifications to Article S22

Section II. Control of Interference to Geostationary-Satellite Systems

MOD S22.2 § 2. (1) Non-geostationary ~~space stations~~ satellite systems shall ~~cease or reduce to a negligible level their emissions, and their associated earth stations shall not transmit to them, whenever there is~~ not cause unacceptable interference to geostationary-satellite ~~space~~ systems in the fixed-satellite service operating in accordance with these Regulations.

ADD S22.5A1 In the frequency bands 10.7 - 11.7 GHz, 12.5 - 12.75 GHz, 17.3 - 18.1 GHz and 18.1 - 18.4 GHz, the maximum aggregate power flux-density produced at the geostationary-satellite orbit by all the space stations in a non-geostationary-satellite system in the fixed-satellite service or in the broadcasting-satellite service shall not exceed the values given in Tables **S22-2** and **S22-4**.

[The provisions **S22.5B** to Table **S22-2** are left in square brackets pending review by WG 4D:

ADD S22.5B § 6. (1) The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary orbit, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-1** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth as specified in Table **S22-1**, for all pointing directions towards the geostationary orbit.

ADD S22.5B.1 [1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within a non-geostationary system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{\max}}\right]$$

where:

- N is the number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater or equal to 0°;
- i is the index of the considered non-geostationary space station;
- pfd_i is the power flux-density produced at the point considered at the Earth's surface in dB(W/m^2) in the reference bandwidth;

– θ_i is the angle between the direction considered towards the geostationary orbit and the direction of the interfering space station in the non-geostationary system;

– $G_r(\theta_i)$ is the gain of the receive reference antenna to be considered as part of a geostationary network;

– G_{max} is the maximum gain of the above receive reference antenna;

– *epfd* is the computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

ADD TABLE **S22-1**

Frequency band allocated to the BSS	Equivalent pfd dB(W/m2)	Percentage of time during which pfd level may not be exceeded	Reference antenna radiation pattern	Reference bandwidth (MHz)
11.7 - 12.5 GHz in Region 1, 11.7 - 12.2 GHz and 12.5 - 12.7 GHz in Region 3	-145 -132	99.7% 100%	Recommendation ITU-R BO.1213 (for Regions 1 and 3)	27
12.2 - 12.7 GHz in Region 2	-144 -131	99.7% 100%	Section 3.7.2 of Annex 5 of Appendix **30** for Region 2	27

ADD **S22.5C** (2) The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-2** for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

ADD **S22.5C.1** [1] The aggregate power flux-density is defined as the summation of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^{\,2}}\right]$$

where:

- N is the number of earth stations in the non-geostationary system with an elevation angle greater or equal to 0°, from which the point considered in the geostationary orbit is visible;
- i is the index of the earth station considered in the non-geostationary system;
- P_i is the RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary system in dB(W/m^2) in the reference bandwidth;
- $\theta_i(t)$ is the off-axis angle between the boresight of the earth station considered in the non-geostationary system and the direction of the point considered in the geostationary-satellite orbit;
- $G_t(\theta_i)$ is the transmit antenna gain of the earth station considered in the non-geostationary system in the direction of the point considered in the geostationary-satellite orbit;
- d is the distance between the earth station considered in the non-geostationary system and the point considered in the geostationary-satellite orbit;
- *apfd* is the aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

ADD

TABLE **S22-2**

Frequency band	Aggregate pfd dB(W/m2)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (MHz)
14.5 - 14.8 GHz in Regions 1 and 3 (outside Europe)	-119	99.97%	27
	-115	100%	
17.3 - 18.1 GHz in Regions 1, 2 and 3			

ADD S22.5D (3) The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall

not exceed the limits given in Table **S22-3** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions into all the reference antennas and in the reference bandwidths specified in this table, and for all pointing directions towards the geostationary orbit.

ADD

TABLE **S22-3**

Frequency band	Equivalent pfd dB(W/m²)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern
10.7 - 10.95 GHz	-179	99.7%	4	60 cm, ITU-R Rec. 465-5
11.7 - 12.2 GHz in Region 2	-192	99.9%	4	3 m, ITU-R Rec. 465-5
12.2 - 12.5 GHz in Region 3	-185	99.97%	4	10 m, ITU-R Rec. 465-5
12.5 - 12.75 GHz in Regions 1 and 3	-170	100%	4	60 cm, 3 m and 10 m, ITU-R Rec. 465-5
17.7 - 18.8 GHz	-153	99%	1 000	30 cm, ITU-R Rec. 465-5
19.7 - 20.2 GHz	-153	99.7%	1 000	2 m, ITU-R Rec. 465-5
	-153	99.9%	1 000	5 m, ITU-R Rec. 465-5
	-138	100%	1 000	30 cm, 2 m and 5 m, ITU-R Rec. 465-5

ADD S21.19

(2) The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-4** for any percentage of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

TABLE **S22-4**

Frequency band	**Aggregate pfd dB(W/m²)**	**Percentage of time during which pfd level may not be exceeded**	**Reference bandwidth (kHz)**
10.7 - 11.7 GHz and 12.5 - 12.75 GHz	-170	100%	4

ADD

12.75 - 13.25 GHz	-186	100%	4
13.75 - 14.5 GHz	-170	100%	4
18.1 - 18.4 GHz 24.75 - 25.75 GHz in Regions 2 and 3 27 - 27.5 GHz in Regions 2 and 3 27.5 - 28.6 GHz 29.1 - 30 GHz*	-145	100%	1 000

* In the band 29.1 - [29.4] [29.5] GHz, these limits do not apply to non-geostationary mobile-satellite service feeder-link networks.

ADD S22.5F The limits given in Tables **S22-2** to **S22-4** may be exceeded on the territory of any country whose administration has so agreed.

Section VI. Earth Station Off-Axis Power Limitations

MOD S22.26 § 9. The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station ~~at angles in the direction of the geostationary-satellite orbit off the main beam axis has a significant impact on interference caused to other geostationary-satellite networks. Enhanced utilization of the geostationary-satellite orbit and easier coordination would be attained by minimizing such off-axis radiation and administrations are encouraged to achieve the lowest values practicable bearing in mind the latest ITU-R Recommendations. Minimizing such levels is particularly important in intensively used up-link bands~~shall not exceed the following values for any off-axis angle φ, which is 2.5° or more off the main lobe axis of an earth station antenna:

Angle off-axis	*Maximum e.i.r.p. per 40 kHz*
2.5° ≤ φ ≤ 7°	(39 - 25 log φ) dB(W/40 kHz)
7° < φ ≤ 9.2°	18 dB(W/40 kHz)
9.2° < φ ≤ 48°	(42 - 25 log φ) dB(W/40 kHz)
48° < φ ≤ 180°	0 dB(W/40 kHz)

ADD S22.27 For FM-TV emissions with energy dispersal, the limits in **S22.26** above may be exceeded by up to 3 dB provided the off-axis total e.i.r.p. of the transmitted FM-TV carrier does not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
2.5° ≤ φ ≤ 7°	(53 - 25 log φ) dBW
7° < φ ≤ 9.2°	32 dBW

9.2°	$< \varphi \leq 48°$	(56 - 25 log φ) dBW
48°	$< \varphi \leq 180°$	14 dBW

ADD S22.28 For FM-TV carriers which operate without energy dispersal, such carriers should be modulated at all times with programme material or appropriate test patterns. In this case, the off-axis total e.i.r.p. of the emitted FM-TV carrier shall not exceed the following values:

Angle off-axis		*Maximum e.i.r.p.*
2.5°	$\leq \varphi \leq 7°$	(53 - 25 log φ) dBW
7°	$< \varphi \leq 9.2°$	32 dBW
9.2°	$< \varphi \leq 48°$	(56 - 25 log φ) dBW
48°	$< \varphi \leq 180°$	14 dBW

ADD S22.29 The e.i.r.p. limits given in **S22.26**, **S22.27** and **S22.28** are applicable in the following frequency bands allocated to the fixed-satellite service (Earth-to-space):

12.5 - 12.75 GHz (Region 1)

12.7 - 12.75 GHz (Region 2)

12.75 - 13.25 GHz

13.75 - 14 GHz

14 - 14.5 GHz

17.3 - 18.4 GHz

ADD **Section VII. Geostationary Space Station Power Limitations**

ADD S22.30 Geostationary space stations shall not produce power flux-density values at the Earth's surface greater than those given in the following table:

Frequency band	Service	Limit in dB(W/m^2) for angle of arrival (δ) above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
11.7 - 12.2 GHz (Region 2)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
12.5 - 12.75 GHz (Region 1)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
19.7 - 20.2 GHz	Fixed-Satellite (S-E)	-105	-105 + 0.5 (δ–5)	-95	10 MHz

ADD S22.31 The limits given in **S22.30** may be exceeded on the territory of any country whose administration has so agreed.

3 Resolutions

Section 3.1 contains the proposals for draft WRC-97 resolutions to implement steps a) and b) referred to in the introduction of this report, i.e. with hard limits included in Article **S22**.

An alternative approach was proposed by the United States in which these limits would be used as thresholds, with the application of provisions similar to those of Resolution 46. A draft WRC-97 resolution implementing this approach has been proposed by the United States as provided in Section 3.2.

3.1 Draft WRC-97 Resolutions proposed to implement steps a) and b)

ADD

DRAFT RESOLUTION [COM5-18]

COEXISTENCE AMONG NON-GEOSTATIONARY SYSTEMS IN THE FIXED-SATELLITE AND GEOSTATIONARY SYSTEMS IN CERTAIN FREQUENCY BANDS

The World Radiocommunication Conference (Geneva, WRC-97),

considering

a) that the diverging interpretations arising from No. **S22.2** result in an ambiguous regulatory status for both existing and future geostationary and non-geostationary systems in the fixed-satellite service in the bands where this provision applies, with consequential risks for both types of systems;

b) that the harmonious development of non-geostationary and geostationary systems in the fixed-satellite service requires that these ambiguities be resolved with no further delay;

c) that these ambiguities can be resolved by including in Article **S22** limits to the power radiated by non-geostationary systems in order to adequately protect geostationary systems in the frequency bands and sharing situations where Resolution **46** does not apply;

d) that such limits have been developed in certain frequency bands which are currently used or planned to be used extensively by geostationary fixed-satellite service systems;

e) that non-geostationary fixed-satellite service systems are proposed in these bands which could meet these limits and receive adequate protection from existing and future fixed-satellite service geostationary systems without imposing additional constraints, therefore avoiding the need for mutual coordination;

f) that the application of Resolution **46**, in the absence of limits constraining the design of geostationary fixed-satellite service and non-geostationary fixed-satellite service systems and promoting the use of mitigation techniques, should be considered with care;

g) that in the bands where these limits apply, there would be no need for a coordination procedure between non-geostationary and geostationary systems in the fixed-satellite service,

resolves

1 that, in the frequency bands specified in Tables **S22-2** to **S22-4**, non-geostationary systems in the fixed-satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the provisional power limits appearing in Article **S22**;

2 [that in applying No. **S22.2,** administrations may consider these provisional power limits as corresponding to permissible levels of interference from a NGSO system [for which complete notification information was received prior to 21 November 1997] into a GSO system, irrespective of the date of receipt by the Bureau of the complete coordination information relating to [this GSO system] [these systems;]

3 [that an administration proposing a NGSO system [for which complete notification information has been received by the Bureau after 21 November 1997 and] which is compliance with the limits referred to in *resolves* 1 above shall be considered as having fulfilled its obligations under **S22.2** [with respect to GSO networks for which complete notification information has been received by the Bureau after 21 November 1997];]

4 that, in the frequency bands from 10.7 to 30 GHz, geostationary satellite systems in the fixed-satellite service for which complete coordination information has been received by the Bureau after 21 November 1997 shall be subject to the provisional limits appearing in Article **S22**;

5 that non-geostationary systems shall not claim protection from geostationary-satellite networks operating in accordance with the Radio Regulations [and *resolves* 4] above, irrespective of the date of receipt by the Bureau of the complete notification information relating to these non-geostationary systems;

6 that the limits given in Tables **S22-1** to **S22-3** may be exceeded on the territory of any country whose administration has so agreed.

7 [that between 21 November 1997 and the date that final limits are adopted applications submitted to the BR for NGSO systems shall not be processed until the provisional limits referred to in *resolves* 1 above have been confirmed by a competent conference;]

8 that, if an administration operating or planning a GSO FSS system considers that the NGSO FSS system proposed by another administration might cause unacceptable interference into its GSO system, the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks,

[instructs the Radiocommunication Bureau

when recording in the Master register assignments to a NGSO system in the fixed-satellite service, to make its finding relating to the compliance of these assignments with the limits referred to in *resolves* 1 above conditional upon the review of this compliance after final adoption of these limits by a competent conference,]

requests the ITU-R

1 to conduct, as a matter of urgency and in time for consideration by WRC-99,

a) the appropriate technical, operational and regulatory studies to review the regulatory conditions relating to the coexistence among NGSO and GSO systems in the fixed-satellite service in order to ensure that they do not pose undue constraints on the development of non-geostationary or geostationary fixed-satellite service systems;

b) to develop a methodology for calculating the power levels produced by NGSO systems and the compliance of these levels with the limits referred to in i), ii) and iii) above;

c) to complete the studies relating to the sharing criteria to be applied for determining the need for coordination between non-geostationary fixed-satellite service systems;

2 to undertake the development of power limits in order to protect existing and future geostationary fixed-satellite service systems in those bands where non-geostationary fixed-satellite service systems are likely to be implemented and geostationary fixed-satellite service systems are used or expected to be used extensively;

ADD

DRAFT RESOLUTION [COM5-19]

USE OF THE FREQUENCY BANDS COVERED BY APPENDICES 30, 30A AND 30B BY NGSO NETWORKS

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that limits have been established and included in Article **S22** to ensure that the interference caused by non-geostationary-satellite systems into assignments operated in conformity with the Appendices 30, 30A and 30B Plans is maintained within negligible levels;

b) that the integrity of the above-mentioned Plans is to be ensured;

c) that NGSO systems should not be entered into those Plans and therefore not apply and not be protected by the associated procedures,

resolves

that NGSO systems in the frequency bands subject to Appendices **30**, **30A** and **30B** shall comply with the limits specified in Article **S22** and may apply, as of 22 November 1997, the procedures of Section I of Article **S9 [11]** and the procedures of Article **S11 [13]**,

requests the ITU-R

a) to conduct, as a matter of urgency and in time for consideration by WRC-99, the appropriate technical, operational and regulatory studies to review the regulatory provisions concerning the operation of NGSO FSS systems in these frequency bands in order to ensure that these conditions ensure appropriate protection of the Plans and their future modifications and, [to the maximum extent practicable,] do not pose unreasonable constraints on the development geostationary systems in these bands;

b) to report to CPM-99 on the conclusion of these studies.

3.2 Draft WRC-97 Resolution with the use of thresholds and Resolution 46 type approach

DRAFT RESOLUTION [COM5-20]

USE OF CERTAIN KU-BANDS FREQUENCIES BY NON-GEOSTATIONARY FIXED-SATELLITE SERVICE (FSS) SYSTEMS

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the International Telecommunication Union has, among its purposes, "to promote the extension of the benefit of the new telecommunication technologies to all the world's inhabitants" (No. **6** of the Constitution of the International Telecommunication Union (Geneva, 1992));

b) that it is desirable, in this respect, to promote systems capable of providing a universal service;

c) that new telecommunication services need advanced and reliable networks permitting high capacity communications;

d) that systems based on the use of new technologies associated with both geostationary (GSO) and non-geostationary (non-GSO) satellite constellations are capable of providing the most isolated regions of the world with high-capacity and low-cost means of communication;

e) that many of the Members of the Union are in need of such systems;

f) that the operation of such systems requires a suitable amount of spectrum in appropriate frequency bands;

g) that decisions on this matter should permit as many systems as possible to be operated;

h) that there is a need for the provision of services on a competitive basis between GSO/FSS and non-GSO/FSS, as well as between non-GSO/FSS and non-GSO FSS;

i) that in spite of the urgency attached to the development of such systems, technical, sharing and regulatory issues should be studied in order to achieve the most efficient and flexible use of the spectrum that may be available for these systems,

noting

1 that information relating to GSO and non-GSO systems [in certain FSS bands] has been communicated to the Radiocommunication Bureau;

2 that many of these systems are in operation and others will begin operations in the near future and, consequently, difficulties may be experienced in modifying their characteristics;

3 that other radio services use these bands on a co-primary basis and the rights of these radio services need to be protected,

considering further

a) that the following frequency bands allocated to the FSS may, in accordance with the Radio Regulations, be used by the GSO FSS and non-GSO FSS networks;

b) that No. **S22.2** may create uncertainty in the planning, coordination, and implementation of GSO FSS and non-GSO FSS systems where **S22.2** applies;

c) that technical studies are required in order to ascertain the extent to which sharing of these FSS frequency bands is feasible between GSO FSS and non-GSO FSS systems, between non-GSO FSS systems and between non-GSO FSS and terrestrial systems;

d) that the ITU-R is currently studying sharing techniques which may be used between and among GSO FSS and non-GSO FSS systems;

e) that the number of these FSS systems, GSO and non-GSO, that are proposed for and in operation in bands allocated to the fixed-satellite service where No. **S22.2** applies varies from band to band;

f) that in certain FSS bands, Resolution **46 (Rev.WRC-95)/S9.11** applies and RR No. **S22.2** does not apply,

resolves

1 that non-GSO FSS systems, in the frequency bands listed in considering further a), are not subject to the provisions of No. **S22.2**, and are subject to the application of the provisions of No. **S9.12** for the coordination of non-GSO FSS systems with GSO FSS systems;

2 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in considering further a), the technical, operational, and regulatory requirements relating to the shared use of these bands by both GSO FSS and non-GSO FSS systems with a view towards developing an approach and applicable criteria to determine the minimum number of coordinations required between GSO FSS and non-GSO FSS systems;

3 that, in the interim, until confirmed by WRC-99 that the need for such a requirement continues to exist, non-GSO FSS systems in the frequency bands listed in considering further a) shall not claim protection from GSO FSS systems;

4 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in considering further a), the technical, operational, and regulatory requirements relating to the shared use of these bands by multiple non-GSO FSS systems with a view towards developing an approach and applicable criteria to assist in coordination between non-GSO FSS systems;

5 that non-GSO FSS systems, in the frequency bands listed in *considering further* a) are subject to the application of the provisions of No. **S9.14** for the coordination of non-GSO FSS systems with terrestrial systems;

6 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in *considering further* a), the technical, operational, and regulatory requirements relating to the use of these bands by both terrestrial and non-GSO FSS systems with a view towards developing an approach and applicable criteria to determine the minimum number of coordinations required between GSO FSS and non-GSO FSS systems;

7 that non-GSO FSS systems, in the frequency bands listed in *considering further* a) are subject to the application of the provisions of No. **S9.12** for coordination between non-GSO FSS systems;

8 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in *considering further* a), the technical, operational, and regulatory requirements relating to sharing between non-GSO FSS systems with a view towards developing an approach and applicable criteria to assist in coordination between non-GSO FSS systems;

9 that non-GSO FSS earth stations, in the appropriately allocated bands listed in *considering further* a), are subject to the application of the provisions of No. **S9.15** with respect to terrestrial stations;

10 that non-GSO FSS earth stations operating in reverse direction, in the appropriately allocated bands listed in *considering further* a), are subject to the application of the provisions of No. **S9.17A** with respect to other earth stations,

further resolves

1 to instruct the Director of the Radiocommunication Bureau to ensure, in consultation with the Chairmen of study groups, that the studies be conducted on an expedited basis, and the results of these studies be made available by [XXXX];

2 that the results of the above studies, once approved through the accelerated procedures, be used on an interim basis to determine if coordination of a non-GSO FSS system with GSO FSS systems is required in accordance with No. **S9.12**;

3 that the results of the above studies, once approved through the accelerated procedures, be used on an interim basis to determine if coordination between non-GSO FSS and terrestrial systems is required in accordance with No. **S9.15**;

4 to recommend that CPM-99 review the results of the above studies and forward their findings to WRC-99;

5 to recommend that WRC-99 take the appropriate action, based on the results of CPM-99, for the harmonious development of GSO FSS, non-GSO FSS, and terrestrial systems in the bands listed in *considering further* a),

recommends

that future world radio conferences consider the results of studies relating to the benefits that may be derived from the use of non-GSO satellite technologies and, if necessary, identify additional frequency bands that may be used by non-GSO FSS systems;

urges administrations

to cooperate, on an expedited basis, to the maximum extent practicable in continuing the required studies, and to conduct such studies and reach results acceptable to all parties concerned.

2 Regulatory conditions concerning the parts of the Ka-band covered by Resolution 118

MOD

GHz
18.6 – 20.2

Allocation to Services		
Region 1	Region 2	Region 3
18.8 – 19.3	FIXED FIXED-SATELLITE (space-to-Earth) MOD S5.523A MOBILE	

MOD

GHz
27 – 29.9

Allocation to Services		
Region 1	Region 2	Region 3
28.5 – 29.1	FIXED FIXED-SATELLITE (Earth-to-space) MOD S5.523A S5.539 MOBILE Earth Exploration-Satellite (Earth-to-space) S5.541 S5.540	

MOD S5.523A ~~The use of the bands 18.8 - 19.3 GHz and 28.6 - 29.1 GHz by the FSS shall be in accordance with Resolution **118 (WRC-95).**~~ The use of the bands 18.8 - 19.3 GHz (space-to-Earth) and 28.6 - 29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **S9.11A**/Resolution **46 (Rev.WRC-95)** and No. **S22.2** [No. **2613**] does not apply. [GSO networks under coordination prior to 18 November 1995 shall successfully coordinate pursuant to No. **S9.11A**/Resolution **46 (Rev.WRC-95)** with non-geostationary networks that have been received by the Bureau prior to that date for notification. Non-geostationary networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix **3** notification information is considered as having been received by the Bureau prior to 18 November 1995.]

ANNEX 1

List of participants to the meetings of Sub-Drafting Group 1 of Drafting Group 1 of 5b ad hoc Group 4 (NGS0/FSS)

Saturday, 8 November 1997, from 1530 to 1800 hours	
Administration/ Organization	**Name**
Australia	B. Mc. Donald
Brazil	J. Albuquerque
Canada	V. Mimis
	M. Dupuis
France	F. Rancy
	V. Meens
	C. Michel
Indonesia	A. Djiwatanpu
Japan	T. Yamauchi
Lebanon	M. Ghazal
	R. Bahsoun
	A. Majeed
Saudi Arabia	B. Lemouchi

Sunday, 9 November 1997, from 1000 to 1600 hours	
Administration/ Organization	**Name**
Australia	B. Mc Donald
Brazil	J. Albuquerque
Canada	V. Mimis
	M. Dupuis
	S. Doiron
France	F. Rancy
	V. Meens
	C. Michel
	J.C. Guiguet
Indonesia	A. Djiwatanpu
Japan	T. Yamauchi
	H. Tanaka
	J. Leary

Monday, 10 November 1997, from 0930 to 1030 hours	
Administration/ Organization	**Name**
Australia	B. Mc Donald
Brazil	J. Albuquerque
Canada	V. Mimis
	M. Dupuis
	S. Doiron
France	F. Rancy
	V. Meens
	C. Michel
	J.C. Guiguet
	J. Chartier
	F. Rontard
Japan	T. Yamauchi
	H. Tanaka

South Africa	S. Hibbard
USA	T . Tycz
	E. Davison
	W. Long
Intelsat	V. Sahay

	T. Otsu
Lebanon	M. Ghazal
	R. Bahsoun
	A. Majeed
Saudi Arabia	B. Lemouchi
South Africa	S. Hibbard
	D. Harie
Turkey	F.M. Yurdal
	A.H. Erdinc
USA	T . Tycz
	E. Davison
	D. Parlow
	G. Creezer
Intelsat	H. Enriques
	V. Sahay

	J. Leary
Lebanon	M. Ghazal
	R. Bahsoun
	A. Majeed
Portugal	F. Guerra
Saudi arabia	B. Lemouchi
South africa	S. Hibbard
	P. Lochner
United Kingdom	C. Cheeseman
USA	T . Tycz
	E. Davison
	W. Long
	G. Creezer
	H. Enriques
Intelsat	K. Betaharon
	H. Henriques
European Commission	R. Niepold
	S. Kramer

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/38-E
10 November 1997
English only

WORKING GROUP 5B

REPORT OF THE CHAIRMAN OF SUB-WORKING GROUP 5B-2 TO THE CHAIRMAN OF WORKING GROUP 5B

1 MSS generic allocation

See DL/29(Rev.1).

2 1 559 - 1 567 MHz

See DL/34.

3 1 675 - 1 710 MHz

See DL/30 (modified text + pages 3, 4, 5).

The attached text gives proposals for:

1) modification of Article S5 and relevant footnotes;
2) Resolution [5B2A-1] to be considered for generic allocation throughout the bands;
3) Resolution [5B2A-2] to be considered for a limited generic allocation (NOC the bands within square brackets).

ARTICLE S5

MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530	**1 525 – 1 530**	**1 525 – 1 530**
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)
FIXED	MOBILE-SATELLITE (space-to-Earth)	FIXED
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth)	Earth Exploration-Satellite	MOBILE-SATELLITE (space-to-Earth)
Earth Exploration-Satellite	Fixed	Earth Exploration-Satellite
Mobile except aeronautical mobile S5.349	Mobile S5.343	Mobile S5.349
~~Land Mobile-Satellite (space-to-Earth) S5.352~~		
S5.341 S5.342 S5.350 S5.351 ADD S5.352A S5.354	S5.341 S5.351 S5.354	S5.341 S5.351 ADD S5.352A S5.354

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.354	**1 530 – 1 533** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 ~~S5.353~~ S5.354	

SUP **S5.352**

ADD **S5.352A** In Regions 1 and 3 in the band 1 525 - 1 530 MHz, mobile earth stations shall not cause harmful interference nor claim protection from stations of the fixed service in France notified prior to 1 April 1998.

ARTICLE S5

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 533 – 1 535 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile except aeronautical mobile ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.351 S5.354	**1 533 – 1 535** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile S5.343 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ S5.354	

MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ ADD S5.353A S5.354 S5.355	
1 544 – 1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545 – 1 555	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 [~~S5.358~~] S5.359 ADD S5.362A	
1 555 – 1 559	~~LAND~~ MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360~~ [~~S5.361 S5.362~~]	

SUP **S5.353**

ADD **S5.353A** In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz, priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to nor claim protection from distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety related communications in the other mobile-satellite services.

NOC **S5.356**

[SUP **S5.358]**

SUP **S5.360**

[SUP **S5.361**

SUP **S5.362**

ADD **S5.362A** In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service (AMS(R)S), providing transmission of messages with priority 1 to 6 in Article **S44.** AMS(R)S communications with priority 1 to 6 in Article **S44** shall have priority access and immediate availability by pre-emption if necessary over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to nor claim protection from AMS(R)S communications with priority 1 to 6 in Article **S44.** Account shall be taken of the priority of safety related communications in the other mobile-satellite services.]

ARTICLE S5

MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5	**1 626.5 – 1 631.5**	
~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	
~~Land Mobile-Satellite (Earth-to-space) S5.352~~		
S5.341 S5.351 S5.354 S5.355 S5.359	S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 ~~S5.373A~~	

MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – ~~1 634.5~~1 636.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE-SATELLITE (Earth-to-space)~~ S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 MOD S5.374 ADD S5.353A	
~~1 634.5~~1 636.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 ~~S5.353~~ ADD S5.353A S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (Earth-to-space) ADD S5.362A S5.341 S5.351 S5.354 S5.355 MOD S5.358 S5.359 S5.376	

Allocation to Services		
Region 1	Region 2	Region 3
1 656.5 – 1 660	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~ MOD S5.374	
1 660 – 1 660.5	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361 S5.362~~ ADD S5.376A	

SUP **S5.373A**

MOD **S5.374** ~~Land earth stations and ship~~Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5 - 1 634.5 MHz and 1 656.5 - 1 660 MHz shall not cause harmful interference to the stations in the fixed service operating in the countries listed in No. **S5.359**.

NOC **S5.375**

ADD **S5.376A** Mobile earth stations operating in the 1 660.0 - 1 660.5 MHz band shall not cause harmful interference to stations operating in the radio astronomy service.

DRAFT RESOLUTION [5B2A-1]

USE OF THE BANDS 1 525 - 1 559 MHz AND 1 626.5 - 1 660.5 MHz BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that WRC-97 allocated the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to multiple mobile-satellite systems in a flexible and efficient manner;

b) that prior to WRC-97 there was a generic allocation by footnote provisions in some countries for the use of the bands 1 530 - 1 544 MHz and 1 631.5 - 1 645.5 MHz by the mobile-satellite service on the condition that maritime mobile-satellite distress and safety communications have priority access over all other communications;

c) that prior to WRC-97, there was a generic allocation by two footnotes for the use of the bands 1 555 - 1 559 MHz and 1 656.5 - 1 660.5 MHz by the mobile-satellite service, where in one of these footnotes in two countries the following conditions applied:

- the aeronautical mobile-satellite (R) service has priority access and immediate availability over all other communications within a network;
- mobile-satellite systems should be interoperable with the aeronautical mobile-satellite (R) service;
- account shall be taken of the priority of safety-related communications in the other mobile-satellite services;

d) that there is at least one global mobile-satellite system that is capable of providing global maritime mobile-satellite distress and safety communications according to Article **S53** and global AMS(R)S communications with priorities 1 to 6 of Article **S44** in accordance with IMO and ICAO requirements;

e) that technical considerations for sharing satellite network resources between MSS (other than AMS(R)S) and AMS(R)S have been developed by the ITU-R (see Recommendation ITU-R **M.[8/17]**);

f) that global and regional mobile-satellite systems are being multilaterally coordinated in the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (E-s) and that the ITU Radio Regulations provide the international framework for multilateral agreements;

g) that in Nos. **S5.362A** and **S5.353A** priority has been given to accommodating the spectrum requirements urgency, distress and safety communications of GMDSS and AMS(R)S communications with priorities 1 to 6 of Article **S44** of AMS(R)S. See No. **S9.11A**, [except No. **S9.13**],

further considering

a) that the Convention on International Civil Aviation (ICAO SARPS) requires that stations of the AMS(R)S shall be in compliance with the internationally agreed Standards and Recommended Practices and Procedures for Air Navigation Services;

b) that ICAO has developed a global Air Traffic Management system (ATM) which requires the interoperability of those mobile-satellite systems providing AMS(R)S communications with the priority message structure of Article **S44**;

c) that IMO may also place similar requirements of interoperability of those mobile-satellite systems providing GMDSS communications with the priority message structure of Article **S51**,

recognizing

that Appendix **S15.2** identifies the bands 1 530 - 1 544 MHz (s-E) and 1 626.5 - 1 645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes,

[*noting*

that for mobile-satellite systems that are already operating on a generic basis in the bands 1 525 - 1 544 MHz, 1 545 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 646.5 - 1 660.5 MHz, administrations may continue to limit the use of these bands to the national mobile-satellite service or, where agreements of administrations concerned are in place, to provide multinational service,]

resolves

1 that the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by mobile satellite and AMS(R)S communications with priority 1 to 6 of Article **S44** should be based on internationally agreed assumptions and methodologies and information on GMDSS and AMS(R)S communication actual traffic usage and growth;

2 that the feasibility of prioritization and real time pre-emptive access between different mobile-satellite systems for GMDSS and AMS(R)S, in order to achieve the most flexible and practical use of the generic allocations, should be determined,

requests ITU-R

1 to develop the assumptions and methodologies and information on GMDSS and AMS(R)S communication actual traffic usage and growth to determine the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by mobile satellite and AMS(R)S communications with priority 1 to 6 of Article **S44**;

2 to determine the feasibility of prioritization and real time pre-emptive access between different mobile-satellite systems for GMDSS and AMS(R)S, in order to achieve the most flexible and practical use of the generic allocations,

requests the next competent WRC

to take into account the outcome of the ITU-R studies and take appropriate action on this subject,

invites

ICAO, IMO, IALA, administrations and other concerned organizations to participate in the studies identified in *requests ITU-R* 1 and 2 above.

DRAFT RESOLUTION [5B2A-2]

USE OF THE 1.5/1.6 GHz BANDS BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the conversion of certain bands to generic MSS allocation would facilitate introduction of MSS networks;

b) that the bands 1 525 - 1 544 MHz, 1 555 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 656.5 - 1 660.5 MHz have been allocated on a generic basis to MSS to facilitate flexible use of this spectrum by multiple MSS systems;

c) that this Conference has reviewed the use of the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz for MSS stations participating in the GMDSS in order to provide spectrum to fulfil the global maritime service requirements while providing protection for GMDSS pursuant to No. **[ADD S5.353A]**;

d) that the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz are currently allocated exclusively to the AMS(R)S on a worldwide basis;

e) that WRC-95, through Recommendation **34 (WRC-95)**, recommended that spectrum should be allocated on a worldwide basis to the most broadly defined services,

recognizing

a) that subject to further study and validation by ITU-R it may be feasible and desirable to relax the constraints on MSS in the bands included in No. **[ADD S5.353A]** at a future WRC in order to further facilitate flexible use of this spectrum by multiple MSS systems, while providing full protection for GMDSS distress and safety requirements and taking into account anticipated spectrum requirements for these services;

b) that subject to further study and validation by ITU-R it may be feasible to allocate the 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz bands to generic MSS with appropriate protection for distress and safety communications,

resolves

that WRC-99 review the constraints on the MSS allocations and establish how to protect the AMS(R)S,

invites ITU-R

as a matter of urgency to:

i) study the technical, operational and economic feasibility of relaxing the constraints to MSS allocations in all or parts of the bands referred to in *considering c*);

ii) study the feasibility of allocating the exclusive AMS(R)S bands referred to in *considering* d) to the generic MSS taking into account the need for protection of safety related communications;

iii) complete these studies and report the results to WRC-99,

invites

ICAO, IMO, IALA, administrations and other concerned organizations to participate in the studies identified in *invites ITU-R* above.

Three meetings were held. A unique consensus was not achieved. Rather, various options were developed.

These options are described below and detailed texts for options 2 and 3 are attached.

The order of these options has no significance.

Option 1 (Attachment 1)

Allocate the band 1 559 - 1 567 MHz to MSS in the downband direction sharing with the current services.

Adopt a footnote requiring MSS to protect the current services allocated in the band.

Adopt a resolution to study the sharing criteria in the ITU-R in time for consideration at WRC-99 (Attachment 1).

The service cannot begin until the sharing criteria is agreed.

Option 2 (Attachment 2)

Adopt a resolution to specifically identify the band 1 559 - 1 567 MHz as a potential downband for study by the ITU-R in time for consideration at WRC-99.

The resolution would request WRC-99 to consider an allocation for MSS in the band, based on the outcome of the ITU-R studies.

Option 3 (Attachment 3)

Allocate the band 1 559 - 1 567 MHz to MSS in the downband direction sharing with the current services.

Establish a provisional pfd for MSS of -112 dB(W/m^2/1 MHz) to protect the current services in the band subject to review of this limit at WRC-99 (an appropriate mechanism would be established for this review).

The date of entry of MSS shall not be before 1 July 2000.

Any MSS system filing for use of the band 1 559 - 1 567 MHz shall comply with the final pfd limits as adopted by WRC-99.

The use of MSS is subject to coordination under Resolution 46.

MSS shall not cause interference to internationally standardized GNSS.

Option 4

NOC

ATTACHMENT 1

OPTION 1

ADD

DRAFT RESOLUTION [COM5-21]

USE OF THE BAND 1 559 - 1 567 MHz BY THE MOBILE-SATELLITE SERVICE (SPACE-TO-EARTH)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559 - 1 567 MHz is currently allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that the WRC-97 has made an allocation of this band to the mobile-satellite service (space-to-Earth) subject to an appropriate protection of the aeronautical radionavigation and radionavigation-satellite services;

c) that the use of this band involves services which are safety of life services;

d) that there is a shortage of frequency spectrum for the mobile-satellite services,

resolves

1 that the WRC-99 establish sharing criteria including the appropriate value of power flux-density of mobile-satellite service space stations to protect the aeronautical radionavigation and radionavigation-satellite services;

2 that the use of this band by the MSS shall be subject to the establishment of appropriate sharing criteria,

invites ITU-R

to complete, as a matter of urgency, the necessary study to recommend sharing criteria including the appropriate value of power flux-density of mobile-satellite service space stations to protect the aeronautical radionavigation and radionavigation-satellite services, taking into account the studies already carried out,

further invites administrations and concerned organizations

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

ATTACHMENT 2

OPTION 2

Sharing studies and further consideration of a downlink band in the mobile-satellite service associated with the [uplink band XXXX]

The World Radiocommunication Conference (Geneva, 1997),

considering

a) [that WRC-97 allocated the band xxxx MHz, on a worldwide basis, to the mobile-satellite (Earth-to-space) service];

b) that Resolution 213 (WRC-95) invited the ITU-R to investigate a potentially suitable related downlink band to assist in meeting the requirements of the mobile-satellite service;

c) that proposals were presented at WRC-97 indicating the band 1 559 - 1 567 MHz as potentially suitable;

d) that further studies are required to determine the feasibility of the sharing of the band 1 559 - 1 567 MHz with the mobile-satellite (space-to-Earth) service and the radionavigation satellite and aeronautical radionavigation services;

e) that the band 1 559 - 1 610 MHz is used by the radionavigation satellite system including components of the ICAO global navigation satellite system (i.e. GPS and GLONASS) for which further ICAO standards are currently being developed;

f) that the global navigation satellite system is an evolutionary system and that future developments also require protection;

g) that RR **S4.10** recognizes that the above radionavigation usage require special measures to ensure freedom from harmful interference,

resolves to invite ITU-R

as a matter of urgency, to complete the technical and operational studies on the feasibility of sharing the band 1 559 - 1 567 MHz between the mobile-satellite service (space-to-Earth) and the radionavigation services mentioned above, including the required means for preventing harmful interference to radionavigation systems and other services as appropriate,

further invites

1 administrations and relevant international organizations to participate actively in such studies;

2 ITU-R to continue to investigate a potentially suitable downlink band that may assist in meeting the spectrum requirements of the mobile-satellite service,

resolves

to review at the 1999 World Radiocommunication Conference (WRC-99), the outcome of these studies and consider the allocation of a suitable downlink band to the mobile-satellite service, including appropriate implementation time-frame, while providing protection for current planned and future radionavigation-satellite service systems,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO and IMO.

ATTACHMENT 3

OPTION 3

MHz

1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 559 – ~~1 610~~1 567	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) ADD S5.354A S5.341 S5.355 S5.359 S5.363	
~~1 559~~1 567 – 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363	

ADD S5.354A The use of the band 1 559 - 1 567 MHz by the mobile-satellite service (space-to-Earth) shall be in accordance with Resolution [XXX] (WRC-97).

DRAFT RESOLUTION [COM5-22] (WRC-97)

USE OF THE BAND 1 559 - 1 567 MHz BY THE MOBILE-SATELLITE SERVICE (SPACE-TO-EARTH)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559 - 1 567 MHz is currently allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that WRC-97 has made an allocation to the mobile-satellite service in the band 1 559 - 1 567 MHz (s-E) subject to appropriate protection for the aeronautical radionavigation and radionavigation-satellite services;

c) that the aeronautical radionavigation and radionavigation-satellite services are safety services (**S4.10** applies);

d) that safety of life services shall be protected,

considering further

a) that there is a shortage of frequency spectrum for the mobile-satellite services;

b) the need to ensure the effective use of the radio spectrum;

c) that there should be equitable access to the scarce radio frequency spectrum resource to allow for the provision of new services;

d) that studies carried out by some administrations indicate that a power flux-density limit at the Earth's surface of -112 dB(W/m^2/1 MHz) for all angles of arrival for mobile-satellite service space stations is appropriate for the protection of aeronautical radionavigation and radionavigation-satellite services;

e) that WRC-99 will consider additional allocations to the radionavigation-satellite service,

recognizing

the essential need to protect the international standard GNSS systems of the aeronautical radionavigation and radionavigation-satellite services,

resolves

1 that the allocation in the band 1 559 - 1 567 MHz to the mobile-satellite service (s-E) shall enter into force on 1 July 2000;

2 that such use by the mobile-satellite service shall be subject to coordination under [Resolution **46 (WRC-97)**/No. **S9.11A**];

3 that stations of the mobile-satellite service (space-to-Earth) operating in this band shall not cause harmful interference to international standard GNSS [add reference to ESA systems if necessary] systems of the aeronautical radionavigation and radionavigation-satellite services;

4 that the power flux-density at the Earth's surface of mobile-satellite service space stations operating in this band shall not exceed the provisional limit of -112 dB(W/m^2/1 MHz) for all angles of arrival; however, this power flux-density limit shall be reviewed by WRC-99 in the light of the studies referred to in the *further resolves* below;

5 that any MSS systems intending to use this band shall comply with the power flux-density limit decided by WRC-99,

further resolves

1 to request the ITU-R to study, as a matter of urgency, the power flux-density limit to be applied to MSS systems operating in this band taking account of the *recognizing* above, with a view to facilitate sharing, and taking account of existing and planned systems and the studies already carried out;

2 to instruct the Director of the Radiocommunication Bureau to ensure, in consultation with the relevant Study Group Chairman, that the results of these studies are available in due time for consideration at WRC-99;

3 to recommend that WRC-99 review the results of these studies with a view to make any necessary adjustment to the power flux-density limit referred to in *resolves* 3 above and any consequential changes to Article **S5**;

4 to urge all administrations and organizations concerned to contribute to these studies and to cooperate to ensure a mutually satisfactory result is presented to WRC-99.

The majority of administrations made proposals for modifications to frequency allocations in the 1 675 - 1 710 MHz band and these proposals reflect the band segmentation approach for accommodating the MSS allocation in this part of the spectrum and protection of meteorological services as discussed in the Report of the Conference Preparatory Meeting (CPM-97). These proposals support allocation of the subband 1 675 - 1 683 MHz for MSS on a worldwide basis and deletion of existing Region 2 MSS allocations in the remaining band, i.e. 1 683 - 1 710 MHz.

In WG 5B2-C, two administrations indicated difficulties with the above proposals on the basis of:

- difficulties with the deletion of MSS allocations in Region 2 from 1 683 - 1 710 MHz and also that a transitional plan for radiosondes would be unacceptable should the band 1 675 - 1 683 MHz be made available to MSS;
- concern regarding problems in frequency sharing between the meteorological-satellite and meteorological aids service.

Since the majority of the proposals were in favour of modifications to the allocations in the band 1 675 - 1 710 MHz and MSS allocation on a worldwide basis by applying a band segmentation approach while ensuring protection to the interests of meteorological services, the attached proposals have been developed for further consideration.

ARTICLE S5

MOD

MHz
1 670 – 1 700

Allocation to Services		
Region 1	Region 2	Region 3
1 675 – ~~1 690~~1 683	**1 675 – ~~1 690~~1 683**	**1 675 – ~~1 690~~1 683**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
MOBILE-SATELLITE (Earth-to-space) ADD S5.377B	MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space) ADD S5.377B
S5.341 MOD S5.377 ADD S5.377A	S5.341 MOD S5.377	S5.341 MOD S5.377 ADD S5.377A

Allocation to Services		
Region 1	Region 2	Region 3
~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341	~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile ~~MOBILE-SATELLITE (Earth-to-space)~~ S5.341 ~~S5.377~~	~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341
1 690 – 1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile S5.289 S5.341 S5.382	**1 690 – 1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) ~~MOBILE-SATELLITE (Earth-to-space)~~ S5.289 S5.341 ~~S5.377~~ S5.381	**1 690 – 1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) S5.289 S5.341 S5.381

MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 700 – 1 710	**1 700 – 1 710**	**1 700 – 1 710**
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	~~MOBILE-SATELLITE (Earth-to-space)~~	
S5.289 S5.341	S5.289 S5.341 ~~S5.377~~	S5.289 S5.341 S5.384

MOD S5.377 In the band 1 675 - ~~1 710~~1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services (see Resolution **213 (Rev.WRC-95)**) and the use of this band shall be subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. In order to avoid causing harmful interference to the meteorological-satellite service, mobile earth stations shall not operate, except on a narrow-band signalling channel, within the exclusion zones around the meteorological-satellite earth stations defined in Recommendation ITU-R **SA.1158**. The mobile-satellite system shall have position determination capabilities to ensure compliance with this provision.

ADD S5.377A In Regions 1 and 3 in the band 1 675 - 1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to or claim protection from existing stations in the fixed service notified and brought into use prior to 21 November 1997.]

ADD S5.377B In Regions 1 and 3 the use of the band 1 675 - 1 683 MHz by the mobile-satellite service shall not commence before 1 July 2000.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/38(Rev.1)-E
12 November 1997
English only

WORKING GROUP 5B

REPORT OF THE CHAIRMAN OF SUB-WORKING GROUP 5B-2 TO THE CHAIRMAN OF WORKING GROUP 5B

1 MSS generic allocation

See DL/29(Rev.1).

2 1 559 - 1 567 MHz

See DL/34.

3 1 675 - 1 710 MHz

See DL/30 (modified text + pages 3, 4, 5).

The attached text gives proposals for:

1) modification of Article S5 and relevant footnotes;
2) Resolution [5B2A-1] to be considered for generic allocation throughout the bands;
3) Resolution [5B2A-2] to be considered for a limited generic allocation (NOC the bands within square brackets).

ARTICLE S5

MOD

MHz
1 452 – 1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525 – 1 530	**1 525 – 1 530**	**1 525 – 1 530**
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)
FIXED	MOBILE-SATELLITE (space-to-Earth)	FIXED
~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth)	Earth Exploration-Satellite	MOBILE-SATELLITE (space-to-Earth)
Earth Exploration-Satellite	Fixed	Earth Exploration-Satellite
Mobile except aeronautical mobile S5.349	Mobile S5.343	Mobile S5.349
~~Land Mobile-Satellite (space-to-Earth) S5.352~~		
S5.341 S5.342 S5.350 S5.351 ADD S5.352A S5.354	S5.341 S5.351 S5.354	S5.341 S5.351 ADD S5.352A S5.354

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530 – 1 533 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.354	**1 530 – 1 533** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A ~~LAND MOBILE-SATELLITE (space-to-Earth)~~ Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 ~~S5.353~~ S5.354	

SUP S5.352

ADD S5.352A ~~In Regions 1 and 3 i~~In the band 1 525 - 1 530 MHz, mobile earth stations shall not cause harmful interference nor claim protection from stations of the fixed service in France [and French overseas territories in Region 3] and Italy notified prior to 1 April 1998.

ARTICLE S5

MOD

MHz
1 530 – 1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 533 – 1 535 SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile except aeronautical mobile ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.342 S5.351 S5.354	**1 533 – 1 535** SPACE OPERATION (space-to-Earth) ~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ADD S5.353A Earth Exploration-Satellite Fixed Mobile S5.343 ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ S5.354	

MOD

MHz
1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535 – 1 544	~~MARITIME~~ MOBILE-SATELLITE (space-to-Earth) ~~Land Mobile-Satellite (space-to-Earth) S5.352~~ S5.341 S5.351 ~~S5.353~~ ADD S5.353A S5.354 S5.355	
1 544 – 1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545 – 1 555	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 ~~[S5.358]~~ S5.359 ADD S5.362A	
1 555 – 1 559	~~LAND~~ MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 [S5.361 S5.362]~~	

SUP **S5.353**

ADD **S5.353A** In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz, priority shall be given to accommodating the spectrum requirements [for distress, urgency and safety communications] of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile satellite distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to nor claim protection from distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety related communications in the other mobile-satellite services.

NOC **S5.356**

[SUP **S5.358]**

SUP **S5.360**

[SUP **S5.361**

SUP **S5.362**

ADD **S5.362A** In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service (AMS(R)S), providing transmission of messages with priority 1 to 6 in Article **S44.** AMS(R)S communications with priority 1 to 6 in Article **S44** shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to nor claim protection from AMS(R)S communications with priority 1 to 6 in Article **S44.** Account shall be taken of the priority of safety related communications in the other mobile-satellite services.] [(See Resolution [5B2A-1)]]

ARTICLE S5

MOD

MHz
1 610.6 – 1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5 – 1 631.5 ~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 S5.354 S5.355 S5.359	**1 626.5 – 1 631.5** MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 ~~S5.373A~~	

MOD

MHz
1 631.5 – 1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5 – ~~1 634.5~~1 636.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~LAND MOBILE SATELLITE (Earth-to-space)~~ S5.341 S5.351 ~~S5.353~~ S5.354 S5.355 S5.359 MOD S5.374 ADD S5.353A	
~~1 634.5~~1 636.5 – 1 645.5	~~MARITIME~~ MOBILE-SATELLITE (Earth-to-space) ~~Land Mobile-Satellite (Earth-to-space) S5.352~~ S5.341 S5.351 ~~S5.353~~ADD S5.353A S5.354 S5.355 S5.359	
1 645.5 – 1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5 – 1 656.5	~~AERONAUTICAL~~ MOBILE-SATELLITE ~~(R)~~ (Earth-to-space) ADD S5.362A S5.341 S5.351 S5.354 S5.355 ~~MOD S5.358~~ S5.359 S5.376	

Allocation to Services		
Region 1	Region 2	Region 3
1 656.5 – 1 660	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 ~~S5.360 S5.361 S5.362~~ MOD S5.374	
1 660 – 1 660.5	~~LAND~~ MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 ~~S5.360 S5.361 S5.362~~ ADD S5.376A	

SUP **S5.373A**

MOD **S5.374** ~~Land earth stations and ship~~Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5 - 1 634.5 MHz and 1 656.5 - 1 660 MHz shall not cause harmful interference to the stations in the fixed service operating in the countries listed in No. **S5.359**.

NOC **S5.375**

ADD **S5.376A** Mobile earth stations operating in the 1 660.0 - 1 660.5 MHz band shall not cause harmful interference to stations operating in the radio astronomy service.

DRAFT RESOLUTION [5B2A-1]

USE OF THE BANDS 1 525 - 1 559 MHz AND 1 626.5 - 1 660.5 MHz BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that WRC-97 allocated the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to multiple mobile-satellite systems in a flexible and efficient manner;

b) that prior to WRC-97 there was a generic allocation by footnote provisions in some countries for the use of the bands 1 530 - 1 544 MHz and 1 631.5 - 1 645.5 MHz by the mobile-satellite service on the condition that maritime mobile-satellite distress and safety communications have priority access over all other communications;

c) that prior to WRC-97, there was a generic allocation by two footnotes for the use of the bands 1 555 - 1 559 MHz and 1 656.5 - 1 660.5 MHz by the mobile-satellite service; where in one of these footnotes in two countries the following conditions applied:

- the aeronautical mobile-satellite (R) service has priority access and immediate availability over all other communications within a network;
- mobile-satellite systems should be interoperable with the aeronautical mobile-satellite (R) service;
- account shall be taken of the priority of safety-related communications in the other mobile-satellite services;

d) that there is at least one global mobile-satellite system that is capable of providing global maritime mobile-satellite distress and safety communications according to Article **S53** and global AMS(R)S communications with priorities 1 to 6 of Article **S44** in accordance with IMO and ICAO requirements;

e) that technical considerations for sharing satellite network resources between MSS (other than AMS(R)S) and AMS(R)S have been developed by the ITU-R (see Recommendation ITU-R **M.[8/17]**);

f) that global and regional mobile-satellite systems are being multilaterally coordinated in the bands 1 525 - 1 559 MHz (s-E) and 1 626.5 - 1 660.5 MHz (E-s) and that the ITU Radio Regulations provide the international framework for multilateral agreements;

g) that in Nos. **S5.362A** and **S5.353A** priority has been given to accommodating the spectrum requirements urgency, distress and safety communications of GMDSS and AMS(R)S communications with priorities 1 to 6 of Article **S44** of AMS(R)S. See No. **S9.11A**, [except No. **S9.13**],

further considering

a) that the Convention on International Civil Aviation (ICAO SARPS) requires that stations of the AMS(R)S shall be in compliance with the internationally agreed Standards and Recommended Practices and Procedures for Air Navigation Services;

b) that ICAO has developed a global Air Traffic Management system (ATM) which requires ~~the~~ interoperability between stations operating in accordance with the ICAO SARPS for ~~of~~ those mobile-satellite systems providing AMS(R)S ~~communications~~ with the priority message structure of Article **S44**;

c) that IMO may also place similar requirements of interoperability of those mobile-satellite systems providing GMDSS communications with the priority message structure of Article **S51**,

recognizing

that Appendix **S15.2** identifies the bands 1 530 - 1 544 MHz (s-E) and 1 626.5 - 1 645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes,

[*noting*

that for mobile-satellite systems that are already operating on a generic basis in the bands 1 525 - 1 544 MHz, 1 545 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 646.5 - 1 660.5 MHz, administrations may continue to limit the use of these bands to the national mobile-satellite service or, where agreements of administrations concerned are in place, to provide multinational service,]

resolves

1 that the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by mobile satellite and AMS(R)S communications with priority 1 to 6 of Article **S44** should ~~be based~~ take into account on internationally agreed assumptions and methodologies and information on GMDSS and AMS(R)S communication actual traffic usage and growth;

[2 that the feasibility of prioritization, ~~and~~ real time pre-emptive access and, if necessary, interoperability, between different mobile-satellite systems for GMDSS and AMS(R)S, in order to achieve the most flexible and practical use of the generic allocations, should be determined,]

3 to complete and report the results of studies called for in resolves 1) and 3) above by WRC-99,

requests ITU-R

1 to develop the assumptions and methodologies and information on GMDSS and AMS(R)S communication actual traffic usage and growth to determine the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by mobile satellite and AMS(R)S communications with priority 1 to 6 of Article **S44**;

2 to determine the feasibility of prioritization, and real time pre-emptive access and, if necessary, interoperability between different mobile-satellite systems for GMDSS and AMS(R)S, in order to achieve the most flexible and practical use of the generic allocations,

requests the next competent WRC

to take into account the outcome of the ITU-R studies and take appropriate action on this subject,

invites

ICAO, IMO, IALA, administrations and other concerned organizations to participate in the studies identified in *requests ITU-R* 1 and 2 above.

DRAFT RESOLUTION [5B2A-2]

USE OF THE 1.5/1.6 GHz BANDS BY THE MOBILE-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the conversion of certain bands to generic MSS allocation would facilitate introduction of MSS networks;

b) that the bands 1 525 - 1 544 MHz, 1 555 - 1 559 MHz, 1 626.5 - 1 645.5 MHz and 1 656.5 - 1 660.5 MHz have been allocated on a generic basis to MSS to facilitate flexible use of this spectrum by multiple MSS systems;

c) that this Conference has reviewed the use of the bands 1 530 - 1 544 MHz and 1 626.5 - 1 645.5 MHz for MSS stations participating in the GMDSS in order to provide spectrum to fulfil the global maritime service requirements while providing protection for GMDSS pursuant to No. **[ADD S5.353A]**;

d) that the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz are currently allocated exclusively to the AMS(R)S on a worldwide basis;

e) that WRC-95, through Recommendation **34 (WRC-95)**, recommended that spectrum should be allocated on a worldwide basis to the most broadly defined services,

recognizing

a) that subject to further study and validation by ITU-R it may be feasible and desirable to relax the constraints on MSS in the bands included in No. **[ADD S5.353A]** at a future WRC in order to further facilitate flexible use of this spectrum by multiple MSS systems, while providing full protection for GMDSS distress and safety requirements and taking into account anticipated spectrum requirements for these services;

b) that subject to further study and validation by ITU-R it may be feasible to allocate the 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz bands to generic MSS with appropriate protection for distress and safety communications,

resolves

that WRC-99 review the constraints on the MSS allocations and establish how to protect the AMS(R)S,

invites ITU-R

as a matter of urgency to:

i) study the technical, operational and economic feasibility of relaxing the constraints to MSS allocations in all or parts of the bands referred to in *considering c)*;

ii) study the feasibility of allocating the exclusive AMS(R)S bands referred to in *considering* d) to the generic MSS taking into account the need for protection of safety related communications;

iii) complete these studies and report the results to WRC-99,

invites

ICAO, IMO, IALA, administrations and other concerned organizations to participate in the studies identified in *invites ITU-R* above.

Three meetings were held. A unique consensus was not achieved. Rather, various options were developed.

These options are described below and detailed texts for options 2 and 3 are attached.

The order of these options has no significance.

Option 1 (Attachment 1)

Allocate the band 1 559 - 1 567 MHz to MSS in the downband direction sharing with the current services.

Adopt a footnote requiring MSS to protect the current services allocated in the band.

Adopt a resolution to study the sharing criteria in the ITU-R in time for consideration at WRC-99 (Attachment 1).

The service cannot begin until the sharing criteria is agreed.

Option 2 (Attachment 2)

Adopt a resolution to specifically identify the band 1 559 - 1 567 MHz as a potential downband for study by the ITU-R in time for consideration at WRC-99.

The resolution would request WRC-99 to consider an allocation for MSS in the band, based on the outcome of the ITU-R studies.

Option 3 (Attachment 3)

Allocate the band 1 559 - 1 567 MHz to MSS in the downband direction sharing with the current services.

Establish a provisional pfd for MSS of -112 dB(W/m^2/1 MHz) to protect the current services in the band subject to review of this limit at WRC-99 (an appropriate mechanism would be established for this review).

The date of entry of MSS shall not be before 1 July 2000.

Any MSS system filing for use of the band 1 559 - 1 567 MHz shall comply with the final pfd limits as adopted by WRC-99.

The use of MSS is subject to coordination under Resolution 46.

MSS shall not cause interference to internationally standardized GNSS.

Option 4

NOC

ATTACHMENT 1

OPTION 1

ADD

DRAFT RESOLUTION [COM5-21]

USE OF THE BAND 1 559 - 1 567 MHz BY THE MOBILE-SATELLITE SERVICE (SPACE-TO-EARTH)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559 - 1 567 MHz is currently allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that the WRC-97 has made an allocation of this band to the mobile-satellite service (space-to-Earth) subject to an appropriate protection of the aeronautical radionavigation and radionavigation-satellite services;

c) that the use of this band involves services which are safety of life services;

d) that there is a shortage of frequency spectrum for the mobile-satellite services,

resolves

1 that the WRC-99 establish sharing criteria including the appropriate value of power flux-density of mobile-satellite service space stations to protect the aeronautical radionavigation and radionavigation-satellite services;

2 that the use of this band by the MSS shall be subject to the establishment of appropriate sharing criteria,

invites ITU-R

to complete, as a matter of urgency, the necessary study to recommend sharing criteria including the appropriate value of power flux-density of mobile-satellite service space stations to protect the aeronautical radionavigation and radionavigation-satellite services, taking into account the studies already carried out,

further invites administrations and concerned organizations

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

ATTACHMENT 2

OPTION 2

Sharing studies and further consideration of a downlink band in the mobile-satellite service associated with the [uplink band XXXX]

The World Radiocommunication Conference (Geneva, 1997),

considering

a) [that WRC-97 allocated the band xxxx MHz, on a worldwide basis, to the mobile-satellite (Earth-to-space) service];

b) that Resolution 213 (WRC-95) invited the ITU-R to investigate a potentially suitable related downlink band to assist in meeting the requirements of the mobile-satellite service;

c) that proposals were presented at WRC-97 indicating the band 1 559 - 1 567 MHz as potentially suitable;

d) that further studies are required to determine the feasibility of the sharing of the band 1 559 - 1 567 MHz with the mobile-satellite (space-to-Earth) service and the radionavigation satellite and aeronautical radionavigation services;

e) that the band 1 559 - 1 610 MHz is used by the radionavigation satellite system including components of the ICAO global navigation satellite system (i.e. GPS and GLONASS) for which further ICAO standards are currently being developed;

f) that the global navigation satellite system is an evolutionary system and that future developments also require protection;

g) that RR **S4.10** recognizes that the above radionavigation usage require special measures to ensure freedom from harmful interference,

resolves to invite ITU-R

as a matter of urgency, to complete the technical and operational studies on the feasibility of sharing the band 1 559 - 1 567 MHz between the mobile-satellite service (space-to-Earth) and the radionavigation services mentioned above, including the required means for preventing harmful interference to radionavigation systems and other services as appropriate,

further invites

1 administrations and relevant international organizations to participate actively in such studies;

2 ITU-R to continue to investigate a potentially suitable downlink band that may assist in meeting the spectrum requirements of the mobile-satellite service,

resolves

to review at the 1999 World Radiocommunication Conference (WRC-99), the outcome of these studies and consider the allocation of a suitable downlink band to the mobile-satellite service, including appropriate implementation time-frame, while providing protection for current planned and future radionavigation-satellite service systems,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO and IMO.

ATTACHMENT 3

OPTION 3

MHz

1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 559 – ~~1 610~~1 567	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) ADD S5.354A S5.341 S5.355 S5.359 S5.363	
~~1 559~~1 567 – 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363	

ADD S5.354A The use of the band 1 559 - 1 567 MHz by the mobile-satellite service (space-to-Earth) shall be in accordance with Resolution [XXX] (WRC-97).

DRAFT RESOLUTION [COM5-22] (WRC-97)

USE OF THE BAND 1 559 - 1 567 MHz BY THE MOBILE-SATELLITE SERVICE (SPACE-TO-EARTH)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559 - 1 567 MHz is currently allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that WRC-97 has made an allocation to the mobile-satellite service in the band 1 559 - 1 567 MHz (s-E) subject to appropriate protection for the aeronautical radionavigation and radionavigation-satellite services;

c) that the aeronautical radionavigation and radionavigation-satellite services are safety services (**S4.10** applies);

d) that safety of life services shall be protected,

considering further

a) that there is a shortage of frequency spectrum for the mobile-satellite services;

b) the need to ensure the effective use of the radio spectrum;

c) that there should be equitable access to the scarce radio frequency spectrum resource to allow for the provision of new services;

d) that studies carried out by some administrations indicate that a power flux-density limit at the Earth's surface of -112 dB(W/m^2/1 MHz) for all angles of arrival for mobile-satellite service space stations is appropriate for the protection of aeronautical radionavigation and radionavigation-satellite services;

e) that WRC-99 will consider additional allocations to the radionavigation-satellite service,

recognizing

the essential need to protect the international standard GNSS systems of the aeronautical radionavigation and radionavigation-satellite services,

resolves

1 that the allocation in the band 1 559 - 1 567 MHz to the mobile-satellite service (s-E) shall enter into force on 1 July 2000;

2 that such use by the mobile-satellite service shall be subject to coordination under [Resolution **46 (WRC-97)**/No. **S9.11A**];

3 that stations of the mobile-satellite service (space-to-Earth) operating in this band shall not cause harmful interference to international standard GNSS [add reference to ESA systems if necessary] systems of the aeronautical radionavigation and radionavigation-satellite services;

4 that the power flux-density at the Earth's surface of mobile-satellite service space stations operating in this band shall not exceed the provisional limit of -112 dB(W/m^2/1 MHz) for all angles of arrival; however, this power flux-density limit shall be reviewed by WRC-99 in the light of the studies referred to in the *further resolves* below;

5 that any MSS systems intending to use this band shall comply with the power flux-density limit decided by WRC-99,

further resolves

1 to request the ITU-R to study, as a matter of urgency, the power flux-density limit to be applied to MSS systems operating in this band taking account of the *recognizing* above, with a view to facilitate sharing, and taking account of existing and planned systems and the studies already carried out;

2 to instruct the Director of the Radiocommunication Bureau to ensure, in consultation with the relevant Study Group Chairman, that the results of these studies are available in due time for consideration at WRC-99;

3 to recommend that WRC-99 review the results of these studies with a view to make any necessary adjustment to the power flux-density limit referred to in *resolves* 3 above and any consequential changes to Article **S5**;

4 to urge all administrations and organizations concerned to contribute to these studies and to cooperate to ensure a mutually satisfactory result is presented to WRC-99.

The majority of administrations made proposals for modifications to frequency allocations in the 1 675 - 1 710 MHz band and these proposals reflect the band segmentation approach for accommodating the MSS allocation in this part of the spectrum and protection of meteorological services as discussed in the Report of the Conference Preparatory Meeting (CPM-97). These proposals support allocation of the subband 1 675 - 1 683 MHz for MSS on a worldwide basis and deletion of existing Region 2 MSS allocations in the remaining band, i.e. 1 683 - 1 710 MHz.

In WG 5B2-C, two administrations indicated difficulties with the above proposals on the basis of:

- difficulties with the deletion of MSS allocations in Region 2 from 1 683 - 1 710 MHz and also that a transitional plan for radiosondes would be unacceptable should the band 1 675 - 1 683 MHz be made available to MSS;
- concern regarding problems in frequency sharing between the meteorological-satellite and meteorological aids service.

Since the majority of the proposals were in favour of modifications to the allocations in the band 1 675 - 1 710 MHz and MSS allocation on a worldwide basis by applying a band segmentation approach while ensuring protection to the interests of meteorological services, the attached proposals have been developed for further consideration.

ARTICLE S5

MOD

MHz
1 670 – 1 700

Allocation to Services		
Region 1	Region 2	Region 3
1 675 – ~~1 690~~1 683	**1 675 – ~~1 690~~1 683**	**1 675 – ~~1 690~~1 683**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
MOBILE-SATELLITE (Earth-to-space) ADD S5.377B	MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space) ADD S5.377B
S5.341 MOD S5.377 ADD S5.377A	S5.341 MOD S5.377	S5.341 MOD S5.377 ADD S5.377A

Allocation to Services		
Region 1	Region 2	Region 3
~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341	~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile ~~MOBILE-SATELLITE (Earth-to-space)~~ S5.341 ~~S5.377~~	~~1 675~~1 683 – 1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.341
1 690 – 1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile S5.289 S5.341 S5.382	1 690 – 1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) ~~MOBILE-SATELLITE (Earth-to-space)~~ S5.289 S5.341 ~~S5.377~~ S5.381	1 690 – 1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) S5.289 S5.341 S5.381

MOD

MHz
1 700 – 2 010

Allocation to Services		
Region 1	Region 2	Region 3
1 700 – 1 710	**1 700 – 1 710**	**1 700 – 1 710**
FIXED	FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
	~~MOBILE-SATELLITE (Earth-to-space)~~	
S5.289 S5.341	S5.289 S5.341 ~~S5.377~~	S5.289 S5.341 S5.384

MOD S5.377 In the band 1 675 - ~~1 710~~1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services (see Resolution **213 (Rev.WRC-95)**) and the use of this band shall be subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. In order to avoid causing harmful interference to the meteorological-satellite service, mobile earth stations shall not operate, except on a narrow-band signalling channel, within the exclusion zones around the meteorological-satellite earth stations defined in Recommendation ITU-R **SA.1158**. The mobile-satellite system shall have position determination capabilities to ensure compliance with this provision.

ADD S5.377A In Regions 1 and 3 in the band 1 675 - 1 683 MHz, stations in the mobile-satellite service shall not cause harmful interference to or claim protection from existing stations in the fixed service notified and brought into use prior to 21 November 1997.]

ADD S5.377B In Regions 1 and 3 the use of the band 1 675 - 1 683 MHz by the mobile-satellite service shall not commence before 1 July 2000.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/39-E
10 November 1997
Original: English

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

COMMITTEE 5
AD HOC 2

RECOMMENDATION [COM5-A] (WRC-97)

USE OF THE FREQUENCY BANDS 2 025 - 2 110 MHz AND 2 200 - 2 290 MHz BY THE SPACE RESEARCH, SPACE OPERATION, EARTH EXPLORATION-SATELLITE, FIXED AND MOBILE SERVICES

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz are allocated on a primary basis to the space research, space operation, earth exploration-satellite, fixed and mobile services;

b) that the use of these bands by the various services has been the subject of extensive study in response to Resolution **211 (WARC-92)** and Resolution **711 (WARC-92)**, and as a consequence of Resolution **113 (WARC-92)**;

c) that these studies have resulted in a number of ITU-R Recommendations, which when adhered to by the services will result in a stable, long-term sharing environment,

considering further

that this Conference noted increasing requirements for emerging communication systems that need to be satisfied in the frequency range below 3 GHz,

recognizing

that enhancements in technology may enable the services mentioned in *considering* a) to reduce the total bandwidth requirement in these frequency bands,

recommends

that administrations planning to operate space research, space operation, earth exploration-satellite, fixed or mobile service systems in the bands 2 025 - 2 110 MHz and 2 200 - 2 290 MHz implement enhancements in technology as early as practicable with a view to reducing the total bandwidth required by each service.

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

CMR-97 CONFÉRENCE MONDIALE DES RADIOCOMMUNICATIONS

Document DL/39-F
10 novembre 1997
Original: anglais

GENÈVE, 27 OCTOBRE – 21 NOVEMBRE 1997

COMMISSION 5
GROUPE AD HOC 2

RECOMMANDATION [COM5-A] (CMR-97)

UTILISATION DES BANDES DE FRÉQUENCES 2 025 - 2 110 MHz ET 2 200 - 2 290 MHz PAR LES SERVICES DE RECHERCHE SPATIALE, D'EXPLOITATION SPATIALE, D'EXPLORATION DE LA TERRE PAR SATELLITE, FIXE ET MOBILE

La Conférence mondiale des radiocommunications (Genève, 1997),

considérant

a) que les bandes 2 025 - 2 110 MHz et 2 200 - 2 290 MHz sont attribuées à titre primaire aux services de recherche spatiale, d'exploitation spatiale, d'exploration de la Terre par satellite, fixe et mobile;

b) que l'utilisation de ces bandes par les divers services a fait l'objet d'études approfondies en application de la Résolution **211 (CAMR-92)** et de la Résolution **711 (CAMR-92)** et pour donner suite à la Résolution **113 (CAMR-92)**;

c) que ces études ont débouché sur plusieurs Recommandations de l'UIT-R qui, lorsque les services s'y conformeront, permettront la mise en place durable d'un environnement de partage stable,

considérant en outre

la multiplication manifeste des besoins à satisfaire pour les nouveaux systèmes de communication aux fréquences inférieures à 3 GHz,

reconnaissant

que les progrès techniques permettront peut-être aux services mentionnés au *considérant* a) de réduire la largeur de bande totale dont ils ont besoin dans ces bandes de fréquences,

recommande

que les administrations qui se proposent d'exploiter des systèmes des services de recherche spatiale, d'exploitation spatiale, d'exploration de la Terre par satellite, fixe ou mobile dans les bandes 2 025 - 2 110 MHz et 2 200 - 2 290 MHz mettent en oeuvre les progrès techniques dans les meilleurs délais en vue de réduire la largeur de bande totale dont chaque service a besoin.

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

CMR-97 CONFERENCIA MUNDIAL DE RADIOCOMUNICACIONES

Documento DL/39-S
10 de noviembre de 1997
Original: inglés

GINEBRA, 27 DE OCTUBRE – 21 DE NOVIEMBRE DE 1997

COMISIÓN 5
GRUPO AD HOC 2

RECOMENDACIÓN [COM5-A] (CMR-97)

UTILIZACIÓN DE LAS BANDAS DE FRECUENCIAS DE 2 025 - 2 110 MHz Y 2 200 - 2 290 MHz POR LOS SERVICIOS DE INVESTIGACIÓN ESPACIAL, DE OPERACIONES ESPACIALES, DE EXPLORACIÓN DE LA TIERRA POR SATÉLITE, FIJO Y MÓVIL

La Conferencia Mundial de Radiocomunicaciones (Ginebra, 1997),

considerando

a) que las bandas de 2 025 - 2 110 MHz y 2 200 - 2 290 MHz están atribuidas a título primario a los servicios de investigación espacial, de operaciones espaciales, de exploración de la Tierra por satélite, fijo y móvil;

b) que la utilización de esas bandas por los diversos servicios ha sido objeto de amplios estudios en respuesta a la Resolución **211 (CAMR-92)** y la Resolución **711 (CAMR-92)**, y a consecuencia de la Resolución **113 (CAMR-92)**;

c) que esos estudios han originado cierto número de Recomendaciones del UIT-R y que, una vez que sean cumplidas por los servicios, darán lugar a un entorno de compartición estable y duradero,

considerando además

que la presente Conferencia ha observado un aumento de las necesidades para los nuevos sistemas de comunicaciones, y que habrá que satisfacer esas necesidades en la gama de frecuencias por debajo de 3 GHz,

reconociendo

que los avances de la tecnología podrían permitir que los servicios mencionados en el *considerando* a) reduzcan la necesidad de anchura de banda total en esas bandas de frecuencias,

recomienda

que las administraciones que prevean explotar sistemas de los servicios de investigación espacial, de operaciones espaciales, la exploración de la Tierra por satélite, fijo o móvil en las bandas de 2 025 - 2 110 MHz y 2 200 - 2 290 MHz, apliquen las mejoras tecnológicas lo antes posible a fin de reducir la anchura de banda total requerida por cada servicio.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/40-E
10 November 1997
Original: English

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WG 5B AD HOC 4

DRAFTING GROUP 1 OF 5B AD HOC 4

REPORT TO 5B AD HOC 4 ON THE REGULATORY PROVISIONS RELATING TO THE OPERATION OF NGSO FSS AND GSO SYSTEMS IN THE 10.7 TO 30 GHz BANDS

This document provides the results of the work of Sub-Drafting Group 1 of Drafting Group 1 of 5B ad hoc Group 4 on the regulatory provisions that would be required in order to enable NGSO FSS systems to be operated in the frequency bands from 10.7 to 30 GHz. These results are presented directly to 5B ad hoc Group 4. The list of participants is provided in Annex 1.

Following the meeting of Drafting Group 1 of 5B ad hoc Group 4, held on Saturday, 8 November 1997 from 1000 hours to 1500 hours, under the chairmanship of Dr. Ito, Sub-Drafting Group 1 of this drafting group met on Saturday 8 November, Sunday 9 November and Monday 10 November in order to prepare possible elements for a regulatory approach to the NGSO FSS issue, along the following three steps, identified in Document CMR97/114(Add.2):

a) Ku-band: establishment of hard limits.

b) Parts of the Ka-band not covered by Resolution 118 or Resolution 120: establishment of hard limits;

c) Parts of the Ka-band covered by Resolution 118: application of Resolution 46.

Section 1 of this report relates to steps a) and b). Section 2 relates to step c).

It should be noted that all these elements should be considered as being in square brackets as the matter needs further discussion and needs to be resolved as a whole. In particular, the exact values of the proposed power limits to be applied to NGSO and to GSO FSS systems, as well as the exact frequency bands in which these limits may apply, still need to be discussed. Similarly, the exact regulatory conditions to determine the relative status of GSO and NGSO systems in the various bands under consideration still need to be discussed.

For completeness, the provisions relating to the protection of Appendices **30** and **30A** are also reproduced. These provisions, as well as Resolution 506 will be addressed by WG 4D. These elements are kept in square brackets pending review by WG 4D. It is suggested that these elements be brought to the attention of WG 4D at the earliest opportunity, in order to facilitate the discussions in this group.

The coordinators:

F. Rancy T. Tycz

1 Regulatory provisions concerning the Ku-band and the parts of Ka-band not covered by Resolution 118 or Resolution 120 (Steps a) and b) of Document CMR97/114(Add.2))

In the frequency bands covered by **S22.2** in Ku- and Ka-bands, the proposed regulatory provisions are intended to ensure protection of GSO FSS and BSS systems and full protection of the Plans and their future modifications. These provisions consists in modifications of Articles **S5** (for the current allocations to FSS and for an additional allocation to FSS) and **S22** and in two Resolutions, addressing respectively the frequency bands which are not subject to a plan and those which are subject to a plan.

Concerning the specific frequency bands that would need to be covered by these provisions, it was agreed that as many as possible of these frequency bands should be the subject of these provisions, in order to retain sufficient flexibility for NGSO operators to design systems that can coexist in all three regions with terrestrial or other services. To ensure such coexistence in all cases, the need for further studies on the possible coexistence between NGSO FSS and terrestrial services in the bands shared between these services, in particular protection of NGSO space stations from radiolocation in the band 17.3 - 17.7 GHz, and from GSO space stations in the 17.3 - 17.8 GHz.

Concerning the level of protection of GSO networks from NGSO systems, USA, CAN and J expressed the view that the derivation of the limit to be applied to NGSO systems for the long-term protection of GSO networks may be based on a more stringent protection level that a 6% noise increase, which currently applies between GSO networks to trigger coordination.

Concerning the protection of GSO systems operating in inclined orbit, simulations on the skybridge system showed that this protection would be ensured at 5° inclination at the same levels as in the case of 0° inclination.

The United States suggested that an alternative approach could consist in placing the proposed limits in an Annex to the Resolution implementing the decisions of WRC-97 in this respect.

1.1 Modifications to Article S5

MOD **S5.441** The use of the bands 4 500 - 4 800 MHz (space-to-Earth), 6 725 - 7 025 MHz (Earth-to-space), by the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7 - 10.95 GHz (space-to-Earth), 11.2 - 11.45 GHz (space-to-Earth) and 12.75 - 13.25 GHz (Earth-to-space) by GSO satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7 - 10.95 GHz (space-to-Earth), 11.2 - 11.45 GHz (space-to-Earth) and 12.75 - 13.25 GHz (Earth-to-space) by NGSO satellite systems in the fixed-satellite service shall be in accordance with the provisions of Resolution [F-1].

MOD

GHz
10.7 – 12.7

Allocation to Services		
Region 1	Region 2	Region 3
11.7 – 12.5 FIXED BROADCASTING BROADCASTING-SATELLITE Mobile except aeronautical mobile	**11.7 – 12.1** FIXED S5.486 FIXED-SATELLITE (space-to-Earth) Mobile except aeronautical mobile S5.485 S5.488	**11.7 – 12.2** FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE
	12.1 – 12.2 FIXED-SATELLITE (space-to-Earth) S5.485 S5.488 S5.489	S5.487 S5.487A
S5.487 S5.487A	**12.2 – 12.7** FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE S5.488 S5.490 S5.492 S5.487A	**12.2 – 12.5** FIXED MOBILE except aeronautical mobile BROADCASTING S5.487 S5.491

[The following two provisions are left in square brackets pending review by WG 4D:

ADD S5.487A *Additional allocation:* in Region 1, the band 11.7 - 12.5 GHz, in Region 2, the band 12.2 - 12.7 GHz and in Region 3 the band 11.7 - 12.2 GHz are also allocated to the fixed-satellite service (space-to-Earth), limited to non-geostationary-satellite systems and subject to the provisions of Resolution [F-1].

MOD S5.516 The use of the band 17.3 - 18.1 GHz by GSO satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. For the use of the band 17.3 - 17.8 GHz in Region 2 by the feeder links for the broadcasting-satellite service in the band 12.2 - 12.7 GHz, see Article ~~S11~~**S10**. The use of the bands 17.3 - 18.1 GHz in Regions 1 and 3 and 17.3 - 17.8 GHz in Region 2 by NGSO satellite systems in the fixed-satellite service is subject to the provisions of Resolution [F-1].]

1.2 Modifications to Article S22

Section II. Control of Interference to Geostationary-Satellite Systems

MOD S22.2 § 2. (1) Non-geostationary ~~space stations~~ satellite systems shall ~~cease or reduce to a negligible level their emissions, and their associated earth stations shall not transmit to them, whenever there is~~ not cause unacceptable interference to geostationary-satellite ~~space~~ systems in the fixed-satellite service operating in accordance with these Regulations.

ADD S22.5A1 In the frequency bands 10.7 - 11.7 GHz, 12.5 - 12.75 GHz, 17.3 - 18.1 GHz and 18.1 - 18.4 GHz, the maximum aggregate power flux-density produced at the geostationary-satellite orbit by all the space stations in a non-geostationary-satellite system in the fixed-satellite service or in the broadcasting-satellite service shall not exceed the values given in Tables **S22-2** and **S22-4**.

[The provisions **S22.5B** to Table **S22-2** are left in square brackets pending review by WG 4D:

ADD S22.5B § 6. (1) The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary orbit, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-1** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth as specified in Table **S22-1**, for all pointing directions towards the geostationary orbit.

ADD S22.5B.1 [1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within a non-geostationary system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

- N is the number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater or equal to 0°;
- i is the index of the considered non-geostationary space station;
- pfd_i is the power flux-density produced at the point considered at the Earth's surface in dB(W/m^2) in the reference bandwidth;

– θ_i is the angle between the direction considered towards the geostationary orbit and the direction of the interfering space station in the non-geostationary system;

– $G_r(\theta_i)$ is the gain of the receive reference antenna to be considered as part of a geostationary network;

– G_{max} is the maximum gain of the above receive reference antenna;

– *epfd* is the computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

ADD TABLE **S22-1**

Frequency band allocated to the BSS	Equivalent pfd dB(W/m2)	Percentage of time during which pfd level may not be exceeded	Reference antenna radiation pattern	Reference bandwidth (MHz)
11.7 - 12.5 GHz in Region 1, 11.7 - 12.2 GHz and 12.5 - 12.7 GHz in Region 3	-145 -132	99.7% 100%	Recommendation ITU-R BO.1213 (for Regions 1 and 3)	27
12.2 - 12.7 GHz in Region 2	-144 -131	99.7% 100%	Section 3.7.2 of Annex 5 of Appendix **30** for Region 2	27

ADD **S22.5C** (2) The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-2** for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

ADD **S22.5C.1** [1] The aggregate power flux-density is defined as the summation of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^{\,2}}\right]$$

where:

- N is the number of earth stations in the non-geostationary system with an elevation angle greater or equal to 0°, from which the point considered in the geostationary orbit is visible;
- i is the index of the earth station considered in the non-geostationary system;
- P_i is the RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary system in dB(W/m^2) in the reference bandwidth;
- $\theta_i(t)$ is the off-axis angle between the boresight of the earth station considered in the non-geostationary system and the direction of the point considered in the geostationary-satellite orbit;
- $G_t(\theta_i)$ is the transmit antenna gain of the earth station considered in the non-geostationary system in the direction of the point considered in the geostationary-satellite orbit;
- d is the distance between the earth station considered in the non-geostationary system and the point considered in the geostationary-satellite orbit;
- *apfd* is the aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

ADD

TABLE **S22-2**

Frequency band	Aggregate pfd dB(W/m^2)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (MHz)
14.5 - 14.8 GHz in Regions 1 and 3 (outside Europe)	-119	99.97%	27
	-115	100%	
17.3 - 18.1 GHz in Regions 1, 2 and 3			

ADD S22.5D (3) The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall

not exceed the limits given in Table **S22-3** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions into all the reference antennas and in the reference bandwidths specified in this table, and for all pointing directions towards the geostationary orbit.

ADD

TABLE **S22-3**

Frequency band	Equivalent pfd dB(W/m²)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern
10.7 - 10.95 GHz 11.7 - 12.2 GHz in Region 2 12.2 - 12.5 GHz in Region 3 12.5 - 12.75 GHz in Regions 1 and 3	-179	99.7%	4	60 cm, ITU-R Rec. 465-5
	-192	99.9%	4	3 m, ITU-R Rec. 465-5
	-185	99.97%	4	10 m, ITU-R Rec. 465-5
	-170	100%	4	60 cm, 3 m and 10 m, ITU-R Rec. 465-5
17.7 - 18.8 GHz 19.7 - 20.2 GHz	-153	99%	1 000	30 cm, ITU-R Rec. 465-5
	-153	99.7%	1 000	2 m, ITU-R Rec. 465-5
	-153	99.9%	1 000	5 m, ITU-R Rec. 465-5
	-138	100%	1 000	30 cm, 2 m and 5 m, ITU-R Rec. 465-5

ADD S21.19 (2) The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-4** for any percentage of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

TABLE **S22-4**

Frequency band	**Aggregate pfd dB(W/m²)**	**Percentage of time during which pfd level may not be exceeded**	**Reference bandwidth (kHz)**
10.7 - 11.7 GHz and 12.5 - 12.75 GHz	-170	100%	4

ADD

12.75 - 13.25 GHz	-186	100%	4
13.75 - 14.5 GHz	-170	100%	4
18.1 - 18.4 GHz 24.75 - 25.75 GHz in Regions 2 and 3 27 - 27.5 GHz in Regions 2 and 3 27.5 - 28.6 GHz 29.1 - 30 GHz*	-145	100%	1 000

* In the band 29.1 - [29.4] [29.5] GHz, these limits do not apply to non-geostationary mobile-satellite service feeder-link networks.

ADD S22.5F The limits given in Tables **S22-2** to **S22-4** may be exceeded on the territory of any country whose administration has so agreed.

Section VI. Earth Station Off-Axis Power Limitations

MOD S22.26 § 9. The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station ~~at angles in the direction of the geostationary-satellite orbit off the main beam axis has a significant impact on interference caused to other geostationary-satellite networks. Enhanced utilization of the geostationary-satellite orbit and easier coordination would be attained by minimizing such off-axis radiation and administrations are encouraged to achieve the lowest values practicable bearing in mind the latest ITU-R Recommendations. Minimizing such levels is particularly important in intensively used up-link bands~~shall not exceed the following values for any off-axis angle φ, which is 2.5° or more off the main lobe axis of an earth station antenna:

Angle off-axis	*Maximum e.i.r.p. per 40 kHz*
2.5° ≤ φ ≤ 7°	(39 - 25 log φ) dB(W/40 kHz)
7° < φ ≤ 9.2°	18 dB(W/40 kHz)
9.2° < φ ≤ 48°	(42 - 25 log φ) dB(W/40 kHz)
48° < φ ≤ 180°	0 dB(W/40 kHz)

ADD S22.27 For FM-TV emissions with energy dispersal, the limits in **S22.26** above may be exceeded by up to 3 dB provided the off-axis total e.i.r.p. of the transmitted FM-TV carrier does not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
2.5° ≤ φ ≤ 7°	(53 - 25 log φ) dBW
7° < φ ≤ 9.2°	32 dBW

9.2°	$< \varphi \leq 48°$	(56 - 25 log φ) dBW
48°	$< \varphi \leq 180°$	14 dBW

ADD S22.28 For FM-TV carriers which operate without energy dispersal, such carriers should be modulated at all times with programme material or appropriate test patterns. In this case, the off-axis total e.i.r.p. of the emitted FM-TV carrier shall not exceed the following values:

Angle off-axis		*Maximum e.i.r.p.*
2.5°	$\leq \varphi \leq 7°$	(53 - 25 log φ) dBW
7°	$< \varphi \leq 9.2°$	32 dBW
9.2°	$< \varphi \leq 48°$	(56 - 25 log φ) dBW
48°	$< \varphi \leq 180°$	14 dBW

ADD S22.29 The e.i.r.p. limits given in **S22.26**, **S22.27** and **S22.28** are applicable in the following frequency bands allocated to the fixed-satellite service (Earth-to-space):

12.5 - 12.75 GHz (Region 1)

12.7 - 12.75 GHz (Region 2)

12.75 - 13.25 GHz

13.75 - 14 GHz

14 - 14.5 GHz

17.3 - 18.4 GHz

ADD **Section VII. Geostationary Space Station Power Limitations**

ADD S22.30 Geostationary space stations shall not produce power flux-density values at the Earth's surface greater than those given in the following table:

Frequency band	Service	Limit in dB(W/m^2) for angle of arrival (δ) above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
11.7 - 12.2 GHz (Region 2)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
12.5 - 12.75 GHz (Region 1)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
19.7 - 20.2 GHz	Fixed-Satellite (S-E)	-105	-105 + 0.5 (δ–5)	-95	10 MHz

ADD S22.31 The limits given in **S22.30** may be exceeded on the territory of any country whose administration has so agreed.

3 Resolutions

Section 3.1 contains the proposals for draft WRC-97 resolutions to implement steps a) and b) referred to in the introduction of this report, i.e. with hard limits included in Article **S22**.

An alternative approach was proposed by the United States in which these limits would be used as thresholds, with the application of provisions similar to those of Resolution 46. A draft WRC-97 resolution implementing this approach has been proposed by the United States as provided in Section 3.2.

3.1 Draft WRC-97 Resolutions proposed to implement steps a) and b)

ADD

DRAFT RESOLUTION [COM5-18]

COEXISTENCE AMONG NON-GEOSTATIONARY SYSTEMS IN THE FIXED-SATELLITE AND GEOSTATIONARY SYSTEMS IN CERTAIN FREQUENCY BANDS

The World Radiocommunication Conference (Geneva, WRC-97),

considering

a) that the diverging interpretations arising from No. **S22.2** result in an ambiguous regulatory status for both existing and future geostationary and non-geostationary systems in the fixed-satellite service in the bands where this provision applies, with consequential risks for both types of systems;

b) that the harmonious development of non-geostationary and geostationary systems in the fixed-satellite service requires that these ambiguities be resolved with no further delay;

c) that these ambiguities can be resolved by including in Article **S22** limits to the power radiated by non-geostationary systems in order to adequately protect geostationary systems in the frequency bands and sharing situations where Resolution **46** does not apply;

d) that such limits have been developed in certain frequency bands which are currently used or planned to be used extensively by geostationary fixed-satellite service systems;

e) that non-geostationary fixed-satellite service systems are proposed in these bands which could meet these limits and receive adequate protection from existing and future fixed-satellite service geostationary systems without imposing additional constraints, therefore avoiding the need for mutual coordination;

f) that the application of Resolution **46**, in the absence of limits constraining the design of geostationary fixed-satellite service and non-geostationary fixed-satellite service systems and promoting the use of mitigation techniques, should be considered with care;

g) that in the bands where these limits apply, there would be no need for a coordination procedure between non-geostationary and geostationary systems in the fixed-satellite service,

resolves

1 that, in the frequency bands specified in Tables **S22-2** to **S22-4**, non-geostationary systems in the fixed-satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the provisional power limits appearing in Article **S22**;

2 [that in applying No. **S22.2,** administrations may consider these provisional power limits as corresponding to permissible levels of interference from a NGSO system [for which complete notification information was received prior to 21 November 1997] into a GSO system, irrespective of the date of receipt by the Bureau of the complete coordination information relating to [this GSO system] [these systems;]

3 [that an administration proposing a NGSO system [for which complete notification information has been received by the Bureau after 21 November 1997 and] which is compliance with the limits referred to in *resolves* 1 above shall be considered as having fulfilled its obligations under **S22.2** [with respect to GSO networks for which complete notification information has been received by the Bureau after 21 November 1997];]

4 that, in the frequency bands from 10.7 to 30 GHz, geostationary satellite systems in the fixed-satellite service for which complete coordination information has been received by the Bureau after 21 November 1997 shall be subject to the provisional limits appearing in Article **S22**;

5 that non-geostationary systems shall not claim protection from geostationary-satellite networks operating in accordance with the Radio Regulations [and *resolves* 4] above, irrespective of the date of receipt by the Bureau of the complete notification information relating to these non-geostationary systems;

6 that the limits given in Tables **S22-1** to **S22-3** may be exceeded on the territory of any country whose administration has so agreed.

7 [that between 21 November 1997 and the date that final limits are adopted applications submitted to the BR for NGSO systems shall not be processed until the provisional limits referred to in *resolves* 1 above have been confirmed by a competent conference;]

8 that, if an administration operating or planning a GSO FSS system considers that the NGSO FSS system proposed by another administration might cause unacceptable interference into its GSO system, the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks,

[instructs the Radiocommunication Bureau

when recording in the Master register assignments to a NGSO system in the fixed-satellite service, to make its finding relating to the compliance of these assignments with the limits referred to in *resolves* 1 above conditional upon the review of this compliance after final adoption of these limits by a competent conference,]

requests the ITU-R

1 to conduct, as a matter of urgency and in time for consideration by WRC-99,

a) the appropriate technical, operational and regulatory studies to review the regulatory conditions relating to the coexistence among NGSO and GSO systems in the fixed-satellite service in order to ensure that they do not pose undue constraints on the development of non-geostationary or geostationary fixed-satellite service systems;

b) to develop a methodology for calculating the power levels produced by NGSO systems and the compliance of these levels with the limits referred to in i), ii) and iii) above;

c) to complete the studies relating to the sharing criteria to be applied for determining the need for coordination between non-geostationary fixed-satellite service systems;

2 to undertake the development of power limits in order to protect existing and future geostationary fixed-satellite service systems in those bands where non-geostationary fixed-satellite service systems are likely to be implemented and geostationary fixed-satellite service systems are used or expected to be used extensively;

ADD

DRAFT RESOLUTION [COM5-19]

USE OF THE FREQUENCY BANDS COVERED BY APPENDICES 30, 30A AND 30B BY NGSO NETWORKS

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that limits have been established and included in Article **S22** to ensure that the interference caused by non-geostationary-satellite systems into assignments operated in conformity with the Appendices 30, 30A and 30B Plans is maintained within negligible levels;

b) that the integrity of the above-mentioned Plans is to be ensured;

c) that NGSO systems should not be entered into those Plans and therefore not apply and not be protected by the associated procedures,

resolves

that NGSO systems in the frequency bands subject to Appendices **30**, **30A** and **30B** shall comply with the limits specified in Article **S22** and may apply, as of 22 November 1997, the procedures of Section I of Article **S9 [11]** and the procedures of Article **S11 [13]**,

requests the ITU-R

a) to conduct, as a matter of urgency and in time for consideration by WRC-99, the appropriate technical, operational and regulatory studies to review the regulatory provisions concerning the operation of NGSO FSS systems in these frequency bands in order to ensure that these conditions ensure appropriate protection of the Plans and their future modifications and, [to the maximum extent practicable,] do not pose unreasonable constraints on the development geostationary systems in these bands;

b) to report to CPM-99 on the conclusion of these studies.

3.2 Draft WRC-97 Resolution with the use of thresholds and Resolution 46 type approach

DRAFT RESOLUTION [COM5-20]

USE OF CERTAIN KU-BANDS FREQUENCIES BY NON-GEOSTATIONARY FIXED-SATELLITE SERVICE (FSS) SYSTEMS

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the International Telecommunication Union has, among its purposes, "to promote the extension of the benefit of the new telecommunication technologies to all the world's inhabitants" (No. 6 of the Constitution of the International Telecommunication Union (Geneva, 1992));

b) that it is desirable, in this respect, to promote systems capable of providing a universal service;

c) that new telecommunication services need advanced and reliable networks permitting high capacity communications;

d) that systems based on the use of new technologies associated with both geostationary (GSO) and non-geostationary (non-GSO) satellite constellations are capable of providing the most isolated regions of the world with high-capacity and low-cost means of communication;

e) that many of the Members of the Union are in need of such systems;

f) that the operation of such systems requires a suitable amount of spectrum in appropriate frequency bands;

g) that decisions on this matter should permit as many systems as possible to be operated;

h) that there is a need for the provision of services on a competitive basis between GSO/FSS and non-GSO/FSS, as well as between non-GSO/FSS and non-GSO FSS;

i) that in spite of the urgency attached to the development of such systems, technical, sharing and regulatory issues should be studied in order to achieve the most efficient and flexible use of the spectrum that may be available for these systems,

noting

1 that information relating to GSO and non-GSO systems [in certain FSS bands] has been communicated to the Radiocommunication Bureau;

2 that many of these systems are in operation and others will begin operations in the near future and, consequently, difficulties may be experienced in modifying their characteristics;

3 that other radio services use these bands on a co-primary basis and the rights of these radio services need to be protected,

considering further

a) that the following frequency bands allocated to the FSS may, in accordance with the Radio Regulations, be used by the GSO FSS and non-GSO FSS networks;

b) that No. **S22.2** may create uncertainty in the planning, coordination, and implementation of GSO FSS and non-GSO FSS systems where **S22.2** applies;

c) that technical studies are required in order to ascertain the extent to which sharing of these FSS frequency bands is feasible between GSO FSS and non-GSO FSS systems, between non-GSO FSS systems and between non-GSO FSS and terrestrial systems;

d) that the ITU-R is currently studying sharing techniques which may be used between and among GSO FSS and non-GSO FSS systems;

e) that the number of these FSS systems, GSO and non-GSO, that are proposed for and in operation in bands allocated to the fixed-satellite service where No. **S22.2** applies varies from band to band;

f) that in certain FSS bands, Resolution **46 (Rev.WRC-95)/S9.11** applies and RR No. **S22.2** does not apply,

resolves

1 that non-GSO FSS systems, in the frequency bands listed in considering further a), are not subject to the provisions of No. **S22.2**, and are subject to the application of the provisions of No. **S9.12** for the coordination of non-GSO FSS systems with GSO FSS systems;

2 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in considering further a), the technical, operational, and regulatory requirements relating to the shared use of these bands by both GSO FSS and non-GSO FSS systems with a view towards developing an approach and applicable criteria to determine the minimum number of coordinations required between GSO FSS and non-GSO FSS systems;

3 that, in the interim, until confirmed by WRC-99 that the need for such a requirement continues to exist, non-GSO FSS systems in the frequency bands listed in considering further a) shall not claim protection from GSO FSS systems;

4 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in considering further a), the technical, operational, and regulatory requirements relating to the shared use of these bands by multiple non-GSO FSS systems with a view towards developing an approach and applicable criteria to assist in coordination between non-GSO FSS systems;

5 that non-GSO FSS systems, in the frequency bands listed in *considering further* a) are subject to the application of the provisions of No. **S9.14** for the coordination of non-GSO FSS systems with terrestrial systems;

6 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in *considering further* a), the technical, operational, and regulatory requirements relating to the use of these bands by both terrestrial and non-GSO FSS systems with a view towards developing an approach and applicable criteria to determine the minimum number of coordinations required between GSO FSS and non-GSO FSS systems;

7 that non-GSO FSS systems, in the frequency bands listed in *considering further* a) are subject to the application of the provisions of No. **S9.12** for coordination between non-GSO FSS systems;

8 to request the ITU-R to study, on an expedited basis, and develop on a band-by-band, case-by-case basis in the frequency bands listed in *considering further* a), the technical, operational, and regulatory requirements relating to sharing between non-GSO FSS systems with a view towards developing an approach and applicable criteria to assist in coordination between non-GSO FSS systems;

9 that non-GSO FSS earth stations, in the appropriately allocated bands listed in *considering further* a), are subject to the application of the provisions of No. **S9.15** with respect to terrestrial stations;

10 that non-GSO FSS earth stations operating in reverse direction, in the appropriately allocated bands listed in *considering further* a), are subject to the application of the provisions of No. **S9.17A** with respect to other earth stations,

further resolves

1 to instruct the Director of the Radiocommunication Bureau to ensure, in consultation with the Chairmen of study groups, that the studies be conducted on an expedited basis, and the results of these studies be made available by [XXXX];

2 that the results of the above studies, once approved through the accelerated procedures, be used on an interim basis to determine if coordination of a non-GSO FSS system with GSO FSS systems is required in accordance with No. **S9.12**;

3 that the results of the above studies, once approved through the accelerated procedures, be used on an interim basis to determine if coordination between non-GSO FSS and terrestrial systems is required in accordance with No. **S9.15**;

4 to recommend that CPM-99 review the results of the above studies and forward their findings to WRC-99;

5 to recommend that WRC-99 take the appropriate action, based on the results of CPM-99, for the harmonious development of GSO FSS, non-GSO FSS, and terrestrial systems in the bands listed in *considering further* a),

recommends

that future world radio conferences consider the results of studies relating to the benefits that may be derived from the use of non-GSO satellite technologies and, if necessary, identify additional frequency bands that may be used by non-GSO FSS systems,

urges administrations

to cooperate, on an expedited basis, to the maximum extent practicable in continuing the required studies, and to conduct such studies and reach results acceptable to all parties concerned.

2 Regulatory conditions concerning the parts of the Ka-band covered by Resolution 118

MOD

GHz
18.6 – 20.2

Allocation to Services		
Region 1	Region 2	Region 3
18.8 – 19.3	FIXED FIXED-SATELLITE (space-to-Earth) MOD S5.523A MOBILE	

MOD

GHz
27 – 29.9

Allocation to Services		
Region 1	Region 2	Region 3
28.5 – 29.1	FIXED FIXED-SATELLITE (Earth-to-space) MOD S5.523A S5.539 MOBILE Earth Exploration-Satellite (Earth-to-space) S5.541 S5.540	

MOD S5.523A ~~The use of the bands 18.8 - 19.3 GHz and 28.6 - 29.1 GHz by the FSS shall be in accordance with Resolution **118 (WRC-95).**~~ The use of the bands 18.8 - 19.3 GHz (space-to-Earth) and 28.6 - 29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **S9.11A**/Resolution **46 (Rev.WRC-95)** and No. **S22.2** [No. **2613**] does not apply. [GSO networks under coordination prior to 18 November 1995 shall successfully coordinate pursuant to No. **S9.11A**/Resolution **46 (Rev.WRC-95)** with non-geostationary networks that have been received by the Bureau prior to that date for notification. Non-geostationary networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix **3** notification information is considered as having been received by the Bureau prior to 18 November 1995.]

ANNEX 1

List of participants to the meetings of Sub-Drafting Group 1 of Drafting Group 1 of 5B ad hoc Group 4 (NGSO/FSS)

Saturday, 8 November 1997, from 1530 to 1800 hours	
Administration/ Organization	**Name**
Australia	B. Mc Donald
Brazil	J. Albuquerque
Canada	V. Mimis
	M. Dupuis
France	F. Rancy
	V. Meens
	C. Michel
Indonesia	A. Djiwatanpu
Japan	T. Yamauchi
Lebanon	M. Ghazal
	R. Bahsoun
	A. Majeed
Saudi Arabia	B. Lemouchi

Sunday, 9 November 1997, from 1000 to 1600 hours	
Administration/ Organization	**Name**
Australia	B. Mc Donald
Brazil	J. Albuquerque
Canada	V. Mimis
	M. Dupuis
	S. Doiron
France	F. Rancy
	V. Meens
	C. Michel
	J.C. Guiguet
Indonesia	A. Djiwatanpu
Japan	T. Yamauchi
	H. Tanaka
	J. Leary

Monday, 10 November 1997, from 0930 to 1030 hours	
Administration/ Organization	**Name**
Australia	B. Mc Donald
Brazil	J. Albuquerque
Canada	V. Mimis
	M. Dupuis
	S. Doiron
France	F. Rancy
	V. Meens
	C. Michel
	J.C. Guiguet
	J. Chartier
	F. Rontard
Japan	T. Yamauchi
	H. Tanaka

South Africa	S. Hibbard
USA	T . Tycz
	E. Davison
	W. Long
Intelsat	V. Sahay

	T. Otsu
Lebanon	M. Ghazal
	R. Bahsoun
	A. Majeed
Saudi Arabia	B. Lemouchi
South Africa	S. Hibbard
	D. Harie
Turkey	F.M. Yurdal
	A.H. Erdinc
USA	T . Tycz
	E. Davison
	D. Parlow
	G. Creezer
Intelsat	H. Enriques
	V. Sahay

	J. Leary
Lebanon	M. Ghazal
	R. Bahsoun
	A. Majeed
Portugal	F. Guerra
Saudi arabia	B. Lemouchi
South africa	S. Hibbard
	P. Lochner
United Kingdom	C. Cheeseman
USA	T . Tycz
	E. Davison
	W. Long
	G. Creezer
	H. Enriques
Intelsat	K. Betaharon
	H. Henriques
European Commission	R. Niepold
	S. Kramer

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

CMR-97 CONFÉRENCE MONDIALE DES RADIOCOMMUNICATIONS

Document DL/40-F
10 novembre 1997
Original: anglais

GENÈVE, 27 OCTOBRE – 21 NOVEMBRE 1997

GT 5B AD HOC 4

GROUPE DE RÉDACTION 1 DU GT 5B AD HOC 4

RAPPORT AU GT 5B AD HOC 4 SUR LES DISPOSITIONS RÉGLEMENTAIRES CONCERNANT L'EXPLOITATION DES SYSTÈMES NON OSG DU SFS ET DES SYSTÈMES OSG DANS LES BANDES DE FRÉQUENCES DE 10,7 À 30 GHz

Le présent document contient les conclusions des travaux du Sous-Groupe de rédaction 1 du Groupe de rédaction 1 du Groupe ad hoc 5B-4 concernant les dispositions réglementaires qui seraient nécessaires pour permettre l'exploitation des systèmes non OSG du SFS dans les bandes de fréquences allant de 10,7 à 30 GHz. Les résultats sont présentés directement au Groupe ad hoc 5B-4. La liste des participants figure à l'annexe 1.

Suite à la réunion du Groupe de rédaction 1 du Groupe ad hoc 4 du Groupe de travail 5B, qui s'est tenue samedi 8 novembre 1997 de 10 heures à 15 heures sous la présidence de M. Ito, le Sous-Groupe de rédaction 1 de ce groupe de rédaction s'est réuni le samedi 8 novembre, le dimanche 9 novembre et le lundi 10 novembre afin d'élaborer les éléments éventuels d'une solution réglementaire à la question du SFS non OSG, qui comporterait les trois étapes suivantes, définies dans le Document CMR97/114(Add.2):

a) bande Ku: établissement de limites strictes;

b) parties de la bande Ka non couvertes par la Résolution 118 ou par la Résolution 120: établissement de limites strictes;

c) parties de la bande Ka couvertes par la Résolution 118: application de la Résolution 46.

La section 1 du présent rapport se rapporte aux Etapes a) et b). La section 2 se rapporte à l'Etape c).

Il convient de signaler que tous ces éléments doivent être considérés comme mis entre crochets, puisque la question doit faire l'objet d'un examen approfondi détaillée et doit être résolue globalement. En particulier les valeurs exactes des limites proposées de puissance surfacique à appliquer aux systèmes non OSG et OSG du SFS, ainsi que les bandes de fréquences précises à l'intérieur desquelles ces limites peuvent s'appliquer, restent à examiner. De manière analogue, les conditions réglementaires précises définissant le statut relatif des systèmes OSG et non OSG dans les différentes bandes considérées restent également à examiner.

A des fins d'exhaustivité, les dispositions concernant la protection des appendices **30 et 30A** sont également reproduites. Ces dispositions, ainsi que la Résolution 506 seront examinées par le Groupe de travail 4D. Ces éléments sont laissés entre crochets en attendant leur examen par le Groupe de travail 4D. Il est suggéré de les porter à l'attention du Groupe de travail 4D à la première occasion, pour faciliter les délibérations au sein du groupe.

Les coordinateurs:

F. Rancy T. Tycz

1 Dispositions réglementaires concernant la bande Ku et les parties de la bande Ka non couvertes par la Résolution 118 ou par la Résolution 120 (Etapes a) et b) du Document CMR97/114(Add.2))

Dans les bandes de fréquences couvertes par l'article **S22.2** dans les bandes Ku et Ka, les dispositions réglementaires proposées visent à assurer la protection des systèmes non OSG du SFS et des systèmes du SRS, ainsi que la protection intégrale des Plans d'attribution et de leurs modifications futures. Les dispositions en question consistent en modifications des articles **S5** (pour les attributions actuelles au SFS et pour une attribution complémentaire au SFS) et **S22** et en deux Résolutions, se rapportant respectivement aux bandes de fréquences ne faisant pas l'objet d'un plan et à celles qui font l'objet d'un plan.

En ce qui concerne les bandes de fréquences spécifiques qui devraient être couvertes par ces dispositions, il a été convenu qu'il conviendrait de soumettre auxdites dispositions un nombre aussi grand que possible de ces bandes de fréquences, afin de conserver une souplesse suffisante à l'intention des exploitants non OSG qui leur permette de concevoir des systèmes capables de coexister dans les trois Régions avec des services terrestres ou avec d'autres services. Pour garantir une coexistence de ce type dans tous les cas, il est apparu nécessaire d'entreprendre des études complémentaires sur les possibilités de coexistence entre les services du SFS non OSG et les services terrestres dans les bandes partagées entre ces différents services, en particulier afin de protéger les stations spatiales non OSG des services de radiolocalisation dans la bande de fréquences 17,3 - 17,7 GHz, et des stations spatiales OSG dans la bande 17,3 - 17,8 GHz.

En ce qui concerne le niveau de protection des réseaux OSG vis-à-vis des systèmes non OSG, les Etats-Unis, le Canada et le Japon ont estimé que la définition de la limite à appliquer aux systèmes non OSG pour la protection à long terme des réseaux OSG peut s'appuyer sur un niveau de protection plus rigoureux qu'une augmentation de 6% du bruit, seuil actuellement appliqué entre les réseaux OSG pour déclencher la coordination.

En ce qui concerne la protection des systèmes OSG fonctionnant sur une orbite inclinée, il résulte des simulations effectuées sur le système Skybridge que cette protection serait assurée à une inclinaison de 5° à des niveaux identiques à ceux obtenus pour une inclinaison de 0°.

Les Etats-Unis ont suggéré qu'une alternative pourrait consister à inscrire les limites proposées dans une annexe à la Résolution appliquant les décisions de la CMR-97 à cet égard.

1.1 Modifications à l'article S5

MOD S5.441

L'utilisation des bandes 4 500 - 4 800 MHz (espace vers Terre), 6 725 - 7 025 MHz (Terre vers espace), par le service fixe par satellite doit être conforme aux dispositions de l'appendice **S30B**. L'utilisation des bandes 10,70 - 10,95 GHz (espace vers Terre), 11,20 - 11,45 GHz (espace vers Terre) et 12,75 - 13,25 GHz (Terre vers espace) par les réseaux à satellites géostationnaires du service fixe par satellite doit être conforme aux dispositions de l'appendice **S30B**. L'utilisation des bandes 10,7 - 10,95 GHz (espace vers Terre), 11,2 - 11,45 GHz et 12,75 - 13,25 GHz (Terre vers espace) par les systèmes à satellites non géostationnaires du service fixe par satellite doit être conforme aux dispositions de la Résolution [F 1].

MOD

GHz
10,7 – 12,7

Attribution aux services		
Région 1	Région 2	Région 3
11,7 – 12,5 FIXE RADIODIFFUSION RADIODIFFUSION PAR SATELLITE Mobile sauf mobile aéronautique	**11,7 – 12,1** FIXE S5.486 FIXE PAR SATELLITE (espace vers Terre) Mobile sauf mobile aéronautique S5.485 S5.488	**11,7 – 12,2** FIXE MOBILE sauf mobile aéronautique RADIODIFFUSION RADIODIFFUSION PAR SATELLITE
	12,1 – 12,2 FIXE PAR SATELLITE (espace vers Terre) S5.485 S5.488 S5.489	S5.487 S5.487A
S5.487 S5.487A	**12,2 – 12,7** FIXE MOBILE sauf mobile aéronautique RADIODIFFUSION RADIODIFFUSION PAR SATELLITE S5.488 S5.490 S5.492 S5.487A	**12,2 – 12,5** FIXE MOBILE sauf mobile aéronautique RADIODIFFUSION S5.487 S5.491

[Les deux dispositions suivantes restent entre crochets en attendant leur examen par le GT 4D:

ADD S5.487A *Attribution additionnelle*: en Région 1, la bande 11,7 - 12,5 GHz, en Région 2, la bande 12,2 - 12,7 GHz et en Région 3 la bande 11,7 - 11,2 GHz sont aussi attribuées à titre primaire au service fixe par satellite (espace vers Terre), limité aux systèmes à satellites non géostationnaires. Cette utilisation est subordonnée aux dispositions de la Résolution [F-1].

MOD S5.516 L'utilisation de la bande 17,3 - 18,1 GHz par des systèmes à satellites OSG dans le service fixe par satellite (Terre vers espace) est limitée aux liaisons de connexion pour le service de radiodiffusion par satellite. En ce qui concerne l'utilisation de la bande 17,3 - 17,8 GHz en Région 2 par les liaisons de connexion pour le service de radiodiffusion par satellite qui utilisent la bande 12,2 - 12,7 GHz, voir l'article ~~**S11**~~**S10**. L'utilisation des

bandes 17,3 - 18,1 GHz en Régions 1 et 3 et 17,3 - 17,8 GHz en Région 2 par les systèmes à satellites non géostationnaires du service fixe par satellite est subordonnée aux dispositions de la Résolution [F-1].]

1.2 Modifications à l'article S22

Section II. Contrôle des brouillages causés aux systèmes à satellites géostationnaires

MOD S22.2 § 2. (1) Les ~~stations spatiales~~ systèmes à satellites non géostationnaires ne doivent ~~cesser leurs émissions ou les réduire à un niveau négligeable, et les stations terriennes qui communiquent avec elles ne doivent plus émettre à leur intention, lorsque des brouillages inacceptables sont causés à des systèmes spatiaux~~ pas provoquer un brouillage inacceptable à des sytèmes à satellites géostationnaires du service fixe par satellite ~~fonctionnant~~, conformément aux dispositions du présent Règlement.

ADD S22.5A1 Dans les bandes de fréquences 10,7 - 11,7 GHz, 12,5 - 12,75 GHz, 17,3 - 18,1 GHz et 18,1 - 18,4 GHz, la densité maximale de puissance cumulative produite sur l'orbite géostationnaire par toutes les stations spatiales d'un système à satellites non géostationnaires du service fixe par satellite ou du service de radiodiffusion par satellite ne doit pas dépasser les valeurs données dans les Tableaux **S22-2** et **S22-4**.

[Les dispositions **S22.5B** relatives au Tableau **S22-2** sont maintenues entre crochets en attendant leur examen par le GT 4D:

ADD S22.5B § 6. (1) La puissance surfacique équivalente[1], en un point quelconque à la surface de la Terre visible depuis l'orbite des satellites géostationnaires, produite par les émissions de toutes les stations spatiales d'un système non géostationnaire du service fixe par satellite fonctionnant dans les bandes de fréquences suivantes, y compris les émissions d'un satellite réflecteur, pour toutes les conditions et toutes les méthodes de modulation, ne doit pas dépasser les limites indiquées dans le Tableau **S22-1** pendant les pourcentages de temps donnés. Ces limites s'entendent de la puissance surfacique équivalente que l'on obtiendrait dans des conditions de propagation en espace libre, et s'appliquent à une antenne de référence et dans la largeur de bande de référence spécifiée au Tableau **S22-1**, dans toutes les directions de pointage vers l'orbite des satellites géostationnaires.

ADD S22.5B.1

[1] La puissance surfacique équivalente est définie comme étant la somme des puissances surfaciques produites en un point de la surface de la Terre par toutes les stations spatiales d'un système non géostationnaire, compte tenu de la discrimination hors axe d'une antenne de réception de référence que l'on suppose pointée en direction de l'orbite des satellites géostationnaires. Elle est calculée à l'aide de la formule suivante:

$$epfd = 10.\log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

où:

– N est le nombre de stations spatiales non géostationnaires visibles depuis le point considéré à la surface de la Terre et dont l'angle d'élévation est supérieur ou égal à 0°;

– i est l'indice de la station spatiale non géostationnaire considérée;

– pfd_i est la puissance surfacique produite au point considéré à la surface de la Terre, en dB (W/m^2) dans la largeur de bande de référence;

– θ_i est l'angle entre la direction considérée vers l'orbite des satellites géostationnaires et la direction de la station spatiale brouilleuse du système non géostationnaire;

– $G_r(\theta_i)$ est le gain de l'antenne réceptrice de référence considérée comme faisant partie d'un réseau géostationnaire;

– G_{max} est le gain maximal de l'antenne réceptrice de référence susmentionnée;

– $epfd$ est la puissance surfacique équivalente calculée en dB(W/m^2) dans la largeur de bande de référence.

ADD TABLEAU **S22-1**

Bande de fréquences attribuée au SRS	Puissance surfacique dB(W/m^2)	Pourcentage de temps pendant lequel le niveau de puissance surfacique ne peut pas être dépassé	Diagramme de rayonnement de l'antenne de référence	Largeur de bande de référence (MHz)
11,7 - 12,5 GHz en Région 1 11,7 - 12,2 GHz et 12,5 - 12,7 GHz en Région 3	-145 -132	99,7% 100%	Recommandation UIT-R **BO.1213** (pour les Régions 1 et 3)	27
12,2 - 12,7 GHz en Région 2	-144 -131	99,7% 100%	Section 3.7.2 de l'annexe 5 de l'appendice **30** pour la Région 2	27

ADD S22.5C (2) La puissance surfacique cumulative[1] produite en un point quelconque de l'orbite des satellites géostationnaires, par les émissions de toutes les stations terriennes d'un système non géostationnaire du service fixe par satellite, pour toutes les conditions et pour toutes les méthodes de modulation, ne doit pas dépasser les limites indiquées dans le Tableau **S22-2** pendant les pourcentages de temps spécifiés. Ces limites s'entendent de la

puissance surfacique que l'on obtiendrait dans des conditions de propagation en espace libre à l'intérieur de la largeur de bande de référence spécifiée dans ce Tableau.

ADD S22.5C.1

---

[1] La puissance surfacique cumulative est définie comme étant la somme des puissances surfaciques produites en un point de l'orbite des satellites géostationnaires par toutes les stations terriennes d'un système non géostationnaire. Elle est calculée à l'aide de la formule suivante:

$$apfd = 10.\log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4.\pi.d_i^2}\right]$$

où:

- N est le nombre de stations terriennes du système non géostationnaire présentant un angle d'élévation supérieur ou égal à 0°, depuis lequel le point considéré de l'orbite des satellites géostationnaires est visible;
- i est l'indice de la station terrienne considérée du système non géostationnaire;
- P_i est la puissance RF à l'entrée de l'antenne d'émission de la station terrienne considérée du système non géostationnaire, en dB (W/m^2) dans la largeur de bande de référence;
- $\theta_i(t)$ est l'angle entre l'axe de visée de la station terrienne considérée du système non géostationnaire et la direction du point considéré de l'orbite du satellite géostationnaire;
- $G_t(\theta_i)$ est le gain de l'antenne d'émission de la station terrienne considérée du système non géostationnaire dans la direction du point considéré de l'orbite des satellites géostationnaires;
- d est la distance entre la station terrienne considérée du système non géostationnaire et le point considéré de l'orbite des satellites géostationnaires;
- *apfd* est la puissance surfacique cumulative, en dB(W/m^2) dans la largeur de bande de référence.

ADD

TABLEAU **S22-2**

Bande de fréquences	Puissance surfacique cumulative en dB(W/m^2)	Pourcentage de temps pendant lequel le niveau de puissance surfacique ne peut pas être dépassé	Largeur de bande de référence (MHz)
14,5 - 14,8 GHz en Régions 1 et 3 (en dehors de l'Europe)	-119 -115	99,97% 100%	27
17,3 - 18,1 GHz en Régions 1, 2 et 3			

ADD S22.5D

(3) La puissance surfacique équivalente[1], en un point quelconque à la surface de la Terre visible depuis l'orbite des satellites géostationnaires, produite par les émissions de toutes les stations spatiales d'un système non géostationnaire du service fixe par satellite fonctionnant dans les bandes de fréquences suivantes, y compris les émissions d'un satellite réflecteur, pour toutes les conditions et toutes les méthodes de modulation, ne doit pas dépasser les limites indiquées dans le Tableau **S22-3** pendant les pourcentages de temps considérés. Ces limites s'entendent de la puissance surfacique équivalente que l'on obtiendrait dans des conditions de propagation en espace libre et s'appliquent à toutes les antennes de référence et dans les largeurs de bande de référence indiquées dans ce Tableau et dans toutes les directions de pointage en direction de l'orbite géostationnaire.

ADD

TABLEAU **S22-3**

Bande de fréquences	Puissance surfacique équivalente dB(W/m^2)	Pourcentage de temps pendant lequel le niveau de puissance surfacique peut ne pas être dépassé	Largeur de bande de référence (KHz)	Diamètre de l'antenne de référence et diagramme de rayonnement de référence
10,7 - 10,95 GHz 11,7 - 12,2 GHz en Région 2 12,2 - 12,5 GHz en Région 3 12,5 - 12,75 GHz en Régions 1 et 3	-179 -192 -185 -170	99,7% 99,9% 99,97% 100%	4 4 4 4	60 cm, ITU-R Rec. 465-5 3 m, ITU-R Rec. 465-5 10 m, ITU-R Rec. 465-5 60 cm, 3 m et 10 m ITU-R Rec. 465-5
17,7 - 18,8 GHz 19,7 - 20,2 Ghz	-153 -153 -153 -138	99% 99,7% 99,9% 100%	1 000 1 000 1 000 1 000	30 cm, ITU-R Rec. 465-5 2 m, ITU-R Rec. 465-5 5 m, ITU-R Rec. 465-5 30 cm, 2 m et 5 m ITU-R Rec. 465-5

ADD **S21.19**

(2) La puissance surfacique cumulative[1] produite en un point quelconque de l'orbite des satellites géostationnaires par les émissions de toutes les stations terriennes d'un système non géostationnaire, pour toutes les conditions et pour toutes les méthodes de modulation, ne doit pas dépasser les limites indiquées dans le Tableau **S21-6** pendant tous les pourcentages de temps. Ces limites s'entendent de la puissance surfacique que l'on obtiendrait dans des conditions de propagation en espace libre dans la largeur de bande de référence indiquée dans ce tableau.

ADD

TABLEAU **S22-4**

Bande de fréquences	Puissance surfacique cumulée dB(W/m^2)	Pourcentage de temps pendant lequel le niveau de puissance surfacique peut ne pas être dépassé	Largeur de bande de référence (kHz)
10,7 - 11,7 GHz et 12,5 - 75 GHz	-170	100%	4
12,75 - 13,25 GHz	-186	100%	4
13,75 - 14,5	-170	100%	1 000
18,1 - 18,4 GHz 24,75 - 25,75 GHz en Régions 2 et 3 27 - 27,5 GHz en Régions 2 et 3 27,5 - 28,6 GHz 29,1 - 30 GHz*	-145	100%	1 000

* Dans la bande 29,1 - [29,4] [29,5] GHz, ces limites ne s'appliquent pas aux réseaux de liaison de connexion non géostationnaires du service mobile par satellite.

ADD S22.5F Les limites indiquées aux Tableaux **S22-2** à **S22-4** peuvent être dépassées sur le territoire de tout pays dont l'administration a donné son approbation à cet effet.

Section VI. Limitations de la puissance des stations terriennes en dehors de l'axe du faisceau principal

MOD S22.26 § 9. Le niveau de puissance isotrope rayonnée équivalente (p.i.r.e.) émis par ~~une~~ toute station terrienne pour tout angle en dehors de l'axe du faisceau principal ~~en direction de l'orbite des satellites géostationnaires exerce une influence significative sur les brouillages causés aux autres réseaux à satellite géostationnaire. La réduction à un minimum des rayonnements hors axe assurerait une utilisation plus efficace de l'orbite des satellites géostationnaires et faciliterait la coordination; les administrations sont invitées à obtenir, à cet égard, les valeurs les plus faibles pratiquement possibles, compte tenu des Recommandations de l'UIT-R les plus récentes. La réduction à un minimum de ces niveaux est particulièrement importante dans les bandes de fréquences utilisées de façon intensive pour les liaisons montantes.~~ ne doit pas dépasser les valeurs suivantes pour tout angle φ hors axe, qui est 2,5° ou plus en dehors de l'axe du lobe principal de l'antenne de la station terrienne:

Angle hors axe	*p.i.r.e. maximum par 40 kHz*
2,5° ≤ φ ≤ 7°	(39 – 25 log φ) dB(W/40 kHz)
7° < φ ≤ 9,2°	18 dB(W/40 kHz)
9,2° < φ ≤ 48°	(42 – 25 log φ) dB(W/40 kHz)
48° < φ ≤ 180°	0 dB(W/40 kHz)

ADD S22.27 Pour les émissions TV-FM utilisant la dispersion d'énergie, les limites indiquées au **S22.26** peuvent être dépassées d'une valeur ne dépassant pas 3 dB à condition que la p.i.r.e. totale hors axe de la porteuse FM-TV émise ne dépasse pas les valeurs suivantes:

Angle hors axe	*p.i.r.e. maximum*
2,5° ≤ φ ≤ 7°	(53 – 25 log φ) dBW
7° < φ ≤ 9,2°	32 dBW
9,2° < φ ≤ 48°	(56 – 25 log φ) dBW
48° < φ ≤ 180°	14 dBW

ADD S22.28 Pour les porteuses FM-TV qui fonctionnent sans dispersion d'énergie, de telles porteuses devraient être modulées en permanence avec le matériel de programme ou les diagrammes de test appropriés. Dans ce cas, la p.i.r.e. totale hors axe de la porteuse FM-TV émise ne doit pas dépasser les valeurs suivantes:

Angle hors axe	*p.i.r.e. maximum*
2,5° ≤ φ ≤ 7°	(53 – 25 log φ) dBW
7° < φ ≤ 9,2°	32 dBW
9,2° < φ ≤ 48°	(56 – 25 log φ) dBW
48° < φ ≤ 180°	14 dBW

ADD S22.29 Les limites de p.i.r.e. indiquées aux numéros **S22.26, S22.27** et **S22.28** sont applicables dans les bandes suivantes attribuées au service fixe par satellite (Terre vers espace):

12,5 - 12,75 GHz (Région 1),

12,7 - 12,75 GHz (Région 2),

12,75 - 13,25 GHz,

13,75 - 14 GHz,

14 - 14,5 GHz,

17,3 - 18,4 GHz

ADD **Section VII. Limites de puissance des stations spatiales géostationnaires**

ADD S22.30

Les stations spatiales géostationnaires ne doivent pas produire de densité de puissance surfacique à la surface de la Terre supérieures aux valeurs indiquées dans le tableau ci-dessous:

Bande de fréquences	Service	Limite en dB(W/m^2) pour l'angle d'incidence δ au-dessus du plan horizontal			Largeur de bande de référence
		0° - 5°	5° - 25°	25° - 90°	
11,7 - 12,2 GHz (Région 2)	Fixe par satellite (E-T)	–114	–114 + 0,5 (δ–5)	–104	10 MHz
12,5 - 12,75 GHz (Région 1)	Fixe par satellite (E-T)	–114	–114 + 0,5 (δ–5)	–104	10 MHz
19,7 - 20,2 GHz	Fixe par satellite (E-T)	–105	–105 + 0,5 (δ–5)	–95	10 MHz

ADD S22.31 Les limites indiquées au numéro **S22.30** peuvent être dépassées sur le territoire de tout pays dont l'administration a donné son accord.

3 Résolutions

La section 3.1 regroupe les propositions de projets de Résolutions de la CMR-97 relatives aux Etapes a) et b) dont il est question dans l'introduction du présent rapport, c'est-à-dire des limites strictes de l'article **S22**.

Les Etats-Unis ont proposé une autre solution selon laquelle ces limites seraient considérées comme des seuils, des dispositions analogues à celles de la Résolution 46 étant appliquées. Un projet de Résolution CMR-97 portant application de cette méthode a été proposé par les Etats-Unis (voir la section 3.2).

3.1 Projets de Résolutions CMR-97 proposés pour les Etapes a) et b)

ADD

PROJET DE RÉSOLUTION [COM5-18]

COEXISTENCE DE SYSTÈMES NON GÉOSTATIONNAIRES DU SERVICE FIXE ET DE SYSTÈMES GÉOSTATIONNAIRES DANS CERTAINES BANDES DE FRÉQUENCES

La Conférence mondiale des radiocommunications (Genève, CMR-97),

considérant

a) que les interprétations divergentes du numéro **S22.2** ont pour conséquence de conférer un statut réglementaire ambigu aux systèmes géostationnaires et aux systèmes non géostationnaires du service fixe par satellite, aussi bien existants que futurs, dans les bandes dans lesquelles cette disposition s'applique, d'où certains risques pour les deux types de systèmes;

b) que pour assurer le développement harmonieux des systèmes non géostationnaires et des systèmes géostationnaires du service fixe par satellite, il est nécessaire de résoudre ces ambiguïtés sans délai;

c) que pour résoudre ces ambiguïtés, on peut inclure dans l'article **S22** des limites de puissance rayonnée par les systèmes non géostationnaires afin de conférer une protection adéquate aux systèmes géostationnaires dans les bandes de fréquences et dans les configurations de partage dans lesquelles la Résolution **46** ne s'applique pas;

d) que de telles limites ont été définies dans certaines bandes de fréquences actuellement utilisées ou que l'on prévoit d'utiliser de façon intensive pour les systèmes géostationnaires du service fixe par satellite;

e) que l'on propose dans ces bandes des systèmes non géostationnaires du service fixe par satellite qui pourraient respecter ces limites et bénéficier d'une protection adéquate contre les émissions des systèmes géostationnaires existants et futurs du service fixe par satellite sans qu'il en résulte des contraintes additionnelles, ce qui permettrait de se dispenser d'une coordination mutuelle;

f) que l'application de la Résolution **46**, en l'absence de limites entraînant des contraintes au niveau de la conception des systèmes géostationnaires et des systèmes non géostationnaires du service fixe par satellite et favorisant l'utilisation de techniques d'atténuation, devrait être envisagée avec prudence;

g) que dans les bandes dans lesquelles ces limites s'appliquent, il ne serait pas nécessaire de prévoir une procédure de coordination entre systèmes non géostationnaires et systèmes géostationnaires du service fixe par satellite,

décide

1 que, dans les bandes de fréquences spécifiées dans les Tableaux **S22-2** à **S22-4**, les systèmes non géostationnaires du service fixe par satellite pour lesquels tous les renseignements de notification ont été reçus par le Bureau des radiocommunications après le 21 novembre 1997 seront visés par les limites provisoires de puissance spécifiées dans l'article **S22**;

2 [que dans l'application du numéro **S22.2**, les administrations pourront considérer ces limites provisoires de puissance comme niveaux admissibles de brouillage occasionné par un système non OSG [pour lequel tous les renseignements de notification ont été reçus avant le 21 novembre 1997] à un système OSG, quelle que soit la date de réception par le Bureau de tous les renseignements relatifs à la coordination concernant [ce système OSG] [ces systèmes];

3 [qu'une administration proposant un système non OSG [pour lequel tous les renseignements de notification ont été reçus par le Bureau après le 21 novembre 1997 et] qui respecte les limites dont il est question plus haut sous *décide* 1 sera considérée comme s'étant acquittée de ses obligations au titre du numéro **S22.2** [relativement aux réseaux OSG pour lesquels tous les renseignements de notification ont été reçus par le Bureau après le 21 novembre 1997];]

4 que, dans les bandes de fréquences comprises entre 10,7 et 30 GHz, les systèmes à satellites géostationnaires du service fixe par satellite pour tous les renseignements relatifs à la coordination ont été reçus par le Bureau après le 21 novembre 1997 seront visés par les limites provisoires définies dans l'article **S22**;

5 qu'il ne sera pas revendiqué, pour des systèmes non géostationnaires, de protection contre les émissions de réseaux à satellite géostationnaires exploités conformément aux dispositions du Règlement des radiocommunications [et du point *décide* 4] ci-dessus, quelle que soit la date de réception par le Bureau de tous les renseignements de notification relatifs à ces systèmes non géostationnaires;

6 que les limites spécifiées dans les Tableaux **S22-1** à **S22-3** pourront être dépassées sur le territoire de tout pays dont l'administration l'accepte;

7 [qu'entre le 21 novembre 1997 et la date d'adoption des limites définitives, les demandes relatives à des systèmes non OSG soumises au BR ne seront pas traitées tant que les limites provisoires dont il est question plus haut sous *décide* 1 n'auront pas été confirmées par une conférence compétente];

8 que, si une administration exploitant ou planifiant un système SFS OSG considère qu'un système SFS non OSG proposé par une autre administration pourrait occasionner un brouillage inacceptable à son système OSG, les administrations concernées ne devront ménager aucun effort pour résoudre les difficultés en procédant dans leurs réseaux à des ajustements mutuellement acceptables,

[charge le Bureau des radiocommunications

lors de l'inscription, dans le Fichier de référence, d'assignations à un système non OSG du service fixe par satellite, de formuler sa conclusion quant à la conformité desdites assignations avec les limites dont il est question plus haut sous *décide* 1 sous réserve d'examen de ladite conformité après l'adoption finale de ces limites par une conférence compétente],

charge l'UIT-R

1 de procéder d'urgence et à temps pour que la CMR-99 puisse les examiner,

a) à des études techniques, opérationnelles et réglementaires appropriées ayant pour objet de réexaminer les conditions réglementaires applicables à la coexistence de systèmes non OSG et de systèmes OSG dans le service fixe par satellite, de sorte que ces systèmes n'entraînent aucune contrainte excessive pour le développement des systèmes non géostationnaires ou des systèmes géostationnaires du service fixe par satellite;

b) d'élaborer une méthode de calcul des niveaux de puissance produits par les systèmes non OSG et la conformité de ces niveaux aux limites dont il est question aux points 1 2 et 3 ci-dessus;

c) de mener à terme les études concernant les critères de partage à appliquer pour déterminer la nécessité de la coordination entre systèmes non géostationnaires du service fixe par satellite;

2 de procéder à l'élaboration de limites de puissance afin de protéger les systèmes géostationnaires du service fixe par satellite, existants et futurs, dans les bandes dans lesquelles des systèmes non géostationnaires du service fixe seront probablement mis en oeuvre et dans lesquelles des systèmes géostationnaires du service fixe sont utilisés ou seront sans doute utilisés, de façon intensive;

ADD

PROJET DE RÉSOLUTION [COM5-19]

UTILISATION DES BANDES DE FRÉQUENCES RÉGIES PAR LES APPENDICES 30, 30A ET 30B PAR DES RÉSEAUX NON OSG

La Conférence mondiale des radiocommunications (Genève, 1997),

considérant

a) que des limites ont été établies et incorporées dans l'article **S22** pour faire en sorte que les brouillages causés par des systèmes à satellites non géostationnaires à des assignations exploitées conformément aux appendices 30, 30A et 30B soient maintenus à des niveaux négligeables;

b) que l'intégrité des Plans ci-dessus mentionnés doit être assurée;

c) que les systèmes non OSG ne doivent pas être incorporés dans ces Plans, de sorte qu'ils ne doivent pas appliquer les procédures associées, lesquelles ne les protègent pas,

décide

que les systèmes non OSG exploités dans les bandes de fréquences visées par les appendices **30**, **30A** et **30B** doivent respecter les limites spécifiées dans l'article **S22** et peuvent appliquer, à compter du 22 novembre 1997, les procédures de la section I de l'article **S9 [11]** et les procédures de l'article **S11 [13]**,

charge l'UIT-R

a) de procéder d'urgence et à temps pour que la CMR-99 puisse les examiner, à des études techniques, opérationnelles réglementaires appropriées ayant pour objet de réexaminer les dispositions réglementaires concernant l'exploitation de systèmes SFS non OSG dans ces bandes de fréquences, afin de conférer aux Plans et à leurs futures modifications une protection appropriée et [dans la mesure du possible] afin de n'imposer aucune contrainte excessive au développement des systèmes géostationnaires dans ces bandes;

b) de faire rapport à la RPC-99 lorsque ces études auront été menées à bien.

3.2 Projet de Résolution CMR-97 utilisant les seuils définis et la méthode de la Résolution 46

PROJET DE RÉSOLUTION [COM5-20]

UTILISATION DE CERTAINES FRÉQUENCES DE LA BANDE KU PAR DES SYSTÈMES NON GÉOSTATIONNAIRES DU SERVICE FIXE PAR SATELLITE (SFS)

La Conférence mondiale des radiocommunications (Genève, 1997),

considérant

a) que l'Union internationale des télécommunications a notamment pour objet "de s'efforcer d'étendre les avantages des nouvelles technologies de télécommunication à tous les habitants de la planète "(numéro **6** de la Constitution de l'Union internationale des télécommunications (Genève, 1992));

b) qu'il est souhaitable, à cet égard, de promouvoir des systèmes susceptibles d'assurer un service universel;

c) que les nouveaux services de télécommunication nécessitent des réseaux perfectionnés et fiables permettant des communications à forte capacité;

d) que les systèmes reposant sur l'utilisation des nouvelles technologies associées aux constellations de satellites géostationnaires (OSG) et non géostationnaires (non OSG) permettent d'assurer, dans les régions les plus isolées du monde, des communications à forte capacité et faible coût;

e) qu'un grand nombre de Membres de l'Union ont besoin de tels systèmes;

f) que l'exploitation de tels systèmes impose de disposer d'une quantité de spectre adéquate dans des bandes de fréquences appropriées;

g) que les décisions prises en la matière doivent permettre d'exploiter un nombre de systèmes aussi élevé que possible;

h) qu'il est nécessaire d'assurer la fourniture des services dans des conditions de concurrence entre systèmes SFS/OSG et systèmes SFS/non OSG, ainsi qu'entre systèmes SFS/non OSG;

i) que s'il est vrai que de tels systèmes doivent être élaborés de tout urgence, certaines questions techniques, de partage et de réglementation doivent être étudiées pour que l'on puisse parvenir à l'utilisation la plus efficace et la plus souple des fréquences pouvant être mises à leur disposition,

notant

1 que des informations relatives aux systèmes OSG et des systèmes non OSG [dans certaines bandes du SFS] ont été communiquées au Bureau des radiocommunications;

2 que bon nombre des systèmes en cause sont en exploitation et que d'autres seront mis en service dans un avenir proche, de sorte qu'il pourra être difficile de modifier leurs caractéristiques;

3 que les autres services de radiocommunication qui utilisent ces bandes à titre coprimaire, ainsi que les droits de ces services, doivent être protégés,

considérant en outre

a) que les bandes de fréquences suivantes attribuées au SFS peuvent, conformément au Règlement des radiocommunications, être utilisées par des réseaux SFS OSG et des réseaux SFS non OSG;

b) que les dispositions du numéro **S22.2** peuvent être à l'origine d'incertitudes dans la planification, la coordination et la mise en oeuvre des systèmes SFS OSG et des systèmes SFS non OSG auxquels ces dispositions s'appliquent;

c) que des études techniques sont requises pour évaluer la mesure dans laquelle le partage de ces bandes de fréquences du SFS est possible entre systèmes SFS OSG et systèmes SFS non OSG, entre systèmes SFS non OSG et entre systèmes SFS non OSG et systèmes de Terre;

d) que l'UIT-R étudie actuellement des techniques de partage susceptibles d'être utilisées entre systèmes SFS OSG et systèmes SFS non OSG ou parmi de tels systèmes;

e) que le nombre de ces systèmes SFS, OSG ou non OSG, proposés et en exploitation dans les bandes attribuées au service fixe par satellite auxquelles s'applique le numéro **S22.2** varie d'une bande à l'autre;

f) que dans certaines bandes du SFS, la Résolution **46 (CMR-95)/S9.11** s'applique tandis que le numéro **S22.2** du Règlement des radiocommunications ne s'applique pas,

décide

1 que, dans les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), les systèmes du SFS non OSG ne sont pas visés par les dispositions du numéro **S22.2** et sont soumis à l'application des dispositions du numéro **S9.12** pour ce qui est de la coordination entre systèmes SFS non OSG et systèmes SFS OSG;

2 de charger l'UIT-R d'étudier et d'établir sans délai bande par bande et cas par cas, pour les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), les prescriptions techniques, opérationnelles et réglementaires relatives à l'utilisation en partage de ces bandes aussi bien par les systèmes SFS OSG que par les systèmes SFS non OSG, en vue de définir une méthode et des critères applicables pour déterminer le nombre minimal de coordination requises entre systèmes SFS OSG et systèmes SFS non OSG;

3 dans l'intervalle, et jusqu'à ce que la CMR-99 confirme qu'une telle prescription demeure nécessaire, que les systèmes SFS non OSG exploités dans les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), ne peuvent revendiquer aucune protection vis-à-vis des systèmes SFS OSG;

4 de charger l'UIT-R d'étudier et d'établir sans délai bande par bande et cas par cas, pour les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), les prescriptions techniques, opérationnelles et réglementaires relatives à l'utilisation en partage de ces bandes par de multiples systèmes du SFS non OSG, afin de définir une méthode et des critères applicables pour faciliter la coordination entre systèmes SFS non OSG;

5 que les systèmes SFS non OSG exploités dans les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), sont soumis à l'application des dispositions du numéro **S9.14** pour ce qui est de la coordination entre systèmes SFS non OSG et systèmes de Terre;

6 de charger l'UIT-R d'étudier et d'établir sans délai, bande par bande et cas par cas, pour les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), les prescriptions techniques, opérationnelles et réglementaires relatives à l'utilisation de ces bandes aussi bien par des systèmes de Terre que par des systèmes SFS non OSG afin de définir une méthode et des critères applicables pour déterminer le nombre minimal de coordination requises entre systèmes SFS OSG et systèmes SFS non OSG;

7 que les systèmes SFS non OSG exploités dans les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), sont soumis à l'application des dispositions du numéro **S9.12** pour ce qui est de la coordination entre systèmes SFS non OSG;

8 de charger l'UIT-R d'étudier et d'établir sans délai, bande par bande et cas par cas, pour les bandes de fréquences dont il est question plus haut au point *considérant en outre* a), les prescriptions techniques opérationnelles et réglementaires relatives au partage entre systèmes SFS non OSG, en vue de définir une méthode et des critères applicables pour faciliter la coordination entre systèmes SFS non OSG;

9 que dans les bandes attribuées comme il convient et dont il est question plus haut au point *considérant en outre* a), les stations terriennes SFS non OSG sont soumises à l'application des dispositions du numéro **S9.15** vis-à-vis des stations de Terre;

10 que dans les bandes attribuées comme il convient et dont il est question plus haut au point *considérant en outre* a), les stations terriennes SFS non OSG exploitées en sens inverse sont soumises à l'application des dispositions du numéro **S9.17A** vis-à-vis des autres stations terriennes,

décide en outre

1 de charger le directeur du Bureau des radiocommunications, après avoir consulté les Présidents des commissions d'études, de faire en sorte que les études en cause soient menées sans délai et que les résultats en soient disponibles d'ici [XXXX];

2 que les résultats des études en cause, lorsqu'ils auront été approuvés par les procédures accélérées, seront utilisés à titre provisoire pour déterminer si la coordination d'un système SFS non OSG avec des systèmes SFS OSG est requise conformément au numéro **S9.12**;

3 que les résultats des études en cause, lorsqu'ils auront été approuvés par les procédures accélérées, seront utilisés à titre provisoire pour déterminer si la coordination entre des systèmes SFS non OSG et des systèmes de Terre est requise conformément au numéro **S9.15**;

4 de recommander que la RPC-99 examine les résultats des études en cause et fasse part de ses conclusions à la CMR-99;

5 de recommander que la CMR-99 prenne des mesures appropriées, sur la base des résultats communiqués par la RPC-99, en vue du développement harmonieux des systèmes SFS OSG, des systèmes SFS non OSG et des systèmes de Terre dans les bandes dont il est question plus haut au point *considérant en outre* a),

recommande

aux futures conférences mondiales des radiocommunications d'examiner les résultats d'études portant sur les avantages qui pourraient découler de l'utilisation de technologies satellitaires non OSG et, si nécessaire, de déterminer des bandes de fréquences additionnelles pouvant être utilisées par des systèmes SFS non OSG,

prie instamment les administrations

de coopérer sans délai, dans la mesure du possible, à la poursuite des études requises, de manière à obtenir des résultats que puissent accepter toutes les parties concernées.

2 Dispositions réglementaires régissant les parties de la bande Ka visées par la Résolution 118

MOD

GHz

18,6 – 20,2

Attribution aux services		
Région 1	Région 2	Région 3
18,8 – 19,3	FIXE FIXE PAR SATELLITE (espace vers Terre) MOD S5.523A MOBILE	

MOD

GHz

27 – 29,9

Attribution aux services		
Région 1	Région 2	Région 3
28,5 – 29,1	FIXE FIXE PAR SATELLITE (Terre vers espace) MOD S5.523A S5.539 MOBILE Exploration de la Terre par satellite (Terre vers espace) S5.541 S5.540	

MOD S5.523A

~~L'utilisation des bandes 18,8 - 19,3 GHz et 28,6 - 29,1 GHz par le SFS doit être conforme à la Résolution **118 (CMR-95)**.~~ L'utilisation des bandes 18,8 - 19,3 GHz (espace vers Terre) et 28,6 - 29,1 GHz (Terre vers espace) par des réseaux géostationnaires et des réseaux non géostationnaires du service fixe par satellite est soumise à l'application des dispositions du numéro **S9.11A**/de la Résolution **46(Rév.CMR-95)** et le numéro **S22.2**[numéro **2613**] ne s'applique pas. [Les réseaux OSG sous coordination avant le 18 novembre 1995 devront avoir mené à bien la coordination au titre du numéro **S9.11A**/de la Résolution **46(Rév.CMR-95)** avec les réseaux non géostationnaires pour lesquels les renseignements requis ont été reçus par le Bureau avant cette date de notification. Les réseaux non géostationnaires ne doivent causer aucun brouillage inacceptable aux réseaux géostationnaires du service fixe par satellite pour lesquels tous les renseignements de notification au titre de l'appendice **3** sont considérés comme ayant été reçus par le Bureau avant le 18 novembre 1995].

ANNEXE 1

Liste des participants aux séances du Sous-Groupe de rédaction 1 du Groupe de rédaction 1 du Groupe ad hoc 5B du Groupe 4 (non OSG/SFS)

Samedi 8 novembre 1997, de 15 h 30 à 18 heures		Dimanche 9 novembre 1997, de 10 heures à 16 heures		Lundi 10 novembre 1997, de 9 h 30 à 10 h 30	
Administration/Organisation	**Nom**	**Administration/Organisations**	**Nom**	**Administration/Organisation**	**Nom**
Australie	B. Mc. Donald	Australie	B. Mc. Donald	Australie	B. Mc. Donald
Brésil	J. Albuquerque	Brésil	J. Albuquerque	Brésil	J. Albuquerque
Canada	V. Mimis	Canada	V. Mimis	Canada	V. Mimis
	M. Dupuis		M. Dupuis		M. Dupuis
France	F. Rancy		S. Doiron		S. Doiron
	V. Meens	**France**	F. Rancy	**France**	F. Rancy
	C. Michel		V. Meens		V. Meens
Indonésie	A. Djiwatanpu		C. Michel		C. Michel
Japon	T. Yamauchi		J.C. Guiguet		J.C. Guiguet
Liban	M. Ghazal	**Indonésie**	A. Djiwatanpu		J. Chartier
	R. Bahsoun	**Japon**	T. Yamauchi		F. Rontard
	A. Majeed		H. Tanaka	**Japon**	T. Yamauchi

Arabie saoudite	B. Lemouchi		J. Leary		H. Tanaka
République Sud-Africaine	S. Hibbard		T. Otsu		J. Leary
Etats-Unis d'Amérique	T. Tycz	**Liban**	M. Ghazal	**Liban**	M. Ghazal
	E. Davison		R. Bahsoun		R. Bahsoun
	W. Long		A. Majeed		A. Majeed
Intelsat	V. Sahay	**Arabie saoudite**	B. Lemouchi	**Portugal**	F. Guerra
		République Sudafricaine	S. Hibbard	**République Sudafricaine**	B. Lemouchi
			D. Harie	**République Sudafricaine**	S. Hibbard
		Turquie	F.M. Yurdal		P. Lochner
			A.H. Erdinc	**Royaume-Uni**	C. Cheeseman
		Etats-Unis d'Amérique	T. Tycz	**Etats-Unis d'Amérique**	T. Tycz
			E. Davison		E. Davison
			D. Parlow		W. Long
			G. Creezer		G. Creezer
		Intelsat	H. Enriques		H. Enriques
			V. Sahay	**Intelsat**	K. Betaharon
					H. Henriques
				Commission européenne	R. Niepold
					S. Kramer

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

CMR-97 CONFERENCIA MUNDIAL DE RADIOCOMUNICACIONES

Documento DL/40-S
10 de noviembre de 1997
Original: inglés

GINEBRA, 27 DE OCTUBRE – 21 DE NOVIEMBRE DE 1997

GT 5B AD HOC 4

GRUPO DE REDACCIÓN 1 DEL GT 5B AD HOC 4

INFORME AL GT 5B AD HOC 4 SOBRE DISPOSICIONES REGLAMENTARIAS RELATIVAS AL FUNCIONAMIENTO DE LOS SISTEMAS DE SATÉLITES NO GEOESTACIONARIOS Y DE SATÉLITES GEOESTACIONARIOS DEL SFS EN LAS BANDAS DE 10,7 A 30 GHz

En este documento figuran los resultados de los trabajos realizados por el Subgrupo de Redacción 1 del Grupo de Redacción 1 del GT 5B ad hoc 4 sobre disposiciones reglamentarias necesarias para permitir a los sistemas de satélites no geoestacionarios del SFS el funcionamiento en bandas de frecuencias entre 10,7 y 30 GHz. Estos resultados se presentan directamente al GT 5B ad hoc 4. En el anexo 1 figura la lista de participantes.

Tras la reunión del Grupo de Redacción 1 del GT 5B ad hoc 4 celebrada el sábado 8 de noviembre de 1997 de las 10.00 horas a las 15.00 horas, bajo la presidencia del Dr. Ito, el Subgrupo de Redacción 1 de este Grupo de Redacción se reunió el sábado 8 de noviembre, el domingo 9 de noviembre y el lunes 10 de noviembre para preparar los posibles elementos de un enfoque reglamentario relativo al tema de los sistemas de satélites no geoestacionarios del SFS, teniendo en cuenta las tres etapas siguientes indicadas en el Documento CMR97/114(Add.2):

a) Banda Ku: establecimiento de límites estrictos.

b) Parte de la banda Ka no regidas por la Resolución 118 o la Resolución 120: establecimiento de límites estrictos.

c) Partes de la banda Ka regidas por la Resolución 118: aplicación de la Resolución 46.

El punto 1 de este Informe se refiere a las etapas a) y b) y la etapa 2, al paso c).

Cabe señalar que todos estos elementos deben considerarse entre corchetes, pues este tema debe ser discutido con más detalle y debe resolverse en su conjunto. En particular, aún debe llegarse a un acuerdo sobre los valores exactos de los límites de potencia propuestos que deben aplicarse a los sistemas de satélites geoestacionarios y no geoestacionarios del SFS así como sobre las bandas de frecuencias concretas en las que pueden aplicarse estos límites. De forma similar, también debe llegarse a un acuerdo sobre las condiciones reglamentarias concretas para determinar la categoría relativa de los sistemas de satélites geoestacionarios y no geoestacionarios en las diversas bandas consideradas.

Para completar el tema, también se reproducen las disposiciones relativas a la protección de los Planes de los apéndices **30** y **30A**. Estas disposiciones, así como la Resolución 506 serán consideradas por el GT 4D. Estos elementos se mantienen entre corchetes a la espera de su examen por el GT 4D. Se sugiere llamar la atención de dicho Grupo sobre estos elementos a la mayor brevedad posible a fin de facilitar su discusión en el citado Grupo.

Los coordinadores:

F. Rancy T. Tycz

1 Disposiciones reglamentarias relativas a la banda Ku y a la parte de la banda Ka no regida por la Resolución 118 o la Resolución 120 (etapas a) y b) del Documento CMR97/114(Add.2))

En las bandas de frecuencias cubiertas por el número **S22.2** en las bandas Ku y Ka, las disposiciones reglamentarias propuestas tienen por objeto asegurar la protección de los sistemas de satélites geoestacionarios del SFS y el SRS y ofrecer una plena protección de los Planes y sus futuras modificaciones. Estas disposiciones consisten en modificaciones de los artículos **S5** (para las atribuciones actuales al SFS y para una atribución adicional al mismo) y **S22** y en dos Resoluciones, referentes respectivamente a las bandas de frecuencias que no están sujetas a un plan y las que están sujetas a un plan.

Con respecto a las bandas de frecuencias específicas que deberían contemplar estas disposiciones, se acordó que el mayor número posible de estas bandas de frecuencias deben someterse a estas disposiciones para que los operadores de los sistemas de satélites no geoestacionarios tengan flexibilidad suficiente como para diseñar sistemas que puedan coexistir en las tres Regiones con los servicios terrenales o de otro tipo. A fin de asegurar tal coexistencia en todos los casos, es necesario realizar más estudios sobre la posible coexistencia entre los sistemas de satélites no geoestacionarios del SFS y los servicios terrenales en las bandas compartidas entre estos servicios, y en particular sobre la protección de las estaciones espaciales no geoestacionarias contra el servicio de radiolocalización en la banda 17,3 - 17,7 GHz y contra las estaciones espaciales geoestacionarias en la banda 17,3 - 17,8 GHz.

Con respecto al nivel de protección de las redes de satélites geoestacionarios contra los sistemas de satélites no geoestacionarios, Estados Unidos de América, Canadá y Japón manifestaron la opinión de que la obtención del límite que debe aplicarse a los sistemas de satélites no geoestacionarios para la protección a largo plazo de las redes de satélites geoestacionarios debe basarse en un nivel de protección más estricto que el del incremento de ruido del 6% actualmente aplicado entre redes de satélites geoestacionarios para activar la coordinación.

Con respecto a la protección de los sistemas de satélites geoestacionarios que funcionan en órbita inclinada, diversas simulaciones realizadas en el sistema "skybridge" han demostrado que esta protección podría asegurarse para un ángulo de inclinación de 5° con los mismos niveles que en el caso de un ángulo de inclinación de 0°.

Estados Unidos de América sugiere un método alternativo que podría consistir en introducir los límites propuestos en un anexo a la Resolución donde figuren las decisiones de la CMR-97 a este respecto.

1.1 Modificaciones al artículo S5

MOD S5.441 La utilización de las bandas 4 500 - 4 800 MHz (espacio-Tierra) y, 6 725 - 7 025 MHz (Tierra-espacio), por el servicio fijo por satélite se ajustará a las disposiciones del apéndice **S30B**. La utilización de las bandas 10,7 - 10,95 GHz (espacio-Tierra), 11,2 - 11,45 GHz (espacio-Tierra) y 12,75 - 13,25 GHz (Tierra-espacio) por las redes de satélites geoestacionarios del ~~el~~ servicio fijo por satélite se ajustará a las disposiciones del apéndice **S30B**. La utilización de las bandas 10,7 - 10,95 GHz (espacio-Tierra) 11,2 - 11,45 GHz y 12,75 - 13,25 GHz (Tierra-espacio) por los sistemas de satélites no geoestacionarios del servicio fijo por satélite se ajustará a las disposiciones de la Resolución [F-1].

MOD

GHz
10,7 – 12,7

<table>
<tr><td colspan="3">Atribución a los servicios</td></tr>
<tr><td>Región 1</td><td>Región 2</td><td>Región 3</td></tr>
<tr><td rowspan="3">11,7 – 12,5
FIJO
RADIODIFUSIÓN
RADIODIFUSIÓN POR SATÉLITE
Móvil salvo móvil aeronáutico</td><td>11,7 – 12,1
FIJO S5.486
FIJO POR SATÉLITE (espacio-Tierra)
Móvil salvo móvil aeronáutico
S5.485 S5.488</td><td rowspan="2">11,7 – 12,2
FIJO
MÓVIL salvo móvil aeronáutico
RADIODIFUSIÓN
RADIODIFUSIÓN POR SATÉLITE
S5.487 S5.487A</td></tr>
<tr><td>12,1 – 12,2
FIJO POR SATÉLITE (espacio-Tierra)
S5.485 S5.488 S5.489</td></tr>
<tr><td>12,2 – 12,7
FIJO
MÓVIL salvo móvil aeronáutico
RADIODIFUSIÓN
RADIODIFUSIÓN POR SATÉLITE
S5.488 S5.490 S5.492 S5.487A</td><td>12,2 – 12,5
FIJO
MÓVIL salvo móvil aeronáutico
RADIODIFUSIÓN
S5.487 S5.491</td></tr>
</table>

[Las dos siguientes propuestas figuran entre corchetes hasta que las examine el GT 4D:

ADD **S5.487A** *Atribución adicional*: en la Región 1 la banda 11,7 - 12,5 GHz, en la Región 2 la banda 12,2 - 12,7 GHz y en la Región 3 la banda 11,7 - 11,2 GHz están también atribuidas, a título primario, al servicio fijo por satélite (espacio-Tierra), limitado a los sistemas de satélites no geoestacionarios. Tal utilización está sujeta a lo dispuesto en la Resolución [F-1].

MOD **S5.516** La utilización de la banda 17,3 - 18,1 GHz por el servicio fijo por satélite (Tierra-espacio) está limitada a los enlaces de conexión para el servicio de radiodifusión por satélite. Para la utilización de la banda 17,3 - 17,8 GHz en la Región 2 por los enlaces de conexión del servicio de radiodifusión por satélite en la banda 12,2 - 12,7 GHz, véase el artículo **~~S11~~S10**. La utilización de las bandas 17,3 - 18,1 GHz en las Regiones 1 y 3 y 17,3 - 17,8 GHz en la Región 2 por los sistemas de satélites no geoestacionarios del servicio fijo por satélite está sujeta a lo dispuesto en la Resolución [F-1].

1.2 Modificaciones al artículo S22

Section II. Medidas contra las interferencias causadas a los sistemas de satélites geoestacionarios

ADD S22.2 §2. (1) ~~Las estaciones espaciales instaladas a bordo~~ Los sistemas de satélites no geoestacionarios ~~deberán cesar sus emisiones o reducirlas a un nivel despreciable, y las estaciones terrenas que comunican con ellas deberán cesar sus emisiones, cuando se produzcan~~ no deberán causar interferencias inaceptables a los sistemas ~~espaciales~~ de satélites geoestacionarios del servicio fijo por satélite explotados de conformidad con las disposiciones del presente Reglamento.

ADD S22.5A1 En las bandas de frecuencias 10,7 - 11,7 GHz, 12,5 - 12,75 GHz, 17,3 - 18,1 GHz y 18,1 - 18,4 GHz, la densidad de flujo de potencia combinada máxima producida en la órbita de los satélites geoestacionarios por todas las estaciones espaciales de un sistema de satélites no geoestacionarios del servicio fijo por satélite o del servicio de radiodifusión por satélite no debe exceder de los valores que figuran en los cuadros **S22-2** y **S22.4**.

[Las disposiciones **S22.5B** al cuadro **S22-2** se dejan entre corchetes hasta que las examine el GT 4D:

ADD S22.5B § 6. (1) En cualquier punto de la superficie de la Tierra visible desde la órbita de los satélites geoestacionarios, la densidad de flujo de potencia equivalente[1] producida por las emisiones de todas las estaciones espaciales de un sistema de satélites no geoestacionarios que funciona en las siguientes bandas de frecuencias del servicio fijo por satélite, incluidas las emisiones desde un satélite reflector, para todas las condiciones y para todos los métodos de modulación, no deberá rebasar los límites estipulados en el Cuadro **S22-1** para los porcentajes de tiempo especificados. Esos límites se refieren a la densidad de flujo de potencia equivalente que se obtendría en condiciones de propagación en el espacio libre, en una antena de referencia y una anchura de banda de referencia como la especificada en el cuadro **S22-1**, para todas las direcciones de puntería dirigidas hacia la órbita de los satélites geoestacionarios.

ADD S22.5B.1 [1] La densidad de flujo de potencia equivalente se define como la suma de las densidades de flujo de potencia producidas en un punto de la superficie de la Tierra por todas las estaciones espaciales de un sistema de satélites no geoestacionarios, teniendo en cuenta la discriminación fuera del eje de una antena receptora de referencia que se supone apuntada hacia la órbita de los satélites geoestacionarios. La densidad de flujo de potencia equivalente se calcula mediante la siguiente fórmula:

$$dfpe = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{dfp_i/10} \cdot \frac{G_r(\theta_i)}{G_{máx}}\right]$$

siendo:

– N, el número de estaciones espaciales no geoestacionarias visibles desde el punto considerado en la superficie de la Tierra, con un ángulo de elevación superior o igual a 0°;

– i, el índice de la estación espacial no geoestacionaria considerada;

– dfp_i, la densidad de flujo de potencia producida en el punto considerado en la superficie de la Tierra en dB(W/m^2) en la anchura de banda de referencia;

– θ_i, el ángulo entre la dirección considerada hacia la órbita de los satélites geoestacionarios y la dirección de la estación espacial interferente en el sistema de satélites no geoestacionarios;

– $G_r(\theta_i)$, la ganancia de la antena receptora de referencia que se ha de considerar como parte de una red geoestacionaria;

– $G_{máx}$, la ganancia máxima de la mencionada antena receptora de referencia;

– $dfpe$, la densidad de flujo de potencia equivalente calculada en dB(W/m^2) en la anchura de banda de referencia.

ADD

CUADRO **S22-1**

Banda de frecuencias atribuida al SRS	dfp equivalente en dB(W/m^2)	Porcentaje de tiempo durante el cual no puede sobrepasarse el nivel de dfp	Diagrama de radiación de la antena de referencia	Anchura de banda de referencia (MHz)
11,7 - 12,5 GHz en la Región 1, 11,7 - 12,2 GHz y 12,5 - 12,7 GHz en la Región 3	-145 -132	99,7% 100%	Recomendación UIT-R BO.1213 (para las Regiones 1 y 3)	27
12,2 - 12,7 GHz en la Región 2	-144 -131	99,7% 100%	Punto 3.7.2 del anexo 5 del apéndice **30** para la Región 2	27

ADD **S22.5C** (2) La densidad de flujo de potencia total[1] producida en un punto de la órbita de los satélites geoestacionarios por las emisiones procedentes de todas las estaciones terrenas de un sistema de satélites geoestacionarios del servicio fijo por satélite, para todas las condiciones y todos los métodos de modulación, no deberá rebasar los límites indicados en el cuadro **S22-2** para los porcentajes de tiempo especificados. Estos límites se refieren a la densidad de flujo de potencia que se obtendría en condiciones de propagación en el espacio libre en la anchura de banda de referencia especificada en este cuadro.

ADD **S22.5C.1**

[1] La densidad de flujo de potencia combinada se define como la suma de las densidades de flujo de potencia producidas en un punto de la órbita de satélite geoestacionario por todas las estaciones terrenas de un sistema de satélites no geoestacionarios. La densidad de flujo de potencia combinada se calcula mediante la siguiente fórmula:

$$dfpc = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^{\,2}}\right]$$

siendo:

- N, el número de estaciones terrenas del sistema de satélites no geoestacionarios con un ángulo de elevación superior o igual a 0°, desde el cual puede verse el punto considerado en la órbita de los satélites geoestacionarios;
- i, el índice de la estación terrena considerada del sistema de satélites no geoestacionarios;
- P_i, la potencia de RF a la entrada de la antena transmisora de la estación terrena considerada del sistema de satélites no geoestacionarios, expresada en dB(W/m^2) en la anchura de banda de referencia;
- $\theta_i(t,)$, el ángulo subtendido entre el eje de puntería de la estación terrena considerada del sistema de satélites no geoestacionarios y la dirección del punto considerado en la órbita de los satélites geoestacionarios;
- $G_t(\theta_i)$, la ganancia de la antena transmisora de la estación terrena considerada del sistema de satélites no geoestacionarios en la dirección del punto considerado en la órbita de los satélites geoestacionarios;
- d, la distancia entre la estación terrena considerada del sistema de satélites no geoestacionarios y el punto considerado en la órbita de los satélites geoestacionarios;
- *dfpd*, la densidad de flujo de potencia combinada expresada en dB(W/m^2) en la anchura de banda de referencia.

ADD

CUADRO **S22-2**

Banda de frecuencia	dfp combinada en dB(W/m2)	Porcentaje de tiempo durante el cual no se puede rebasar el nivel de dfp	Anchura de banda de referencia (MHz)
14,5 - 14,8 GHz en las Regiones 1 y 3 (fuera de Europa)	-119	99,97%	27
	-115	100%	
17,3 - 18,1 GHz en las Regiones 1, 2 y 3			

ADD S22.5D (3) La densidad de flujo de potencia equivalente[1] producida en cualquier punto de la superficie de la Tierra visible desde la órbita de los satélites geoestacionarios y por las emisiones procedentes de todas las estaciones espaciales de un sistema de satélites no geoestacionarios que funcione en las siguientes bandas de frecuencias del servicio fijo por satélite, incluidas las emisiones procedentes de un satélite de reflexión, para todas las condiciones y todos los métodos de modulación, no deberá rebasar los límites indicados en el cuadro **S22-3** para los porcentajes de tiempo indicados. Estos límites se refieren a la densidad de flujo de potencia equivalente que se obtendría en condiciones de propagación en espacio libre en todas las antenas de referencia y anchuras de banda de referencia especificadas en este cuadro y para todas las direcciones de puntería dirigidas hacia la órbita de los satélites geoestacionarios.

ADD

CUADRO **S22-3**

Banda de frecuencias	dfp equivalente dB(W/m^2)	Porcentaje de tiempo durante el cual no puede rebasarse el nivel de dfp	Anchura de banda de referencia (kHz)	Diámetro de la antena de referencia y diagrama de radiación de referencia
10,7 - 10,95 GHz 11,7 - 12,2 GHz en la Región 2 12,2 - 12,5 GHz en la Región 3 12,5 - 12,75 GHz en las Regiones 1 y 3	-179	99,7%	4	60 cm, Rec. UIT -R 465-5
	-192	99,9%	4	3 m, Rec. UIT -R 465-5
	-185	99,97%	4	10 m, Rec. UIT -R 465-5
	-170	100%	4	60 cm, 3 m y 10 m, Rec. UIT -R 465-5
17,7 - 18,8 GHz 19,7 - 20,2 GHz	-153	99%	1 000	30 cm, Rec. UIT -R 465-5
	-153	99,7%	1 000	2 m, Rec. UIT -R 465-5
	-153	99,9%	1 000	5 m, Rec. UIT -R 465-5
	-138	100%	1 000	30 cm, 2 m y 5 m, Rec. UIT -R 465-5

ADD S21.19 (2) La densidad de flujo de potencia combinada[1] producida en cualquier punto de la órbita de los satélites geoestacionarios por emisiones procedentes de todas las estaciones terrenas de un sistema de satélites no geoestacionarios para todas las condiciones y todos los métodos de modulación, no deberá rebasar los límites indicados en el cuadro **S22-4** para cualquier porcentaje de tiempo. Estos límites se refieren a la densidad de flujo de potencia que se obtendría en condiciones de propagación de espacio libre en la anchura de banda de referencia especificada en este cuadro.

CUADRO **S22-4**

Banda de frecuencias	**dfp combinada dB(W/m²)**	**Porcentaje de tiempo durante el cual no puede rebasarse el nivel de dfp**	**Anchura de banda de referencia (kHz)**
10,7 - 11,7 GHz y 12,5 - 12,75 GHz	-170	100%	4

ADD

12,75 - 13,25 GHz	-186	100%	4
13,75 - 14,5 GHz	-170	100%	4
18,1 - 18,4 GHz 24,75 - 25,75 GHz en las Regiones 2 y 3 27 - 27,5 GHz en las Regiones 2 y 3 27,5 - 28,6 GHz 29,1 - 30 GHz*	-145	100%	1 000

* En la banda 29,1 - [29,4] [29,5] GHz, estos límites no se aplican a las redes de enlaces de conexión con satélites no geoestacionarios del servicio móvil por satélite.

ADD S22.5F Los límites indicados en los cuadros **S22-2** a **S22-4** pueden rebasarse en el territorio de cualquier país cuya administración haya dado su acuerdo.

Sección VI. Limitaciones de la potencia fuera del eje de las antenas de estaciones terrenas

MOD S22.26 § 9. El nivel de la potencia isótropa radiada equivalente (p.i.r.e.) emitida por ~~una~~ cualquier estación terrena en ~~dirección de la órbita de los satélites geoestacionarios y fuera del~~ cualquier ángulo con el eje del haz principal~~, repercute considerablemente en la interferencia causada a otras redes de satélites geoestacionarios. Minimizando dicha radiación fuera del eje se mejoraría la utilización de la órbita de los satélites geoestacionarios y se facilitaría la coordinación, por lo que se invita a las administraciones a lograr los valores más bajos posible, teniendo en cuenta las más recientes Recomendaciones del UIT-R. La reducción al mínimo de esos niveles es particularmente importante en las bandas de enlaces ascendentes muy utilizadas.~~ no debe rebasar los valores siguientes en cualquier ángulo φ con el eje, correspondiente a un ángulo de 2,5° como mínimo con el eje del lóbulo principal de la antena de la estación terrena:

Ángulo con el eje	*p.i.r.e. máxima por 40 kHz*
2,5° ≤ φ ≤ 7°	(39 – 25 log φ) dB(W/40 kHz)
7° < φ ≤ 9,2°	18 dB(W/40 kHz)
9,2° < φ ≤ 48°	(42 – 25 log φ) dB(W/40 kHz)
48° < φ ≤ 180°	0 dB(W/40 kHz)

ADD S22.27 Para las emisiones de televisión con modulación de frecuencia que utilizan dispersión de energía, los límites indicados en **S22.26** pueden rebasarse en un valor no superior a 3 dB a condición de que la p.i.r.e. total fuera del eje de la portadora de televisión con modulación de frecuencia emitida no sobrepase los valores siguientes:

Ángulo con el eje	*p.i.r.e. máxima*
2,5° ≤ φ ≤ 7°	(53 – 25 log φ) dBW
7° < φ ≤ 9,2°	32 dBW
9,2° < φ ≤ 48°	(56 – 25 log φ) dBW
48° < φ ≤ 180°	14 dBW

ADD S22.28 Las portadoras de televisión con modulación de frecuencia que funcionan sin dispersión de energía deberían modularse permanentemente con material radiofónico o señales de prueba apropiados. En tal caso, la p.i.r.e. total fuera del eje de la portadora de televisión con modulación de frecuencia emitida no deberá rebasar los valores siguientes:

Ángulo con el eje	*p.i.r.e. máxima*
2,5° ≤ φ ≤ 7°	(53 – 25 log φ) dBW
7° < φ ≤ 9,2°	32 dBW
9,2° < φ ≤ 48°	(56 – 25 log φ) dBW
48° < φ ≤ 180°	14 dBW

ADD S22.29 Los límites de p.i.r.e. indicados en los números S22.26, S22.27 y S22.28 son aplicables en las bandas siguientes, atribuidas al servicio fijo por satélite (Tierra-espacio):

12,5 - 12,75 GHz (Región 1),

12,7 - 12,75 GHz (Región 2),

12,75 - 13,25 GHz,

13,75 - 14 GHz,

14 - 14,5 GHz,

17,3 - 18,4 GHz

ADD **Sección VII. Límites de potencia de las estaciones espaciales geoestacionarias**

ADD S22.30 Las estaciones espaciales geoestacionarias no deben producir en la superficie de la Tierra una densidad de flujo de potencia superior a los valores indicados en el cuadro que sigue:

Banda de frecuencias	Servicio	Límite (en dB(W/m^2)) para un ángulo de llegada (δ) por encima del plano horizontal de			Anchura de banda de referencia
		0° - 5°	5° - 25°	25° - 90°	
11,7 - 12,2 GHz (Región 2)	Fijo por satélite (espacio-Tierra)	–114	–114 + 0,5 (δ–5)	–104	10 MHz
12,5 - 12,75 GHz (Región 1)	Fijo por satélite (espacio-Tierra)	–114	–114 + 0,5 (δ–5)	–104	10 MHz
19,7 - 20,2 GHz	Fijo por satélite (espacio-Tierra)	–105	–105 + 0,5 (δ–5)	–95	10 MHz

ADD S22.31 Los límites indicados en **S22.30** pueden rebasarse en el territorio de cualquier país cuya administración haya dado su acuerdo.

3 Resoluciones

En el punto 3.1 figuran las propuestas sobre unos proyectos de Resoluciones de la CMR-97 para aplicar las etapas a) y b) indicadas en la introducción de este Informe; es decir referentes a los límites estrictos incluidos en el artículo **S22**.

Estados Unidos de América propuso un método alternativo en el cual se utilizarían estos límites como valores umbral, con aplicación de disposiciones similares a las de la Resolución 46. En el punto 3.2 figura una propuesta de Estados Unidos relativa a un proyecto de Resolución de la CMR-97 para aplicar este método.

3.1 Proyectos de Resoluciones de la CMR-97 propuestas para aplicar las etapas a) y b)

ADD

PROYECTO DE RESOLUCIÓN [COM5-18]

COEXISTENCIA ENTRE SISTEMAS DE SATÉLITES NO GEOESTACIONARIOS Y SISTEMAS DE SATÉLITES GEOESTACIONARIOS EN ALGUNAS BANDAS DE FRECUENCIAS

La Conferencia Mundial de Radiocomunicaciones (Ginebra, CMR-97),

considerando

a) que las diversas interpretaciones del número **S22.2** dan lugar a que los actuales y futuros sistemas de satélites geoestacionarios y no geoestacionarios del servicio fijo por satélite en las bandas donde se aplica esta disposición tengan una categoría reglamentaria ambigua, con los riesgos consiguientes para ambos tipos de sistemas;

b) que el desarrollo armónico de los sistemas de satélites geoestacionarios y no geoestacionarios del servicio fijo por satélite exige resolver estas ambigüedades a la mayor brevedad posible;

c) que dichas ambigüedades pueden resolverse incluyendo en el artículo **S22** límites para la potencia radiada por los sistemas de satélites no geoestacionarios a fin de proteger adecuadamente los sistemas de satélites geoestacionarios en las bandas de frecuencias y situaciones de compartición en las que no se aplica la Resolución **46**;

d) que se han establecido dichos límites para ciertas bandas de frecuencias utilizadas actualmente, o cuya utilización exhaustiva está prevista, por los sistemas de satélites geoestacionarios del servicio fijo por satélite;

e) que en estas bandas se han propuesto sistemas de satélites no geoestacionarios del servicio fijo por satélite que deben satisfacer estos límites y recibir la protección adecuada contra los sistemas de satélites geoestacionarios del servicio fijo por satélite existentes y futuros sin imponer limitaciones adicionales, evitando por consiguiente la necesidad de realizar una coordinación mutua;

f) que la aplicación de la Resolución **46** en ausencia de límites que restrinjan el diseño de los sistemas de satélites geoestacionarios y no geoestacionarios del servicio fijo por satélite y promuevan la utilización de técnicas de reducción de la interferencia debe considerarse con suma precaución;

g) que en las bandas en que se aplican estos límites no sería necesario establecer un procedimiento de coordinación entre sistemas de satélites no geoestacionarios y geoestacionarios del servicio fijo por satélite,

resuelve

1 que en las bandas de frecuencias especificadas en los cuadros **S22-2** a **S22-4**, los sistemas de satélites no geoestacionarios del servicio fijo por satélite sobre los cuales la Oficina de Radiocomunicaciones recibió la información de notificación completa después del 21 de noviembre de 1997 estarán sujetos a los límites de potencia provisionales que figuran en el artículo **S22**;

2 [que en aplicación del número **S22.2**, las administraciones pueden considerar estos límites de potencia provisionales como correspondientes a niveles de interferencia admisibles causados por un sistema de satélites no geoestacionarios [sobre el cual la información de notificación completa se recibió antes del 21 de noviembre de 1997] a un sistema de satélites geoestacionarios, independientemente de la fecha de recepción por la Oficina de la información de coordinación completa relativa a [este sistema de satélites geoestacionarios] [estos sistemas];]

3 [que se considere que una administración que proponga un sistema de satélites no geoestacionarios [sobre el cual la Oficina recibió la información de notificación completa después del 21 de noviembre de 1997 y] que satisface los límites indicados en el *resuelve* 1, ha cumplido sus obligaciones con arreglo al número **S22.2** [con respecto a las redes de satélites geoestacionarios sobre las cuales la Oficina recibió la información de notificación completa después del 21 de noviembre de 1997];]

4 que, en las bandas de frecuencias entre 10,7 y 30 GHz, los sistemas de satélites geoestacionarios del servicio fijo por satélite sobre los cuales la Oficina recibió información de coordinación completa después del 21 de noviembre de 1997 estarán sujetos a los límites provisionales que figuran en el artículo **S22**;

5 que los sistemas de satélites geoestacionarios no deberán reclamar protección contra las redes de satélites geoestacionarios que funcionen de acuerdo con el Reglamento de Radiocomunicaciones [y el *resuelve* 4], independientemente de la fecha de recepción por la Oficina de la información de notificación completa relativa a estos sistemas de satélites no geoestacionarios;

6 que los límites que figuran en los cuadros **S22-1** a **S22-3** pueden rebasarse en el territorio de cualquier país cuya administración haya dado su acuerdo;

7 [que entre 21 de noviembre de 1997 y la fecha en que se adopten los límites definitivos, no se procesen las aplicaciones presentadas a la BR para sistemas de satélites no geoestacionarios hasta que una conferencia competente confirme los límites provisionales indicados en el *resuelve* 1;]

8 que si una administración que explota un sistema de satélites geoestacionarios del SFS, o tiene prevista su explotación, considera que un sistema de satélites no geoestacionarios del SFS propuesto por otra administración puede causar interferencia inaceptable a su sistema de satélites geoestacionarios, las administraciones implicadas tomen todas las medidas necesarias para resolver las dificultades introduciendo en sus redes ajustes mutuamente aceptables,

[encarga a la Oficina de Radiocomunicaciones

que al inscribir en el Registro Internacional de Frecuencias asignaciones a un sistema de satélites no geoestacionarios del servicio fijo por satélite, condicione sus conclusiones relativas al cumplimiento de estas asignaciones con los límites indicados en el *resuelve* 1 al examen de dicho cumplimiento tras la adopción definitiva de estos límites por una conferencia competente,]

pide al UIT-R

1 que lleve a cabo con carácter de urgencia y a tiempo para su consideración por la CMR-99,

a) los adecuados estudios técnicos, de explotación y reglamentarios a fin de examinar las condiciones reglamentarias relativas a la coexistencia de los sistemas de satélites no geoestacionarios y geoestacionarios del servicio fijo por satélite para asegurar que no imponen limitaciones debidas al desarrollo de los sistemas de satélites no geoestacionarios o geoestacionarios del servicio fijo por satélite;

b) la elaboración de una metodología para calcular los niveles de potencia producidos por los sistemas de satélites no geoestacionarios y el cumplimiento de estos niveles con los límites indicados en los apartados i), ii) y iii);

c) los estudios relativos a los criterios de compartición que deben aplicarse para determinar la necesidad de coordinación entre los sistemas de satélites no geoestacionarios del servicio fijo por satélite;

2 que determine los límites de potencia adecuados para proteger los sistemas de satélites geoestacionarios actuales y futuros del servicio fijo por satélite en las bandas donde probablemente se implantarán sistemas de satélites no geoestacionarios del servicio fijo por satélite y se utilizan o se espera que se utilicen ampliamente los sistemas de satélites geoestacionarios del servicio fijo por satélite;

ADD

PROYECTO DE RESOLUCIÓN [COM5-19]

UTILIZACIÓN POR LOS SISTEMAS DE SATÉLITES NO GEOESTACIONARIOS DE LAS BANDAS DE FRECUENCIAS CUBIERTAS POR LOS APÉNDICES 30, 30A Y 30B

La Conferencia Mundial de Radiocomunicaciones (Ginebra, 1997),

considerando

a) que se han establecido e incorporado en el artículo **S22** límites destinados a mantener en niveles despreciables las interferencias producidas por los sistemas de satélites no geoestacionarios a las asignaciones que funcionan conforme a los Planes de los apéndices 30, 30A y 30B;

b) que debe asegurarse la integridad de los Planes mencionados;

c) que los sistemas de satélites no geoestacionarios no deben inscribirse en dichos Planes y, por tanto, no deben aplicar los procedimientos correspondientes ni estar protegidos por ellos,

resuelve

que los sistemas de satélites no geoestacionarios en las bandas de frecuencias sujetas a los apéndices **30**, **30A** y **30B** cumplan los límites especificados en el artículo **S22** y puedan aplicarse, a partir del 22 de noviembre de 1997, los procedimientos de la sección I del artículo **S9 [11]** y los procedimientos del Artículo **S11 [13]**,

pide al UIT-R

a) que lleve a cabo con carácter de urgencia y a tiempo para su consideración por la CMR-99 los estudios técnicos, de explotación y reglamentarios adecuados para examinar las disposiciones reglamentarias relativas al funcionamiento de los sistemas de satélites no geoestacionarios en estas bandas de frecuencias a fin de asegurar que estas condiciones garantizan la protección adecuada de los Planes y sus futuras modificaciones y que [en la medida de lo posible] no imponen limitaciones poco razonables al desarrollo de los sistemas de satélites geoestacionarios en estas bandas;

b) que informe a la RPC-99 sobre las conclusiones de estos estudios.

3.2 Proyecto de Resolución de la CMR-97 sobre la utilización de niveles umbral y aplicación de disposiciones similares a las de la Resolución 46

PROYECTO DE RESOLUCIÓN [COM5-20]

UTILIZACIÓN DE CIERTAS FRECUENCIAS EN LA BANDA KU POR SISTEMAS DE SATÉLITES NO GEOESTACIONARIOS DEL SERVICIO FIJO POR SATÉLITE

La Conferencia Mundial de Radiocomunicaciones (Ginebra, 1997),

considerando

a) que la Unión Internacional de Telecomunicaciones tiene entre otros objetivos el de "promover la extensión de los beneficios de las nuevas tecnologías de telecomunicaciones a todos los habitantes del Planeta" (número **6** de la Constitución de la Unión Internacional de Telecomunicaciones (Ginebra, 1992));

b) que es conveniente a este respecto promover sistemas capaces de proporcionar un servicio universal;

c) que los nuevos servicios de telecomunicaciones exigen redes avanzadas y fiables que permitan comunicaciones de gran capacidad;

d) que los sistemas basados en la utilización de las nuevas tecnologías asociadas a las constelaciones de satélites geoestacionarios y no geoestacionarios son capaces de proporcionar a las regiones más aisladas del mundo comunicaciones de alta capacidad a un bajo coste;

e) que la mayoría de los Miembros de la Unión necesitan estos sistemas;

f) que el funcionamiento de dichos sistemas exige un volumen adecuado de espectro en las bandas de frecuencias adecuadas;

g) que las decisiones sobre este asunto debe permitir la explotación del mayor número de sistemas posible;

h) que es preciso la introducción de servicios en un régimen de competencia entre los sistemas de satélites geoestacionarios y no geoestacionarios del SFS así como entre los propios sistemas de satélites no geoestacionarios del SFS;

i) que a pesar de la urgencia inherente al desarrollo de tales sistemas, deben estudiarse los temas técnicos, de compartición y reglamentarios pertinentes para lograr la utilización más eficaz y flexible del espectro que pueda ponerse a disposición de estos sistemas,

observando

1 que la información relativa a los sistemas de satélites geoestacionarios y no geoestacionarios [en ciertas bandas del SFS] ha sido comunicada a la Oficina de Radiocomunicaciones;

2 que la mayoría de estos sistemas están funcionando y otros empezarán a funcionar en un próximo futuro y, en consecuencia, puede haber dificultades para modificar sus características;

3 que es necesario proteger a otros servicios de radiocomunicaciones que utilizan estas bandas también a título primario así como a los derechos de dichos servicios,

considerando además

a) que las siguientes bandas de frecuencias atribuidas al SFS, de acuerdo con el Reglamento de Radiocomunicaciones, pueden ser utilizadas por las redes de satélites geoestacionarios y no geoestacionarios del SFS;

b) que el número **S22.2** puede provocar incertidumbres en la planificación, coordinación y aplicación de los sistemas de satélites geoestacionarios y no geoestacionarios del SFS a los que se aplica dicha disposición;

c) que es necesario realizar estudios técnicos para evaluar el grado en que es posible la compartición de estas bandas de frecuencias del SFS entre sistemas de satélites geoestacionarios y no geoestacionarios del SFS, entre sistemas de satélites no geoestacionarios del SFS y entre sistemas de satélites no geoestacionarios del SFS y sistemas terrenales;

d) que el UIT-R está estudiando actualmente técnicas de compartición que pueden utilizarse entre los sistemas de satélites geoestacionarios y no geoestacionarios del SFS;

e) que el número de estos sistemas de satélites geoestacionarios y no geoestacionarios del SFS propuestos para su funcionamiento en bandas atribuidas al servicios fijo por satélite en los que se aplica el número **S22.2** varía de una banda a otra;

f) que en algunas bandas del SFS, se aplica la Resolución **46 (Rev.CMR-95)/S9.11** y no se aplica el número **S22.2**,

resuelve

1 que los sistemas de satélites no geoestacionarios del SFS en las bandas de frecuencias indicadas en el *considerando* a) no estén sujetos a las disposiciones del número **S22.2** y se sometan a la aplicación de las disposiciones del número **S9.12** para la coordinación de los sistemas de satélites no geoestacionarios del SFS con los sistemas de satélites geoestacionarios del SFS;

2 solicitar al UIT-R que estudie, con carácter de urgencia, y desarrolle banda a banda y caso por caso en las bandas de frecuencias indicadas en el *considerando* a), los requisitos técnicos, de explotación y reglamentarios relativos a la utilización compartida de estas bandas por los sistemas de satélites geoestacionarios y no geoestacionarios del SFS con objeto de elaborar un método y un criterio aplicable para determinar el número mínimo de coordinaciones necesarias entre los sistemas de satélites geoestacionarios y no geoestacionarios del SFS;

3 que mientras tanto, y hasta que la CMR-99 confirme la necesidad de que continúe existiendo dicho requisito, los sistemas de satélites no geoestacionarios del SFS en las bandas de frecuencias indicadas en el *considerando además* a) no reclamarán protección contra los sistemas de satélites geoestacionarios del SFS;

4 solicitar al UIT-R que estudie con carácter de urgencia, y desarrolle banda a banda y caso por caso en las bandas de frecuencias indicadas en el *considerando además* a), los requisitos técnicos, de explotación y reglamentarios relativos a la utilización compartida de estas bandas por sistemas múltiples de satélites no geoestacionarios del SFS con objeto de elaborar un método y un criterio aplicable para ayudar a la coordinación entre sistemas de satélites no geoestacionarios del SFS;

5 que los sistemas de satélites no geoestacionarios del SFS en las bandas de frecuencias indicadas en el *considerando además* a) estén sujetos a la aplicación de las disposiciones del número **S9.14** para la coordinación de los sistemas de satélites no geoestacionarios del SFS con los sistemas terrenales;

6 solicitar al UIT-R que estudie con carácter de urgencia, y desarrolle banda a banda y caso por caso en las bandas de frecuencias indicadas en el *considerando además* a), los requisitos técnicos, de explotación y reglamentarios relativos a la utilización de estas bandas por los sistemas terrenales y de satélites no geoestacionarios del SFS con objeto de elaborar un método y un criterio aplicable para determinar el número mínimo de coordinaciones necesarias entre los geoestacionarios y no geoestacionarios;

7 que los sistemas de satélites no geoestacionarios del SFS en las bandas de frecuencias indicadas en el *considerando además* a) estén sujetos a la aplicación de las disposiciones del número **S9.12** para la coordinación entre sistemas no geoestacionarios del SFS;

8 solicitar al UIT-R que estudie con carácter de urgencia, y desarrolle banda a banda y caso por caso en las bandas de frecuencias indicadas en el *considerando además* a), los requisitos técnicos, de explotación y reglamentarios relativos a la compartición entre sistemas de satélites no geoestacionarios del SFS con objeto de elaborar un método y un criterio aplicable para ayudar a la coordinación entre los sistemas de satélites no geoestacionarios del SFS;

9 que las estaciones terrenas de satélites no geoestacionarios del SFS en las bandas adecuadamente atribuidas indicadas en el *considerando además* a) estén sujetas a la aplicación de las disposiciones del número **S9.15** con respecto a las estaciones terrenales;

10 que las estaciones terrenas de los satélites no geoestacionarios del SFS que funcionan en sentido inverso en las bandas adecuadamente atribuidas indicadas en el *considerando además* a), estén sujetas a la aplicación de las disposiciones del número **S9.17A** con respecto a otras estaciones terrenas,

resuelve además

1 encargar al Director de la Oficina de Radiocomunicaciones que asegure, en consulta con los Presidentes de las Comisiones de Estudio, que los estudios se realizan de manera urgente y los resultados de los mismos están disponibles el [XXXX];

2 que los resultados de los citados estudios, una vez aprobados por el procedimiento acelerado se utilicen en forma provisional para determinar si es necesaria la coordinación de un sistema de satélites no geoestacionarios del SFS con los sistemas de satélites geoestacionarios del SFS, con arreglo al número **S9.12**;

3 que los resultados de los anteriores estudios, una vez aprobados por el procedimiento acelerado, se utilicen de forma provisional para determinar si es necesaria la coordinación entre sistemas de satélites no geoestacionarios del SFS y sistemas terrenales de acuerdo con el número **S9.15**;

4 recomendar que la RPC-99 examine los resultados de los estudios anteriores y transmita sus conclusiones a la CMR-99;

5 recomendar que la CMR-99 tome las medidas adecuadas basándose en los resultados de la RPC-99 para el desarrollo armónico de los sistemas de satélites geoestacionarios y no geoestacionarios del SFS y los sistemas terrenales en las bandas indicadas en el *considerando además* a),

recomienda

que las futuras conferencias mundiales de radiocomunicaciones consideren los resultados de los estudios relativos a las ventajas que pueden obtenerse de la utilización de las tecnologías de satélites no geoestacionarios y, si es necesario, identifiquen bandas de frecuencias adicionales que puedan utilizar los sistemas de satélites no geoestacionarios del SFS,

insta a las administraciones

a que cooperen de manera urgente y en el mayor grado posible en la realización de los estudios para alcanzar resultados que sean aceptables por todas las partes interesadas.

2 Condiciones reglamentarias relativas a la parte de la banda Ka regida por la Resolución 118

MOD

GHz
18,6 – 20,2

Atribución a los servicios		
Región 1	Región 2	Región 3
18,8 – 19,3	FIJO FIJO POR SATÉLITE (espacio-Tierra) MOD S5.523A MÓVIL	

MOD

GHz
27 – 29,9

Atribución a los servicios		
Región 1	Región 2	Región 3
28,5 – 29,1	FIJO FIJO POR SATÉLITE (Tierra-espacio) MOD S5.523A S5.539 MÓVIL Exploración de la Tierra por satélite (Tierra-espacio) S5.541 S5.540	

MOD S5.523A ~~La utilización de las bandas 18,8 - 19,3 GHz y 28,6 - 29,1 GHz por el servicio fijo por satélite se ajustará a las disposiciones de la Resolución 118 (CMR-95).~~ La utilización de las bandas 18,8 - 19,3 GHz (espacio-Tierra) y 28,6 - 29,1 GHz (Tierra-espacio) por las redes de los servicios fijos por satélite geoestacionario y no geoestacionario está sujeta a la aplicación de las disposiciones del número **S9.11A**/Resolución **46 (Rev.CMR-95)** y el número **S22.2** [número 2613] no se aplica. [Las redes sujetas a coordinación antes del 18 de noviembre de 1995 se coordinarán satisfactoriamente en cumplimiento del número **S9.11A**/Resolución **46 (Rev. CMR-95)** con las redes no geoestacionarias cuya notificación se haya recibido en la Oficina antes de esa fecha. Las redes no geoestacionarias no causarán interferencia inaceptable a las redes del servicio fijo por satélite geoestacionario respecto de los cuales la Oficina considere que ha recibido una información completa de la notificación del apéndice **3** antes del 18 de noviembre de 1995.]

ANEXO 1

Lista de participantes en la reunión del Subgrupo de Redacción 1 del Grupo de Redacción 1 del GT 5B ad hoc 4 (SFS/no-OSG)

Sábado, 8 de noviembre de 1997, de las 15.30 a las 18.00 horas	
Administración/ Organización	**Nombre**
Australia	B. Mc. Donald
Brasil	J. Albuquerque
Canadá	V. Mimis
	M. Dupuis
Francia	F. Rancy
	V. Meens
	C. Michel
Indonesia	A. Djiwatanpu
Japón	T. Yamauchi
Líbano	M. Ghazal
	R. Bahsoun
	A. Majeed
Arabia Saudita	B. Lemouchi

Domingo, 9 de noviembre de 1997, de las 10.00 a las 16.00 horas	
Administración/ Organización	**Nombre**
Australia	B. Mc Donald
Brasil	J. Albuquerque
Canadá	V. Mimis
	M. Dupuis
	S. Doiron
Francia	F. Rancy
	V. Meens
	C. Michel
	J.C. Guiguet
Indonesia	A. Djiwatanpu
Japón	T. Yamauchi
	H. Tanaka
	J. Leary

Lunes, 10 de noviembre de 1997, de las 09.30 a las 10.30 horas	
Administración/ Organización	**Nombre**
Australia	B. Mc Donald
Brasil	J. Albuquerque
Canadá	V. Mimis
	M. Dupuis
	S. Doiron
Francia	F. Rancy
	V. Meens
	C. Michel
	J.C. Guiguet
	J. Chartier
	F. Rontard
Japón	T. Yamauchi
	H. Tanaka

República Sudafricana	S. Hibbard
Estados Unidos de América	T . Tycz
	E. Davison
	W. Long
Intelsat	V. Sahay

	T. Otsu
Líbano	M. Ghazal
	R. Bahsoun
	A. Majeed
Arabia Saudita	B. Lemouchi
República Sudafricana	S. Hibbard
	D. Harie
Turquía	F.M. Yurdal
	A.H. Erdinc
Estados Unidos de América	T . Tycz
	E. Davison
	D. Parlow
	G. Creezer
Intelsat	H. Enriques
	V. Sahay

	J. Leary
Líbano	M. Ghazal
	R. Bahsoun
	A. Majeed
Portugal	F. Guerra
Arabia Saudita	B. Lemouchi
República Sudafricana	S. Hibbard
	P. Lochner
Reino Unido	C. Cheeseman
Estados Unidos de América	T . Tycz
	E. Davison
	W. Long
	G. Creezer
	H. Enriques
Intelsat	K. Betaharon
	H. Henriques
Comisión Europea	R. Niepold
	S. Kramer

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Corrigendum 1 to Document DL/40-E 11 November 1997 Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5B AD HOC GROUP 4

DRAFTING GROUP 1 OF WORKING GROUP 5B AD HOC GROUP 4

DRAFT RESOLUTION [COM5-18]

COEXISTENCE AMONG NON-GEOSTATIONARY SYSTEMS IN THE FIXED-SATELLITE SERVICE AND GEOSTATIONARY SYSTEMS IN CERTAIN FREQUENCY BANDS

The World Radiocommunication Conference (Geneva, WRC-97),

considering

a) that the diverging interpretations arising from No. **S22.2** result in an ambiguous regulatory status for both existing and future geostationary and non-geostationary systems in the fixed-satellite service in the bands where this provision applies, with consequential risks for both types of systems;

b) that the harmonious development of non-geostationary and geostationary systems in the fixed-satellite service requires that these ambiguities be resolved with no further delay;

c) that these ambiguities can be resolved by including in Article **S22** limits to the power radiated by non-geostationary systems in order to adequately protect geostationary systems in the frequency bands and sharing situations where Resolution **46** does not apply;

d) that such limits have been developed in certain frequency bands which are currently used or planned to be used extensively by geostationary fixed-satellite service systems;

e) that non-geostationary fixed-satellite service systems are proposed in these bands which could meet these limits and receive adequate protection from existing and future fixed-satellite service geostationary systems without imposing additional constraints, therefore avoiding the need for mutual coordination;

f) that the application of Resolution **46**, in the absence of limits constraining the design of geostationary fixed-satellite service and non-geostationary fixed-satellite service systems and promoting the use of mitigation techniques, should be considered with care;

g) that in the bands where these limits apply, there would be no need for a coordination procedure between non-geostationary and geostationary systems in the fixed-satellite service,

resolves

1 that, in the frequency bands specified in Tables **S22-2** to **S22-4**, non-geostationary systems in the fixed-satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the power limits appearing in Article **S22**;

2 that these limits will be applied provisionally until the end of the WRC-99 Conference, which may decide to revise them;

~~2~~3 ~~[~~that, as of 22 November 1997, in applying No. **S22.2**, administrations may consider these provisional power limits as corresponding to permissible levels of interference from a NGSO system ~~[for which complete notification information was received prior to 21 November 1997]~~ into a GSO system, irrespective of the date of receipt by the Bureau of the complete coordination information relating to ~~[this GSO system] [~~these systems~~]~~;

~~3~~4 ~~[~~that, as of the end of WRC-99, an administration proposing a NGSO system ~~[for which complete notification information has been received by the Bureau after 21 November 1997 and]~~ which is compliance with the limits referred to in *resolves* 1 above shall be considered as having fulfilled its obligations under **S22.2** ~~[~~with respect to any GSO network~~s~~, irrespective of the date of receipt by the Bureau of the complete notification information relating to the NGSO system and of the ~~for which~~ complete ~~notification~~coordination information ~~has been received by the Bureau after 21 November 1997;]~~of the GSO network;

~~4~~5 that, in the frequency bands from 10.7 to 30 GHz, geostationary satellite systems in the fixed satellite service for which complete coordination information has been received by the Bureau after 21 November 1997 shall be subject to the provisional limits appearing in Article **S22**~~.~~;

~~5~~6 that non-geostationary systems shall not claim protection from geostationary satellite networks operating in accordance with the Radio Regulations [and *resolves* 4] above, irrespective of the date of receipt by the Bureau of the complete notification information relating to these non-geostationary systems~~.~~;

~~6~~7 that the limits given in Tables **S22-1** to **S22-3** may be exceeded on the territory of any country whose administration has so agreed~~.~~;

~~7 [that between 21 November 1997 and the date that final limits are adopted applications submitted to the BR for NGSO systems shall not be processed until the provisional limits referred to in *resolves* 1 above have been confirmed by a competent conference;]~~

8 that, if an administration operating or planning a GSO FSS system considers that the NGSO FSS system proposed by another administration might cause unacceptable interference into its GSO system, the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks~~.~~;

9 that, as of 22 November 1997, NGSO systems in the FSS in the frequency bands referred to in *resolves* 1 above, shall be subject to the application of the provisions of No. **S9.12** for the coordination with other NGSO systems in the FSS,

~~*[instructs the Radiocommunication Bureau*~~

~~when recording in the Master register assignments to a NGSO system in the fixed-satellite service, to make its finding relating to the compliance of these assignments with the limits referred to in *resolves* 1 above conditional upon the review of this compliance after final adoption of these limits by a competent conference,]~~

requests ITU-R

1 to conduct, as a matter of urgency and in time for consideration by WRC-99,

a) the appropriate technical, operational and regulatory studies to review the regulatory conditions relating to the coexistence among NGSO and GSO systems in the fixed-satellite service in order to ensure that they do not pose undue constraints on the development of non-geostationary or geostationary fixed-satellite service systems;

b) develop a methodology for calculating the power levels produced by NGSO systems and the compliance of these levels with the limits referred to in 1, 2 and 3 above~~.~~;

c) complete the studies relating to the sharing criteria to be applied for determining the need for coordination between non-geostationary fixed-satellite service systems~~.~~, with a view to promote efficient use of spectrum/orbit resources and equitable access to these resources by all countries;

2 to undertake the development of power limits in order to protect existing and future geostationary fixed-satellite service systems in those bands where non-geostationary fixed-satellite service systems are likely to be implemented and geostationary fixed-satellite service systems are used or expected to be used extensively.

ADD

DRAFT RESOLUTION [COM5-19]

USE OF THE FREQUENCY BANDS COVERED BY APPENDICES 30, 30A AND 30B BY NGSO NETWORKS

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that limits have been established and included in Article **S22** to ensure that the interference caused by non-geostationary-satellite systems into assignments operated in conformity with the Appendices **30**, **30A** and **30B** Plans is maintained within negligible levels;

b) that the integrity of the above-mentioned Plans is to be ensured;

c) that NGSO systems should not be entered into those Plans and therefore not apply and not be protected by the associated procedures,

resolves

that, as of 22 November 1997, NGSO systems in the fixed-satellite service operating in the frequency bands ~~subject to~~covered by Appendices **30**, **30A** and **30B**,

a) shall comply with the limits specified in Article **S22**;

b) ~~and~~ may apply, ~~as of 22 November 1997,~~ the procedures of Section I of Article 11/**S9** and the procedures of Article 13/**S11**,; and

c) shall be subject to the application of the provisions of No. **S9.12** for the coordination with other NGSO systems in the FSS,

requests ITU-R

a) to conduct, as a matter of urgency and in time for consideration by WRC-99, the appropriate technical, operational and regulatory studies to review the regulatory provisions concerning the operation of NGSO FSS systems in these frequency bands in order to ensure that these conditions ensure appropriate protection of the Plans and their future modifications and, ~~[to the maximum extent practicable,]~~ do not pose unreasonable constraints on the development of geostationary systems in these bands;

b) to report to CPM-99 on the conclusion of these studies.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/40(Add.1)-E
13 November 1997
Original: English

ANNEX TO DRAFT RESOLUTION [COM 5-18]

PROVISIONAL LIMITS

Section I. Control of Interference to Geostationary-Satellite Systems

1.1 In the frequency bands 10.7 - 11.7 GHz, 12.5 - 12.75 GHz, 17.3 - 18.1 GHz and 18.1 - 18.4 GHz, the maximum aggregate power flux-density produced at the geostationary-satellite orbit by all the space stations in a non-geostationary-satellite system in the fixed-satellite service or in the broadcasting-satellite service shall not exceed the values given in Tables **2** and **4**.

[The provisions 1.2 to Table 2 are left in square brackets pending review by WG 4D:

1.2 The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary orbit, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **1** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth as specified in Table **1**, for all pointing directions towards the geostationary orbit.

---

[1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within a non-geostationary system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

– N is the number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater or equal to 0°;

– i is the index of the considered non-geostationary space station;

– pfd_i is the power flux-density produced at the point considered at the Earth's surface in dB(W/m^2) in the reference bandwidth;

– θ_i is the angle between the direction considered towards the geostationary orbit and the direction of the interfering space station in the non-geostationary system;

– $G_r(\theta_i)$ is the gain of the receive reference antenna to be considered as part of a geostationary network;

– G_{max} is the maximum gain of the above receive reference antenna;

– *epfd* is the computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

TABLE 1

Frequency band allocated to the BSS	Equivalent pfd dB(W/m^2)	Percentage of time during which pfd level may not be exceeded	Reference antenna radiation pattern	Reference bandwidth (MHz)
11.7 - 12.5 GHz in Region 1, 11.7 - 12.2 GHz and 12.5 - 12.7 GHz in Region 3	-145 -132	99.7% 100%	Recommendation ITU-R BO.1213 (for Regions 1 and 3)	27
12.2 - 12.7 GHz in Region 2	-144 -131	99.7% 100%	Section 3.7.2 of Annex 5 of Appendix **30** for Region 2	27

1.3 The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **2** for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

[1] The aggregate power flux-density is defined as the summation of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^{\,2}}\right]$$

where:

- N is the number of earth stations in the non-geostationary system with an elevation angle greater or equal to 0°, from which the point considered in the geostationary orbit is visible;
- i is the index of the earth station considered in the non-geostationary system;
- P_i is the RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary system in dB(W/m^2) in the reference bandwidth;
- $\theta_i(t)$ is the off-axis angle between the boresight of the earth station considered in the non-geostationary system and the direction of the point considered in the geostationary-satellite orbit;
- $G_t(\theta_i)$ is the transmit antenna gain of the earth station considered in the non-geostationary system in the direction of the point considered in the geostationary-satellite orbit;
- d is the distance between the earth station considered in the non-geostationary system and the point considered in the geostationary-satellite orbit;
- $apfd$ is the aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

TABLE 2

Frequency band	Aggregate pfd dB(W/m^2)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (MHz)
14.5 - 14.8 GHz in Regions 1 and 3 (outside Europe)	-119	99.97%	27
	-115	100%	
17.3 - 18.1 GHz in Regions 1, 2 and 3			

1.4 The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting

satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **3** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions into all the reference antennas and in the reference bandwidths specified in this table, and for all pointing directions towards the geostationary orbit.

TABLE **3**

Frequency band	Equivalent pfd dB(W/m²)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern
10.7 - 10.95 GHz 11.7 - 12.2 GHz in Region 2 12.2 - 12.5 GHz in Region 3 12.5 - 12.75 GHz in Regions 1 and 3	-179	99.7%	4	60 cm, ITU-R Rec. 465-5
	-192	99.9%	4	3 m, ITU-R Rec. 465-5
	-185	99.97%	4	10 m, ITU-R Rec. 465-5
	-170	100%	4	60 cm, 3 m and 10 m, ITU-R Rec. 465-5
17.7 - 18.8 GHz 19.7 - 20.2 GHz	-153	99%	1 000	30 cm, ITU-R Rec. 465-5
	-153	99.7%	1 000	2 m, ITU-R Rec. 465-5
	-153	99.9%	1 000	5 m, ITU-R Rec. 465-5
	-138	100%	1 000	30 cm, 2 m and 5 m, ITU-R Rec. 465-5

1.5 The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system for all conditions and for all methods of modulation, shall not exceed the limits given in Table **4** for any percentage of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

TABLE **4**

Frequency band	**Aggregate pfd dB(W/m²)**	**Percentage of time during which pfd level may not be exceeded**	**Reference bandwidth (kHz)**
10.7 - 11.7 GHz and 12.5 - 12.75 GHz	-170	100%	4

12.75 - 13.25 GHz	-186	100%	4
13.75 - 14.5 GHz	-170	100%	4
18.1 - 18.4 GHz 24.75 - 25.75 GHz in Regions 2 and 3 27 - 27.5 GHz in Regions 2 and 3 27.5 - 28.6 GHz 29.1 - 30 GHz*	-145	100%	1 000

* In the band 29.1 - [29.4] [29.5] GHz, these limits do not apply to non-geostationary mobile-satellite service feeder-link networks.

1.6 The limits given in Tables **2** to **4** may be exceeded on the territory of any country whose administration has so agreed.

Section II. Earth Station Off-Axis Power Limitations

2.1 The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station ~~at angles in the direction of the geostationary-satellite orbit off the main beam axis has a significant impact on interference caused to other geostationary-satellite networks. Enhanced utilization of the geostationary-satellite orbit and easier coordination would be attained by minimizing such off-axis radiation and administrations are encouraged to achieve the lowest values practicable bearing in mind the latest ITU-R Recommendations. Minimizing such levels is particularly important in intensively used up-link bands~~shall not exceed the following values for any off-axis angle φ, which is 2.5° or more off the main lobe axis of an earth station antenna:

Angle off-axis	*Maximum e.i.r.p. per 40 kHz*
$2.5° \leq \varphi \leq 7°$	$(39 - 25 \log \varphi)$ dB(W/40 kHz)
$7° < \varphi \leq 9.2°$	18 dB(W/40 kHz)
$9.2° < \varphi \leq 48°$	$(42 - 25 \log \varphi)$ dB(W/40 kHz)
$48° < \varphi \leq 180°$	0 dB(W/40 kHz)

2.2 For FM-TV emissions with energy dispersal, the limits in 2.1 above may be exceeded by up to 3 dB provided the off-axis total e.i.r.p. of the transmitted FM-TV carrier does not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
$2.5° \leq \varphi \leq 7°$	$(53 - 25 \log \varphi)$ dBW
$7° < \varphi \leq 9.2°$	32 dBW

$9.2° < \varphi \leq 48°$ $(56 - 25 \log \varphi)$ dBW

$48° < \varphi \leq 180°$ 14 dBW

2.3 For FM-TV carriers which operate without energy dispersal, such carriers should be modulated at all times with programme material or appropriate test patterns. In this case, the off-axis total e.i.r.p. of the emitted FM-TV carrier shall not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
$2.5° \leq \varphi \leq 7°$	$(53 - 25 \log \varphi)$ dBW
$7° < \varphi \leq 9.2°$	32 dBW
$9.2° < \varphi \leq 48°$	$(56 - 25 \log \varphi)$ dBW
$48° < \varphi \leq 180°$	14 dBW

2.4 The e.i.r.p. limits given in 2.1, 2.2 and 2.3 are applicable in the following frequency bands allocated to the fixed-satellite service (Earth-to-space):

12.5 - 12.75 GHz (Region 1)

12.7 - 12.75 GHz (Region 2)

12.75 - 13.25 GHz

13.75 - 14 GHz

14 - 14.5 GHz

17.3 - 18.4 GHz

Section III. Geostationary Space Station Power Limitations

3.1 Geostationary space stations shall not produce power flux-density values at the Earth's surface greater than those given in the following table:

Frequency band	Service	Limit in dB(W/m2) for angle of arrival (δ) above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
11.7 - 12.2 GHz (Region 2)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
12.5 - 12.75 GHz (Region 1)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
19.7 - 20.2 GHz	Fixed-Satellite (S-E)	-105	-105 + 0.5 (δ–5)	-95	10 MHz

3.2 The limits given in 3.1may be exceeded on the territory of any country whose administration has so agreed.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Corrigendum 1 to Addendum 1 to Document DL/40-E 13 November 1997 English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

ANNEX TO DRAFT RESOLUTION [COM5-18]

PROVISIONAL LIMITS

Section I. Control of Interference to Geostationary-Satellite Systems

1.1 In the frequency bands 10.7 - 11.7 GHz, 12.5 - 12.75 GHz and 18.1 - 18.4 GHz, the maximum aggregate power flux-density produced at the geostationary-satellite orbit by all the space stations in a non-geostationary-satellite system in the fixed-satellite service, shall not exceed the values given in Table 1.

1.2 The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table 2 for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions into all the reference antennas and in the reference bandwidths specified in this table, and for all pointing directions towards the geostationary orbit.

[1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within a non-geostationary system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{\max}}\right]$$

where:

- N is the number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater or equal to 0°;
- i is the index of the considered non-geostationary space station;
- pfd_i is the power flux-density produced at the point considered at the Earth's surface in dB(W/m^2) in the reference bandwidth;
- θ_i is the angle between the direction considered towards the geostationary orbit and the direction of the interfering space station in the non-geostationary system;
- $G_r(\theta_i)$ is the gain of the receive reference antenna to be considered as part of a geostationary network;
- G_{max} is the maximum gain of the above receive reference antenna;
- $epfd$ is the computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

TABLE 2

Frequency band	**Equivalent pfd dB(W/m^2)**	**Percentage of time during which pfd level may not be exceeded**	**Reference bandwidth (kHz)**	**Reference antenna diameter and reference radiation pattern**
10.7 - 10.95 GHz	-179	99.7%	4	60 cm, ITU-R Rec. 465-5
11.7 - 12.2 GHz in Region 2	-192	99.9%	4	3 m, ITU-R Rec. 465-5
	-185	99.97%	4	10 m, ITU-R Rec. 465-5
12.2 - 12.5 GHz in Region 3	-170	100%	4	60 cm, 3 m and 10 m, ITU-R Rec. 465-5
12.5 - 12.75 GHz in Regions 1 and 3				
17.7 - 18.8 GHz	-153	99%	1 000	30 cm, ITU-R Rec. 465-5
19.7 - 20.2 GHz	-153	99.7%	1 000	2 m, ITU-R Rec. 465-5
	-153	99.9%	1 000	5 m, ITU-R Rec. 465-5
	-138	100%	1 000	30 cm, 2 m and 5 m, ITU-R Rec. 465-5

1.3 The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system for all conditions and for all methods of modulation, shall not exceed the limits given in Table 4 for any percentage of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

[1] The aggregate power flux-density is defined as the summation of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^2}\right]$$

where:

- N is the number of earth stations in the non-geostationary system with an elevation angle greater or equal to 0°, from which the point considered in the geostationary orbit is visible;
- i is the index of the earth station considered in the non-geostationary system;
- P_i is the RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary system in dB(W/m^2) in the reference bandwidth;
- $\theta_i(t)$ is the off-axis angle between the boresight of the earth station considered in the non-geostationary system and the direction of the point considered in the geostationary-satellite orbit;
- $G_t(\theta_i)$ is the transmit antenna gain of the earth station considered in the non-geostationary system in the direction of the point considered in the geostationary-satellite orbit;
- d is the distance between the earth station considered in the non-geostationary system and the point considered in the geostationary-satellite orbit;
- *apfd* is the aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

TABLE 1

Frequency band	**Aggregate pfd dB(W/m2)**	**Percentage of time during which pfd level may not be exceeded**	**Reference bandwidth (kHz)**
10.7 - 11.7 GHz and 12.5 - 12.75 GHz	-170	100%	4
12.75 - 13.25 GHz	-186	100%	4
13.75 - 14.5 GHz	-170	100%	4
18.1 - 18.4 GHz 24.75 - 25.75 GHz in Regions 2 and 3 27 - 27.5 GHz in Regions 2 and 3 27.5 - 28.6 GHz 29.1 - 30 GHz*	-145	100%	1 000
* In the band 29.1 - [29.4] [29.5] GHz, these limits do not apply to non-geostationary mobile-satellite service feeder-link networks.			

1.4 The limits given in Table 1 may be exceeded on the territory of any country whose administration has so agreed.

Section II. Earth Station Off-Axis Power Limitations

2.1 The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station ~~at angles in the direction of the geostationary-satellite orbit off the main beam~~ ~~axis has a significant impact on interference caused to other geostationary-satellite networks. Enhanced utilization of the geostationary-satellite orbit and easier coordination would be attained by minimizing such off-axis radiation and administrations are encouraged to achieve the lowest values practicable bearing in mind the latest ITU-R Recommendations. Minimizing such levels is particularly important in intensively used up-link bands~~shall not exceed the following values for any off-axis angle φ, which is 2.5° or more off the main lobe axis of an earth station antenna:

Angle off-axis	*Maximum e.i.r.p. per 40 kHz*
2.5° ≤ φ ≤ 7°	(39 - 25 log φ) dB(W/40 kHz)
7° < φ ≤ 9.2°	18 dB(W/40 kHz)
9.2° < φ ≤ 48°	(42 - 25 log φ) dB(W/40 kHz)
48° < φ ≤ 180°	0 dB(W/40 kHz)

2.2 For FM-TV emissions with energy dispersal, the limits in 2.1 above may be exceeded by up to 3 dB provided the off-axis total e.i.r.p. of the transmitted FM-TV carrier does not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
2.5° ≤ φ ≤ 7°	(53 - 25 log φ) dBW
7° < φ ≤ 9.2°	32 dBW
9.2° < φ ≤ 48°	(56 - 25 log φ) dBW
48° < φ ≤ 180°	14 dBW

2.3 For FM-TV carriers which operate without energy dispersal, such carriers should be modulated at all times with programme material or appropriate test patterns. In this case, the off-axis total e.i.r.p. of the emitted FM-TV carrier shall not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
2.5° ≤ φ ≤ 7°	(53 - 25 log φ) dBW
7° < φ ≤ 9.2°	32 dBW
9.2° < φ ≤ 48°	(56 - 25 log φ) dBW
48° < φ ≤ 180°	14 dBW

2.4 The e.i.r.p. limits given in 2.1, 2.2 and 2.3 are applicable in the following frequency bands allocated to the fixed-satellite service (Earth-to-space):

12.5 - 12.75 GHz (Region 1)

12.7 - 12.75 GHz (Region 2)

12.75 - 13.25 GHz

13.75 - 14 GHz

14 - 14.5 GHz

17.3 - 18.4 GHz

Section III. Geostationary Space Station Power Limitations

3.1 Geostationary space stations shall not produce power flux-density values at the Earth's surface greater than those given in the following table:

Frequency band	Service	Limit in dB(W/m^2) for angle of arrival (δ) above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
11.7 - 12.2 GHz (Region 2)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
12.5 - 12.75 GHz (Region 1)	Fixed-Satellite (S-E)	-114	-114 + 0.5 (δ–5)	-104	10 MHz
19.7 - 20.2 GHz	Fixed-Satellite (S-E)	-105	-105 + 0.5 (δ–5)	-95	10 MHz

3.2 The limits given in 3.1 may be exceeded on the territory of any country whose administration has so agreed.

ANNEX TO DRAFT RESOLUTION [COM5-19]

PROVISIONAL LIMITS

Section I. Control of Interference to Geostationary-Satellite Systems

1.1 In the frequency band 17.3 - 18.1 GHz the maximum aggregate power flux-density produced at the geostationary-satellite orbit by all the space stations in a non-geostationary-satellite system in the fixed-satellite service or in the broadcasting-satellite service shall not exceed the values given in Table 2.

[The provisions 1.2 to Table 2 are left in square brackets pending review by Working Group 4D:

1.2 The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary orbit, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table 1 for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth as specified in Table 1, for all pointing directions towards the geostationary orbit.

---

[1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within a non-geostationary system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{\max}}\right]$$

where:

- N is the number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater or equal to 0°;
- i is the index of the considered non-geostationary space station;
- pfd_i is the power flux-density produced at the point considered at the Earth's surface in dB(W/m^2) in the reference bandwidth;
- θ_i is the angle between the direction considered towards the geostationary orbit and the direction of the interfering space station in the non-geostationary system;
- $G_r(\theta_i)$ is the gain of the receive reference antenna to be considered as part of a geostationary network;
- G_{max} is the maximum gain of the above receive reference antenna;
- $epfd$ is the computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

TABLE 1

Frequency band allocated to the BSS	**Equivalent pfd dB(W/m²)**	**Percentage of time during which pfd level may not be exceeded**	**Reference antenna radiation pattern**	**Reference bandwidth (MHz)**
11.7 - 12.5 GHz in Region 1, 11.7 - 12.2 GHz and 12.5 - 12.7 GHz in Region 3	-145 -132	99.7% 100%	Recommendation ITU-R BO.1213 (for Regions 1 and 3)	27
12.2 - 12.7 GHz in Region 2	-144 -131	99.7% 100%	Section 3.7.2 of Annex 5 of Appendix 30 for Region 2	27

]

1.3 The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table 2 for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

---

[1] The aggregate power flux-density is defined as the summation of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^2}\right]$$

where:

- N is the number of earth stations in the non-geostationary system with an elevation angle greater or equal to 0°, from which the point considered in the geostationary orbit is visible;
- i is the index of the earth station considered in the non-geostationary system;
- P_i is the RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary system in dB(W/m²) in the reference bandwidth;
- $\theta_i(t)$ is the off-axis angle between the boresight of the earth station considered in the non-geostationary system and the direction of the point considered in the geostationary-satellite orbit;
- $G_t(\theta_i)$ is the transmit antenna gain of the earth station considered in the non-geostationary system in the direction of the point considered in the geostationary-satellite orbit;
- d is the distance between the earth station considered in the non-geostationary system and the point considered in the geostationary-satellite orbit;
- $apfd$ is the aggregate power flux-density in dB(W/m²) in the reference bandwidth.

TABLE 2

Frequency band	Aggregate pfd dB(W/m²)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (MHz)
14.5 - 14.8 GHz in Regions 1 and 3 (outside Europe)	-119 -115	99.97% 100%	27
17.3 - 18.1 GHz in Regions 1, 2 and 3			

1.4 The limits given in Table 2 may be exceeded on the territory of any country whose administration has so agreed.

Section II. Earth Station Off-Axis Power Limitations

2.1 The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station ~~at angles in the direction of the geostationary-satellite orbit off the main beam axis has a significant impact on interference caused to other geostationary-satellite networks. Enhanced utilization of the geostationary-satellite orbit and easier coordination would be attained by minimizing such off-axis radiation and administrations are encouraged to achieve the lowest values practicable bearing in mind the latest ITU-R Recommendations. Minimizing such levels is particularly important in intensively used up-link bands~~shall not exceed the following values for any off-axis angle φ, which is 2.5° or more off the main lobe axis of an earth station antenna:

Angle off-axis	*Maximum e.i.r.p. per 40 kHz*
2.5° ≤ φ ≤ 7°	(39 - 25 log φ) dB(W/40 kHz)
7° < φ ≤ 9.2°	18 dB(W/40 kHz)
9.2° < φ ≤ 48°	(42 - 25 log φ) dB(W/40 kHz)
48° < φ ≤ 180°	0 dB(W/40 kHz)

2.2 For FM-TV emissions with energy dispersal, the limits in 2.1 above may be exceeded by up to 3 dB provided the off-axis total e.i.r.p. of the transmitted FM-TV carrier does not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
2.5° ≤ φ ≤ 7°	(53 - 25 log φ) dBW
7° < φ ≤ 9.2°	32 dBW
9.2° < φ ≤ 48°	(56 - 25 log φ) dBW
48° < φ ≤ 180°	14 dBW

2.3 For FM-TV carriers which operate without energy dispersal, such carriers should be modulated at all times with programme material or appropriate test patterns. In this case, the off-axis total e.i.r.p. of the emitted FM-TV carrier shall not exceed the following values:

Angle off-axis	*Maximum e.i.r.p.*
$2.5° \leq \varphi \leq 7°$	$(53 - 25 \log \varphi)$ dBW
$7° < \varphi \leq 9.2°$	32 dBW
$9.2° < \varphi \leq 48°$	$(56 - 25 \log \varphi)$ dBW
$48° < \varphi \leq 180°$	14 dBW

2.4 The e.i.r.p. limits given in 2.1, 2.2 and 2.3 are applicable in the following frequency bands allocated to the fixed-satellite service (Earth-to-space):

12.75 - 13.25 GHz

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Corrigendum 1(Rev.1) to Document DL/40-E 11 November 1997 English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

DRAFTING GROUP 1 OF
5B AD-HOC GROUP 4

DRAFT RESOLUTION

COEXISTENCE AMONG NON-GEOSTATIONARY SYSTEMS IN THE FIXED-SATELLITE SERVICE AND GEOSTATIONARY SYSTEMS IN CERTAIN FREQUENCY BANDS

The World Radiocommunication Conference (Geneva, WRC-97),

considering

a) that the diverging interpretations arising from No. **S22.2** result in an ambiguous regulatory status for both existing and future geostationary and non-geostationary systems in the fixed-satellite service in the bands where this provision applies, with consequential risks for both types of systems;

b) that the harmonious development of non-geostationary and geostationary systems in the fixed-satellite service requires that these ambiguities be resolved with no further delay;

c) that these ambiguities can be resolved by including in Article **S22** limits to the power radiated by non-geostationary systems in order to adequately protect geostationary systems in the frequency bands and sharing situations where Resolution **46** does not apply;

d) that such limits have been developed in certain frequency bands which are currently used or planned to be used extensively by geostationary fixed-satellite service systems;

e) that non-geostationary fixed-satellite service systems are proposed in these bands which could meet these limits and receive adequate protection from existing and future fixed-satellite service geostationary systems without imposing additional constraints, therefore avoiding the need for mutual coordination;

f) that the application of Resolution **46**, in the absence of limits constraining the design of geostationary fixed-satellite service and non-geostationary fixed-satellite service systems and promoting the use of mitigation techniques, should be considered with care;

g) that in the bands where these limits apply, there would be no need for a coordination procedure between non-geostationary and geostationary systems in the fixed-satellite service,

resolves

1 that, in the frequency bands specified in Tables **S22-~~2~~3** and ~~to~~ **S22-4**, non-geostationary systems in the fixed-satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the power limits appearing in Article **S22**;

2 that these limits will be applied provisionally until the end of the WRC-99 Conference, and that non-geostationary systems in the fixed-satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the power limits appearing in Article **S22** as revised, if appropriate, by WRC-99 ~~which may decide to revise them~~;

3 that, as of 22 November 1997, in applying No. **S22.2,** administrations may consider these provisional power limits as corresponding to permissible levels of interference from a NGSO system into a GSO system, irrespective of the date of receipt by the Bureau of the complete ~~coordination information relating to these systems;~~ notification information relating to the NGSO system and of the complete coordination information of the GSO network;

4 that, as of the end of WRC-99, an administration proposing a NGSO system which is in compliance with the limits referred to in resolves 2~~1~~ above shall be considered as having fulfilled its obligations under **S22.2** with respect to any GSO network, irrespective of the date of receipt by the Bureau of the complete notification information relating to the NGSO system and of the complete coordination information of the GSO network;

5 that, in the frequency bands from [10.7 to 30 GHz], geostationary-satellite systems in the fixed-satellite service for which complete coordination information has been received by the Bureau after 21 November 1997 shall be subject to the provisional limits appearing in Article **S22**;

6 that non-geostationary systems shall not claim protection from geostationary-satellite networks operating in accordance with the Radio Regulations [and *resolves* 4] above, irrespective of the date of receipt by the Bureau of the complete notification information relating to these non-geostationary systems;

7 ~~that the limits given in Tables **S22-1 to S22-3** may be exceeded on the territory of any country whose administration has so agreed;~~

8 [that between 21 November 1997 and the date that final limits are adopted applications submitted to the BR for NGSO systems shall not be processed until the provisional limits referred to in *resolves* 1 above have been confirmed by a competent conference.];

9 that, after WRC-99, if an administration operating or planning a GSO FSS system considers that the NGSO FSS system proposed by another administration might cause unacceptable interference into its GSO system, the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks;

10 that, as of 22 November 1997, NGSO systems in the FSS in the frequency bands referred to in *resolves* 1 above, shall be subject to the application of the provisions of No. **S9.12** for the coordination with other NGSO systems in the FSS,

requests ITU-R

1 to conduct, as a matter of urgency and in time for consideration by WRC-99:

a) the appropriate technical, operational and regulatory studies to review the regulatory conditions relating to the coexistence among NGSO and GSO systems in the fixed-satellite service in order to ensure that they do not pose undue constraints on the development of non-geostationary or geostationary fixed-satellite service systems;

b) to develop a methodology for calculating the power levels produced by NGSO systems and the compliance of these levels with the limits referred to in i, ii and iii above;

c) to complete the studies relating to the sharing criteria to be applied for determining the need for coordination between non-geostationary fixed-satellite service systems, with a view to promote efficient use of spectrum/orbit resources and equitable access to these resources by all countries;

2 to undertake the development of power limits in order to protect existing and future geostationary fixed-satellite service systems in those bands where non-geostationary fixed-satellite service systems are likely to be implemented and geostationary fixed-satellite service systems are used or expected to be used extensively.

ADD

DRAFT RESOLUTION [COM5-19]

USE OF THE FREQUENCY BANDS COVERED BY APPENDICES 30, 30A AND 30B BY NGSO NETWORKS

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that limits have been established and included in Article **S22** to ensure that the interference caused by non-geostationary-satellite systems into assignments operated in conformity with the Appendices 30, 30A and 30B Plans is maintained within negligible levels;

b) that the integrity of the above-mentioned Plans is to be ensured;

c) that NGSO systems should not be entered into those Plans and therefore not apply and not be protected by the associated procedures,

resolves

that, as of 22 November 1997, NGSO systems in the fixed-satellite service operating in the frequency bands covered by Appendices 30, 30A and 30B:

a) shall comply with the provisional limits specified in Article **S22**;

b) may apply, the procedures of Section I of Article 11/**S9** and the procedures of Article 13/**S11**; and

c) shall be subject to the application of the provisions of No. **S9.12** for the coordination with other NGSO systems in the FSS,

requests ITU-R

a) to conduct, as a matter of urgency and in time for consideration by WRC-99, the appropriate technical, operational and regulatory studies to review the regulatory provisions concerning the operation of NGSO FSS systems in these frequency bands in order to ensure that these conditions ensure appropriate protection of the Plans and their future modifications and do not pose unreasonable constraints on the development of geostationary systems in these bands;

b) to report to CPM-99 on the conclusion of these studies.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Corrigendum 1(Rev.2)
Document DL/40-E
13 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Drafting Group 1 of

5B AD-HOC GROUP 4

DRAFT RESOLUTION [COM 5-18]

USE OF NON-GEOSTATIONARY SYSTEMS IN THE FIXED-SATELLITE SERVICE IN CERTAIN FREQUENCY BANDS

The World Radiocommunication Conference (Geneva, WRC-97),

considering

a) that the International Telecommunication Union has, among its purposes, "to promote the extension of the benefit of the new telecommunication technologies to all the world's inhabitants" (No. **6** of the Constitution of the International Telecommunication Union (Geneva, 1992));

b) that it is desirable, in this respect, to promote systems capable of providing a universal service;

c) that new telecommunication services need advanced and reliable networks permitting high capacity communications;

d) that systems based on the use of new technologies associated with both geostationary (GSO) and non-geostationary (NGSO) satellite constellations are capable of providing the most isolated regions of the world with high-capacity and low-cost means of communication;

e) that many of the Members of the Union are in need of such systems;

f) that the operation of such systems requires a suitable amount of spectrum in appropriate frequency bands;

g) that decisions on this matter should permit as many systems as possible to be operated;

h) that in spite of the urgency attached to the development of such systems, technical, operational and regulatory issues should be studied in order to achieve the most efficient use of the spectrum that may be available for these systems;

i) that there is a need for the provision of services on a competitive basis between GSO/FSS and NGSO/FSS as well as between NGSO/FSS and NGSO/FSS,

considering further

a) that further technical, operational and regulatory studies are required in order to further determine the conditions under which sharing of the frequency bands 10-30 GHz and other frequency bands is feasible between GSO and NGSO systems, between NGSO systems and between NGSO and terrestrial systems;

b) that it is likely that NGSO/FSS systems communicated to the Radiocommunication Bureau will not be brought into use before the 1999 World Radiocommunication Conference (WRC-99) ;

c) that the diverging interpretations arising from No. **S22.2** result in an ambiguous regulatory status for both existing and future geostationary (GSO) and non-geostationary (NGSO) systems in the fixed-satellite service (FSS) in the bands where this provision applies, with consequential risks for both types of systems;

d) that the harmonious development of NGSO and GSO systems in the FSS requires that these ambiguities be resolved with no further delay;

e) that in resolving these ambiguities in the bands listed in *resolves 1 and resolves 2* below, the GSO arc must be protected to ensure continued use of existing FSS systems and the development of new GSO technologies and systems;

f) that these ambiguities may be resolved in certain frequency bands by adopting power flux density (pfd) limits which would apply to NGSO FSS systems to protect GSO FSS systems, by including in Article **S22** limits to the power radiated by NGSO FSS systems in order to adequately protect GSO FSS systems in the frequency bands and sharing situations where Resolution **46** does not apply;

g) that provisional pfd limits applicable to NGSO FSS systems have been developed in certain frequency bands which are currently used or planned to be used extensively by GSO FSS systems;

h) that NGSO FSS systems have been proposed in these bands which could meet these limits and receive adequate protection from existing and future GSO FSS , provided minimum contraints are applied to GSO FSS systems, , such as off-axis earth station eirp limits and space stations pfd limits;

i) that the application of Resolution **46**, in the absence of limits constraining the design of GSO and NGSO FSS systems and promoting the use of mitigation techniques, should be considered with care;

j) that in the bands where the limits referred to in *considering further f), g)* and *h)* would apply, there would be no need for a coordination procedure between NGSO/FSS and GSO systems with the exception of coordination between earth stations operating in opposite directions of transmissions;

k) that there would be a need for a coordination procedure between NGSO systems within the FSS or between NGSO FSS systems and NGSO systems in other services and for specific sharing criteria associated with this procedure, also taking into consideration various types of NGSO systems, including those in highly elliptical orbits;

l) the need to protect other co-primary services allocated in the frequency bands referred to in *considering further* a) above and the need to further assess the sharing conditions between NGSO FSS systems and these services;

noting

1. that information relating to GSO and NGSO systems in the FSS in the 10-30 GHz bands has been communicated to the Radiocommunication Bureau;

2. that some of these systems are in operation and others will be operated in the near future and, consequently, difficulties may be experienced in modifying their characteristics;

3. the need to protect existing terrestrial and space services and systems,

4. that **S22.2** is an operational provision which is to be applied between Administrations, and does not require any specific action or finding by the Bureau.

recognizing

that the geostationary satellite orbit and its associated spectrum are a uniquely valuable resource and that equitable access to this resource needs to be protected for all countries in the world.

resolves

1 that, as of 22 November 1997, in the frequency bands specified in Tables **S22-3** and **S22-4**, non-geostationary systems in the fixed-satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the provisional power limits appearing in Article **S22** and in Annex 1 of this Resolution;

2 that these limits will be applied provisionally until the end of the WRC-99 conference, and that non-geostationary systems in the fixed satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the power limits appearing in Article **S22** as revised, if appropriate, by WRC-99 ;

3 that, as of 22 November 1997, in applying No. **S22.2,** administrations may consider these provisional power limits as corresponding to permissible levels of interference from a NGSO system into a GSO system, irrespective of the date of receipt by the Bureau of the complete notification information relating to the NGSO system and of the complete coordination information of the GSO network;

4 that, as of the end of WRC-99, an administration already operating or planning to operate a NGSO FSS system which is in compliance with the limits appearing in Article **S22** as revised, if appropriate, by WRC-99, shall be considered as having fulfilled its obligations under **S22.2** with respect to any GSO network, irrespective of the date of receipt by the Bureau of the complete notification information relating to the NGSO system and of the complete coordination information of the GSO network;

5 that, as of 22 November 1997, in the frequency bands specified in **S22.29** and **S22.30** and Annex 1 to this Resolution, GSO FSS systems for which complete coordination information has been received by the Bureau after 21 November 1997 shall be subject to the provisional limits appearing in Article **S22**

6 that, as of 22 November 1997, in the frequency bands specified in **S22.29** and **S22.30** and Annex 1 to this Resolution, non geostationary systems shall not claim protection from geostationary satellite networks operating in accordance with the Radio Regulations above, irrespective of the date of receipt by the Bureau of the complete notification information relating to these non-geostationary systems.

7 that, after WRC-99, if an administration operating or planning to operate a GSO FSS system considers that the NGSO FSS system operated or planned to be operated by another administration [and which complies with the limits] might cause unacceptable interference into its GSO system, the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks.

8 That, as of 22 November 1997, NGSO systems in the FSS in the frequency bands referred to in *resolves 1* above, shall be subject to the application of the provisions of No. **S9.12** for the coordination with other NGSO systems in the FSS;

requests the ITU-R

1 to conduct, as a matter of urgency and complete, in time for consideration by WRC-99,

a) the appropriate technical, operational and regulatory studies to review the regulatory conditions relating to the coexistence among NGSO and GSO systems in the FSS in order to ensure that they do not pose undue constraints on the development of NGSO and GSO FSS systems;

b) the development of a methodology for calculating the power levels produced by NGSO FSS systems and the compliance of these levels with the limits referred to in*resolves 1 and 2* above.

c) the studies relating to the sharing criteria to be applied for determining the need for coordination between NGSO FSS systems on the one hand and NGSO systems in the FSS and in other space services and terrestrial services , with a view to promote efficient use of spectrum/orbit resources and equitable access to these resources by all countries.

2 to undertake the development of power limits in order to protect existing and future GSO systems in the frequency bands other than those referred to in *resolves 1* above and where NGSO FSS systems are likely to be implemented and GSO systems are used or expected to be used extensively;

Instructs the radiocommunication Bureau,

As of the end of WRC-99, to review and, if appropriate, revise, any finding previously made on the compliance with the limits contained in Article **S22**, of a NGSO FSS system for which notification information has been received between 22 November 1997 and the end of WRC-99. This review shall be based on the values appearing in Article **S22**, as revised, if appropriate, by WRC-99.

F/62/2
ADD

DRAFT RESOLUTION [COM 5-19]

USE OF THE FREQUENCY BANDS COVERED BY APPENDI[X][CES] [30, 30A AND] 30B BY NGSO SYSTEMS IN THE FIXED-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that limits have been established and included in Article **S22** to ensure that the interference caused by non-geostationary-satellite (NGSO) systems in the Fixed Satellite Service (FSS) into assignments operated in conformity with the Appendices 30, 30A and 30B Plans is maintained within negligible levels;

b) that the integrity of the above-mentioned Plans and their future modifications is to be ensured;

c) that NGSO systems should not be entered into those Plans and therefore not apply and not be protected by the procedures associated with these Plans,

d) [that this conference has decided to introduce in Article **S5** of the Radio Regulations a new allocation to the FSS in the frequency bands 11.7 GHz to 12.7 GHz, limited to NGSO/FSS systems;]

resolves

1. that, as of 22 November 1997, NGSO FSS systems operating in the frequency bands covered by Appendices [30, 30A and]30B in the frequency bands from 10.7 GHz to 17.8 GHz,

a) shall comply with the provisional limits specified in Article **S22** and in Annex 1 to this Resolution;

b) may apply, the procedures of Section I of Article 11/**S9** and the procedures of Article 13/**S11**, and

c) shall be subject to the application of the provisions of No. **S9.12** for the coordination with other NGSO systems in the FSS.

2. that NGSO FSS systems in the frequency bands referred to in *resolves 1* above shall not be operated before the end of WRC-99;

requests the ITU-R

a) to conduct, as a matter of urgency and in time for consideration by WRC-99, the appropriate technical, operational and regulatory studies to review the regulatory provisions concerning the operation of NGSO FSS systems in the frequency bands referred to in *resolves 1 above* in order to ensure that these conditions ensure appropriate protection of the Plans and their future modifications and do not pose unreasonable constraints on the development of GSO systems in these bands;b) to undertake and complete the development of a methodology for calculating the power levels produced by NGSO FSS systems and the compliance of these levels with the limits referred to in *resolves 1 above;*

c) to complete the studies relating to the sharing criteria to be applied for determining the need for coordination between NGSO FSS systems, with a view to promote efficient use of spectrum/orbit resources and equitable access to these resources by all countries.

d) to report to CPM-99 on the conclusion of these studies.

Instructs the Radiocommunication Bureau,

As of the end of WRC-99, to review and, if appropriate, revise, any finding previously made on the compliance with the limits contained in Article **S22**, of a NGSO FSS system for which notification information has been received between 22 November 1997 and the end of WRC-99. This review shall be based on the values appearing in Article **S22**, as revised, if appropriate, by WRC-99.

NOTE TO GT/PLEN 1

The following agenda item should be included in the draft agenda for WRC-99:

On the basis of the results of the studies in accordance with Resolutions [COM 5-18], [COM 5-19], [COM 5-20] and [COM 5-23], review and if appropriate, revise the power limits appearing in Articles **S21** and **S22** in relation to the sharing conditions among NGSO FSS, GSO FSS, GSO BSS and terrestrial services, to ensure that these power limits do not pose under constraints to the development of these systems and services.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Corrigendum 1(Rev.3) to Document DL/40-E
13 November 1997
English only

DRAFTING GROUP 1 OF 5B AD HOC GROUP 4

DRAFT RESOLUTION [COM5-18]

USE OF NON-GEOSTATIONARY SYSTEMS IN THE FIXED-SATELLITE SERVICE IN CERTAIN FREQUENCY BANDS

The World Radiocommunication Conference (Geneva, WRC-97),

considering

a) that the International Telecommunication Union has, among its purposes, "to promote the extension of the benefit of the new telecommunication technologies to all the world's inhabitants" (No. **6** of the Constitution of the International Telecommunication Union (Geneva, 1992));

b) that it is desirable, in this respect, to promote systems capable of providing a universal service;

c) that new telecommunication services need advanced and reliable networks permitting high capacity communications;

d) that systems based on the use of new technologies associated with both geostationary (GSO) and non-geostationary (NGSO) satellite constellations are capable of providing the most isolated regions of the world with high-capacity and low-cost means of communication;

e) that many of the Members of the Union are in need of such systems;

f) that the operation of such systems requires a suitable amount of spectrum in appropriate frequency bands;

g) that decisions on this matter should permit as many systems as possible to be operated;

h) that in spite of the urgency attached to the development of such systems, technical, operational and regulatory issues should be studied in order to achieve the most efficient use of the spectrum that may be available for these systems;

i) that there is a need for the provision of services on a competitive basis between GSO/FSS and NGSO/FSS as well as between NGSO/FSS and NGSO/FSS,

considering further

a) that further technical, operational and regulatory studies are required in order to further determine the conditions under which sharing of the frequency bands 10-30 GHz which are allocated to the FSS and ~~and other frequency bands~~ where Resolution 46 does not apply is feasible between GSO and NGSO systems, between NGSO systems and between NGSO and terrestrial systems;

b) that it is likely that NGSO/FSS systems communicated to the Radiocommunication Bureau will not be brought into use before the 1999 World Radiocommunication Conference (WRC-99) ;

c) that the diverging interpretations arising from No. **S22.2** result in an ambiguous regulatory status for both existing and future ~~geostationary (~~GSO~~)~~ and ~~non-geostationary (~~NGSO~~)~~ systems in the fixed-satellite service (FSS) in the bands where this provision applies, with consequential risks for both types of systems;

d) that the harmonious development of NGSO and GSO systems in the FSS requires that these ambiguities be resolved with no further delay;

e) that in resolving these ambiguities in the bands referred to ~~listed~~ in *resolves 1 ~~and resolves 2~~* below, the GSO arc must be protected to ensure continued use of existing FSS systems and the development of new GSO technologies and systems;

f) that these ambiguities may be resolved in certain frequency bands by adopting power flux density (pfd) limits which would apply to NGSO FSS systems to protect GSO FSS systems, by including in Article **S22** limits to the power radiated by NGSO FSS systems in order to adequately protect GSO FSS systems in the frequency bands and sharing situations where Resolution **46** does not apply;

g) that in certain frequency bands which are currently used or planned to be used extensively by GSO FSS systems, provisional pfd limits applicable to NGSO FSS systems have been developed ~~in certain frequency bands which are currently used or planned to be used extensively by GSO FSS systems~~;

h) [that NGSO FSS systems have been proposed in some of these bands which could meet these limits and would not require specific ~~receive adequate~~ protection from existing and future GSO FSS-, provided minimum constraints are applied to GSO FSS systems, ~~,~~such as off-axis earth station eirp limits and space stations pfd limits;]

~~i) that the application of Resolution 46, in the absence of limits constraining the design of GSO and NGSO FSS systems and promoting the use of mitigation techniques, should be considered with care;~~

i) that in the bands where the limits referred to in *considering further f), g)* and *h)* would apply, there would be no need for a coordination procedure between NGSO/FSS and GSO systems with the exception of coordination between earth stations operating in opposite directions of transmissions;

j) that there would be a need for a coordination procedure between NGSO systems within the FSS and ~~or~~ between NGSO FSS systems and NGSO systems in other services and for specific sharing criteria associated with this procedure, also taking into consideration various types of NGSO systems, including those in highly elliptical orbits;

k) the need to protect other co-primary services allocated in the frequency bands referred to in *considering further* a) above and the need to further assess the sharing conditions between NGSO FSS systems and these services;

l) further studies on sharing conditions in frequency bands other than the 10-30 GHz frequency bands, where Resolution 46 does not apply, may be also be necessary on the basis of the requirements that may develop.

noting

1. that information relating to GSO and NGSO systems in the FSS in the 10-30 GHz bands has been communicated to the Radiocommunication Bureau;

[2. that some of these systems are in operation and others will be operated in the near future and, consequently, difficulties may be experienced in modifying their characteristics;]

3. the need to protect existing and future terrestrial and space services and systems,

4. that **S22.2** is an operational provision which is to be applied between Administrations, and does not require any specific action or finding by the Bureau.

recognizing

that the geostationary satellite orbit and its associated spectrum are a uniquely valuable resource and that equitable access to this resource needs to be protected for all countries in the world.

resolves

1 that, as of 22 November 1997, in the frequency bands specified in Tables **S22-3** and **S22-4**, and in the Tables in Annex 1 of this Resolution, NGSO/FSS ~~non-geostationary systems in the fixed satellite service~~ for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the provisional power limits appearing in Article **S22** and in Annex 1 of this Resolution;

2 that these limits shall ~~will~~ be applied provisionally until the end of the WRC-99 conference, and that non-geostationary systems in the fixed satellite service for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the power limits appearing in Article **S22** as revised, if appropriate, by WRC-99 ;

3 that, as of 22 November 1997, in applying No. **S22.2,** administrations may consider these provisional power limits as corresponding to permissible levels of interference from a NGSO system into a GSO system, irrespective of the dates of receipt by the Bureau of the complete notification information relating to the NGSO system and of the complete coordination information of the GSO network;

4 that, as of the end of WRC-99, an administration ~~already~~ operating ~~or planning to operate~~ a NGSO FSS system which is in compliance with the limits appearing in Article **S22** as revised, if appropriate, by WRC-99, shall be considered as having fulfilled its obligations under **S22.2** with respect to any GSO network[, irrespective of the dates of receipt by the Bureau of the complete notification information relating to the NGSO system and of the complete coordination information of the GSO network;]

5 [that, as of 22 November 1997, in the frequency bands specified in **S22.29** and **S22.30** and Tables [xx] and [yy] of Annex 1 to this Resolution, GSO FSS systems for which complete coordination information has been received by the Bureau after 21 November 1997 shall be subject to the provisional limits appearing in Article **S22**;]

6 that these limits shall be applied provisionally until the end of the WRC-99 conference, and that GSO/FSS systems for which complete coordination information has been received by the Radiocommunication Bureau after the end of WRC-99 shall be subject to the power limits appearing in Article **S22** as revised, if appropriate, by WRC-99 ;

7 that, as of 22 November 1997, in the frequency bands specified in **S22.29** and **S22.30** and Tables [xx] and [yy] of Annex 1 to this Resolution, non geostationary systems shall not claim protection from geostationary satellite networks operating in accordance with the Radio Regulations ~~above~~, irrespective of the dates of receipt by the Bureau of the complete notification information relating to these non-geostationary systems and of the complete coordination information of the GSO networks;~~-~~

8 that, after WRC-99, if an administration operating or planning to operate a GSO FSS system considers that the NGSO FSS system operated or planned to be operated by another administration ~~[~~and which complies with the limits appearing in Article **S22** as revised, if appropriate, by WRC-99~~]~~ might cause unacceptable interference into its GSO system, the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks.

9 That, as of 22 November 1997, NGSO systems in the FSS in the frequency bands referred to in *resolves 1* above, shall be subject to the application of the provisions of No. **S9.12**/Paragraph 2.2 of Section II of Resolution 46 for the coordination with other NGSO systems in the FSS;

requests the ITU-R

1 taking into account *considering further a)*, to conduct, as a matter of urgency and complete, in time for consideration by WRC-99,

a) the appropriate technical, operational and regulatory studies to review the regulatory conditions relating to the coexistence among NGSO and GSO systems in the FSS in order to ensure that they do not pose undue constraints on the development of NGSO and GSO FSS systems;

b) the development of a methodology for calculating the power levels produced by NGSO FSS systems and the compliance of these levels with the limits referred to in *resolves 1 and 2* above.

c) the studies relating to the sharing criteria to be applied for determining the need for coordination between NGSO FSS systems on the one hand and NGSO systems in the FSS and in other space services and terrestrial services , with a view to promote efficient use of spectrum/orbit resources and equitable access to these resources by all countries.

Annex 2 of this resolution describes the activities to be carried out during the period between WRC-97 and CPM-99 to this effect

2 taking into account *considering further l)*, to undertake the development of power limits or other frequency sharing mechanisms ~~in order to protect existing and future~~ among GSO, NGSO and terrestrial systems in the frequency bands other than those referred to in *resolves 1*

above and where NGSO FSS systems are likely to be implemented and GSO systems are used or expected to be used extensively;

Instructs the radiocommunication Bureau,

As of the end of WRC-99, to review and, if appropriate, revise, any finding previously made on the compliance with the limits contained in Article **S22**, of a NGSO FSS system for which notification information has been received between 22 November 1997 and the end of WRC-99. This review shall be based on the values appearing in Article **S22**, as revised, if appropriate, by WRC-99.

ANNEX 2 TO RESOLUTION [COM5-18]

ACTIVITIES TO BE CARRIED OUT DURING THE WRC-97 TO WRC-99 INTERVAL TO REVIEW THE PROVISIONAL POWER FLUX-DENSITY LIMITS

To review the provisional power flux-density limits it is necessary to carry out technical activities using software simulation capabilities, and when necessary carry out consultations with operators of existing and planned networks to clarify any difficulties. These activities would generally consist of the following:

1) in conjunction with the BR establish an appropriate group to carry out simulation exercises (after first agreeing on the simulation capability to use and the technical bases in the Attachment);
2) using agreed classes (characteristics) of GSO networks derived from the S4's (AP3) on file at the ITU-R, conduct simulation exercises to determine the categories of GSO networks which are protected by the provisional limits;
3) identify those GSO networks which do not receive protection from these provisional limits;
4) conduct consultations with those proposing such GSO networks identified in 3) above to determine ways to provide necessary protection including revision of the limits;
5) prepare reports for consideration by appropriate ITU-R groups including Study Group 4 and the CPM.

ATTACHMENT TO ANNEX 2

1) Develop criteria to protect GSO from interference.
2) Define generic class of GSO networks to protect.
3) Methodology from verification.

DRAFT RESOLUTION [COM 5-19]

USE OF THE FREQUENCY BANDS COVERED BY APPENDI[X][CES] [30, 30A AND] 30B BY NGSO SYSTEMS IN THE FIXED-SATELLITE SERVICE

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that limits have been established and included in Article **S22** to ensure that the interference caused by non-geostationary-satellite (NGSO) systems in the Fixed Satellite Service (FSS) into assignments operated in conformity with the Appendices 30, 30A and 30B Plans is maintained within negligible levels;

b) that the integrity of the above-mentioned Plans and their future modifications is to be ensured;

c) that NGSO systems should not be entered into those Plans and therefore not apply and not be protected by the procedures associated with these Plans,

d) [that this conference has decided to introduce in Article **S5** of the Radio Regulations a new allocation to the FSS in the frequency bands 11.7 GHz to 12.7 GHz, limited to NGSO/FSS systems;]

resolves

1. that, as of 22 November 1997, NGSO FSS systems operating in the frequency bands covered by Appendices [30, 30A and]30B in the frequency bands from 10.7 GHz to 17.8 GHz,

   a) shall comply with the provisional limits specified in Article **S22** and in Annex 1 to this Resolution;

   b) may apply, the procedures of Section I of Article 11/**S9** and the procedures of Article 13/**S11**, and

   c) shall be subject to the application of the provisions of No. **S9.12** for the coordination with other NGSO systems in the FSS.

2. that NGSO FSS systems in the frequency bands referred to in *resolves 1* above shall not be operated before the end of WRC-99;

requests the ITU-R

a) to conduct, as a matter of urgency and in time for consideration by WRC-99, the appropriate technical, operational and regulatory studies to review the regulatory provisions concerning the operation of NGSO FSS systems in the frequency bands referred to in *resolves 1 above* in order to ensure that these conditions ensure appropriate protection of the Plans and their future modifications and do not pose unreasonable constraints on the development of GSO systems in these bands;b) to undertake and complete the development of a methodology for calculating the power levels produced by NGSO FSS systems and the compliance of these levels with the limits referred to in *resolves 1 above;*

c) to complete the studies relating to the sharing criteria to be applied for determining the need for coordination between NGSO FSS systems, with a view to promote efficient use of spectrum/orbit resources and equitable access to these resources by all countries.

d) to report to CPM-99 on the conclusion of these studies.

Instructs the Radiocommunication Bureau,

As of the end of WRC-99, to review and, if appropriate, revise, any finding previously made on the compliance with the limits contained in Article **S22**, of a NGSO FSS system for which notification information has been received between 22 November 1997 and the end of WRC-99. This review shall be based on the values appearing in Article **S22**, as revised, if appropriate, by WRC-99.

NOTE TO GT/PLEN 1

The following agenda item should be included in the draft agenda for WRC-99:

On the basis of the results of the studies in accordance with Resolutions [COM 5-18], [COM 5-19], [COM 5-20] and [COM 5-23], review and if appropriate, revise the power limits appearing in Articles **S21** and **S22** in relation to the sharing conditions among NGSO FSS, GSO FSS, GSO BSS and terrestrial services, to ensure that these power limits do not pose under constraints to the development of these systems and services.

UNION INTERNATIONALE DES TELECOMMUNICATIONS

CMR-97 CONFERENCE MONDIALE DES RADIOCOMMUNICATIONS

GENEVE, 27 OCTOBRE – 21 NOVEMBRE 1997

Document DL 41/-F/E/S

C1/5

COMMISSION DE DIRECTION

ORDRE DU JOUR DE LA CINQUIEME SEANCE DE LA COMMISSION 1

Mardi, 11 novembre 1997, à 17 hrs 45
(Salle III-IV)

		Document
1.	Calendrier du 12 au 15 novembre 1997	-
2.	Divers	-

AGENDA OF THE FIFTH MEETING OF COMMITTEE 1

Tuesday, 11 November 1997, at 1745 hrs
(Room III-IV)

		Document
1.	Calendar from 12 to 15 November 1997	-
2.	Other business	-

ORDEN DEL DIA DE LA QUINTA SESION DE LA COMISION 1

Martes, 11 de noviembre de 1997, a las 1745 horas
(Sala III-IV)

		Documento
1.	Calendario del 12 al 15 de noviembre 1997	-
2.	Otros asuntos	-

R. SMITH
Président / Chairman / Presidente

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER - 21 NOVEMBER 1997

Document DL/42-E
11 November 1997
Original: English only

COMMITTEE 4

COMMITTEE 5

WORKING DOCUMENT ON THE DEVELOPMENT OF LIMITS FOR NGSO FSS TO PROTECT GSO NETWORKS

Agenda Items 1.9.1 and 1.10

RESPONSES TO THE QUESTIONS RECEIVED AS OF 10 NOVEMBER 1997

During the meetings of WG 4D and 5B Ad-hoc Group 4, several questions were raised on specific aspects of the proposals made in documents CMR-97/5 and 62 in relation to the incorporation of hard power limits in Article **S22** in order to protect GSO systems in the FSS and in the BSS. This working document provides a list of those questions which have been received by 10 November 1997, and the corresponding answers which have been given in response. Each question is identified by the administration having raised it.

USA/1 When should a NGSO satellite shut down its transmissions and is there a decision point?

There are two aspects to be taken into consideration:

- spatial mechanics (simply because a NGSO satellite is moving with regards to any GSO satellite),
- Radio performances.

The spatial mechanics of NGSO impose frequent satellite handoffs because satellites are moving in the sky. Consequently, any NGSO earth station will loose satellite visibility and must switch traffic to another satellite in order to maintain connectivity. Handoff transparency to the user requires that there is always another satellite visible that can relay the transmissions of the first one. Several techniques are possible in order to guarantee this transparency to the users. Adding a handoff in order to avoid the GSO arc is not a burden, it is simply a design choice.

Turning-off transmissions under certain circumstances is one possible design choice in order to limit interference and meet the proposed limits. The choice of the appropriate technique should be left to the system designers and not imposed by the radio regulations. There are many possible trade-offs between the satellite antenna design and the constellation design (e.g. number of satellites, orbital parameters). A decision point for turning off transmissions is then a system dependent decision, and would have to be provided to the BR for verification of compliance with the limits.

The NGSO satellite antenna performance is the driving parameter to achieve compliance with the limits, since it controls the discrimination between the GSO and NGSO systems in the downlink. Antenna patterns are usually provided to the BR when submitting Appendix **S4** information.

One system, described in Part A of document CMR-97/62 in the Ku band is designed with a GSO avoidance arc of $\pm$ 10°. This technique, among others, allows to meet the proposed epfd and apfd limits.

USA/2 How can the BR be sure that the limits are met?

Any administration submitting a NGSO network in the bands where hard limits would apply would have to provide the Bureau with the relevant values of equivalent pfd and aggregate pfd produced by all the NGSO system, in addition to the information currently requested under Appendix S4 for NGSO systems. The Bureau would check that these values are in conformity with the hard limits.

The limits proposed in document CMR-97/5, and in Addendum 1 to document CMR-97/62 are of three types:

Pfd limits to protect the terrestrial services,
Long term Equivalent pfd and aggregate pfd limits to protect the GSO systems
Short term Equivalent pfd and aggregate pfd limits to protect the GSO systems

The first limit is classical and does not need explanation. Determination of the compliance with the other limits on the basis of the general parameters of the space and earth stations in the NGSO system require computer simulations. However there are ways to obtain rough results by hand calculations. For the long term limit a simple way to get confidence into the results is to consider *n* satellites (*n* equal to the number of visible satellites) into the GSO antenna back-lobes. Similar preliminary calculations can be undertaken for the up-link. However, statistics can be accurately derived only by software simulations.
For the short-term limits similar approximations can be undertaken, however complete simulations are necessary to obtain a fully accurate result.

Resolution 115 resolves that, in the case of interference caused by a NGSO MSS feeder link system into a GSO system, "the power flux density shall be determined by simulation of the complete orbital constellation of the NGSO network". The proposed approach is that, similar to what was adopted by WRC-95 in Resolution 115, the ITU-R be invited to developed a methodology for calculating the aggregate level of apfd and epfd. A possible approach to develop this methodology is provided in Section 2 of Part 9 to document CMR-97/62.

USA/3 On site verification

In case of actual interference reported from a NGSO system into a GSO earth station, on-site verification could be done using a reference antenna pointing in the direction of the wanted GSO satellite. At the end of the period of repetition of the NGSO system constellation, the actual statistics of the measured epfd could be compared with the proposed limits.

It should be noted that this situation is not specific of the approach proposed : under Resolution 46, harmful interference may occur, which would lead to a requirement to identify the source of the interference. Also, under RR 2613, unacceptable interference may occur and a similar situation could occur.

USA/4 Frequency sharing between NGSO satellite systems

The sharing situation between NGSO satellite systems has been analyzed in Part 9, Section 6 of Document 62-E (starting page 71).

Different techniques have been devised to enable and facilitate this frequency-sharing situation. Among those techniques, constellations of different NGSO systems can be defined in order to provide sufficient antenna discrimination by insuring a certain amount of angular discrimination between the space stations of the considered systems.

For example, two NGSO satellite systems such as the proposed F-SATMULTI 1B NGSO system have been chosen in such a way that the transmission characteristics of the two systems are the same, but the orbital characteristics of the satellite of the two considered systems are different (keeping constant the inclination angle and the satellite altitude). The orbital positions of the satellites within the orbital planes, and the orbital planes themselves are interleaved in order to avoid in line situations at all times. It is shown in this case that the noise temperature increase of each of the systems never exceeds a few percent. This technique was also shown to be efficient in the Ka band frequency range (see Section 4.4.1 in CPM report).

In the case of non-homogeneous constellations (with different satellite altitude and inclination angle of the orbital plane), it is also possible to select the adequate mean ascension and right ascension of the ascending node of the satellite orbit in order to minimize the probability of in-line or quasi in-line situation. This process would require a cooperation between the administrations responsible for each of these new systems.

The proposed approach does not include any regulatory provisions that may be used in order to ensure coexistence between non-homogeneous NGSO constellations. This complex issue should be studied as a matter of urgency by the ITU-R in order to ensure equitable access by all countries to the spectrum resources.

USA/5 How can a NGSO system meet the limits and still be viable?

The best way to answer this concern is to consider a NGSO system which has been already filed and proposes technical answers for the protection of the GSO systems. The SkyBridge system, which is described in Document CMR-97/62, is a NGSO system that could meet the proposed limits while offering a continuous service.

The SkyBridge system has been designed integrating the need to protect the GSO systems. It therefore applies the **S22.2** requirement, which states that a NGSO system should reduce or cease its emissions, if it creates unacceptable interference into a GSO system.

The main principles of operation are therefore as follows:

- Use of a spread spectrum waveform and power control in order to limit the power radiated by both the NGSO earth stations and the NGSO space stations.
- Use of satellite diversity to avoid main beam to main beam transmissions.

In order to achieve continuous service with high quality requirements, the NGSO satellite constellation has been optimised so that there is always a satellite far away from the GSO arc for any point on the ground.

With such optimisation of the system it has been possible to propose the SkyBridge system for consideration by the international community. It meets the limits and still operates with high quality transmissions.

USA/6 Non symmetrical antennas

Generally speaking, antenna radiation patterns are of revolution around the radiation main axis of the antenna. This was the rationale when developing Recommendations dealing with the establishment of reference antenna radiation pattern.

However, during the CEPT technical preparation of WRC-97, the use of radiation pattern which are not of revolution have also been addressed. For instance the use of " diamond like " antenna privileging a radiation plane to the detriment of the radiation plane at 45° from the main one has been analyzed with measures kindly provided by an antenna manufacturer. It was shown that such kind of antennas while providing improved radiation characteristics in the main radiation plane, does not show a large degradation of the radiation plane in any direction outside the geostationary-satellite direction. Moreover, the compliance of this last radiation pattern with Rec. 465-5, which is used in calculating the compliance with the proposed limits, was also demonstrated.

USA/7 Protection of NGSO satellites systems from GSO satellite networks

The general principle adopted for frequency sharing between NGSO satellite systems and GSO satellites Networks calls for the implementation of mitigation techniques. The use of these mitigation techniques (GSO orbital arc avoidance, satellite diversity...) ensures for instance that a certain level of antenna discrimination is provided between NGSO transmitters and GSO receivers. These techniques have also a reciprocal effect by ensuring also angular discrimination between the GSO satellite network transmitters and the NGSO satellite receivers.

This antenna isolation coupled with the current power flux density limits given in Article S21 for the protection of terrestrial services are also shown to protect adequately the reception of the earth stations of NGSO satellite systems (see Section 5, Part 9, page 69 of document 62-E). Even higher pfd limits are also shown not to produce interference in excess into these NGSO earth stations.

There is also a need to define an adequate level of maximum off-axis e.i.r.p. of the GSO satellite network earth stations. The off-axis e.i.r.p. density limits given in Recommendation ITU-R 524-5 are shown also to adequately protect NGSO satellite systems.

As a consequence, it is also proposed in Document 62-E (Part 6, page 39) to include in Article S22 the e.i.r.p. density limits which are given in ITU-R Recommendation ITU-R 524-5.

USA/8 There is no limit to the inclination of a GSO space station. How is this factor accounted for ? How does the inclination angle of a GSO affect the required orbital avoidance arc and the capacity of the NGSO system ? How will the NGSO system know which GSO's are in inclined orbit ?

There are several questions in USA/8 which are all interrelated and which may assume that the effect of the NGSO satellite system on a GSO satellite system operating in inclined orbit would be worse than the case of a geostationary-satellite operated with a standard inclination (e.g. 0.1°).

The difference between geostationary and geosynchronous is an old debate which could not find q conclusion at this time as the result depends on the services provided. Without reopening this debate, it may be considered that protection of (or from) other services as the fixed service may limit the inclination angle of a geostationary satellite. In the 7 GHz frequency band S22.5 provides protection for GSO system against interference from NGSO MSS feeder links only up to 5 degree inclination angle.

The protection of the GSO satellite networks is addressed in the Radio Regulations in Article S21 :

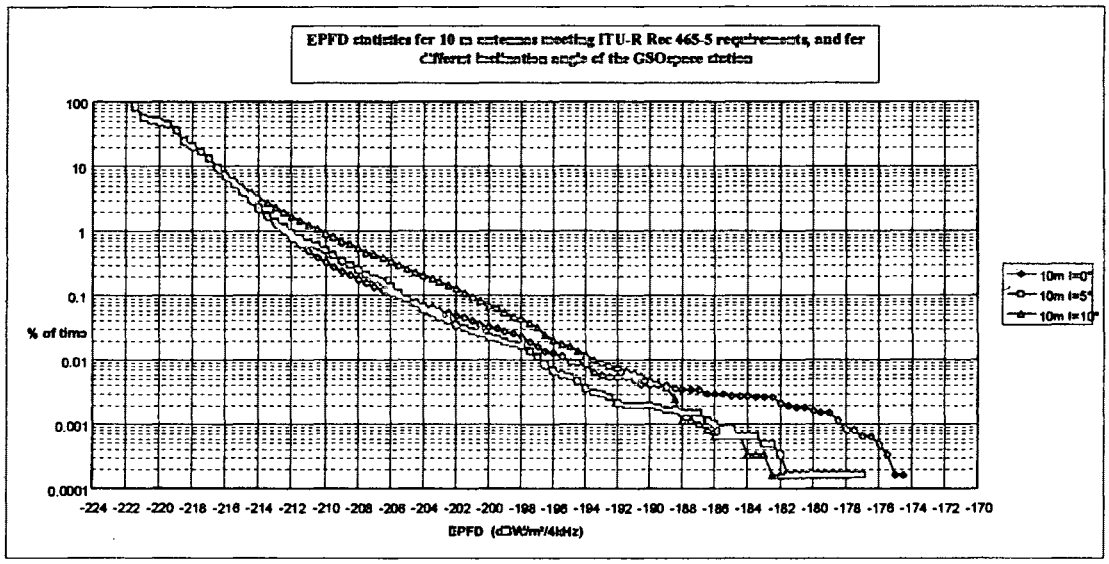
S21.2.4 indicates that for transmitting stations in the fixed and mobile services above 10 GHz that the minimum separation angle with respect to geostationary-satellite orbit is 1.5 degrees. It can therefore be concluded that the protection of the GSO satellite networks above this separation angle and from these stations is not envisaged in the Radio Regulations in those frequency bands shared with FS and MS in the Earth-to-space direction.

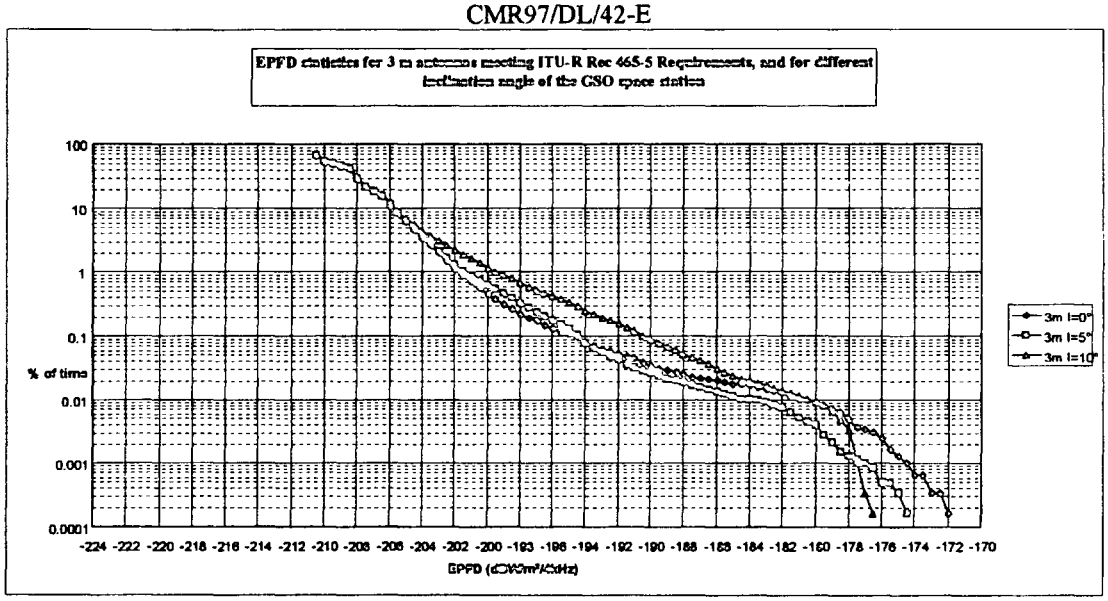
- *" How is this factor accounted for ? "*

The operation of GSO satellite networks in inclined orbit implies that the GSO earth station must track the GSO satellite which moves around its nominal location and this operation mode can only be undertaken with large antennas (e.g. diameter above 3 m). Then the half power beam width is small compared to the proposed GSO avoidance arc. The consequence of that is more on the " long term " interference than on the short term one.

The simulations have been performed for 3m and 10 m antennas. The following chart presents the epfd statistics for an inclination angle of 0°, 5° and 10°. It is shown that the long term interference statistics are modified, but not in a significant manner and this concerns mainly the event of small amplitude. It can also be seen that short term statistics are improved. This can be explained by the random phasing between the two system orbits. Although these simulations refer to a particular system, this result could easily be generalised.

In conclusion, the operation of the GSO satellite in inclined orbit operation is also insured with the limits as proposed.





- *" How does the inclination angle of a GSO affect the required orbital avoidance arc and the capacity of the NGSO system ? How will the NGSO system know which GSO's are in inclined orbit ? "*

As explained before, protection of inclined GSO operation does not require a modification of the proposed NGSO limits, and has no impact on the NGSO capacity. The NGSO systems are protected through the same means.

USA/9 : From a GSO operator standpoint it is important to know the actual pfd the NGSO system is producing on the Earth's surface vs the apfd and the epfd limits. What is the PFD as a function of the angle of arrival and as a function of the GSO avoidance arc ?

- *The first part of the question indicates that " from the GSO operator standpoint it is important to know the actual pfd of the NGSO system is producing on the Earth's surface vs the apfd and the epfd limits ".*

Neither the concept which is proposed in Documents 5 and 62, nor the actual interference mechanism between NGSO system and GSO networks seem to be understood. The proposal is to quantify the " unacceptable ", interference levels produced by the NGSO system and which are referred to in S22.2, and which is in fact the important metric from the GSO operator viewpoint.

The fact that a NGSO constellation is composed of several satellites, that some of them may be simultaneously visible from a single location at the Earth's surface, and that the GSO antenna placed at this location is steered towards a particular location of the GSO indicates that the aggregate noise level of the constellation is the sum of the noise level produced by each of the NGSO space station taking into account the antenna discrimination of the receiving antenna.

This explains the concept of epfd and apfd which are the relevant metric for the GSO satellite operator to quantify the actual noise level which will be received by the antenna.

Additionally, the apfd which is produced has not relation with the pfd produced by the NGSO satellite at the Earth's surface (the apfd being generated at the geostationary-satellite orbit).

The 100% epfd limit represents the pfd which would be generated by a single NGSO space station placed in the main beam of the receive antenna, and is the direct measure of the produced pfd.

- *The second part of the question addresses the need to define the PFD as a function of the angle of arrival and as a function of the GSO avoidance arc ?*

The purpose of the concept is to define what is acceptable by the GSO networks, not to impose a mitigation technique (note that RR2613 has been simplified in such a way in 1995 when being renamed S22.2). Thus the proposed epfd concept is the sole valid metric, and it is the total flux which would be generated by the NGSO transmitters, taking also into account the motion of the satellites. Therefore defining a pfd versus the GSO avoidance arc as well as the angle of arrival would not be of help to finally assess the levels generated by the NGSO system in the GSO receivers.

It should be noted also that this concept was proposed during WP4-A, which was to present the proposed PFD limit (which is also a function of the GSO avoidance arc and the elevation angle) as a function of the number of satellites of the constellation. This single PFD concept is thus not adequate since it does not take into account of the actual constellation characteristics (altitude of the satellites, inclination angle of the satellites, phasing between the satellites, ...). The difficulty of this approach is that it does not model correctly the interference mechanism, while in the 7 GHz frequency range allocated to the MSS feeder links in the space-to-Earth the correct approach was taken by aggregating the total power generated by all the NGSO satellites.

The only way to define the effects of the NGSO emissions in the GSO receivers is in fact to quantify the resulting aggregate of the levels produced by the NGSO transmitters rather than allocating an arbitrary an inadequate amount of power to each of the NGSO satellites.

INS/1 Clarification of the long term and short term definition

The use of the terms "short term" limit for a value of interfering power to be met 100% of the time and the terms "long term" limit for a value of interfering power to be met for 99.x% of the time requires some clarification. In fact the protection levels used to ensure the protection of the GSO links in the different frequency bands reflect the specific nature of NGSO/GSO interference. The two limits for each band and antenna diameter consist of:

- a long term power flux density limit to be met 99.x % of the time
- a so-called short term power flux density limit which is a maximum power flux density not to be exceeded during the remaining (100 – 99.x) % of the time.

The 99.x % limit (long-term limit) can be exceeded only for (100-99.x)% of the time, but the 100% (short-term limit) of the time limit can never be exceeded.

The proposed values for x in the percentages of time 99.x% have been determined taking into account the quality of service and availability requirements of the GSO systems in the bands considered.

The choice of a short term limit to be met for 100% of the time ensures that the interference is bounded at any time.

J/1 Where does the value of 99.7% of the time comes from?

At least in the Ku-band, there are some circuits which connects with PSTN. According to ITU-R Rec. S522-5, S614 and S1062, unavailability should be less than 0.2% of the time, unavailability should be less than 0.2% of the time, because these Recs are developed from the quality of the circuit view, regardless of the antenna diameter. Therefore, availability should be more than 99.8% (even for 60cm diameter antenna) in total, and it would become higher when other reasons for unavailability such as rain attenuation, equipment failure,.. are taken into consideration.

More detailed discussions are required with Japan in order to clarify the scope of the question.

The long term protection criteria (i.e. the level of power flux density and percentage of time this pfd is applicable) have been derived with the DTH performance in mind. Such carriers are defined, in Appendix 30 Plan, for 99% of the worse month, which corresponds to 99.7% of the time. Limits levels have been defined so that in the long term case, the power level generated by a NGSO system is negligible and that during the remaining time, the link is neither broken nor significantly degraded.

A detailed link budget with the characteristics of the wanted link is required from Japan in order to assess the impact of the interference into such a link.

J/2 In part 9 of Doc F/62, it describes that up to 6 systems can co-exist in the same frequency band. However, the simulation only shows that at maximum two systems will not exceed the proposed value. If we have more than 3 systems, how can we examine and/or ensure that those 3 systems will not generate higher PFD than proposed ?

Section 6 of Part 9 of document CMR-97/62 indeed shows that up to six system like Skybridge can coexist in the same frequency band.

Although the simulation provided in Section 4 of Part 9 of document CMR-97/62 only concludes in the case of two F-SATMULTI 1B systems, the results provided in this Section and in Section 3 of Part 9 of Document CMR-97/62 allow to conclude also in the case of cumulative interference by more such NGSO systems. In this case, two aspects have to be considered:

- the cumulative effect of long term interference is clearly additive in power, i.e. if one NGSO system produces, for example, an epfd level of –179 dB(W/m²/4 kHz) into a 60 cm GSO FSS antenna for 99.7% of the time (as shown in Figure 2), the cumulative effect of six such NGSO systems will produce an epfd level of –179 + 10 log (6) = -171dB (W/m²/4 kHz) into a 60 cm GSO FSS antenna for 99.7% of the time. This is the same level as that produced 100% of the time by six GSO system with each of them producing a 6% noise increase (hence for which no coordination is required by any of them);

- the cumulative effect of short term interference is not additive in power because the corresponding interference events are very short: as can be seen in Figure 7, in the case of interference from one NGSO system, the maximum duration of an interference event during which the level of –171 dB(W/m²/4 kHz) is exceeded (the –170 level being never exceeded) is 1 second. As shown in Figure 2, the cumulated percentage of time of such events is 0.001%, or less than 1 second a day. If six such NGSO systems are used in the same frequency band, since these events are extremely rare, they will not occur at the same time[1] and there will be a maximum of six seconds a day

[1] In this case, in particular, since all the NGSO satellites of any NGSO constellation operating co-frequency with another will have significant angular discrimination with the satellites on the other constellation in order not to produce excess interference into it, this angular discrimination ensures that there will never be more than one NGSO in an in-line situation.

during which the cumulative interference exceeds –171 dB(W/m²/4 KHz). On this basis, exceeding the proposed short term limit , which corresponds to a cumulated percentage of 0.3% of the time would require 300 such NGSO systems to operate simultaneously in the band.

The simulations provided in Section 4 of document CMR-97/62 confirm that the worst case epfd values do not cumulate for two systems.

J/3 Are the Ka-band pfd limits of document CMR-97/62 compatible with the Japanese notified satellite networks

The characteristics of these networks have been provided to France on 5 November 1997 at 20h30. detailed analysis is being performed and will be reported at the next meeting of 5B Adhoc 4. The following Table provides the calculations made for the carrier parameters provided by Japan on 4 November 1997 in Ka band. It shows what the impact of the epfd and apfd values proposed by CEPT would be on these carriers.

For antenna diameters larger than 5 meters, a " higher maximum gain advantage " and a " better near side lobe advantage " have been taken into account when assessing the impact of the long term epfd level, i.e. when the non-GSO satellite serving the cell is in the side-lobes of the GSO earth station antenna. These advantages are :

1) Higher maximum gain advantage

This advantage is equal to $G_{max}(D) - G_{max}(5 \text{ meter})$. The reason for this advantage is that the larger the diameter, the higher the discrimination :

$$epfd = pfd + G(\varphi) - Gmax(D)$$

Thus if a non-GSO network complies with the long term epfd value proposed for a 5 meter antenna, the epfd level produced at the same angle φ for another antenna diameter D will automatically be:

$$epfd(D) = epfd(5 \text{ meter}) - G_{max}(D) + G_{max}(5 \text{ meter})$$

2) Better near side-lobes advantage

This advantage is equal to 3 dB if the near side-lobes ($\varphi < 20°$) conform to $29-25\log(\varphi)$. The reason for this advantage is that if a non-GSO network complies with the long term epfd criterion when running the simulation with an antenna pattern conforming to $32-25\log(\varphi)$, the epfd value produced by the same non-GSO satellite located in the near side lobe of a GSO earth station antenna with a pattern following $29-25\log(\varphi)$ will be 3 dB lower.

	Clear Sky	Rain Down	Clear Sky	Rain Down	Clear Sky	Rain Down	Clear Sky	Rain Down	Clear Sky	Rain Down	
System characteristics	**JPN-1**	**JPN-1**	**JPN-2**	**JPN-2**	**JPN-3**	**JPN-3**	**JPN-4**	**JPN-4**	**JPN-5**	**JPN-5**	
Occupied bandwidth	28.600	28.600	0.048	0.048	0.048	0.048	1.860	1.860	7.380	7.380	MHz
Data Rate											Mbps
Required C/N	5.9	5.9	5.1	5.1	5.1	5.1	7.0	7.0	6.4	6.4	dB
Required availability	99.8%	99.8%	99.5%	99.5%	99.5%	99.5%	99.0%	99.0%	99.0%	99.0%	
Up link											
Frequency	29000.0	29000.0	29000.0	29000.0	29000.0	29000.0	29000.0	29000.0	29000.0	29000.0	MHz
Earth station e.i.r.p	65.4	65.4	43.7	43.7	41.5	41.5	48.1	48.1	51.7	51.7	dBW
Eirp spectral density	-9.2	-9.2	-3.1	-3.1	-5.3	-5.3	-14.6	-14.6	-17.0	-17.0	dB(W/Hz)
Slant range (at 35° elevation angle)	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	km
Free space path loss	-213.3	-213.3	-213.3	-213.3	-213.3	-213.3	-213.3	-213.3	-213.3	-213.3	dB
Atmospheric loss	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	dB
Pointing / polarization loss	-0.3	-0.3	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	dB
Rain fade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	dB
Satellite antenna gain	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	dBi
Receiver temperature	891	891	891	891	891	891	891	891	891	891	K
satellite G/T clear sky (peak)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	dB/K
beam peak / edge	0.0	0.0	-9.0	-9.0	0.0	0.0	-2.0	-2.0	0.0	0.0	dB
Wanted pfd	-111.8	-111.8	-105.7	-105.7	-107.9	-107.9	-117.2	-117.2	-119.6	-119.6	dB(W/m²/MHz)
Down link											
Frequency	19000.0	19000.0	19000.0	19000.0	19000.0	19000.0	19000.0	19000.0	19000.0	19000.0	MHz
Satellite e.i.r.p	43.5	43.5	23.5	23.5	21.5	21.5	35.1	35.1	40.5	40.5	dBW
Eirp spectral density	-31.1	-31.1	-23.3	-23.3	-25.3	-11.7	-27.6	-27.6	-28.2	-28.2	dB(W/Hz)
Slant range (at 35° elevation angle)	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	38180.8	km
Free space path loss	-209.7	-209.7	-209.7	-209.7	-209.7	-209.7	-209.7	-209.7	-209.7	-209.7	dB
Atmospheric loss	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	dB
Antenna diameter	**7.6**	**7.6**	**3.0**	**3.0**	**1.4**	**1.4**	**3.0**	**3.0**	**3.0**	**3.0**	m
Antenna efficiency	62%	62%	56%	56%	45%	45%	56%	56%	56%	56%	
Antenna gain	61.5	61.5	53.0	53.0	45.4	45.4	53.0	53.0	53.0	53.0	dBi
Receiver temperature	250	250	300	300	300	300	300	300	300	300	K
ES G/T clear sky	37.5	37.5	28.2	28.2	20.6	20.6	28.2	28.2	28.2	28.2	dB/K
Pointing / polarization loss	-0.3	-0.3	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	dB
Rain fade	0.0	-15.9	0.0	-14.7	0.0	-5.7	0.0	-7.3	0.0	-7.3	dB
Rain degradation	0.0	-17.9	0.0	-16.7	0.0	-7.3	0.0	-9.0	0.0	-9.1	dB
beam peak / edge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	dB
Wanted pfd	-133.7	-133.7	-125.9	-125.9	-127.9	-127.9	-130.2	-130.2	-130.8	-130.8	dB(W/m²/MHz)
Thermal link budget											
Up link C/N	20.4	20.4	17.3	17.3	24.1	24.1	12.8	12.8	12.4	12.4	dB
Down link C/N	24.8	6.9	23.1	6.4	13.5	6.2	18.8	9.8	18.2	9.1	dB
Total link thermal C/N	19.1	6.7	16.3	6.0	13.1	6.1	11.8	8.0	11.4	7.4	dB
Transmission gain	**-1.1**	**-17.0**	**1.1**	**-13.6**	**-15.3**	**-21.0**	**1.3**	**-6.0**	**1.1**	**-6.2**	dB
Useful received power C	-105.3	-121.2	-134.0	-148.7	-143.6	-149.3	-122.4	-129.7	-117.0	-124.3	dBW
Total link thermal noise temperature	938	414	1441	514	326	441	1495	666	1441	667	K
Intra system interference											
DOWN LINK											
C/I intra system	300.0	300.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	dB
I/N	-275.2	-293.1	3.1	-13.6	-6.5	-13.8	-1.2	-10.2	-1.8	-10.9	dB
Downlink Temperature increase	0.0%	0.0%	203.3%	4.3%	22.3%	4.1%	75.5%	9.5%	66.0%	8.1%	
Corresponding total Temperature increase	0.0%	0.0%	42.3%	4.0%	20.5%	4.1%	15.2%	6.3%	13.7%	5.5%	
C/Nth+intra	19.06	6.71	14.73	5.87	12.31	5.94	11.19	7.75	10.82	7.19	dB

Interference from other GSO networks											
C/I due to other GSO systems	26.1	13.7	21.7	12.9	19.3	12.9	18.2	14.7	17.8	14.2	dB
$I_{other\ GSO}/N_{thermal}$	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	dB
Downlink Noise increase	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	
Total link budget											
Total C/N	18.3	5.9	13.9	5.1	11.5	5.1	10.4	7.0	10.0	6.4	dB
Total noise power : N	-123.5	-127.1	-147.9	-153.7	-155.1	-154.4	-132.8	-136.6	-127.0	-130.7	dBW
Total noise temperature	1125	497	2461	642	472	550	2065	850	1967	844	K
Required C/N	5.9	5.9	5.1	5.1	5.1	5.1	7.0	7.0	6.4	6.4	dB
Margin to threhold C/N	**12.4**	**0.0**	**8.8**	**0.0**	**6.4**	**0.0**	**3.4**	**0.0**	**3.6**	**0.0**	dB
Sensitivity to interference from a NGSO network											
UP LINK											
%f time level cannot be exceeded	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	%
maximum equivalent pfd	**-145.0**	**-145.0**	**-145.0**	**-145.0**	**-145.0**	**-145.0**	**-145.0**	**-145.0**	**-145.0**	**-145.0**	dB(W/m²/MHz)
Interfering power I at Earth station antenna output	-138.2	-154.1	-163.7	-178.4	-180.1	-185.8	-147.6	-154.9	-141.8	-149.1	dBW
C/I due to a single NGSO system	32.9	32.9	29.8	29.8	36.6	36.6	25.3	25.3	24.9	24.9	dB
I/N	-14.6	-27.0	-15.8	-24.7	-25.1	-31.4	-14.9	-18.3	-14.9	-18.5	dB
Noise increase du the NGSO system uplink	**3.4%**	**0.2%**	**2.6%**	**0.3%**	**0.3%**	**0.1%**	**3.3%**	**1.5%**	**3.3%**	**1.4%**	
C/(N+I)	18.1	5.9	13.8	5.1	11.5	5.1	10.3	6.9	9.9	6.3	
Margin to threshold C/N	12.2	0.0	8.7	0.0	6.4	0.0	3.3	-0.1	3.5	-0.1	dB
Degradation of C/N due to the NGSO system	0.15	0.01	0.11	0.01	0.01	0.00	0.14	0.06	0.14	0.06	dB
DOWN LINK											
%f time level cannot be exceeded	**99.9%**	**99.9%**	**99.7%**	**99.7%**	**99.5%**	**99.5%**	**99.7%**	**99.7%**	**99.7%**	**99.7%**	
maximum equivalent pfd	**-153.0**	**-153.0**	**-153.0**	**-153.0**	**-153.0**	**-153.0**	**-153.0**	**-153.0**	**-153.0**	**-153.0**	dB(W/m²/MHz)
higher maximum gain advantage	-3.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	dB
better near side-lobe advantage	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	dB
Interfering power I at Earth station antenna output	-130.3	-146.2	-163.5	-178.2	-171.1	-176.8	-147.6	-154.9	-141.6	-148.9	dBW
C/I due to a single NGSO system	25.0	25.0	29.6	29.6	27.6	27.6	25.3	25.3	24.7	24.7	dB
I/N	-6.7	-19.1	-15.6	-24.5	-16.1	-22.4	-14.9	-18.3	-14.7	-18.3	dB
Noise increase due to the NGSO system	**21.2%**	1.2%	**2.7%**	0.4%	**2.5%**	**0.6%**	**3.3%**	1.5%	**3.4%**	1.5%	
C/(N+I)	**17.3**	**5.9**	**13.7**	**5.0**	**11.4**	**5.1**	**10.1**	**6.8**	**9.7**	**6.3**	**dB**
Margin to threshold C/N	11.4	0.0	8.6	-0.1	6.3	0.0	3.1	-0.2	3.3	-0.1	dB
Degradation of C/N due to the NGSO network	0.96	0.06	0.23	0.03	0.12	0.03	0.27	0.13	0.28	0.12	dB
%f time level cannot be exceeded	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	%
maximum equivalent pfd	**-138.0**	**-138.0**	**-138.0**	**-138.0**	**-138.0**	**-138.0**	**-138.0**	**-138.0**	**-138.0**	**-138.0**	dB(W/m²/MHz)
Interfering power I	-109.3	-125.2	-145.5	-160.2	-153.1	-158.8	-129.6	-136.9	-123.6	-130.9	dBW
C/I due to a single NGSO system	4.0	4.0	11.6	11.6	9.6	9.6	7.3	7.3	6.7	6.7	dB
I/N	14.3	1.9	2.4	-6.5	1.9	-4.4	3.1	-0.3	3.3	-0.3	dB
Total Noise increase	2669.1%	155.4%	172.4%	22.4%	156.3%	36.0%	205.3%	92.9%	215.7%	93.6%	
C/(N + I)	**3.0**	**1.0**	**9.5**	**4.2**	**7.4**	**3.8**	**5.5**	**4.1**	**5.0**	**3.5**	dB
Margin to threshold C/N	**-2.1**	**-4.1**	**4.4**	**-0.9**	**2.3**	**-1.3**	**-1.5**	**-2.9**	**-1.4**	**-2.9**	dB
Degradation of C/N due to the NGSO network	14.4	4.1	4.4	0.9	4.1	1.3	4.9	2.9	5.0	2.9	dB
LONG TERM COMBINATION OF UP & DOWN LINKS											
Total noise increase	**24.6%**	1.4%	**5.3%**	0.7%	**2.0%**	**0.6%**	**6.5%**	**2.9%**	**6.7%**	**2.9%**	
Total C/N degradation	1.0	0.1	0.2	0.0	0.1	0.0	0.3	0.1	0.3	0.1	dB
Margin to threshold C/N	11.4	0.0	8.6	-0.1	6.3	0.0	3.1	-0.2	3.3	-0.1	dB

The analysis of these results leads to the following conclusions:

In all cases except for the largest 7.6 meter antenna, the noise increase due to the long term epfd level that could come from a non-GSO network is below or approximately equal to 6%. For the largest antenna, the long term noise increase is almost 25%, which corresponds to a degradation of the clear sky margin of 1dB. Protecting this specific type of transmission with 6% noise increase could require a 6 dB tightening of the epfd. It should be noted however, that this specific type of transmission is inherently very sensitive to interference and that its protection from other GSO systems is also likely to raise difficulties.

As far as the short term epfd level is concerned, the link budgets provided herafter indicate that in several cases the link would be shutdown by short term interference under clear sky conditions. In order to avoid the occurrence of such a situation in these specific cases, it may be necessary to tighten the short term epfd criterion by 1 or 2 dB.

J/4 When will France be able to supply the missing section of document CMR-97/62 (Part 12, describing the simulation results of the F-SAT-ICO-WEST system) ?

Part-12 has been provided to the Conference on 10 November 1997 as Addendum 3 to document CMR-97/62, and an advance copy made available to 5B Ad-Hoc group 4 on 6 November.

In addition, Part 13 has been provided to the Conference on 11 November 1997 as Addendum 4 to document CMR-97/62, and an advance copy made available to 5B Ad-Hoc group 4 on 6 November. This Part 13 gives simulation results concerning the F-SATMULTI 1-A NGSO FSS system, which operates at Ka-band and has been described and discussed in WP 4-A and in the reported upon by the CPM.

IRN/1 Up link: Calculation is based on 82 dBW EIRP, whereas different EIRPs are employed in the plan.

The calculation has been undertaken for the minimum EIRP.

IRN/2 Up link: Calculation is performed for one type of antenna, whereas there are various type of antennas.

The computation is not based on a particular type of antenna, but on the ratio of power flux-densities at the geostationary-satellite orbit.

IRN/3 Up link: System availability does not take into account the effect of rain, i.e. that is the claimed availability won't be realized if rain attenuation factor is taken into account.

Either the rain attenuation is not high, and then the variation of the C/I is limited and has really no impact on the availability of the system. Or the rain attenuation implies the use of a power control in order to decouple the up-link and the down-link attenuation and in this case the C/I is constant. In both cases, NGSO interference is maintained weak and will not degrade the link availability.

IRN/4 Down link : Pfd as specified in Annex 4 is -147 dB(W/m^2/27 MHz), where as the offered calculation is based on -145 dB(W/m^2/27MHz). The gaussian curve based on -145 dB(W/m^2/27 MHz) is more flat than what is obtained based on -147 dB(W/m^2/27MHz), giving rise to more received interference.

In the case which is presented in Document 62, the minimum wanted pfd is set at -108 dB(W/m^2/27MHz), while i n the case of Annex 4, the minimum wanted pfd is set at -103 dB(W/m^2/27 MHz).

The 10° antenna discrimination corresponding to the Annex 5 radiation pattern of the BSS antenna pattern is 25 dB at 10°, instead of (35.5- (29-25*log(10)) = 31.5 dB in the case of ITU-R BO1213 Recommendation.

Therefore the antenna discrimination difference at this point is equal to 6.5 dB. With a 5 dB difference in wanted power flux-density, this makes a 1.5 dB difference in C/I, which is equal in this case to 35.5 dB. However, the noise temperature is higher in the case of Annex 7, which indicates that the I/N would be lower in the case of Annex 7 than in the case of ITU-R Rec BO1213.

Therefore it can be concluded that with the proposed level the Annex 7 antennas are also protected with even a lower noise temperature increase.

IRN/5 Down link : It is claimed that more single entry C/I as necessary will be obtained, however this does not seem to be the case, as the offered calculation is based on 60 cm antenna and 56 dBW EIRP and -108 dBW/m² PFD for individual reception per REC. 521. Furthermore it should be noted that there exist :

- **different antenna type,**
- **different EIRPs,**
- **different contour service areas,**
- **some types of assignments with current EIRP and 31 dB protection ratio.**

Therefore your assumption is not valid for case of operation, thus will not protect all situations. For example, if antenna diameter is 30 cm and if plan's EIRP is 51 dBW and if -10 dB service area contour is used 21 dB less protection will be provided.

The calculation has been done for standard plan parameters and protection should be given to the system of the plan according to the criteria from the plan. Non standard systems cannot claim the same level of protection. Some administrations strongly disagree with protection of non standard systems. The type of transmission suggested as an example lead to a –17 dB margin by clear sky.

frequency	11,7	GHz
EIRP	51,0	dBW
service area	-10,0	dB
Distance	-205,6	39000 km
antenna G/T (30 cm)	7,3	dB/K
pointing accuracy	-0,5	dB
rain attenuation	0,0	dB
G/T degradation	0,0	dB
C/T	-157,8	dBW/K
Bandwidth	27,0	MHz
C/N thermal down	-3,0	dB
C/N margin	- 17,0	dB

IRN/6 Down link : The effect of linear polarization with different angle of arrival is not taken into account.

The case of polarization re-use has been considered into the calculations, which make the results independent of the polarization.

IRN/7 Down link: Different bandwidths other than 27 MHz, and different types of modulation have not been taken into account.

It was assumed that the limit derived would be applicable for a digital transmission, with a flat spectrum, or noise like. It is possible to scale it in a linear manner the proposed limit in 27 MHz in a 4 kHz reference bandwidth.

IRN/8 Down link: 1% rain margin factor is compromised with the effect of random interference situation, i.e. in rain condition the 99% reliability per worst month is not obtained.

Under rain conditions (a few percent of the time), the amount of interference is 99,7% of time limited to the value of -145 dBW/m²/27 MHz. It must be understood that, on top of that, the NGSO interference is also attenuated, like the signal, by the rain, that the thermal noise of the link is also increased by the rain attenuation. The C/I is larger in rain condition than in clear sky one i.e. larger than 37 dB.....

IRN/9 Down link: C/N is assumed as 14 dB where as in WARC-77 plan 14.5 dB is used. This lower C/N results in 4% more interference.

No, since the wanted power is higher by 5 dB in WARC-77 Plan, the result is that the actual C/I also varies at the same (the I/N decreases also). Therefore the situation is improved in this case.

	case I	case II	
Thermal C/N	14,5	14	dB
wanted pfd	-103	-108	dB(W/m²/27 MHz)
interfering pfd	-132	-132	dB(W/m²/27 MHz)
C/I	29	24	dB
Gr	37	35,5	dBi
f	12	12	GHz
C	-109,0	-115,5	dBW
N	-123,5	-129,5	dBW
I	-138,0	-139,5	dBW
I/N	-14,5	-10,0	dB
Noise temperature increase	3,5	10,0	%

IRN/10 Down link : It has been assumed that interference from NGSO to GSO is through side lobe whereas this could occur through the main lobe.

The proposed metric takes into account the actual discrimination of the GSO receive antennas with respect to each NGSO space stations. Therefore the case of the main lobe is also taken into account. The purpose is to present a pfd which would be equivalent to the pfd of a GSO space station co-located with the wanted GSO space station.

IRN/11 Down link: There is no software yet available to check whether or not the pfd level is met. How the BR could formulate findings.

This question has been addressed in **USA/2.**

IRN/12 Down link : The effect of multi NGSO is not properly calculated. (not a question ?)

The effect of multi NGSO systems has been considered and should not be of concern see for instance F/62 part 9 fig 11,12, 13, 14 and the text.

IRN/13 Down link: It is still not known, how the NGSO is will be switched off, if it is in the visibility within 10° of GSO in the direction of the earth.

The answer is contained in Document 62, part 8, page 49, and in the answer to USA/1.

IRN/14 Down link: In the event of a modification to an assignment in the Regions 1 and 3 plan, the use of new orbital position is subjected to 8 dB eirp reduction (Annex 7 A3, para 2). The case is not

taken into account in your calculation.

Yes the case is taken into account in the Annexes to Part 4 of Document 62.

IRN/15 Down link: How are you going to apply your proposed power limits to operational GSO/FSS systems (in shared band with terrestrial systems)

Power limits are not proposed to be retroactive and will be applied when the Conference Final Acts will enter into force.

IRN/16 Up link: How will SNG systems (up link) having usually lower eirp in the Ku band will be protected ?

SNG systems are part of the FSS and not of the BSS. Limits are proposed in the FSS frequency bands to cover this case.

IRN/17 Down link : There are a lot of FS (in particular point to point microwave systems) in the band 10.7-14.5 GHz in Iran, please verify the following:
a) The measures proposed for providing protection to the systems from the proposed space stations.
b) The measures proposed for providing protection to the systems from earth stations.

a) See the work performed by 5B,AH-3.
b) This is treated under standard coordination procedures.

IRN/18 As the proposed system is composed of several satellites, the experience(esp. in the FSS band) has shown that because of propagation characteristics of these frequencies, being scattered or reflected by certain geographical areas and acting as a secondary source, there might be a need to carry out studies in this regard.

NGSO systems can re-use frequency of GSO system simply because they are using directive antenna. The use of directive antenna considerably limits the effects of scattering. This is a general question also applicable to GSO and other systems.

IRN/19 Regarding the analysis of the impact of the interference caused by a NGSO FSS system to the allotment band in Appendix 30B, it has been claimed on pages 35 of Doc 62 that for 99,9% of the time noise temperature increase is 2.8% and there GSO system is not affected. Also it has been shown in that page that for 100% of the time noise temperature increase is 448%. The question arises that what is the amount of the availability for 0.1% of the time as it has not been shown explicitly, taking into account that comparing the results for 99.9% of the time and 100% of the time does not indicate to what degree the availability of the link would be affected.

Most of the time, the interference, if any, occur when there is no rain (due to the fact that the rain fade and the interference level are independently statistical variables). When there is a rain fade on the wanted signal, there is also a rain fade on the interfering power. The thermal noise temperature increase of the wanted receiver is also increased. A convolution of the two phenomenon is therefore required in order to identify the availability of the link with and without interference. Thus the degradation of the availability is not noticeable when making the computations.

IRN/ 20 To protect Ap.30B plan, aggregate C/I should at least be greater than 26 dB. With the assumption max. Single entry C/I of 32.5 dB for F-SATMULTI-1B, entering a new satellite to the plan would become difficult, seems all of the satellite in the plan will with aggregate C/I of 27.1 dB or less will be degraded so that there new aggregate C/I would become 26 dB or less. Taking

into account theabove fact, and considering the subject that all of the calculations are based on single entry C/I, how would this matter be considered ?

Degradation of the aggregate C/I is taken equal to 0.25 dB, as for the appendices 30 and 30A. This gives a single entry of 38.5 dB. Strengthening of the limit by 6 dB could be envisaged.

IRN/21 How is it proposed to provide protection to the networks in the BSS plan with low EIRP (including digital networks)

Protection criteria of the plan does not apply to system which are not standard.

IRN/22 For which part of the world the exclusion zone mitigation technique would be used ? Will it be used for Europe ?

The mitigation technique will be employed for any point on the Earth. Thus the mitigation technique applies on the entire world.

IRN/23 In case of de-pointing of satellite antenna the interference cause by the NGSO network seems much broader than GSO. What measures will be taken for elimination of interference and if the antenna switch-off, what will be the compensation for the service ?

The same question may apply to any GSO or NGSO manufacturer or operator. In case of SkyBridge, the probability of occurrence of such an event is extremely weak and caused by a double failure. One must add that in the GSO history this never happened....

IRN/24 For FS networks with antenna elevation angle of > 10°, what kind of mitigation technique will be used ?

This case of FS networks operating at 10° elevation angle is not realistic.

IRN/25 The CPM report concludes on the feasibility of developing power limits to be applied to NGSO FSS systems only to protect GSO system. Why this concept has been extended to GSO FSS networks.

This concept has been extended following the discussion held during the CPM meeting indicating there would be a need to have some regulatory tools to avoid NGSO systems to claim for undue protection requirements. The purpose of these limits is therefore to indicate to the NGSO systems the interference level to be accepted.

IRN/26 You have guaranteed only 16 kb/s availability. How is it proposed to accommodate such applications like video on demand, Internet... with such a low bit rate ? Will there be a request for more band soon ?

16 kb/s is the minimum bit rate (e.g. for voice or low data rate...) The SkyBridge system and other NGSO FSS provide much larger bit rate to the end user. The instantaneous bit rate can be up-to several tens of Mb/s, which permits to accommodate services like IVoD, high speed Internet,...
The request is to have access to the whole Ku band.

IRN/27 Skybridge consist of 64 satellites with no intersatellite link and only with independent domestic narrow beam coverage, what kind of new facilities will Skybridge introduce to the domestic satellites ?

Skybridge will offer a range of complementary services to the domestic geostationary-satellites, by permitting the introduction of new services requiring low latency performances which are not possible through geostationary satellite networks.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Addendum 1 to Document DL/42-E 11 November 1997 Original: English only

COMMITTEE 4
COMMITTEE 5

WORKING DOCUMENT ON THE DEVELOPMENT OF LIMITS FOR NGSO FSS TO PROTECT GSO NETWORKS

1. **USA/10** The pfd value of -147 appearing in Annex 4 applies to interservice interregional sharing. In the case of co-regional sharing the criteria of OEPM of 0.25 dB should apply.

The pfd mask appearing in Annex 4 of AP 30 is intended to protect the BSS service i.e. all the assignments in the plan and the future modifications of the plan. If the OEPM criteria is used to protect a nominal assignment in the plan the value of :

- -147 dB(W/m2/Hz) in Region 1 and 3 leads to 0.17 dB OEPM degradation from an initial OEPM of 0 dB using current Annex 5 of AP30 parameters ;
- -145 in Region 1 and 3 leads to 0.17 dB OEPM degradation from an initial OEPM of 0 dB using the Recommendation 521 parameters ;
- -147 in Region 2 leads to 0.25 dB OEPM degradation from an initial OEPM of 0 dB using Annex 5 of AP 30 parameters.

In conclusion the proposed parameters are consistent or more conservative than what is suggested by the USA.

2. **CAN/1** The Region 2 plan is based on a 28 dB aggregate C/I and not 23 dB like proposed in Region 1 and 3.

This point has been taken into account in the above answer.

3. **CAN/2** For the protection of the region 2 BSS Plan, the proposed short term criterion is 16 dB lower than the objective of the Plan.

The -131 short term limit proposed for region 2 corresponds to a C/I single entry of 28 dB not to be exceeded at any time. The simulation on the Skybridge system provided in document CMR-97/62 Part 9, Figure 6, page 64 of the English version, show that the worst case epfd of -132 dB (W/m^2/27 MHz), or a single entry C/I of 29 dB, would be reached once a day, for less than 0.5 seconds.

A single entry C/I of 29 dB is currently accepted without coordination for 100% of the time between GSO operators throughout the world.

4. **MTN/1**

Inconsistencies appear in the definition of apfd in the French version of the text. This needs to be corrected.

5. **MLA/1** Why an apfd approach selected in the uplink rather than an epfd ?

This results from the fact that there is no standard antenna pattern for the space stations in the plan, since the coverage area could vary from one country to another. This is in contrast with the downlink, where the antenna size and pattern is defined precisely in Annex 5 of Appendix 30. The apfd approach in the uplink provides a worst case assumption.

6. **IND/1** A 4 kHz référence bandwidth should be used for the apfd and epfd limits

Agreed. This would lead to epfd and apfd values 38 dB lower in 4 kHz than in 27 MHz.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/43-E
11 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 5B

FREQUENCY RANGE 149.9 - 150.05 MHz AND 399.9 - 400.05 MHz

The informal group met once to deal with outstanding items on the frequency bands 149.9 - 150.05 MHz and 399.9 - 400.5 MHz. The meeting was attended by delegates from four Administrations, namely Germany, Indonesia, Russia and the United States. After a short discussion the informal group concluded to remove the square brackets from the dates in footnotes **ADD S5.224A** and **ADD S5.224B**. The meeting also revised Table 1 of Annex 2 to Resolution **46 (Rev.WRC-95)**, paragraph A2.3.3 as shown in Corrigendum 1 to Part 2 of Document CMR97/210.

3 Frequency range 149.9 - 150.05 MHz and 399.9 - 400.05 MHz

MOD

MHz
148 – 156.8375

Allocation to Services		
Region 1	Region 2	Region 3
149.9 – 150.05	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) MOD S5.209 ~~S5.224~~ RADIONAVIGATION-SATELLITE MOD S5.220 S5.222 S5.223 ADD S5.224A ADD S5.224B	

MOD

MHz
322 – 400.15

Allocation to Services		
Region 1	Region 2	Region 3
399.9 – 400.05	~~LAND~~-MOBILE-SATELLITE (Earth-to-space) MOD S5.209 RADIONAVIGATION-SATELLITE S5.222 S5.260 MOD S5.220 ~~S5.224~~ADD S5.224A ADD S5.224B	

MOD **S5.209** The use of the bands 137 - 138 MHz, 148 - ~~149.9~~150.05 MHz, 399.9 - 400.05 MHz, 400.15 - 401 MHz, 455 - 456 MHz and 459 - 460 MHz by the mobile-satellite service ~~and the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the land mobile-satellite service~~ is limited to non-geostationary-satellite systems.

MOD **S5.220** The use of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the ~~land~~-mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-95)**/No. **S9.11A**. The ~~land~~-mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz.

SUP **S5.224**

ADD **S5.224A** The use of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015.

ADD **S5.224B** The allocation of the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz to the radionavigation-satellite service ceases to be valid on 1 January 2015.

Annex 2 to Resolution 46 (Rev.WRC-95), paragraph A2.3.2

....

MOD

TABLE 1

Earth stations operating at frequencies below 1 GHz

Frequency Sharing Situation		Coordination Distance (In sharing situations involving services allocated with equal rights)
Frequency band and earth station for which coordination area is determined	Other service or station ~~(station in terrestrial service)~~	
148.0 - 149.9 MHz ground-based (mobile)	ground-based stations	As determined using Equation (1) and Figure 1 of Recommendation ITU-R M.1185 In this case, the coordination distance is calculated by the administration of the terrestrial station using the parameters of its terrestrial stations and the most updated relevant parameters published by the Bureau for the earth station.
149.9 - 150.05 MHz ground-based (mobile) 399.9 - 400.05 MHz ground-based (mobile)	radionavigation-satellite service	The coordination distance is calculated by the administration of the mobile-satellite service earth station using the parameters of its earth stations and the most updated relevant parameters published by the Bureau for the radionavigation-satellite service earth station
400.15 - 401 MHz ground-based	meteorological aids (radiosonde)	582 km
All bands below 1 GHz ground-based	mobile (aircraft)	500 km
All bands below 1 GHz aircraft (mobile)	ground-based stations	500 km
400.15 - 401 MHz aircraft (mobile)	meteorological aids (radiosonde)	1 082 km
All bands below 1 GHz aircraft (mobile)	mobile (aircraft)	1 000 km
455 - 456 MHz 459 - 460 MHz ground-based	ground-based stations	500 km

MOD

RESOLUTION 715 (~~WRC-95~~Rev.WRC-97)

STUDIES CONCERNING SHARING BETWEEN THE RADIONAVIGATION-SATELLITE SERVICE AND THE MOBILE-SATELLITE SERVICE IN THE BANDS 149.9 - 150.05 MHz AND 399.9 - 400.05 MHz

The World Radiocommunication Conference (Geneva, 199~~5~~7),

considering,

a) that the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz are allocated to and used by radionavigation-satellite service (RNSS) on a primary basis;

~~*b) that the World Administrative Radio Conference (Malaga-Torremolinos, 1992) allocated the band 149.9 - 150.05 MHz (Earth-to-space) to the land mobile-satellite service on primary basis;*~~

~~*c*~~*b)* that this Conference ~~has~~ allocated the bands 149.9 - 150.05 MHz and 399.9 - 400.05 MHz (Earth-to-space) to the ~~land~~ mobile-satellite service on a primary basis;

~~*d*~~*c)* that requirements of the RNSS and the mobile-satellite service (MSS) should be met in these frequency bands;

~~*e) that the MSS requirements are not limited solely to use by the land mobile-satellite service;*~~

~~*f*~~*d)* that there may be difficulties in the sharing between the RNSS and the MSS, and studies are being carried out by ITU-R;

~~*g*~~*e)* that there is a need ~~to study~~ for further studies of the operational and technical means to facilitate sharing between the RNSS and the MSS (in the Earth-to-space and space-to-Earth directions) in these bands,

recognizing

that No. **953/S4.10** of the Radio Regulations applies to the use of these bands by the RNSS,

resolves

to invite ITU-R, ~~as a matter of urgency, in preparation for the Conference Preparatory Meeting for the 1997 World Radiocommunication Conference (WRC-97)~~, to continue to carry out studies in order to finalize recommendations which identify the operational and technical measures necessary to facilitate sharing between the MSS and the RNSS,

~~*instructs the Secretary-General*~~

~~to bring this Resolution to the attention of the Council, at its next session, with a view to including this item in the agenda of WRC-97,~~

urges

~~1.~~ administrations to participate in such studies by submitting contributions to ITU-R relating to the above-mentioned studies as soon as possible~~;~~.

~~2. ITU-R to bring the results of these studies to the attention of WRC-97 and of preparatory meetings, in order to determine operational criteria for sharing between the RNSS and the MSS.~~

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/44-E
12 November 1997
Original: English only

WORKING GROUP 5B

Report of Chairman of Working Group 5B Ad Hoc Group on 1 559 - 1 567 MHz

The Ad Hoc Group met once in an attempt to reduce the number of options for utilization of the band 1 559 - 1 567 MHz as summarized in Document DL/38.

Based on a proposal from the Chairman, the four options outlined in DL/38 on pages 11 - 15 have been reduced to two options as follows:

Option A For no change to the current Table of Allocations

NOC

MHz
1 535 – 1 610.6

Allocation to Services	
Region 1	
1 559 – 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363

Option B This option, if adopted, would introduce an allocation for MSS on a worldwide basis in the band 1 559 - 1 567 MHz subject to a Resolution establishing protection for SNSS services and requesting the completion of sharing studies. This option is a combination of the earlier Options 1 and 3 as given in DL/38.

OPTION B

MHz

1 535 – 1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 559 – ~~1 610~~1 567	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) ADD S5.354A S5.341 S5.355 S5.359 S5.363	
~~1 559~~1 567 – 1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) S5.341 S5.355 S5.359 S5.363	

ADD S5.354A The use of the band 1 559 - 1 567 MHz by the mobile-satellite service (space-to-Earth) shall be in accordance with Resolution [COM5/22] (WRC-97).

DRAFT RESOLUTION [COM5-22] (WRC-97)

USE OF THE BAND 1 559 - 1 567 MHz BY THE MOBILE-SATELLITE SERVICE (SPACE-TO-EARTH)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559 - 1 567 MHz is currently allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that WRC-97 has made an allocation to the mobile-satellite service in the band 1 559 - 1 567 MHz (s-E) subject to appropriate protection for the aeronautical radionavigation and radionavigation-satellite services;

c) that the aeronautical radionavigation and radionavigation-satellite services are safety services (**S4.10** applies);

d) that safety of life services shall be protected,

considering further

a) that there is a shortage of frequency spectrum for the mobile-satellite services;

b) the need to ensure the effective use of the radio spectrum;

c) that there should be equitable access to the scarce radio frequency spectrum resource to allow for the provision of new services;

d) that studies carried out by some administrations indicate that a power flux-density limit at the Earth's surface of -112 dB(W/m^2/1 MHz) for all angles of arrival for mobile-satellite service space stations is appropriate for the protection of aeronautical radionavigation and radionavigation-satellite services;

d bis) "that some other administrations consider that the power flux density limit of -112 dB(W/m^2/1 MHz) given in considering d) may not be adequate to protect aeronautical radionavigation and radionavigation-satellite services;"

e) that WRC-99 will consider additional allocations to the radionavigation-satellite service,

recognizing

the essential need to protect the international standard GNSS systems of the aeronautical radionavigation and radionavigation-satellite services,

resolves

1 that the allocation in the band 1 559 - 1 567 MHz to the mobile-satellite service (s-E) shall enter into force on 1 July 2000;

2 that such use by the mobile-satellite service shall be subject to coordination under [Resolution **46 (WRC-97)**/No. **S9.11A**];

3 that stations of the mobile-satellite service (space-to-Earth) operating in this band shall not cause harmful interference to international standard GNSS and other already planned radionavigation systems of the aeronautical radionavigation and radionavigation-satellite services;

4 that the power flux-density at the Earth's surface of mobile-satellite service space stations operating in this band shall not exceed the provisional limit of -112 dB(W/m^2/1 MHz) for all angles of arrival; however, this power flux-density limit shall be reviewed by WRC-99 in the light of the studies referred to in the *further resolves* below;

5 that any MSS systems intending to use this band shall comply with the power flux-density limit decided by WRC-99,

further resolves

1 to request the ITU-R to study, as a matter of urgency, the power flux-density limit to be applied to MSS systems operating in this band taking account of the *recognizing* above, with a view to facilitate sharing, and taking account of existing and planned systems and the studies already carried out;

2 to instruct the Director of the Radiocommunication Bureau to ensure, in consultation with the relevant Study Group Chairman, that the results of these studies are available in due time for consideration at WRC-99;

3 to recommend that WRC-99 review the results of these studies with a view to make any necessary adjustment to the power flux-density limit referred to in *resolves* 4 above and any consequential changes to Article **S5**;

4 to urge all administrations and organizations concerned to contribute to these studies and to cooperate to ensure a mutually satisfactory result is presented to WRC-99.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/45-E
12 November 1997
English only

DRAFTING GROUP 4A4

Composite Proposals

AGENDA ITEM 1.2.

KEN/UGA/TZA/47/4
NOC

ARTICLE S9

Procedure for Effecting Coordination With or Obtaining Agreement of Other Administrations[1, 2, 3]

Procedure for Effecting Coordination With or Obtaining Agreement of Other Administrations[1, 2, 3, 4]

IAP/40/4
MOD A.S9.1 (CPM-97)

[1] For the application of the provisions of this Article with respect to stations in a space radiocommunication service using frequency bands covered by the fixed-satellite service allotment plan, see also Appendix **S30B** ~~and Resolution 107 (Orb-88)~~.

IAP/40/5
MOD A.S9.3 (Mod CPM-97)

[3] See Appendices **S30** and **S30A** respectively for the coordination of: ~~frequency assignments of other services in relation to stations of the broadcasting-satellite service and to stations of feeder links for this service in the bands covered by those Appendices.~~

a) proposed modifications to the Appendices **S30** Plan for the broadcasting-satellite service in the frequency bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

b) frequency assignments in other services to which the frequency bands referred to in a) above are allocated, with respect to assignments in the broadcasting-satellite service which are subject to the Appendix **S30** Plans;

c) proposed modifications to the Appendices **S30A** Plan for the feeder links to the broadcasting-satellite service in the frequency bands 17.3 -17.8 GHz (in Region 2), and 14.5 - 14.8 GHz and 17.3 - 18.1 GHz (in Regions 1 and 3), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked to bring • their copies to the meeting since no others can be made available.

d) frequency assignments in other services to which the frequency bands referred to in c) above are allocated, with respect to assignments in the fixed-satellite service (Earth-to-space) which are subject to Appendix **S30A** Plan.

For the broadcasting-satellite service and for the feeder links for the broadcasting-satellite service in the fixed-satellite service in Region 2, Resolution **42 (Orb-85)** is also applicable.

CUB/66/6
MOD A.S9.3 (CPM-97)

[3] See Appendices **S30** and **S30A** ~~for the coordination of frequency assignments of other services in relation to stations of the broadcasting-satellite service and to stations of feeder links for this service in the bands covered by those Appendices.~~ respectively for the coordination of:

a) proposed modifications to the Appendices **S30** Plan for the broadcasting-satellite service in the frequency bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

b) frequency assignments in other services to which the frequency bands referred to in a) above are allocated, with respect to assignments in the broadcasting-satellite service which are subject to Appendix **S30** Plans;

c) proposed modifications to the Appendices **S30A** Plan for the feeder links to the broadcasting-satellite service in the frequency bands 17.3 - 17.8 GHz (in Region 2), and 14.5 - 14.8 GHz and 17.3 - 18.1 GHz (in Regions 1 and 3), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

d) frequency assignments in other services to which the frequency bands referred to in c) above are allocated, with respect to assignments in the fixed-satellite service (Earth-to-space) which are subject to Appendix **S30A** Plan.

For the broadcasting-satellite service and for the feeder links in the fixed-satellite service for the broadcasting-satellite service in Region 2, Resolution **42 (Orb-85)** is also applicable.

Section I - Advance Publication of Information on Planned Satellite Networks or Satellite Systems

EUR/5/2
MOD S9.1

Before initiating any action under this Article or under Article **S11** in respect of frequency assignments for a satellite network or a satellite system, an administration, or one[1] acting on behalf of a group of named administrations, shall, prior to the coordination procedure described in Section II of Article **S9** below, where applicable, send to the Bureau a general description of the network or system for advance publication in the Weekly Circular not earlier than six years and preferably not later than two years before the planned date of bringing into use of the network or system (see also No. **S11.44**). The characteristics to be provided for this purpose are listed in Appendix **S4**. The coordination or notification information may also be communicated to the Bureau at the same time; it shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the information for advance publication where coordination is required by Section II of Article **S9**. Where coordination is not required by Section II, notification shall be considered as having been received by the Bureau not earlier than six months after the date of publication of the advance publication information.

CPM

MOD **S9.2** Amendments to the information sent in accordance with the provisions of No. **S9.1** shall also be sent to the Bureau as soon as they become available. ~~For geostationary-satellite networks and non-geostationary-satellite networks which are subject to Section II of Article S9,~~ The use of an additional frequency band will require the application of the advance publication procedure for this band. ~~For non-geostationary-satellite networks which are not subject to Section II of Article S9, the use of an additional frequency band or an extension of the service area will require the application or recommencing, respectively, of the advance publication procedures for these modifications (see Resolution 48 (WRC-95)).~~

Sub-Section IIA. Requirement and Request for Coordination

CPM

MOD **S9.6** Before an administration[1,2] notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. **S9.27**:

CPM

MOD **S9.6.1** [1] In the case of coordination of an assignment in a satellite network ~~in relation to another satellite network~~, an administration may act on behalf of a group of named administrations. Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of the group retain the right to respond in respect of their own services which could affect or be affected by the proposed assignment~~networks or systems~~.

CPM

- **ADD** **S9.6.2** [2] In all cases, the coordination of an earth station with terrestrial stations or other earth stations operating in the opposite direction of transmission shall remain within the authority of the administration on the territory of which this station is located.

CPM

MOD **S9.7** a) for a station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, ~~for~~ in any space radiocommunication service~~s and frequency bands except those covered by the Plans of Appendices **S30**, **S30A** and **S30B**~~ in a frequency band and in a region where this service is not subject to a Plan, with the exception of the coordination under No **S9.17A**.

• *Note: There is no provision for the coordination of a receive space station in the FSS (Earth-to-space) in the bands 10.7 - 10.95 GHz and 11.2 - 11.45 GHz with Appendix 30B Plan.*

CUB/66/7
MOD S9.7
(CPM-97)

a) for a station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, ~~for~~in any space radiocommunication service~~s and frequency bands except those covered by the Plans of Appendices **S30**, **S30A** and **S30B**~~ in a frequency band and in a region where this service is not subject to a Plan, with the exception of the coordination under No **S9.17A**.

IAP/40/6
MOD S9.7
(CPM-97)

a) for a station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a region where this service is not subject to a plan, in respect of any other satellite network using that orbit, ~~for~~in any space radiocommunication service~~s and frequency bands except those covered by the Plans of Appendices **S30**, **S30A** and **S30B**~~in a frequency band and in a region where this service is not subject to a plan, with the exception of the coordination under No. **S9.17A**;

SEN/9/4
MOD S9.7

a) for a station in a satellite network using the geostationary-satellite orbit~~, in respect of any other satellite network using that orbit, for~~in any space radiocommunication service~~s and frequency bands except those covered by the Plans of Appendices **S30**, **S30A** and **S30B**~~, in a frequency band and in a region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, in any space radiocommunication service in a frequency band and in a region where this service is not subject to a Plan, with the exception of the coordination under No. **S9.17A**;

CUB/66/8
SUP S9.8
(CPM-97)

IAP/40/7
SUP S9.8

IAP/40/8
SUP S9.9

CUB/66/9
SUP S9.9
(CPM-97)

CUB/66/10
MOD S9.11 (CPM-97)

d) for a space station in the broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and ~~in which there is no plan for~~where the broadcasting-satellite service is not subject to a plan, in respect of terrestrial services;

IAP/40/9
MOD S9.11 (CPM-97)

d) for a space station in the broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and ~~in which there is no plan for~~where the broadcasting-satellite service, in respect of terrestrial services;

CPM
MOD S9.11 d) for a space station in the broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and ~~in which there is no plan for~~where the broadcasting-satellite service is not subject to a plan, in respect of terrestrial services;

CPM
NOC S9.11A e) for a station for which the requirement to coordinate is included in a footnote of the Table of Frequency Allocations referring to this provision:

CPM
MOD S9.13 ii) in a satellite network using the geostationary-satellite orbit, in respect of any other satellite network using a non-geostationary-satellite orbit, with the exception of the coordination under No. **S9.17A**;

CPM
MOD S9.17 f)~~3~~ for any specific earth station or typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services, in respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country, with the exception of the coordination under No. **S9.15** and under Article 4/T4 of Appendix **30** and Article 4/T4 of Appendix **30A**;

IAP/40/10
MOD S9.17 (Mod CPM-97)

f)[5] for any specific earth station or typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services, in respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country, with the exception of the coordination under No. **S9.15, [MOD Appendix S30] or MOD Appendix 30A**;

~~[5] Application of these provisions is suspended pending the decision of the 1997 World Radiocommunication Conference on revision of Appendices S30 and S30A with respect to Articles 6 and 7 of those two Appendices.~~

~~[3] Application of these provisions is suspended pending the decision of the 1997 World Radiocommunication Conference on revision of Appendices 30 and 30A with respect to Articles 6 and 7 of those two Appendices.~~

CUB/66/11
MOD S9.17 (Mod CPM-97)

f)[5] for any specific earth station or typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services, in respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country, with the exception of the coordination under No. **S9.15** and under Article 4 of Appendix **30** and Articles 4 and 5 of Appendix **30A**;

---

[5] ~~Application of these provisions is suspended pending the decision of the 1997 World Radiocommunication Conference on revision of Appendices **30 [S30]** and **30A [S30A]** with respect to Articles **6** and **7** of those two Appendices~~.

SEN/9/5
NOC S9.17A

g) for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country;

IAP/40/11
MOD S9.17A (CPM-97)

g) for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission ~~and where the coordination area of the earth station includes the territory of another country~~ with the exception of the frequency bands subject to Appendix **S30A** Plans;

IAP/40/120
MOD S9.17A

g) for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station;

CUB/66/12
MOD S9.17A (CPM-97)

g) for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission ~~and where the coordination area of the earth station includes the territory of another country~~, with the exception of the frequency bands subject to Appendix **30A** Plans;

CPM
MOD S9.18

h) for any transmitting station of a terrestrial service in the bands referred to in No. **S9.17** within the –coordination area of an earth station, in respect of an earth station, with the exception of the coordination under No. **S9.16** and **S9.19**;

IAP/40/12
MOD S9.18 (CPM-97)

h) for any transmitting station of a terrestrial service in the bands referred to in No. **S9.17** within the coordination area of an earth station, in respect of an earth station, with the exception of the coordination under No. **S9.16** and No. **S9.19**;

CUB/66/13
MOD S9.18 (Mod CPM-97)

h) for any transmitting station of a terrestrial service in the bands referred to in No. **S9.17** within the coordination area of an earth station, in respect of an earth station, with the exception of the coordination under Nos. **S9.16** and **S9.19** and that provided for under Article 6 of Appendix **S30**;

IAP/40/13
MOD S9.19
(CPM-97)

i)[6] for any transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the broadcasting-satellite service, except where this service is subject to the Appendix **S30** Plan;

~~[6] The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices S30 and S30A is suspended pending the decision for the 1997 World Radiocommunication Conference on revision of those two Appendices.~~

CUB/66/14
MOD S9.19
(CPM-97)

i)[4] for any transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the broadcasting-satellite service except where this service is subject to the Appendix 30 Plan;

~~[4] The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices S30 and S30A is suspended pending the decision of the 1997 World Radiocommunication Conference on revision of those two Appendices~~.

CUB/66/15
MOD S9.32
(CPM-97)

If the responsible administration concludes that coordination is not required under No~~s~~. **S9.7** ~~**to S9.9**~~, it shall send the relevant information pursuant to Appendix **S4** to the Bureau for action under No. **S9.34**.

IAP/40/14
MOD S9.32
(CPM-97)

If the responsible administration concludes that coordination is not required under Nos. **S9.7** ~~**to S9.9**~~, it shall send the relevant information pursuant to Appendix **S4** to the Bureau for action under No. **S9.34**.

IAP/40/121
MOD S9.32

If the responsible administration concludes that coordination is not required under No~~s~~. **S9.7** ~~**to S9.9**~~, it shall send the relevant information pursuant to Appendix **S4** to the Bureau for action under No. **S9.34** or Article **S11**. For each network not requiring coordination under Section II the Bureau shall take each notice so communicated to the Bureau into account as from the date of its receipt by the Bureau.

IAP/40/122
MOD S9.32A

If the responsible administration, following the application of Nos. **S9.15** to **S9.19**, concludes that coordination is not required, it may send the relevant information pursuant to Appendix **S4** to the Bureau for action under Section I of Article **S11**. For each station not requiring coordination under Section II the Bureau shall take each notice so communicated to the Bureau into account as from the date of its receipt by the Bureau.

IAP/40/15
MOD S9.41 Following receipt of the Weekly Circular referring to requests for coordination under Nos. **S9.7 ~~to S9.9~~**, an administration believing that it should have been included in the request shall, within four months of the date of publication of the relevant Weekly Circular, inform the initiating administration and the Bureau, giving its technical reasons for doing so, and shall request that its name be included.

CUB/66/16
MOD S9.41 Following receipt of the Weekly Circular referring to a request~~s~~ for
(CPM-97) coordination under No~~s~~. **S9.7 ~~to S9.9~~**, an administration believing that it should have been included in the request shall, within four months of the date of publication of the relevant Weekly Circular, inform the initiating administration and the Bureau, giving its technical reasons for doing so, and shall request that its name be included.

CPM
MOD S9.43 ~~Following action under No. S9.41, t~~Those administrations not responding under **S9.41** within the time limit specified in No. **S9.41** shall be regarded as unaffected and the provisions of Nos. **S9.48** and **S9.49** shall apply.

CUB/66/17
MOD S9.43 ~~Following action under No. S9.41, t~~Those administrations not responding
(CPM-97) under **S9.41** within the time limit specified in No. **S9.41** shall be regarded as unaffected and the provisions of Nos. **S9.48** and **S9.49** shall apply.

Sub-Section IIC. Action Upon a Request for Coordination

CPM
MOD S9.50 An administration having received a request for coordination under Nos. **S9.7** to **S9.21**, or having been included in the procedure following action under No. **S9.41**, shall promptly examine the matter with regard to interference which may be caused to, or in certain cases, by its own assignments[2], identified in accordance with Appendix **S5**[3].

CUB/66/18
MOD S9.50 An administration having received a request for coordination under Nos.
(CPM-97) **S9.7** to **S9.21**, or having been included in the procedure following action under No. **S9.41**, shall promptly examine the matter with regard to interference which may be caused to, or in certain cases, by its own assignments[2], identified in accordance with Appendix **S5**[3].

CUB/66/19
MOD S9.51 Following its action under No. **S9.50**, the administration with which
(CPM-97) coordination was sought under Nos. **S9.~~7 to S9.9~~** shall, within four months of the date of the relevant Weekly Circular, either inform the requesting administration and the Bureau of its agreement or act under No. **S9.52**.

IAP/40/16
MOD S9.51 Following its action under No. **S9.50**, the administration with which
(CPM-97) coordination was sought under Nos. **S9.~~7 to S9.9~~** shall, within four months of the date of the relevant Weekly Circular, either inform the requesting administration and the Bureau of its agreement or act under No. **S9.52**.

ASP/14/6
MOD S9.51 Following its action under No. **S9.50**, the administration with which coordination was sought under Nos. **S9.7** to **S9.9** shall, within four months of the date of publication of the information in the ~~relevant~~ Weekly Circular under No. **S9.38**, either inform the requesting administration and the Bureau of its agreement or act under No. **S9.52**.

ASP/14/7
MOD S9.51A Following its action under No. **S9.50**, the administration with which coordination was sought under Nos. **S9.15** to **S9.19** shall, within four months of the date of dispatch of the coordination data under No. **S9.29**, either inform the requesting administration of its agreement or act under No. **S9.52**.

CPM

MOD S9.52 If an administration, following its action under Nos. **S9.50**, does not agree to the request for coordination, it shall, within ~~the same~~ four-months of the date of dispatch of the coordination data, or from the date of publication of the information under **S9.38** ~~period~~, inform the requesting administration of its disagreement and shall provide information concerning its own assignments upon which that disagreement is based. It shall also make such suggestions as it is able to offer with a view to satisfactory resolution of the matter. A copy of that information shall be sent to the Bureau. Where the information relates to terrestrial stations or earth stations operating in the opposite direction of transmission within the coordination area of an earth station, only that information relating to existing radiocommunication stations or to those to be brought into use within the next three months for terrestrial stations, or three years for earth stations, shall be treated as notifications under Nos. **S11.2** or **S11.9**.

ASP/14/8

MOD S9.52 If an administration, following its action under No~~s~~. **S9.50**, does not agree to the request for coordination, it shall, within the ~~same~~ four-months ~~period~~ of the date of publication of the information in the Weekly Circular under **S9.38**, or of the date of dispatch of the coordination data under No. **S9.29**, inform the requesting administration of its disagreement and shall provide information concerning its own assignments upon which that disagreement is based. It shall also make such suggestions as it is able to offer with a view to satisfactory resolution of the matter. A copy of that information shall be sent to the Bureau. Where the information relates to terrestrial stations or earth stations operating in the opposite direction of transmission within the coordination area of an earth station, only that information relating to existing radiocommunication stations or to those to be brought into use within the next three months for terrestrial stations, or three years for earth stations, shall be treated as notifications under Nos. **S11.2** or **S11.9**.

CPM

MOD S9.52C For coordination requests under Nos. **S9.11** to **S9.14** and **S9.21**, an administration not responding under No. **S9.52** within the same four-month period shall be regarded as unaffected and, in the cases of **S9.11** to **S9.14**, the provisions of Nos. **S9.48** and **S9.49** shall apply. However, **S9.49** shall not apply to assignments to terrestrial stations which have been notified to the Bureau prior to the expiry of the same four-month period nor to assignments to terrestrial stations notified in accordance with *resolves* 1 of Resolution 716.

ASP/14/9

MOD S9.60 If, within the same four-month period specified in Nos. **S9.51** or **S9.51A**, an administration with which coordination is sought fails to reply or to give a decision under Nos. **S9.51** or **S9.51A** or, following its ~~action~~ disagreement under No. **S9.52**, fails to ~~reply, to give a decision or to~~ provide information concerning its own assignments on which its disagreement is based, the requesting administration may seek the assistance of the Bureau.

AGENDA ITEM 7

ARTICLE S9

Procedure for Effecting Coordination With or Obtaining Agreement of Other Administrations[1, 2, 3]

LUX/NOR/42/1A
MOD

Procedure for Effecting Coordination With or Obtaining Agreement of Other Administrations[1, 2, 3, 4]

LUX/NOR/42/1B
ADD **AS9.4** [4] Resolution [LUX/NOR-1] shall also be applied with respect to those Space Networks that are subject to it.

ASP/14/254
MOD **S9.1** Before initiating any action under this Article in respect of frequency assignments for a satellite network or a satellite system, an administration, or one[1] acting on behalf of a group of named administrations, shall, prior to the coordination procedure described in Section II of Article **S9** below, where applicable, send to the Bureau a general description of the network or system for advance publication ~~in the Weekly Circular~~ not earlier than ~~six~~ five years[2] and preferably not later than two years before the planned date of bringing into use of the network or system (see also Nos. **S11.44** and **S11.44B**). The characteristics to be provided for this purpose are listed in Appendix **S4**. The coordination or notification information may also be communicated to the Bureau at the same time; it shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the information for advance publication where coordination is required by Section II of Article **S9**. Where coordination is not required by Section II, notification shall be considered as having been received by the Bureau not earlier than six months after the date of publication of the advance publication information.

ASP/14/255
ADD **S9.1.2** [2] This revised period of five years shall apply to networks for which Appendix **S4** advance information has been received by the Bureau after [21 November 1997].

B/49/45
MOD **S9.1** Before initiating any action under this Article in respect of frequency assignments for a satellite network or a satellite system, an administration, or one[1] acting on behalf of a group of named administrations, shall, prior to the coordination procedure described in Section II of Article **S9** below, where applicable, send to the Bureau a general description of the network or system for advance publication in the Weekly Circular not earlier than ~~six~~ five years and preferably not later than two years before the planned date of bringing into use of the network or system (see also No. **S11.44**). The characteristics to be provided for this purpose are listed in Appendix **S4**. The coordination or notification information may also be communicated to the Bureau at the same time; it shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the information for advance publication where coordination is required by Section II of Article **S9**. Where coordination is not required by Section II, notification shall be considered as having been received by the Bureau not earlier than six months after the date of publication of the advance publication information.

EUR/5/17

MOD S9.1 Before initiating any action under this Article in respect of frequency assignments for a satellite network or a satellite system, an administration, or one[1] acting on behalf of a group of named administrations, shall, prior to the coordination procedure described in Section II of Article **S9** below, where applicable, send to the Bureau a general description of the network or system for advance publication in the Weekly Circular not earlier than five ~~six~~ years and preferably not later than two years before the planned date of bringing into use of the network or system (see also No. **S11.44**). The characteristics to be provided for this purpose are listed in Appendix **S4**. The coordination or notification information may also be communicated to the Bureau at the same time; it shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the information for advance publication where coordination is required by Section II of Article **S9**. Where coordination is not required by Section II, notification shall be considered as having been received by the Bureau not earlier than six months after the date of publication of the advance publication information

ASP/14/256

MOD S9.2 Amendments to the information sent in accordance with ~~the provisions of~~ No. **S9.1** shall also be sent to the Bureau as soon as they become available. ~~For geostationary-satellite networks and non-geostationary-satellite networks which are subject to Section II of Article **S9**,~~ tThe use of an additional frequency band will require the application of the advance publication procedure for this band. ~~For non-geostationary-satellite networks which are not subject to Section II of Article **S9**, the use of an additional frequency band or an extension of the service area will require the application or recommencing, respectively, of the advance publication procedures for these modifications (see Resolution **48 (WRC-95)**).~~

ASP/14/257

MOD S9.2B On receipt of the complete information sent under Nos. **S9.1** and **S9.2**, the Bureau shall publish it in ~~a Special Section of its Weekly Circular~~ the Space Network List (SNL) within three months. When the Bureau is not in a position to comply with the time limit referred to above, it shall periodically so inform the administrations, giving the reasons therefor.

ASP/14/258

ADD S9.2BA For the purposes of No. **S9.2B**, the Bureau shall publish the following data items in the Space Network List (SNL):

- identity of a satellite network;
- country symbol of notifying administration;
- date of bringing into use;
- frequency range;
- class of station(s) and nature of service;
- orbital information;
- the territories of administrations which are covered by the service area; and
- date of receipt of the information by the Bureau.

ASP/14/259

MOD **S9.3** If, upon receipt of the ~~Weekly Circular~~ Space Network List containing information published under No. **S9.2B**, an administration believes that interference which may be unacceptable may be caused to its existing or planned satellite networks or systems or terrestrial stations[2], it shall within four months of the date of the ~~Weekly Circular~~ Space Network List communicate to the publishing administration its comments on the particulars of the anticipated interference to its existing or planned systems. A copy of these comments shall also be sent to the Bureau. Thereafter, both administrations shall endeavour to cooperate in joint efforts to resolve any difficulties, with the assistance of the Bureau, if so requested by either of the parties, and shall exchange any additional relevant information that may be available. If no such comments are received from an administration within the aforementioned period, it may be assumed that the administration concerned has no basic objections to the planned satellite network(s) of the system on which details have been published.

B/49/46

MOD **S9.5A** The procedure of Section I shall be considered ~~solely~~ mainly for the purposes of informing all administrations of developments in the use of space radiocommunications ~~and minimizing any difficulties that might otherwise arise during the coordination stage~~.

EUR/5/18

ADD **S9.5B** If the data for the request for coordination under No. **S9.30** has not been received by the Bureau within 24 months of the date of receipt of the data for the Advance Publication, the Bureau shall cancel the publication under No. **S9.2B** after informing the notifying administration of its proposed action at least three months before the end of the period.

ASP/14/260

MOD SECTION II. PROCEDURE FOR EFFECTING COORDINATION ~~PROCEDURE~~

ASP/14/261

ADD **S9.30A** Where coordination is required by Nos. **S9.7** to **S9.14** and **S9.21** but the information under No. **S9.30** is not sent to the Bureau within the period of 24 months following the date of receipt by the Bureau of the relevant information under Nos. **S9.1** and **S9.2**, the information under Nos. **S9.1** and **S9.2** shall be regarded as withdrawn. The Bureau shall publish the withdrawal in the Weekly Circular.

B/49/47

ADD **S9.30A** If the information under No. **S9.30** has not been received by the Bureau within the period of 24 months of the date of receipt by the Bureau of the relevant information under Nos. **S9.1** and **S9.2**, the information published under No. **S9.2B** shall be cancelled after the administration concerned has been informed at least three months before the end of the period. The Bureau shall also publish the cancellation in the Weekly Circular.

ASP/14/262
ADD

Sub-Section IIE. Due Diligence Information for a Satellite Network being coordinated

B/49/48
ADD

SECTION III. DUE DILIGENCE INFORMATION FOR A SATELLITE NETWORK BEING COORDINATED

ASP/14/263
ADD **S9.66** Due diligence information listed in Appendix **S4A** to these Regulations shall be sent to the Bureau by the administration requesting coordination for a satellite network not later than two years before the date of bringing into use which was specified in the information of Appendix **S4** already communicated to the Bureau under Nos. **S9.1** or **S9.30**, as appropriate.

B/49/49
ADD **S9.66** The administration requesting coordination for a satellite network shall send to the Bureau the due diligence information listed in Appendix **S4A** not later than two years before the date of bringing into use which was specified in the information of Appendix **S4** submitted under Nos. **S9.1** or **S9.30**, as appropriate.

B/49/50
ADD **S9.67** If the information pursuant to Appendix **S4A** has not reached the Bureau within the time limit specified in No. **S9.66** or if the information is found to be incomplete, the Bureau shall immediately request the administration concerned to submit any information not provided.

ASP/14/264
ADD **S9.67** On receipt of the complete information sent under No. **S9.66** the Bureau shall promptly publish the complete information in the Weekly Circular within four months. When the Bureau is not in a position to comply with the time limit referred to above, it shall periodically so inform the administrations, giving the reasons therefor.

ASP/14/265
ADD **S9.68** If the information under No. **S9.66** has not reached the Bureau within the time limit specified in No. **S9.66** or if the information is found to be incomplete, the Bureau shall immediately request the administration concerned to submit information not provided.

B/49/51
ADD **S9.68** If an administration, following a request under No. **S9.67**, fails to send the complete due diligence information within 30 days from the date of the request, the satellite network concerned shall not be taken into account in the application of the coordination and recording procedures by the other satellite networks submitted later.

ASP/14/266
ADD **S9.69** If an administration, following request under No. **S9.68**, fails to send the complete due diligence information within 30 days from the date of the request, the relevant request for coordination shall be removed from the coordination procedure under Article **S9**.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/45(Rev.1)-E
12 November 1997
English only

DRAFTING GROUP 4A4

ARTICLE S9

LUX/NOR/42/1A
MOD

Procedure for Effecting Coordination With or Obtaining Agreement of Other Administrations[1, 2, 3, 4]

LUX/NOR/42/1B
ADD AS9.4 [4] Resolution [GT PLEN 2-1] shall also be applied with respect to those Space Networks that are subject to it.

IAP/40/4
MOD A.S9.1 [1] **(CPM-97)** For the application of the provisions of this Article with respect to stations in a space radiocommunication service using frequency bands covered by the fixed-satellite service allotment plan, see also Appendix **S30B** ~~and Resolution 107 (Orb-88)~~.

IAP/40/5
MOD A.S9.3 [3] **(Mod CPM-97)** See Appendices **S30** and **S30A** respectively for the coordination of: ~~frequency assignments of other services in relation to stations of the broadcasting-satellite service and to stations of feeder links for this service in the bands covered by those Appendices.~~

a) proposed modifications to the Appendices **S30** Plan for the broadcasting-satellite service in the frequency bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

b) frequency assignments in other services to which the frequency bands referred to in a) above are allocated, with respect to assignments in the broadcasting-satellite service which are subject to the Appendix **S30** Plans;

c) proposed modifications to the Appendices **S30A** Plan for the feeder links to the broadcasting-satellite service in the frequency bands 17.3 -17.8 GHz (in Region 2), and 14.5 - 14.8 GHz and 17.3 - 18.1 GHz (in Regions 1 and 3), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

d) frequency assignments in other services to which the frequency bands referred to in c) above are allocated, with respect to assignments in the fixed-satellite service (Earth-to-space) which are subject to Appendix **S30A** Plan.

For the broadcasting-satellite service and for the feeder links for the broadcasting-satellite service in the fixed-satellite service in Region 2, Resolution **42 (Orb-85)** is also applicable.

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked to bring • their copies to the meeting since no others can be made available.

CUB/66/6
MOD A.S9.3
(CPM-97)

[3] See Appendices **S30** and **S30A** ~~for the coordination of frequency assignments of other services in relation to stations of the broadcasting-satellite service and to stations of feeder links for this service in the bands covered by those Appendices.~~ respectively for the coordination of:

a) proposed modifications to the Appendices **S30** Plan for the broadcasting-satellite service in the frequency bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

b) frequency assignments in other services to which the frequency bands referred to in a) above are allocated, with respect to assignments in the broadcasting-satellite service which are subject to Appendix **S30** Plans;

c) proposed modifications to the Appendices **S30A** Plan for the feeder links to the broadcasting-satellite service in the frequency bands 17.3 - 17.8 GHz (in Region 2), and 14.5 - 14.8 GHz and 17.3 - 18.1 GHz (in Regions 1 and 3), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

d) frequency assignments in other services to which the frequency bands referred to in c) above are allocated, with respect to assignments in the fixed-satellite service (Earth-to-space) which are subject to Appendix **S30A** Plan.

For the broadcasting-satellite service and for the feeder links in the fixed-satellite service for the broadcasting-satellite service in Region 2, Resolution **42 (Orb-85)** is also applicable.

MOD

SECTION I. ADVANCE PUBLICATION OF INFORMATION ON PLANNED SATELLITE NETWORKS OR SATELLITE SYSTEMS- GENERAL

MOD S9.1 Before initiating any action under this Article or under Article S11 in respect of frequency assignments for a satellite network or a satellite system, an administration, or one[1] acting on behalf of a group of named administrations, shall, prior to the coordination procedure described in Section II of Article **S9** below, where applicable, send to the Bureau a general description of the network or system for advance publication in the Weekly Circular not earlier than five~~s~~ix years and preferably not later than two years before the planned date of bringing into use of the network or system (see also No. **S11.44 [and S11.44B]**). The characteristics to be provided for this purpose are listed in [Appendix **S4**]. The coordination or notification information may also be communicated to the Bureau at the same time~~; it shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the information for advance publication where coordination is required by Section II of Article S9~~. Where coordination is not required by Section II, notification shall be considered as having been received by the Bureau not earlier than six months after the date of publication of the advance publication information.

Note to WG4A App. S4 will have to clearly indicate that for networks not subject to coordination, the existing data requirements will be maintained and for networks subject to coordination, the simplified data requirements will be required.

NOC S9.1.1 [1] Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of that group retain the right to respond in respect of their own networks or systems.

MOD S9.2 Amendments to the information sent in accordance with the provisions of No.

S9.1 shall also be sent to the Bureau as soon as they become available. ~~For geostationary-satellite networks and non-geostationary-satellite networks which are subject to Section II of Article S9,~~ The use of an additional frequency band will require the application of the advance publication procedure for this band. ~~For non-geostationary-satellite networks which are not subject to Section II of Article S9, the use of an additional frequency band or an extension of the service area will require the application or recommencing, respectively, of the advance publication procedures for these modifications (see Resolution 48 (WRC-95)).~~

NOC S9.2A If the information is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification required and information not provided.

NOC S9.2B On receipt of the complete information sent under Nos. **S9.1** and **S9.2**, the Bureau shall publish it in a Special Section of its Weekly Circular within three months. When the Bureau is not in a position to comply with the time limit referred to above, it shall periodically so inform the administrations, giving the reasons therefor.

Section IA. Advance Publication of Information on Planned Satellite Networks or Satellite Systems That are not subject to coordination under Section II

MOD S9.3 If, upon receipt of the Weekly Circular containing information published under No. **S9.2B**, any administration believes that interference which may be unacceptable may be caused to its existing or planned satellite networks or systems[or terrestrial stations][2], it shall within four months of the date of the Weekly Circular communicate to the publishing administration its comments on the particulars of the anticipated interference to its existing or planned systems. A copy of these comments shall also be sent to the Bureau. Thereafter, both administrations shall endeavour to cooperate in joint efforts to resolve any difficulties, with the assistance of the Bureau, if so requested by either of the parties, and shall exchange any additional relevant information that may be available. If no such comments are received from an administration within the aforementioned period, it may be assumed that the administration concerned has no basic objections to the planned satellite network(s) of the system on which details have been published.

SUP S9.3.1 ~~[2] The only terrestrial stations to be taken into account are those for which the requirement to coordinate is under Nos. S9.11, S9.11A and S9.21.~~

MOD S9.4 In the case of difficulties, the administration responsible for the planned satellite network shall explore all possible means to resolve the difficulties without considering the possibility of adjustment to networks of other administrations. If no such means can be found, it may request the other administrations to explore all possible means to meet its requirements. The administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks. An administration on behalf of which details of planned satellite networks have been published in accordance with the provisions of No. **S9.2B** shall, after the period of four months, inform the Bureau of the progress made in resolving any difficulties. If necessary, a further report shall be provided prior to ~~the commencement of coordination or~~ the submission of notices under Art. **S11** to the Bureau.

NOC S9.5 The Bureau shall inform all administrations of the list of administrations which have sent comments under No. **S9.3** and provide a summary of the comments received.

MOD S9.5A The procedure of Section IA shall be considered solely for the purposes of informing all administrations of developments in the use of space radiocommunications ~~and minimizing any difficulties that might otherwise arise during the coordination stage~~.

Section IB. Advance Publication of Information on Planned Satellite Networks or Satellite Systems That are subject to coordination under Section II

ADD S9.5B If, upon receipt of the Weekly Circular containing information published under No. **S9.2B**, any administration ~~believes that interference which may be unacceptable may be caused to its existing or planned satellite networks or systems or terrestrial stations[2], it shall within four months of the date of the Weekly Circular communicate to the publishing administration its comments on the particulars of the anticipated interference to its existing or planned systems~~ considers its planned satellite systems or networks to be affected, it may send its comments to the administration responsible for the satellite system or networks in question, so that the latter may take those comments into consideration when initiating the coordination procedure. A copy of these comments shall also be sent to the Bureau. Thereafter, both administrations shall endeavour to cooperate in joint efforts to resolve any difficulties, with the assistance of the Bureau, if so requested by either of the parties, and shall exchange any additional relevant information ~~[1]~~that may be available~~. If no such comments are received from an administration within the aforementioned period, it may be assumed that the administration concerned has no basic objections to the planned satellite network(s) of the system on which details have been published~~.

~~ADD S9.5B.1 [2] The only terrestrial stations to be taken into account are those for which the requirement to coordinate is under Nos. **S9.11**, **S9.11A** and **S9.21**~~. For geostationary stationary networks, the administration shall also send, at the same time that it initiates coordination under S9.7, the relevant information to any administration commenting with respect to its non geostationary satellite networks that are not subject to coordination for which the commenting administration requests such information.

~~**S9.4** In the case of difficulties, the administration responsible for the planned satellite network shall explore all possible means to resolve the difficulties without considering the possibility of adjustment to networks of other administrations. If no such means can be found, it may request the other administrations to explore all possible means to meet its requirements. The administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks. An administration on behalf of which details of planned satellite networks have been published in accordance with the provisions of No. **S9.2B** shall, after the period of four months, inform the Bureau of the progress made in resolving any difficulties. If necessary, a further report shall be provided prior to the commencement of coordination or the submission of notices to the Bureau.~~

~~**S9.5** The Bureau shall inform all administrations of the list of administrations which have sent comments under No. **S9.3** and provide a summary of the comments received~~.

ADD S9.5C The procedure of Section IB shall be considered solely for the purposes of informing all administrations of developments in the use of space radiocommunications

ADD S9.5D If the information under No. **S9.30** has not been received by the Bureau within the period of 24 months of the date of receipt by the Bureau of the relevant information under Nos. **S9.1 and S9.2**, the information published under No. **S9.2B** shall be canceled after the administration concerned has been informed at least three months before the end of the 24 month period. The Bureau shall also publish the cancellation in its Weekly Circular.

SECTION II. PROCEDURE FOR EFFECTING COORDINATION ~~PROCEDURE~~

ASP/14/260
MOD

Sub-Section IIA. Requirement and Request for Coordination

CPM
MOD S9.6 Before an administration[1,2] notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. **S9.27**:

CPM
MOD S9.6.1 [1] In the case of coordination of an assignment in a satellite network ~~in relation to another satellite network~~, an administration may act on behalf of a group of named administrations. Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of the group retain the right to respond in respect of their own services which could affect or be affected by the proposed assignment~~networks or systems~~.

CPM
• ADD S9.6.2 [2] In all cases, the coordination of an earth station with terrestrial stations or other earth stations operating in the opposite direction of transmission shall remain within the authority of the administration on the territory of which this station is located.

CPM
MOD S9.7 a) for a station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, ~~for~~ in any space radiocommunication services ~~and frequency bands except those covered by the Plans of Appendices **S30**, **S30A** and **S30B**~~ in a frequency band and in a region where this service is not subject to a Plan, with the exception of ~~the~~ coordination ~~under No. **S9.17A**~~ between earth stations operating in the opposite direction of transmission.

• [2] *Note: There is no provision for the coordination of a receive space station in the FSS (Earth-to-space) in the bands 10.7 - 10.95 GHz and 11.2 - 11.45 GHz with Appendix 30B Plan.*

CUB/66/8
SUP S9.8
(CPM-97)

IAP/40/7
SUP S9.8

IAP/40/8
SUP S9.9

CUB/66/9
SUP S9.9
(CPM-97)

CPM
MOD **S9.11** d) for a space station in the broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and ~~in which there is no plan for~~where the broadcasting-satellite service is not subject to a plan, in respect of terrestrial services;

CPM
NOC **S9.11A** e) for a station for which the requirement to coordinate is included in a footnote of the Table of Frequency Allocations referring to this provision:

CPM
MOD **S9.13** ii) in a satellite network using the geostationary-satellite orbit, in respect of any other satellite network using a non-geostationary-satellite orbit, with the exception of ~~the~~ coordination ~~under No. S9.17A~~ between earth stations operating in the opposite direction of transmission;

MOD **S9.15** iv) which is either a specific earth station or typical [mobile] earth station of a non-geostationary satellite network, in respect of terrestrial stations in frequency bands allocated with equal rights to space and terrestrial services and where the coordination area of the earth station includes the territory of another country;

CPM
MOD **S9.17** f)~~3~~ for any specific earth station or typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services, in respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country, with the exception of the coordination under No. **S9.15** and under [Article 4/T4 of Appendix **30** and Article 4/T4 of Appendix **30A**];

SEN/9/5
NOC S9.17A *g)* for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country;

IAP/40/11
MOD S9.17A *g)* for any specific earth station, in respect of other earth stations operating
(CPM-97) in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission ~~and where the coordination area of the earth station includes the territory of another country~~ with the exception of the frequency bands subject to Appendix **S30A** Plans;

~~3 Application of these provisions is suspended pending the decision of the 1997 World Radiocommunication Conference on revision of Appendices 30 and 30A with respect to Articles 6 and 7 of those two Appendices.~~

IAP/40/120
MOD S9.17A

g) for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station;

CUB/66/12
MOD S9.17A (CPM-97)

g) for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission ~~and where the coordination area of the earth station includes the territory of another country~~, with the exception of the frequency bands subject to Appendix **30A** Plans;

CUB/66/13
MOD S9.18 (Mod CPM-97)

h) for any transmitting station of a terrestrial service in the bands referred to in No. **S9.17** within the coordination area of an earth station, in respect of an earth station, with the exception of the coordination under Nos. **S9.16** and **S9.19** [and that provided for under Article 6 of Appendix **S30**];

IAP/40/13
MOD S9.19 (CPM-97)

i)[6] for any transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the broadcasting-satellite service, except where this service is subject to the Appendix **S30** Plan;

[6] ~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices S30 and S30A is suspended pending the decision for the 1997 World Radiocommunication Conference on revision of those two Appendices.~~

CUB/66/14
MOD S9.19 (CPM-97)

i)[4] for any transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the broadcasting-satellite service except where this service is subject to the Appendix 30 Plan;

[4] ~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices S30 and S30A is suspended pending the decision of the 1997 World Radiocommunication Conference on revision of those two Appendices~~.

CUB/66/15
MOD S9.32 (CPM-97)

If the responsible administration concludes that coordination is not required under No~~s~~. **S9.7** ~~**to S9.9**~~, it shall send the relevant information pursuant to Appendix **S4** to the Bureau for action under No. **S9.34**.

IAP/40/14
MOD S9.32 (CPM-97)

If the responsible administration concludes that coordination is not required under Nos. **S9.7** ~~**to S9.9**~~, it shall send the relevant information pursuant to Appendix **S4** to the Bureau for action under No. **S9.34**.

IAP/40/15
MOD S9.41 Following receipt of the Weekly Circular referring to requests for coordination under Nos. **S9.7 ~~to S9.9~~**, an administration believing that it should have been included in the request shall, within four months of the date of publication of the relevant Weekly Circular, inform the initiating administration and the Bureau, giving its technical reasons for doing so, and shall request that its name be included.

CUB/66/16
MOD S9.41 Following receipt of the Weekly Circular referring to a request~~s~~ for
(CPM-97) coordination under No~~s~~. **S9.7 ~~to S9.9~~**, an administration believing that it should have been included in the request shall, within four months of the date of publication of the relevant Weekly Circular, inform the initiating administration and the Bureau, giving its technical reasons for doing so, and shall request that its name be included.

CPM
MOD S9.43 ~~Following action under No. S9.41, t~~Those administrations not responding under **S9.41** within the time limit specified in No. **S9.41** shall be regarded as unaffected and the provisions of Nos. **S9.48** and **S9.49** shall apply.

Sub-Section IIC. Action Upon a Request for Coordination

CPM
MOD S9.50 An administration having received a request for coordination under Nos. **S9.7** to **S9.21**, or having been included in the procedure following action under No. **S9.41**, shall promptly examine the matter with regard to interference which may be caused to, or in certain cases, by its own assignments[2], identified in accordance with Appendix S5[3].

CUB/66/19
MOD S9.51 Following its action under No. **S9.50**, the administration with which
(CPM-97) coordination was sought under No~~s~~. **S9.7 ~~to S9.9~~** shall, within four months of the date of the relevant Weekly Circular, either inform the requesting administration and the Bureau of its agreement or act under No. **S9.52**.

IAP/40/16
MOD S9.51 Following its action under No. **S9.50**, the administration with which
(CPM-97) coordination was sought under No~~s~~. **S9.7 ~~to S9.9~~** shall, within four months of the date of the relevant Weekly Circular, either inform the requesting administration and the Bureau of its agreement or act under No. **S9.52**.

ASP/14/6
MOD S9.51 Following its action under No. **S9.50**, the administration with which coordination was sought under Nos. **S9.7** [to **S9.9**] shall, within four months of the date of publication of the information in the ~~relevant~~ Weekly Circular under No. **S9.38**, either inform the requesting administration and the Bureau of its agreement or act under No. **S9.52**.

ASP/14/7
MOD S9.51A Following its action under No. **S9.50**, the administration with which coordination was sought under Nos. **S9.15** to **S9.19** shall, within four months of the date of dispatch of the coordination data under No. **S9.29**, either inform the requesting administration of its agreement or act under No. **S9.52**.

ASP/14/8
MOD S9.52 If an administration, following its action under Nos. **S9.50**, does not agree to the request for coordination, it shall, within the ~~same~~ four-months ~~period~~of the date of publication of the information in the Weekly Circular under **S9.38**, or of the date of dispatch of the coordination data under No. **S9.29**, inform the requesting administration of its disagreement and shall provide information concerning its own assignments upon which that disagreement is based. It shall also make such suggestions as it is able to offer with a view to satisfactory resolution of the matter. A copy of that information shall be sent to the Bureau. Where the information relates to terrestrial stations or earth stations operating in the opposite direction of transmission within the coordination area of an earth station, only that information relating to existing radiocommunication stations or to those to be brought into use within the next three months for terrestrial stations, or three years for earth stations, shall be treated as notifications under Nos. **S11.2** or **S11.9**.

CPM
MOD S9.52C For coordination requests under Nos. **S9.11** to **S9.14** and **S9.21**, an administration not responding under No. **S9.52** within the same four-month period shall be regarded as unaffected and, in the cases of **S9.11** to **S9.14**, the provisions of Nos. **S9.48** and **S9.49** shall apply. However, **S9.49** shall not apply to assignments to terrestrial stations which have been notified to the Bureau prior to the expiry of the same four-month period nor to assignments to terrestrial stations notified in accordance with *resolves* 1 of Resolution 716(WRC-95).

ASP/14/9
MOD S9.60 If, within the same four-month period specified in Nos. **S9.51** or **S9.51A**, an administration with which coordination is sought under Nos. S9.7 - S9.9 and S9.15 - S9.19 fails to reply or to give a decision under Nos. **S9.51** or **S9.51A** or, following its ~~action~~disagreement under No. **S9.52**, fails to ~~reply, to give a decision or to~~ provide information concerning its own assignments on which its disagreement is based, the requesting administration may seek the assistance of the Bureau.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/46-E
12 November 1997
English only

DRAFTING GROUP 4A4

COMPOSITE PROPOSALS

AGENDA ITEM 1.2.

KEN/UGA/TZA/47/5
KEN/70/6
NOC

ARTICLE S11

Notification and Recording of Frequency Assignments[1]

A.S11.1 [1] For the notification and recording of assignments in the following Regions and frequency bands see the appropriate appendices:

Region 1	Region 2	Region 3	Appendix
11.7 - 12.5 GHz	12.2 - 12.7 GHz	11.7 - 12.2 GHz	**S30**
14.5 - 14.8 GHz 17.3 - 18.1 GHz	17.3 - 17.8 GHz	14.5 - 14.8 GHz 17.3 - 18.1 GHz	**S30A**
All Regions, fixed-satellite service only 4 500 - 4 800 MHz (space-to-Earth) 6 725 - 7 025 MHz (Earth-to-space) 10.7 - 10.95 GHz (space-to-Earth) 11.2 - 11.45 GHz (space-to-Earth) 12.75 - 13.25 GHz (Earth-to-space)			**S30B**

IAP/40/17
CUB/66/20 (CPM-97)
MOD A.S11.1

~~[1] For the notification and recording of assignments in the following Regions and frequency bands see also the appropriate Appendices~~:

See Appendices **S30** and **S30A** respectively, for the notification and recording of:

a) frequency assignments to stations in the broadcasting-satellite service in the frequency bands 11.7 - 12.2 GHz (in Region 3), 11.7 - 12.5 GHz (in Region 1) and 12.2 - 12.7 GHz (in Region 2);

b) frequency assignments in other services to which the frequency bands referred to in a) above are allocated, so far as their relationship to the broadcasting-satellite service which is subject to Appendix **S30** is concerned;

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked to bring • their copies to the meeting since no others can be made available.

c) frequency assignments to feeder-link stations in the fixed-satellite service (Earth-to-space) in the frequency bands 14.5 - 14.8 GHz in Region 1 (see No. **S5.510**) and in Region 3, 17.3 - 18.1 GHz in Regions 1 and 3, and
17.3 - 17.8 GHz in Region 2 and other services in these bands;

d) frequency assignments in the same service or in other services to which the frequency bands referred to in c) above are allocated, so far as their relationship to the fixed-satellite service (Earth-to-space) in these bands is concerned.

For the broadcasting-satellite service in Region 2 and for feeder links in the fixed-satellite service for the broadcasting-satellite service in Region 2, Resolution **42 (Rev.Orb-88)** is also applicable.

See also Appendix 30B for the notification and recording of assignments in the following frequency bands:

All Regions, fixed-satellite service only

4 500 - 4 800 MHz	(space-to-Earth)
6 725 - 7 025 MHz	(Earth-to-space)
10.7 - 10.95 GHz	(space-to-Earth)
11.2 - 11.45 GHz	(space-to-Earth)
12.75 - 13.25 GHz	(Earth-to-space)

~~Region 1~~	~~Region 2~~	~~Region 3~~	~~Appendix~~
~~11.7 - 12.5 GHz~~	~~12.2 - 12.7 GHz~~	~~11.7 - 12.2 GHz~~	~~S30~~
~~14.5 - 14.8 GHz~~ ~~17.3 - 18.1 GHz~~	~~17.3 - 17.8 GHz~~	~~14.5 - 14.8 GHz~~ ~~17.3 - 18.1 GHz~~	~~S30A~~
~~All Regions, fixed-satellite service only~~ ~~4 500 - 4 800 MHz~~ ~~(space-to-Earth)~~ ~~6 725 - 7 025 MHz~~ ~~(Earth-to-space)~~ ~~10.7 - 10.95 GHz~~ ~~(space-to-Earth)~~ ~~11.2 - 11.45 GHz~~ ~~(space-to-Earth)~~ ~~12.75 - 13.25 GHz~~ ~~(Earth-to-space)~~		~~See also S30B~~	~~See also Appendix 30B~~

SECTION I. NOTIFICATION

S11.1 The expression "frequency assignment", wherever it appears in this Article, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called the *Master Register*).

S11.2 Any frequency assignment to a transmitting station and to its associated receiving stations except for those mentioned in Nos. **S11.13** and **S11.14** shall be notified to the Bureau:

S11.3 *a)* if the use of that assignment is capable of causing harmful interference to any service of another administration; or

S11.4 *b)* if that assignment is to be used for international radiocommunication; or

S11.5 *c)* if that assignment is subject to a world or regional frequency allotment or assignment plan which does not have its own notification procedure; or

S11.6 *d)* if that assignment is subject to the coordination procedure of Article **S9** or is involved in such a case; or

S11.7 *e)* if it is desired to obtain international recognition for that assignment; or

S11.8 *f)* if it is a non-conforming assignment under No. **S8.4** and if the administration wishes to have it recorded for information.

S11.9 Similar notification shall be made for a frequency assignment to a receiving earth station or space station, or to a land station for reception from mobile stations, when:

S11.10 *a)* any of the conditions in Nos. **S11.4, S11.5** or **S11.7** apply to the receiving station; or

S11.11 *b)* any of the conditions in No. **S11.2** apply to the associated transmitting station.

S11.12 Any frequency to be used for reception by a particular radio astronomy station may be notified if it is desired that such data be included in the Master Register.

S11.13 Assignments involving specific frequencies which are prescribed by these Regulations for common use by terrestrial stations of a given service shall not be notified. They shall be entered in the Master Register and a consolidated table shall also be published in the Preface to the International Frequency List (IFL).

S11.14 Frequency assignments for ship stations and for mobile stations of other services, for stations in the amateur service, for earth stations in the amateur-satellite service, and those for broadcasting stations in the high frequency bands 5 950 - 6 200 kHz, 7 100 - 7 300 kHz (Regions 1 and 3), 9 500 - 9 900 kHz, 11 650 - 12 050 kHz, 13 600 - 13 800 kHz, 15 100 - 15 600 kHz, 17 550 - 17 900 kHz, 21 450 - 21 850 kHz, 25 670 - 26 100 kHz, for which Article **S12A** applies shall not be notified under this Article.

CUB/66/21 (Mod CPM-97)
MOD S11.14

Frequency assignments ~~for~~to ship stations and ~~for~~to mobile stations of other services, ~~for~~to stations in the amateur service, ~~for~~to earth stations in the amateur-satellite service, and those ~~for~~to broadcasting stations in the high frequency bands ~~5 950~~5 900 - 6 200 kHz, 7 100 - 7 300 kHz (Regions 1 and 3), 7 300 - 7 350 kHz, ~~9 500~~9 400 - 9 900 kHz, ~~11 650~~11 600 - ~~12 050~~12 100 kHz, ~~13 600~~13 570 - ~~13 800~~13 870 kHz, 15 100 - ~~15 600~~15 800 kHz, ~~17 550~~17 480 - 17 900 kHz, 18 900 - 19 070 kHz, 21 450 - 21 850 kHz, 25 670 - 26 100 kHz~~,~~ which are subject to Article **S12A** ~~applies~~ shall not be notified under this Article.

S11.15 When notifying a frequency assignment, the administration[1] shall provide the relevant characteristics listed in Appendix **S4**. Alternatively, if an administration has already communicated information to the Bureau under No. **S9.30**, it may identify that communication as a notification and send to the Bureau only the changes thereto.

S11.15.1 [1] A frequency assignment to a space station or typical earth station as part of the satellite network may be notified by one administration acting on behalf of a group of named administrations. Any further notice (modification or deletion) relating to such an assignment shall, in the absence of information to the contrary, be regarded as having been submitted on behalf of the entire group.

S11.16 Not used

ARS/UAE/JOR/MTN/OMA/QAT/SYR/76/2
ADD S11.16

When an administration in need of special assistance desires to seek the help of the Bureau in selecting frequencies for a station of the fixed service in the high frequency bands allocated to that service, it shall notify such characteristics as it is able from the table in Appendix **S4** and shall state the specific assistance required from the Bureau, see also Resolution **103**.

S11.17 Frequency assignments relating to a number of stations or earth stations may be notified in the form of the characteristics of a typical station or a typical earth station and the intended geographical area of operation. Except for mobile earth stations, individual notices of frequency assignments are however necessary in the following cases (see also No. **S11.14**):

S11.18 *a)* stations covered by the allotment or assignment plan of Appendices **S25, S26** and **S27**;

CUB/66/22
IAP/40/18(CPM-97)
MOD S11.18

a) stations covered by the allotment~~ or assignment~~ plan of Appendices **S25**, **S26** and **S27**;

S11.19 *b)* broadcasting stations;

S11.20 *c)* terrestrial stations within the coordination area of an earth station;[2]

S11.21 *d)* any terrestrial stations, in bands shared with space services, which exceed the limits specified in No. **S21.3**, in accordance with No. **S21.7**;[2]

CUB/66/23 (CPM-97)
MOD S11.21

d) any terrestrial stations in bands shared with space services which exceed the limits specified in Table II of Appendix **S7** and in **S21.3**~~, which exceed the limits specified in No. S21.3, in accordance with No. S21.7~~;[2]

CUB/66/24 (CPM-97)
ADD S11.21A

e) any terrestrial stations in bands listed in Table S21-2;[2]

S11.22 *e)* earth stations whose coordination area extends to the territory of another administration;[2]

CUB/66/25 (CPM-97)
MOD S11.22

~~e)~~f) earth stations whose coordination area extends to the territory of another administration;[2]

S11.23 *f)* earth stations whose interference potential is greater than that of a coordinated typical earth station.[2]

CUB/66/26 (CPM-97)
MOD S11.23

~~f)~~g) earth stations whose interference potential is greater than that of a coordinated typical earth station.[2]

S11.20.1
to
S11.23.1

[2] In these cases, individual notices of frequency assignments are required for frequency bands allocated with equal rights to terrestrial and space services where coordination is required under Appendix **S5**, Table S5-1.

S11.24 Notices relating to assignments for stations of terrestrial services, except for those referred to in No. **S11.25**, shall reach the Bureau not earlier than three months before, preferably not later than one month before, and in no case later than one month after the assignments are brought into use.

CUB/66/27
MOD S11.24

Notices relating to assignments for stations of terrestrial services, except for those referred to in No. **S11.25**, shall reach the Bureau not earlier than three months before, and preferably not later than one month before~~, and in no case later than one month after~~ the date on which the assignments are brought into use.

S11.25 Notices relating to assignments for stations in space services, and for terrestrial stations involved in the coordination of a satellite network, shall reach the Bureau not earlier than three years before and not later than three months before the assignments are brought into use.

CUB/66/28 (Mod CPM-97)
MOD S11.25

Notices relating to assignments for stations in space services, and for terrestrial stations involved in the coordination with a space or earth station of a satellite network, shall reach the Bureau not earlier than three years before~~ and not later than three months before~~ the assignments are brought into use.

S11.26 Not used

SECTION II. EXAMINATION OF NOTICES AND RECORDING OF FREQUENCY ASSIGNMENTS IN THE MASTER REGISTER

S11.27 Notices not containing the basic characteristics specified in Appendix **S4** shall be returned with comments to help the notifying administration to complete and submit them again.

CUB/66/29 (CPM-97)
MOD S11.27

Notices not containing ~~the basic~~those characteristics specified in Appendix **S4** as mandatory or required shall be returned with comments to help the notifying administration to complete and submit them again, unless the information not provided is immediately forthcoming in response to an inquiry of the Bureau.

S11.28 Complete notices shall be marked by the Bureau with their date of receipt and shall be examined in the date order of their receipt. On receipt of a complete notice the Bureau shall, within no more than two months, publish its contents, with any diagrams and maps and the date of receipt, in the Weekly Circular which shall constitute the acknowledgement to the notifying administration of receipt of its notice. When the Bureau is not in a position to comply with the time limit referred to above, it shall periodically so inform the administrations, giving the reasons therefor.

S11.29 The Bureau shall not postpone the formulation of a finding on a complete notice unless it lacks sufficient data to reach a conclusion thereon. Moreover, the Bureau shall not act upon any notice having a technical bearing on an earlier notice which is still under consideration by the Bureau until it has reached a finding with respect to the earlier notice.

S11.30 Each notice shall be examined:

S11.31 *a)* with respect to its conformity with the Table of Frequency Allocations[1] and the other provisions[2] of these Regulations, except those relating to conformity with the procedures for obtaining coordination or the probability of harmful interference, or those relating to conformity with a plan, as appropriate, which are the subject of the following sub-paragraphs;[3]

S11.31.1 [1] Conformity with the Table of Frequency Allocations implies the successful application of No. **S9.21**, when necessary.

S11.31.2 [2] The "other provisions" shall be identified and included in the Rules of Procedure.

S11.31.3 [3] Notices relating to radio astronomy stations are only examined with respect to No. **S11.31**.

IAP/40/19 (CPM-97)
MOD S11.31.3

---

[3] Notices relating to radio astronomy stations ar~~e only~~ examined with respect to No. **S11.31** only.

S11.32 *b)* with respect to its conformity with the procedures relating to coordination with other administrations applicable to the radiocommunication service and the frequency band concerned; or

S11.32A c) with respect to the probability of harmful interference that may be caused to or by assignments recorded with a favourable finding under Nos. **S11.36** and **S11.37** or **S11.38**, or recorded in application of No. **S11.41**, or published under Nos. **S9.38** or **S9.58** but not yet notified, as appropriate, for those cases for which the notifying administration states that the procedure for coordination under No. **S9.7** could not be successfully completed (see also No. **S9.65**);[4] or

IAP/40/20 (CPM-97)
NOC S11.32A

S11.32A.1 [4] The examination of such notices with respect to any other frequency assignment for which a request for coordination under **S9.7** has been published under No. **S9.38** but not yet notified shall be effected by the Bureau in the order of their publication under the same number using the most recent information available.

S11.33 *d)* with respect to the probability of harmful interference that may be caused to or by other assignments recorded with a favourable finding in application of Nos. **S11.36** and **S11.37** or **S11.38** or in application of No. **S11.41**, as appropriate, for those cases for which the notifying administration states that the procedure for coordination or prior agreement under Nos. **S9.17**[5], **S9.17A** or **S9.18**[5] could not be successfully completed (see also No. **S9.65**);[6] or

S11.33.2 [5] When typical earth stations are involved, administrations are required to furnish the necessary information to enable the Bureau to effect the examination.

S11.33.3 [6] The examination under No. **S11.33** shall also take into account assignments for terrestrial services which are in use or which are to be brought into use within the next three years and have been communicated to the Bureau as a result of continuing disagreement in coordination.

S11.34 *e)* where appropriate, with respect to its conformity with a world or regional allotment or assignment plan and the associated provisions.

S11.35 Not used

S11.36 When the examination with respect to No. **S11.31** leads to a favourable finding, the assignment shall be recorded in the Master Register or examined further with respect to Nos. **S11.32** to **S11.34**, as appropriate. When the finding with respect to No. **S11.31** is unfavourable, the assignment shall be recorded in the Master Register only if it includes a reference to No. **S4.4**, otherwise the notice shall be returned with an indication of the appropriate action.

CUB/66/30
MOD S11.36

When the examination with respect to No. **S11.31** leads to a favourable finding, the assignment shall be recorded in the Master Register or examined further with respect to Nos. **S11.32** to **S11.34**, as appropriate. When the finding with respect to No. **S11.31** is unfavourable, the assignment shall be recorded in the Master Register, for information and subject to the application of No. **S8.5**, only if ~~it includes a reference to~~the notifying administration states that it will be operated in accordance with No. **S4.4**~~,~~; otherwise the notice shall be returned with an indication of the appropriate action.

IAP/40/21 (CPM-97)
MOD S11.36

When the examination with respect to No. **S11.31** leads to a favourable finding, the assignment shall be recorded in the Master Register or examined further with respect to Nos. **S11.32** to **S11.34**, as appropriate. When the finding with respect to No. **S11.31** is unfavourable, the assignment shall be recorded in the Master Register only if ~~it includes a reference to~~the administration shall undertake that it will be operated in accordance with No. **S4.4**, otherwise the notice shall be returned with an indication of the appropriate action.

SEN/9/6 (CPM-97)
ADD S11.36A

If harmful interference to the reception of any station whose assignment is in accordance with **S11.31** is actually caused by the use of a frequency assignment which is not in conformity with **S11.31**, the station using the latter frequency assignment shall, on receipt of advice thereof, immediately eliminate this harmful interference.

S11.37 When the examination with respect to No. **S11.32** leads to a favourable finding, the assignment shall be recorded in the Master Register indicating the administrations with which the coordination procedure has been completed. When the finding is unfavourable, the notice shall be returned to the notifying administration, with an indication of the appropriate action, if Nos. **S11.32A** or **S11.33** do not apply.

IAP/40/22 (CPM-97)
ADD S11.37.1

When the agreement of the administrations affected has been obtained only for a specified period, the Bureau shall be notified accordingly and the frequency assignment shall be recorded in the Master Register with a note indicating that the frequency assignment is valid only for the period specified. The notifying administration using the frequency assignment over a specified period shall not subsequently use this circumstance to justify continued use of the frequency beyond the period specified if it does not obtain the agreement of the administration(s) concerned.

S11.38 When the examination with respect to Nos. **S11.32A** or **S11.33** leads to a favourable finding, the assignment shall be recorded in the Master Register indicating the names of the administrations with which coordination was completed and those with which it was not completed but in respect of which the finding was favourable. When the finding is unfavourable, the notice shall be returned with an indication of the appropriate action.

S11.39 When the examination with respect to No. **S11.34** leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the notice shall be returned to the notifying administration, with an indication of the appropriate action. However, notices under Appendices **S26** and **S27** shall be treated as follows:

S11.39A In the case of a notice in conformity with the technical principles of Appendix **S27**, but not in conformity with the Allotment Plan, the Bureau shall examine whether the protection specified in Appendix **S27** is afforded to the allotments in the Plan and to assignments already recorded in the Master Register with a favourable finding.

S11.39B When the examination under **S11.39A** leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the assignment shall be recorded in the Master Register with a symbol indicating that it shall cause no harmful interference to any frequency assignment which is either in conformity with the Allotment Plan or recorded in the Master Register with a favourable finding with respect to **S11.39A**.

S11.39C A notice in conformity with the technical principles of Appendix **S26**, but not in conformity with the Allotment Plan, shall be examined with respect to the allotments in Part III of Appendix **S26**.

S11.39D When the examination under **S11.39C** leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the assignment shall be recorded in the Master Register with a symbol indicating that it shall cause no harmful interference to any frequency assignment which is either in conformity with the Allotment Plan or recorded in the Master Register with a favourable finding with respect to **S11.39C**.

S11.40 Not used

S11.41 After a notice is returned under No. **S11.38**, should the notifying administration resubmit the notice and insist upon its reconsideration, the Bureau shall enter the assignment provisionally in the Master Register with an indication of those administrations whose assignments were the basis of the unfavourable finding[7]. The entry shall be changed from provisional to definitive recording in the Master Register only if the Bureau is informed that the new assignment has been in use, together with the assignment which was the basis for the unfavourable finding, for at least four months without any complaint of harmful interference being made (see Nos. **S11.47** and **S11.49**).

S11.41.1 [7] The entry shall be definitive in the case of a frequency assignment to a receiving station, under the condition that the notifying administration has undertaken that no complaint will be made in respect of any harmful interference which may be caused to that assignment by the assignment which was the basis for the unfavourable finding.

S11.41A Should the assignments that were the basis of the unfavourable finding under Nos. **S11.32A** or **S11.33** not be brought into use within the period specified in Nos. **S11.24**, **S11.25** or **S11.44**, as appropriate, then the finding of the assignments resubmitted under **S11.41** shall be reviewed accordingly.

S11.42 Should harmful interference be caused by an assignment recorded under No. **S11.41** to any recorded assignment which was the basis of the unfavourable finding, the station using the frequency assignment recorded under No. **S11.41** shall, upon receipt of advice thereof, immediately eliminate this harmful interference.

IAP/40/23
NOC S11.42

S11.43 In every case when a new assignment is recorded in the Master Register it shall, in accordance with the provisions of Article **S8** of this Chapter, include an indication of the finding and of the consequent status of the assignment. This information shall also be published in the Weekly Circular.

S11.43A A notice of a change in the characteristics of an assignment already recorded, as specified in Appendix **S4**, shall be examined by the Bureau under Nos. **S11.31** to **S11.34**, as appropriate.

S11.43B In the case of a change in the characteristics of an assignment which is in conformity with No. **S11.31**, should the Bureau reach a favourable finding with respect to Nos. **S11.32** to **S11.34**, as appropriate, or find that the changes do not increase the probability of harmful interference to assignments already recorded, the amended assignment shall retain the original date of entry in the Master Register. The date of receipt by the Bureau of the notice relating to the change shall be entered in the Master Register.

S11.43C Where the notifying administration resubmits the notice and the Bureau finds that the coordination procedures specified in **S11.32** have been successfully completed with all administrations whose space or terrestrial radiocommunication stations may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Bureau of the original notice shall be entered in the appropriate column of the Master Register. The date of receipt by the Bureau of the resubmitted notice shall be entered in the "Remarks" column.

S11.43D Where the notifying administration resubmits the notice with a request that the Bureau effect the required coordination under **S9.7** to **S9.19**, the Bureau shall take the necessary action in accordance with the relevant provisions of Articles **S9** and **S11**, as appropriate. However, in any subsequent recording of the assignment, the date of receipt by the Bureau of the resubmitted notice shall be entered in the "Remarks" column.

S11.44 The notified date of bringing into use of any assignment to a space station of a satellite network shall be no later than six years following the date of publication of the relevant Weekly Circular referred to in No. **S9.2B**. The notified date of bringing into use will be extended at the request of the notifying administration by not more than three years.

LUX/41/17 (Mod CPM-97)
MOD S11.44

The notified date of bringing into use of any assignment to a space station of a satellite network shall be no later than six years following the date of ~~publication~~receipt by the Bureau of the relevant ~~Weekly Circular referred to in No. **S9.2B**~~ complete information under No. **S9.00**. Any change in the characteristics in accordance with No. **S11.43** shall be brought into use no later than [6] years following the date of receipt of the information by the Bureau. The notified date of bringing into use will be extended at the request of the notifying administration by not more than three years.

Proposed modification to S11.44 (Reference to MOD S13.20 in the CPM Report)

ARS/UAE/JOR/MTN/OMA/QAT/SYR/76/11

The signatories of this document agree with the proposed modification but consider that the 3 month period referred to the provision S13.20 is a minimal value and shall not be reduced as proposed in the note appearing in the CPM report.

Proposed modifications to S11.44 (Reference to MOD S11.44 in the CPM Report)

ARS/UAE/JOR/MTN/OMA/QAT/SYR/76/17

In its Report the CPM recommends a modification to S11.44 changing the starting date for the count of the 6 year period from the date of publication to the date of receipt by the Bureau. The date of receipt by the Bureau should be used only for fixing the rights and obligations of assignments. Dates which depend on the workload in the Bureau should be related to the date of publication. It is therefore proposed not to accept the modification proposed by the CPM in this respect.

ASP/14/10
ADD S11.44A

A notice not conforming to No. **S11.44** shall be returned to the notifying administration with a recommendation to restart the advance publication procedure.

S11.45 The notified date of bringing into use of an assignment to a terrestrial station will be extended at the request of the notifying administration by not more than six months.

LUX/41/
IAP/40/24
NOC S11.45

S11.46 In applying the provisions of this Article, any resubmitted notice which is received by the Bureau more than six months after the date on which the original notice was returned by the Bureau shall be considered to be a new notice.

LUX/41/
IAP/40/25
NOC S11.46

S11.47 All frequency assignments notified in advance of their being brought into use shall be entered provisionally in the Master Register. Within thirty days of such an assignment being brought into use, the notifying administration shall so inform the Bureau. If the Bureau does not receive that confirmation within the above period it shall cancel the entry. The Bureau shall however consult the administration concerned before taking such action.

LUX/41/
NOC S11.47

S11.48 If after the expiry of the period of six years, plus the extension specified in No. **S11.44**, as appropriate, from the date of publication of the relevant Weekly Circular, the administration responsible for the satellite network has not submitted the Appendix **S4** information for notification under No. **S11.2** and has not brought the frequency assignments to stations of the network into use, the information published under Nos. **S9.2B** and **S9.38** shall be cancelled only after the administration concerned has been informed, at least three months before the expiry date referred to in **S11.44**.

LUX/41/18 (Mod CPM-97)
MOD S11.48

If after the expiry of the period of six years, plus the extension specified in No. **S11.44**, as appropriate, from the date of ~~publication of the relevant Weekly Circular~~receipt of the complete information referred to in No. **S9.00**, the administration responsible for the satellite network has not submitted the Appendix **S4** information for notification under No. **S11.2** and has not brought the frequency assignments to stations of the network into use, the corresponding information published under Nos. **S9.2B** ~~and~~or **S9.38** shall be cancelled only after the administration concerned has been inform~~ed~~, at least three months before the expiry date referred to in **S11.44**.

S11.49 Where the use of a recorded assignment to a space station is suspended for a period not exceeding eighteen months, the notifying administration shall, as soon as possible, inform the Bureau of the date on which such use was suspended and the date on which the assignment is to be brought back into regular use. This latter date shall not exceed two years from the date of suspension.

LUX/41/
NOC S11.49

EUR/5/4
MOD S11.49

An administration may suspend the use of a recorded assignment to a space station for a period not exceeding two years. In this case ~~Where the use of a recorded assignment to a space station is suspended for a period not exceeding eighteen months,~~ the notifying administration shall, as soon as possible, inform the Bureau of the date on which such use was suspended and the date on which the assignment is to be brought back into regular use~~. This latter date shall not exceed two years from the date of suspension.~~ For any suspension exceeding a period of two years, the Bureau shall cancel the corresponding assignment from the Master Register and the corresponding Special Sections after informing the administration concerned.

IAP/40/123
MOD S11.49

Where the use of a recorded assignment to a space station is suspended for a period not exceeding ~~eighteen months~~one year, the notifying administration shall, as soon as possible, inform the Bureau of the date on which such use was suspended and the date on which the assignment is to be brought back into regular use. This latter date shall not exceed two years from the date of suspension.

AGENDA ITEM 7

ARTICLE S11

Notification and Recording of Frequency Assignments[1]

ASP/14/267

ADD S11.15A When notifying a frequency assignment to a space station in a satellite network, the administration shall also provide the due diligence information listed in Appendix **S4A** to these Regulations to the Bureau.

B/49/52

ADD S11.15A When notifying a frequency assignment to a space station in a satellite network, the administration shall also provide the due diligence information listed in Appendix **S4A** to the Bureau.

ASP/14/268

MOD S11.27 Notices ~~not~~ neither containing the basic characteristics specified in Appendix **S4** nor the due diligence information listed in Appendix **S4A** shall be returned with comments to help the notifying administration to complete and submit them again.

B/49/53

MOD S11.27 Notices ~~not~~ neither containing the basic characteristics specified in Appendix **S4** nor the due diligence information listed in Appendix **S4A**, as appropriate, shall be returned with comments to help the notifying administration to complete and submit them again.

ASP/14/269

MOD S11.44 The notified date of bringing into use of any assignment to a space station of a satellite network shall be no later than ~~six~~ five years[1] following the date of ~~publication~~ receipt by the Bureau of the relevant ~~Weekly Circular referred to in No. S9.2B~~ complete information under No. **S9.1**. ~~The notified date of bringing into use will be extended at the request of the notifying administration by not more than three years.~~ Any change in the characteristics in accordance with No. **S11.43A** shall be brought into use no later than five[1] years following the date of receipt of the information concerning the change.

ASP/14/270

ADD S11.44.1 [1] This revised period of five years shall apply to networks for which Appendix S4 advance information has been received by the Bureau [after 21 November 1997].

B/49/54

MOD S11.44 The notified date of bringing into use of any assignment to a space station of a satellite network shall be no later than ~~six~~ five years following the date of ~~publication~~ receipt by the Bureau of the relevant ~~Weekly Circular referred to in No. S9.2B~~. complete information under No. **S9.1**. The notified date of bringing into use of any change in the characteristics in accordance with No. **S11.43A** shall be no later than five years following the date of receipt by the Bureau of the information referred to in No. **S9.1**. The notified date of bringing into use ~~will~~ may be extended at the request of the notifying administration by not more than ~~three~~ two years only under the conditions specified in No. **S11.44A**.

EUR/5/19

MOD S11.44 The notified date of bringing into use of any assignment to a space station of a satellite network shall be no later than five ~~six~~ years following the date ~~of publication~~ receipt by the Bureau of the relevant information under No. **S9.1** ~~relevant Weekly Circular referred to in No. S9.2B~~. The notified date of the bringing into use of any change in the characteristics in accordance with No. **S11.43A** shall be no later than 5 years following the date of receipt by the Bureau of the information referred to in No. **S9.1**. The notified date of bringing into use ~~may~~ will be extended at the request of the notifying administration by not more than ~~two three~~ years only under the conditions specified under No. **S11.44B**. Any frequency assignment not brought into use within the required period shall be cancelled by the Bureau after having informed the administration at least 3 months before the expiry of the above date.

B/49/55

ADD S11.44A The date of bringing into use of the frequencies of a satellite network may be extended by the Bureau in accordance with No. **S11.44** under the following limited and specific conditions[1]:

B/49/56

ADD S11.44A.1 _____

[1] In applying the above, the administration shall clearly state which of the above reasons applies for its request for an extension and provide the details supporting its request.

B/49/57

ADD S11.44B a) launch failure;

B/49/58

ADD S11.44C b) launch delays;

B/49/59

ADD S11.44D c) delays caused by design problems in the satellite; or

B/49/60

ADD S11.44E d) by modifications intended to reach agreement during coordination;

B/49/61

ADD S11.44F e) force majeure.

ASP/14/271

ADD S11.44B If the notifying administration cannot act in accordance with No. **S11.44** for the reasons either of launch failure, launch delays, delays caused by design problems in the satellite or by modifications intended to reach agreement on coordination [other specific narrow circumstances to be defined], or *force majeure*, the notified date of bringing into use may be extended at its request by not more than two years.

EUR/5/20

ADD S11.44B The date of the bringing into use of the frequencies of a satellite network may be extended by the Bureau in accordance with No. **S11.44** under the following limited and specific conditions:

- the coordination, if applicable, has commenced [and the due diligence] under [.....] has been satisfied; and
- the notifying administration submits a certification that there has been a launch failure or a delay in the launch due to circumstances beyond the control of the administration or the operating entity; or
- there has been a certification submitted by the satellite manufacturer via the administration, that there have been problems in meeting the design specifications; or
- there has been a certification submitted by the satellite manufacturer and the operating entity via the administration, that there is a need to modify the satellite to implement some design changes as a result of the coordination agreements, or
- [the notifying administration makes a formal declaration of *force majeur*].

In applying the above, the administration shall clearly state which of the above reasons applies for its request for an extension and provide the details supporting its request

ASP/14/272

MOD S11.48 If after the expiry of the period of ~~six~~ five years, plus the extension specified in Nos. **S11.44** and **S11.44B**, as appropriate, from the date of ~~publication of the relevant Weekly Circular~~receipt of the complete information referred to in **S9.1**, the administration responsible for the satellite network has not submitted the Appendix **S4** information for notification under No. **S11.2** and has not brought the frequency assignments to stations of the network into use, the corresponding information published under Nos. **S9.2B** and **S9.38** shall be cancelled only after the administration concerned has been informed, at least three months before the expiry date referred to in **S11.44** and **S11.44B**.

B/49/62

MOD S11.48 If after the expiry of the period of ~~six~~ five years, plus the extension specified in No. **S11.44**, as appropriate, from the date of ~~publication of the relevant Weekly Circular~~ receipt of the complete information referred to in **S9.1**, the administration responsible for the satellite network has not submitted the Appendix **S4** information for notification under No. **S11.2** and has not brought the frequency assignments to stations of the network into use, the corresponding information published under Nos. **S9.2B** and **S9.38** shall be cancelled only after the administration concerned has been informed, at least three months before the expiry date referred to in **S11.44**.

EUR/5/21

MOD S11.48 If after the expiry of the period of five ~~six~~ years, plus the extension specified in No. **S11.44**, as appropriate, from the date of ~~publication of the relevant Weekly Circular~~ receipt of the complete information referred to in **S9.1**, the administration responsible for the satellite network has not submitted the Appendix **S4** information for notification under No. **S11.2** and has not brought the frequency assignments to stations of the network into use, the corresponding information published under Nos. **S9.2B** and **S9.38** shall be cancelled only after the administration concerned has been informed, at least three months before the expiry date referred to in **S11.44**.

LUX/NOR/42/2A

MOD S11.48 If after the expiry of the period of six years, plus the extension specified in No. **S11.44**, as appropriate, from the date of publication of the relevant Weekly Circular, the administration responsible for the satellite network has not submitted the Appendix **S4** information for notification under No. **S11.2** and has not brought the frequency assignments to stations of the network into use[1], the information published under Nos. **S9.2B** and **S9.38** shall be cancelled only after the administration concerned has been informed, at least three months before the expiry date referred to in **S11.44**.

LUX/NOR/42/2B

ADD S11.48.1 [1] For those networks that are subject to the application of Resolution [LUX/NOR-1], the administrations when notifying the Bureau that the frequencies have been brought into use shall also submit to the Bureau a certification signed by responsible officers of the Satellite Contractor and the Launch Service Provider that the satellite with the frequency bands covered by the applicable notice was put into orbit on a specific date. If such certification is not received then the Bureau shall consider that the frequencies have not been brought into use.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/47-E
13 November 1997
Original: Spanish

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 4D
AD HOC 4

NOTE BY THE CHAIRMAN OF AD HOC GROUP 4 OF WORKING GROUP 4D

Ad hoc Group 4 of Working Group 4D has held two meetings to analyse the technical limits that would be necessary to ensure that the operation of non-GSO FSS networks in the frequency bands to which Appendices 30 and 30A apply affords adequate protection to BSS systems and their associated feeder links.

The terms of reference of WG 4D ad hoc 4 are contained in Document DT/108. The frequency bands affected are shown in Table 1.

TABLE 1

Frequency bands for the BSS and feeder links

Frequency band (GHz)	**Region 1**	**Region 2**	**Region 3**
11.7 - 12.1	↓ BSS	-	↓ BSS
12.1 - 12.2	↓ BSS	-	↓ BSS
12.2 - 12.5	↓ BSS	↓ BSS	-
12.5 - 12.7	-	↓ BSS	↓ BSS community
12.7 - 12.75	-	-	↓ BSS community
14.5 - 14.8	↑ F.L.*	↑ F.L.	↑ F.L.
17.3 - 17.8	↑ F.L.	↓ BSS** ↑ F.L.	↑F.L.
17.8 - 18.1	↑ F.L.	↑ F.L.	↑ F.L.

* Outside Europe
** As from 1 April 2007

F.L. = feeder link

In conducting its work, WG 4D ad hoc 4 has taken account of the contributions by administrations contained in Documents EUR/5, F/62 + Add.1, IAP/40 (Add.1/43), USA/30(Add.2), ARS/76, VTN/74 (Add.2), LBN/114 + Add.1 + Add.2, AFS/192/4.

From the information provided by administrations, it has been possible to derive the proposed power limits for non-GSO FSS systems. The Group has not discussed the regulatory form in which these limits should be applied after WRC-97, and has therefore not drawn up any resolutions or other such regulatory text.

In the technical discussions on this complex interference mechanism, the Group has also based itself on Temporary Documents DL/42 + Add.1, which provide information in response to specific questions raised by administrations.

From the discussions held, there would appear to be agreement on the need to consider any limits adopted by WRC-97 as provisional. Administrations likewise agree that ITU-R should be requested to carry out, as a matter of urgency and in time for consideration by WRC-99, the technical, operational and regulatory studies necessary in order to revise or confirm those limits.

Bearing in mind the available information provided by administrations and the studies carried out to date, Tables S22-1 and S22-2 summarize the proposals with respect to the power flux-density limits that would apply to non-GSO FSS networks in the frequency bands covered by Appendices 30 and 30A and others allocated to the BSS. Those proposals are still under consideration and technical discussions are taking place between administrations with a view to facilitating their technical interpretation and evaluating the scope of the said limits. So far as feeder links are concerned, their consideration remains pending until such time as a conclusion has been reached on the question of BSS downlinks.

a) Proposal for the protection of BSS downlinks

§ 6. (1) The equivalent power flux-density, at any point on the Earth's surface visible from the geostationary orbit, produced by emissions from all the space stations of a non-geostationary system operating in the following frequency bands in the fixed-satellite service, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-1** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth as specified in Table **S22-1**, for all pointing directions towards the geostationary orbit.

TABLE **S22-1**

Frequency band allocated to the BSS	Equivalent pfd dB(W/m^2)	Percentage of time during which pfd level may not be exceeded	Reference antenna radiation pattern	Reference bandwidth (MHz)
11.7 - 12.5 GHz in Region 1, 11.7 - 12.2 GHz and 12.5 - 12.7 GHz in Region 3	-145 -132	99.7% 100%	Recommendation ITU-R BO.1213 (for Regions 1 and 3)	27
12.2 - 12.7 GHz 17.3 - 17.8 GHz in Region 2	-144 -131	99.7% 100%	Section 3.7.2 of Annex 5 of Appendix **30** for Region 2	27

The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within a non-geostationary system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

- N is the number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater or equal to 0°;
- i is the index of the considered non-geostationary space station;
- pfd_i is the power flux-density produced at the point considered at the Earth's surface in dB(W/m^2) in the reference bandwidth;
- θ_i is the angle between the direction considered towards the geostationary orbit and the direction of the interfering space station in the non-geostationary system;
- $G_r(\theta_i)$ is the gain of the receive reference antenna to be considered as part of a geostationary network;
- G_{max} is the maximum gain of the above receive reference antenna;
- $epfd$ is the computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

b) Proposal for the protection of BSS feeder links

The aggregate power flux-density produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-2** for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

TABLE **S22-2**

Frequency band	Aggregate pfd dB(W/m^2)	Percentage of time during which pfd level may not be exceeded	Reference bandwidth (MHz)
14.5 - 14.8 GHz in Regions 1 and 3 (outside Europe)	-119	99.97%	27
	-115	100%	
17.3 - 18.1 GHz in Regions 1, 2 and 3			

The aggregate power flux-density is defined as the summation of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^{\,2}}\right]$$

where:

- N is the number of earth stations in the non-geostationary system with an elevation angle greater or equal to 0°, from which the point considered in the geostationary orbit is visible;
- i is the index of the earth station considered in the non-geostationary system;
- P_i is the RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary system in dB(W/m^2) in the reference bandwidth;
- $\theta_i(t)$ is the off-axis angle between the boresight of the earth station considered in the non-geostationary system and the direction of the point considered in the geostationary-satellite orbit;
- $G_t(\theta_i)$ is the transmit antenna gain of the earth station considered in the non-geostationary system in the direction of the point considered in the geostationary-satellite orbit;
- d is the distance between the earth station considered in the non-geostationary system and the point considered in the geostationary-satellite orbit;
- *apfd* is the aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

J. SESEÑA
Chairman of WG 4D ad hoc 4

CMR-97 CONFÉRENCE MONDIALE DES RADIOCOMMUNICATIONS

Document DL/47-F
13 novembre 1997
Original: espagnol

GENÈVE, 27 OCTOBRE – 21 NOVEMBRE 1997

GROUPE AD HOC 4 DU
GROUPE DE TRAVAIL 4D

Note du Président du Groupe ad hoc 4 du Groupe de travail 4D

Le Groupe ad hoc 4 du Groupe de travail 4D s'est réuni deux fois en vue d'analyser les limites techniques qui seraient nécessaires pour que dans l'exploitation des réseaux non OSG du service fixe par satellite (SFS) dans les bandes de fréquences auxquelles s'appliquent les appendices 30 et 30A, le service de radiodiffusion par satellite (SRS) et les liaisons de connexion associées soient suffisamment protégés.

Le mandat du Groupe ad hoc 4 du Groupe de travail 4D est défini dans le Document DT/108. Les bandes de fréquences affectées sont indiquées au Tableau 1.

TABLEAU 1

Bandes de fréquences du SRS et liaisons de connexion

Bande de fréquences (GHz)	**Région 1**	**Région 2**	**Région 3**
11,7 - 12,1	↓ SRS	-	↓ SRS
12,1 - 12,2	↓ SRS	-	↓ SRS
12,2 - 12,5	↓ SRS	↓ SRS	-
12,5 - 12,7	-	↓ SRS	↓ SRS commune
12,7 - 12,75	-	-	↓ SRS commune
14,5 - 14,8	↑ L.C.*	↑ L.C.	↑ L.C.
17,3 - 17,8	↑ L.C.	↓ SRS** ↑ L.C.	↑L.C.
17,8- 18,1	↑ L.C.	↑ L.C.	↑ L.C.

* Hors d'Europe

** A partir du 1.4.2007

L.C. = Liaison de connexion

Le Groupe ad hoc 4 du GT 4D a tenu compte des contributions des administrations présentées sous les cotes suivantes: EUR/5, F/62 + Add.1, IAP/40 (Add.1/43), USA/30(Add.2), ARS/76, VTN/74 (Add.2), LBN/114 + Add.1 + Add.2, AFS/192/4.

Les limites de puissance proposées pour les systèmes à satellites non géostationnaires du SFS découlent des renseignements fournis par les administrations. Le Groupe n'a pas discuté du type de réglementation qui devrait s'appliquer à ces limites après la CMR-97. En conséquence, il n'a pas élaboré de Résolution ni d'autre texte réglementaire analogue.

Dans les débats techniques consacrés à ce mécanisme de brouillage complexe, le Groupe s'est appuyé sur le Document temporaire DL/42 + Add.1, qui contient une information concernant des questions concrètes soulevées par les administrations.

Il ressort des délibérations que l'on paraît s'accorder sur la nécessité de considérer comme provisoires les limites que la CMR-97 pourrait adopter. Par ailleurs, les administrations sont d'accord pour demander à l'UIT-R d'effectuer d'urgence, et à temps pour qu'elles puissent être examinées par la CMR-99, les études relatives aux questions techniques, d'exploitation et de réglementation qui sont nécessaires pour pouvoir réviser ou confirmer lesdites limites.

Compte tenu de l'information émanant des administrations et des études réalisées jusqu'à présent, les Tableaux S22-1 et S22-2 résument les propositions sur les limites de puissance surfacique qui seraient applicables aux réseaux non OSG du SFS dans les bandes de fréquences des appendices 30 et 30A et dans les autres bandes attribuées au SRS. Ces propositions sont toujours à l'étude et des discussions techniques sont en cours entre les administrations en vue d'en faciliter l'interprétation technique et d'évaluer la portée des limites en question. La partie relative aux liaisons de connexion n'a pas été étudiée tant que l'on ne sera pas parvenu à une conclusion sur les liaisons descendantes du SRS.

a) Proposition concernant la protection des liaisons descendantes du SRS

§ 6. (1) La puissance surfacique équivalente, en un point quelconque à la surface de la Terre visible depuis l'orbite des satellites géostationnaires, produite par les émissions de toutes les stations spatiales d'un système non géostationnaire du service fixe par satellite fonctionnant dans les bandes de fréquences suivantes, y compris les émissions d'un satellite réflecteur, pour toutes les conditions et toutes les méthodes de modulation, ne doit pas dépasser les limites indiquées dans le Tableau S22-1 pendant les pourcentages de temps donnés. Ces limites s'entendent de la puissance surfacique équivalente que l'on obtiendrait dans des conditions de propagation en espace libre, et s'appliquent à une antenne de référence et dans la largeur de bande de référence spécifiée au Tableau S22-1, dans toutes les directions de pointage vers l'orbite des satellites géostationnaires.

TABLEAU S22-1

Bande de fréquences attribuée au SRS	Puissance surfacique dB(W/m^2)	Pourcentage de temps pendant lequel le niveau de puissance surfacique ne peut pas être dépassé	Diagramme de rayonnement de l'antenne de référence	Largeur de bande de référence (MHz)
11,7 - 12,5 GHz en Région 1 11,7 - 12,2 GHz et 12,5 - 12,7 GHz en Région 3	-145 -132	99,7% 100%	Recommandation UIT-R **BO.1213** (pour les Régions 1 et 3)	27
12,2 - 12,7 GHz 17,3 - 17,8 GHz en Région 2	-144 -131	99,7% 100%	Section 3.7.2 de l'annexe 5 de l'appendice **30** pour la Région 2	27

La puissance surfacique équivalente est définie comme étant la somme des puissances surfaciques produites en un point de la surface de la Terre par toutes les stations spatiales d'un système non géostationnaire, compte tenu de la discrimination hors axe d'une antenne de réception de référence que l'on suppose pointée en direction de l'orbite des satellites géostationnaires. Elle est calculée à l'aide de la formule suivante:

$$epfd = 10.\log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

où:

- N est le nombre de stations spatiales non géostationnaires visibles depuis le point considéré à la surface de la Terre et dont l'angle d'élévation est supérieur ou égal à 0°;
- i est l'indice de la station spatiale non géostationnaire considérée;
- pfd_i est la puissance surfacique produite au point considéré à la surface de la Terre, en dB (W/m^2) dans la largeur de bande de référence;
- θ_i est l'angle entre la direction considérée vers l'orbite des satellites géostationnaires et la direction de la station spatiale brouilleuse du système non géostationnaire;
- $G_r(\theta_i)$ est le gain de l'antenne réceptrice de référence considérée comme faisant partie d'un réseau géostationnaire;
- G_{max} est le gain maximal de l'antenne réceptrice de référence susmentionnée;
- $epfd$ est la puissance surfacique équivalente calculée en dB(W/m^2) dans la largeur de bande de référence.

b) Proposition concernant la protection des liaisons de connexion du SRS

La puissance surfacique cumulative produite en un point quelconque de l'orbite des satellites géostationnaires, par les émissions de toutes les stations terriennes d'un système non géostationnaire du service fixe par satellite, pour toutes les conditions et pour toutes les méthodes de modulation, ne

doit pas dépasser les limites indiquées dans le Tableau **S22-2** pendant les pourcentages de temps spécifiés. Ces limites s'entendent de la puissance surfacique que l'on obtiendrait dans des conditions de propagation en espace libre à l'intérieur de la largeur de bande de référence spécifiée dans ce Tableau.

TABLEAU **S22-2**

Bande de fréquences	Puissance surfacique cumulative en dB(W/m^2)	Pourcentage de temps pendant lequel le niveau de puissance surfacique ne peut pas être dépassé	Largeur de bande de référence (MHz)
14,5 - 14,8 GHz en Régions 1 et 3 (en dehors de l'Europe)	-119	99,97%	27
	-115	100%	
17,3 - 18,1 GHz en Régions 1, 2 et 3			

La puissance surfacique cumulative est définie comme étant la somme des puissances surfaciques produites en un point de l'orbite des satellites géostationnaires par toutes les stations terriennes d'un système non géostationnaire. Elle est calculée à l'aide de la formule suivante:

$$apfd = 10.\log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4.\pi.d_i^{\,2}}\right]$$

où:

- N est le nombre de stations terriennes du système non géostationnaire présentant un angle d'élévation supérieur ou égal à 0°, depuis lequel le point considéré de l'orbite des satellites géostationnaires est visible;
- i est l'indice de la station terrienne considérée du système non géostationnaire;
- P_i est la puissance RF à l'entrée de l'antenne d'émission de la station terrienne considérée du système non géostationnaire, en dB (W/m^2) dans la largeur de bande de référence;
- $\theta_i(t)$ est l'angle entre l'axe de visée de la station terrienne considérée du système non géostationnaire et la direction du point considéré de l'orbite du satellite géostationnaire;
- $G_t(\theta_i)$ est le gain de l'antenne d'émission de la station terrienne considérée du système non géostationnaire dans la direction du point considéré de l'orbite des satellites géostationnaires;
- d est la distance entre la station terrienne considérée du système non géostationnaire et le point considéré de l'orbite des satellites géostationnaires;
- *apfd* est la puissance surfacique cumulative, en dB(W/m^2) dans la largeur de bande de référence.

J. SESAÑA
Président du Groupe ad hoc 4
du GT 4D

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

CMR-97 CONFERENCIA MUNDIAL DE RADIOCOMUNICACIONES

Documento DL/47-S
13 de noviembre de 1997
Original: español

GINEBRA, 27 DE OCTUBRE – 21 DE NOVIEMBRE DE 1997

GRUPO AD HOC 4 DEL GRUPO DE TRABAJO 4D

Nota del Presidente del Grupo ad hoc 4 del Grupo de Trabajo 4D

El Grupo ad hoc 4 del Grupo de Trabajo 4D se ha reunido en dos ocasiones con el objetivo de analizar los límites técnicos que serían necesarios para que la operación de redes no-OSG del servicio fijo por satélite (SFS) en las bandas de frecuencias donde aplican los apéndices 30 y 30A protejan suficientemente a los sistemas del servicio de radiodifusión por satélite (SRS) y sus enlaces de conexión asociados.

El mandato del Grupo ad hoc 4 del Grupo de Trabajo 4D está contenido en el Documento DT/108. Las bandas de frecuencias afectadas están indicadas en el cuadro 1.

CUADRO 1

Bandas de frecuencias del SRS y enlaces de conexión

Banda de frecuencias (GHz)	Región 1	Región 2	Región 3
11,7 - 12,1	↓ SRS	-	↓ SRS
12,1 - 12,2	↓ SRS	-	↓ SRS
12,2 - 12,5	↓ SRS	↓ SRS	-
12,5 - 12,7	-	↓ SRS	↓ SRS comunal
12,7 - 12,75	-	-	↓ SRS comunal
14,5 - 14,8	↑ E.C.*	↑ E.C.	↑ E.C.
17,3 - 17,8	↑ E.C.	↓ SRS** ↑ E.C.	↑E.C.
17,8- 18,1	↑ E.C.	↑ E.C.	↑ E.C.

* Fuera de Europa

** A partir del 1.4.2007

E.C. = Enlace de conexión

En el trabajo del Grupo ad-hoc 4 del GT 4D se han tenido en cuenta las contribuciones de las administraciones, contenidas en los documentos que se detallan a continuación: EUR/5, F/62 + Add.1, IAP/40 (Add.1/43), USA/30(Add.2), ARS/76, VTN/74 (Add.2), LBN/114+Add.1 + Add.2, AFS/192/4.

De la información facilitada por las administraciones, se han deducido las propuestas de límites de potencia para los sistemas de satélites no-geoestacionarios del SFS. El Grupo no ha debatido la forma reglamentaria que habría de aplicarse a estos límites después de la CMR-97. En consecuencia, el Grupo no ha elaborado Resoluciones u otro texto reglamentario similar.

En los debates técnicos mantenidos sobre este complejo mecanismo de interferencia, el Grupo también se ha apoyado en los Documentos Temporales DL/42 + Add.1, que proporcionan información en atención a preguntas concretas suscitadas por las administraciones.

De los debates mantenidos, parece que sí existe acuerdo sobre la necesidad de considerar como provisionales a los límites que pueda adoptar la CMR-97. Asimismo, las administraciones están de acuerdo en solicitar al UIT-R que efectúe con carácter urgente, y a tiempo para su consideración por la CMR-99, los estudios técnicos, de explotación y reglamentarios necesarios que permitan la revisión o la confirmación de dichos límites.

Habida cuenta de la información disponible facilitada por las administraciones y los estudios realizados hasta la fecha, los cuadros S22-1 y S22-2 resumen las propuestas sobre los límites de densidad de flujo de potencia que serían aplicables a las redes no-OSG del SFS en las bandas de frecuencias de los apéndices 30 y 30A y otros atribuidos al SRS. Estas propuestas siguen aún en debate y se están produciendo conversaciones técnicas entre las administraciones con el fin de facilitar su interpretación técnica y evaluar el alcance de dichos límites. La parte relativa a los enlaces de conexión está aún pendiente de consideración, hasta que primeramente pueda alcanzarse una conclusión sobre los enlaces descendentes SRS.

a) Propuesta para la protección de enlaces descendentes SRS

§ 6. (1) En cualquier punto de la superficie de la Tierra visible desde la órbita de los satélites geoestacionarios, la densidad de flujo de potencia equivalente[1] producida por las emisiones de todas las estaciones espaciales de un sistema de satélites no geoestacionarios que funciona en las siguientes bandas de frecuencias del servicio fijo por satélite, incluidas las emisiones desde un satélite reflector, para todas las condiciones y para todos los métodos de modulación, no deberá rebasar los límites estipulados en el Cuadro **S22-1** para los porcentajes de tiempo especificados. Esos límites se refieren a la densidad de flujo de potencia equivalente que se obtendría en condiciones de propagación en el espacio libre, en una antena de referencia y una anchura de banda de referencia como la especificada en el cuadro **S22-1**, para todas las direcciones de puntería dirigidas hacia la órbita de los satélites geoestacionarios.

CUADRO **S22-1**

Banda de frecuencias atribuida al SRS	dfp equivalente en dB(W/m^2)	Porcentaje de tiempo durante el cual no puede sobrepasarse el nivel de dfp	Diagrama de radiación de la antena de referencia	Anchura de banda de referencia (MHz)
11,7 - 12,5 GHz en la Región 1, 11,7 - 12,2 GHz y 12,5 - 12,7 GHz en la Región 3	-145 -132	99,7% 100%	Recomendación UIT-R BO.1213 (para las Regiones 1 y 3)	27
12,2 - 12,7 GHz 17,3 - 17,8 GHz en la Región 2	-144 -131	99,7% 100%	Punto 3.7.2 del anexo 5 del apéndice **30** para la Región 2	27

La densidad de flujo de potencia equivalente se define como la suma de las densidades de flujo de potencia producidas en un punto de la superficie de la Tierra por todas las estaciones espaciales de un sistema de satélites no geoestacionarios, teniendo en cuenta la discriminación fuera del eje de una antena receptora de referencia que se supone apuntada hacia la órbita de los satélites geoestacionarios. La densidad de flujo de potencia equivalente se calcula mediante la siguiente fórmula:

$$dfpe = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{dfp_i/10} \cdot \frac{G_r(\theta_i)}{G_{máx}}\right]$$

siendo:

- N, el número de estaciones espaciales no geoestacionarias visibles desde el punto considerado en la superficie de la Tierra, con un ángulo de elevación superior o igual a 0°;
- i, el índice de la estación espacial no geoestacionaria considerada;
- dfp_i, la densidad de flujo de potencia producida en el punto considerado en la superficie de la Tierra en dB(W/m^2) en la anchura de banda de referencia;
- θ_i, el ángulo entre la dirección considerada hacia la órbita de los satélites geoestacionarios y la dirección de la estación espacial interferente en el sistema de satélites no geoestacionarios;
- $G_r(\theta_i)$, la ganancia de la antena receptora de referencia que se ha de considerar como parte de una red geoestacionaria;
- $G_{máx}$, la ganancia máxima de la mencionada antena receptora de referencia;
- $dfpe$, la densidad de flujo de potencia equivalente calculada en dB(W/m^2) en la anchura de banda de referencia.

b) Propuesta para la protección de enlaces de conexión del SRS

La densidad de flujo de potencia total[1] producida en un punto de la órbita de los satélites geoestacionarios por las emisiones procedentes de todas las estaciones terrenas de un sistema de satélites geoestacionarios del servicio fijo por satélite, para todas las condiciones y todos los métodos de modulación, no deberá rebasar los límites indicados en el cuadro **S22-2** para los porcentajes de tiempo especificados. Estos límites se refieren a la densidad de flujo de potencia que se obtendría en condiciones de propagación en el espacio libre en la anchura de banda de referencia especificada en este cuadro.

CUADRO **S22-2**

Banda de frecuencia	dfp combinada en dB(W/m^2)	Porcentaje de tiempo durante el cual no se puede rebasar el nivel de dfp	Anchura de banda de referencia (MHz)
14,5 - 14,8 GHz en las Regiones 1 y 3 (fuera de Europa)	-119	99,97%	27
17,3 - 18,1 GHz en las Regiones 1, 2 y 3	-115	100%	

La densidad de flujo de potencia combinada se define como la suma de las densidades de flujo de potencia producidas en un punto de la órbita de satélite geoestacionario por todas las estaciones terrenas de un sistema de satélites no geoestacionarios. La densidad de flujo de potencia combinada se calcula mediante la siguiente fórmula:

$$dfpc = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi \cdot d_i^{\,2}}\right]$$

siendo:

- N, el número de estaciones terrenas del sistema de satélites no geoestacionarios con un ángulo de elevación superior o igual a 0°, desde el cual puede verse el punto considerado en la órbita de los satélites geoestacionarios;
- i, el índice de la estación terrena considerada del sistema de satélites no geoestacionarios;
- P_i, la potencia de RF a la entrada de la antena transmisora de la estación terrena considerada del sistema de satélites no geoestacionarios, expresada en dB(W/m^2) en la anchura de banda de referencia;
- $\theta_i(t,)$, el ángulo subtendido entre el eje de puntería de la estación terrena considerada del sistema de satélites no geoestacionarios y la dirección del punto considerado en la órbita de los satélites geoestacionarios;
- $G_t(\theta_i)$, la ganancia de la antena transmisora de la estación terrena considerada del sistema de satélites no geoestacionarios en la dirección del punto considerado en la órbita de los satélites geoestacionarios;

– *d*, la distancia entre la estación terrena considerada del sistema de satélites no geoestacionarios y el punto considerado en la órbita de los satélites geoestacionarios;

– *dfpd*, la densidad de flujo de potencia combinada expresada en dB(W/m^2) en la anchura de banda de referencia.

J. SESEÑA
Presidente del Grupo ad hoc 4 del GT 4D

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/48-E
12 November 1997
Original: English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 4D

NOTE BY THE CHAIRMAN OF WORKING GROUP 4D

EXTRACT OF PROPOSALS ON BEAM GROUPING AND SATELLITE CLUSTER CONCEPT/ORBITAL OFFSET

BEAM GROUPING

IRN/44/29

This Administration could support the concept of beam group as embodied in the Region 2 Plan for the revision of Regions 1 and 3 Plans, provided that the impact of such concept and the entire compatibility resulting from its implementation is carried out and decided by the Conference.

However, the extension of this concept to the multiple orbital location, although providing flexibility to some members of the group, can lead to negative consequences to many other administrations. These negative consequences include:

- inefficient use of the orbit/spectrum resource because two or more orbital positions are used to provide the same number of channels that could be provided from a single position;
- the opportunity to "warehouse" orbital positions because all of the channels associated with the multiple positions in the group, including those not in use at a given position, must be protected from interference;
- the possibility that administrations which agree to a proposed modification may not be identified as affected by subsequent modifications grouped with the first.

Therefore, the beam group should not be used in the plan modification procedure and should be limited to the Plan established at a conference.

The concept should be limited to the beams at the same orbital position, and in no way should include beams at different orbital positions.

No multiple orbital positions grouping are allowed under any circumstances. In case of modification of orbital position by an administration, the Bureau shall with some internal rules, protect both the initial and modified orbital positions during a limited period of time (say, five years) and after that the responsible administration shall select one of the orbital positions and cancel the other.

CAN/35/147

1) no change be made to paragraph 9 of Section 10.2 of Article 10 of Appendix 30 or of Section 9.2 of Article 9 of Appendix 30A, at least in so far as those paragraphs apply to the plans of Region 2; and

CAN/35/148

2) that the Rules of Procedure of the RRB be clarified to correctly reflect the original intent of the grouping concept, at least for Region 2, which is that it should involve only the grouping of two or more satellite beams from a single orbit location.

Reasons: The concept of grouping of service areas at a given single orbit position, and application of that concept in the formulation of the plan in 1983, is included in Appendices 30 and 30A. Many Region 2 assignments have flexibility of implementation because of those decisions of RARC-83 and WARC-85. These characteristics of the Region 2 portions of the Appendices 30 and 30A Plans should not be lost in the review of these Appendices by WRC-97.

Discussion

WRC-97 should ensure that the Region 2 portion of the plans of the 12 GHz broadcasting-satellite service and the associated feeder links in the 17 GHz band are not compromised by possible changes to those appendices as part of the review of the Region 1 and 3 portion of those plans. Specifically, WRC-97 should ensure that paragraph 9 of Section 10.2 of Article **10** of Appendix **30** and Paragraph 9 of Section 9.2 of Article 9 of Appendix 30A are not modified in such a way that the Grouping Concept that was developed at RARC-83 and incorporated into the Radio Regulations at WARC-85 is not modified at WRC-97 in a manner not consistent with Canadian objectives.

This proposal is made by Canada after having taken into account that:

i) twenty groups were defined at RARC-83, and are included in Table 1 of Article **10** of Appendix **30** and of Article **9** of Appendix **30A**;

ii) these groups were defined and developed at RARC-83 to be used by either individual administrations or groups of administrations to enable them to develop cost-effective early-generations of broadcasting satellites in which a number of adjacent beams could be served from a single orbit location, as long as this process did not "affect" the assignments of another administration;

iii) since 1985 the IFRB, now the RRB, has modified significantly the concept of grouping in its Rules of Procedure for the above paragraphs, to include grouping involving a number of satellite orbit locations;

iv) the MSPACE computer program of the RRB has extended the concept of grouping to other parameters of broadcasting-satellite systems as well;

v) the modifications made since 1985 might be incorporated into the Radio Regulations through proposed changes to the above paragraphs of Appendices 30 and 30A, at least for Regions 1 and 3;

vi) these modifications, if they are made, are not in accordance with the original concept as applied in the Plan for Region 2.

J/29/68

ADD **T4.23*bis*** When a beam group communicated to the Bureau under **T4.7*ter*** involves several orbital positions, only one of these orbital positions shall be used in the beam group for the new and modified assignment to be included in the plan. For this purpose, an administration acting under **T4.23** shall indicate to the Bureau the orbital position to be retained for the proposed beam group when the administration notifies its frequency assignment to the Bureau. This provision does not apply however, in the case of assignments within 0.2° of a nominal orbital location.

2 **Add** the following provisions in the proposed Article T5.11 in Chapter 6 of the CPM Report.

J/29/69

MOD T.5.11 Where the Bureau reaches a favourable finding with respect to paragraphs T.5.10 a) and T.5.10 b), the frequency assignment of an administration shall be recorded in the Master Register. When the frequency assignment consists of a beam group with multiple orbital positions, only one of these orbital positions shall be recorded in the Master Register and the frequency assignment in another orbital position shall be cancelled. The date of receipt of the notice by the Bureau shall be recorded. In relations between administrations, all frequency assignments brought into use in conformity with the appropriate Regional Plan and recorded in the Master Register shall be considered to have the same status irrespective of the dates recorded for such frequency assignments.

J/29/70

3 To **adopt** the Resolution attached.

Reasons: The beam group concept is useful during the coordination phase of published systems calling for modification of, or addition to, the BSS or uplink plans as it allows the temporary maintenance of the current assignments in the plans while coordinating additional channels/orbital position until the eventual agreements are obtained.

However, grouped assignments in different orbital positions rule out new broadcasting-satellite systems and cause waste of orbit/spectrum resources. For the purpose of efficient use of spectrum resources, an administration should indicate to the Bureau an orbital position to be registered and the Bureau should record this assignment only.

Satellites located within the same cluster (i.e. satellite located at +0.2° and -0.2° from the centre of the cluster) should be taken into account.

USA/30/179

ADD 4.1.2 The concept of a beam group shall involve only one nominal orbital position in Region 1 or 3 or a single cluster as defined in Section 4.13.1 of Annex 3 of Appendix **30A** in Region 2.

Reasons: To preclude inefficient utilization of orbital positions.

USA/30/180

ADD 4.1.3 Simultaneous transmission on the same channels/assignments that are part of the same group is permitted. For interference calculations from assignments belonging to a group into assignments that are not part of the same group, the aggregate interference from that group is to be taken into consideration in the manner described in Article **10** of Appendix **S30** and Articles **9** and **9A** of Appendix **S30A**.

Reasons: Efficient use of resources.

USA/30/255

ADD 4.1.2 The concept of a beam group shall involve only one nominal orbital position in Region 1 or 3 or a single cluster as defined in Section 4.13.1 of Annex 3 of this Appendix in Region 2.

Reasons: To preclude inefficient utilization of orbital positions.

USA/30/256

ADD 4.1.3 Simultaneous transmission on the same channels/assignments that are part of the same group is permitted. For interference calculations from assignments belonging to a group into assignments that are not part of the same group, the aggregate interference from that group is to be taken into consideration in the manner described in Article **10** of Appendix **S30** and Articles **9** and **9A** of Appendix **S30A**.

Reasons: Efficient use of resources.

ASP/14/253

Introduction

The following modifications are proposed in relation to the text of Section T4 of Article S10 contained in the CPM Report. They introduce the group concept and associated safeguards.

T4.7*ter* In proposing a modification to a plan, one or more administrations may indicate that several assignments, either already included in the plan or proposed to be included in the plan, will be part of a beam group. In this case, the aggregate interference produced by all emissions from that beam group into any assignment in conformity with a Plan or for which this procedure has been started, shall not exceed the worst-case interference produced into the same assignment by any of the assignments which are part of the same beam group. For the calculation of interference into assignments that are part of the same beam group, only the interference contributions from assignments that are not part of the same beam group are to be included. A given beam group shall not involve more than two orbital locations.

Reasons: Define the concept of beam group and its treatment under this Article, with a limitation on the number of orbital locations to be used in order to avoid warehousing of orbital resources. See also T4.23*bis* as a possible safeguard to avoid adverse consequences as highlighted in Section 6.5.2.3. e) of the CPM Report.

T4.23*bis* When a beam group communicated to the Bureau under **T4.7*ter*** involves several orbital positions, only one of these orbital positions shall be used in the beam group for the new of modified assignment to be included in the Plan. For this purpose, an administration acting under **T4.23** shall indicate to the Bureau the orbital position to be retained for the proposed beam group. This provision does not apply however, in the case of assignments within 0.2° of a nominal orbital location.

Reasons: Need to limit the application of the concept of beam group when several orbital positions are involved, in order to ensure efficient use of spectrum/orbit resources. The exception proposed for an orbital offset of less than 0.2° reflects a possible approach to implement the possibility of such an offset as part of a beam group through the application of this procedure, rather than applying the cluster concept.

EUR/5/143

b) Beam group and satellite cluster/orbital offsets

The concepts of beams groups and satellite cluster concepts need to be defined adequately and appropriate safeguards established to avoid any negative consequences that the introduction of these concepts in Regions 1 and 3 Plans may have.

J/29/71
ADD

DRAFT RESOLUTION [J-3]

TREATMENT OF MODIFICATION TO THE PLAN AND BEAM GROUP CONCEPT

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the World Radiocommunication Conference (Geneva, 1997) reviewed Appendices **S30** and **S30A** for Regions 1 and 3 in response to Resolution **531 (WRC-95)**;

b) that there are a significant number of applications under Article **4** of Appendices **S30** and **S30A**;

c) that most applications intend to include a new frequency assignment in the plan;

d) that many applications will remain unstudied after the World Radiocommunication Conference (Geneva, 1997);

e) that it is desirable to use original assignments of each country in view of the efficient use of spectrum resources;

f) that there are some assignments which are unlikely to be brought into use because of the inclusion of new frequency assignments to the plan without use of its original assignments;

g) that the application of the group concept in multiple orbital positions may reduce orbit-spectrum utilization,

resolves

1 to suppress those assignments assigned in the 1977 World Administrative Radio Conference (WARC-BS-77) or the 1988 World Administrative Radio Conference (WARC ORB-88) to which inclusion of new frequency assignments has been completed without use of its original assignment and which an administration does not intend to bring into use;

2 to retain assignments recorded in the Master Register at one of the multiple orbital positions which are currently grouped and suppress other ones in the group,

instructs the Director of the Radiocommunication Bureau

1 to consult administrations which have included new frequency assignments without use of its original assignments whether they will intend to use their original assignments or not;

2 to consult administrations which have assignments grouped at multiple orbital positions and recorded in the Master Register on the preference of an orbital position at which assignments are maintained.

EXTRACT OF SECTION 6.5.2.3 OF THE CPM-97 REPORT ON BEAM GROUPING

e) Beam group concept

The concept of grouping two or more beams to which the same channels and the same orbital position have been assigned was defined for the BSS and feeder-link Plans of Region 2 at RARC-83 (see item 9/GR of Section 10.2 of Article 10 of Appendix 30 and item 9/GR of Section 9.2 of Article 9 of Appendix 30A). The same concept was defined for the feeder-link Plan of Regions 1 and 3 at WARC ORB-88 (see item 8 of Section 9A.2 of Article 9A of Appendix 30A). The purpose of the concept was to allow the implementation, without having to modify the Plans, of a first-generation system using a single BSS satellite which could broadcast to, and be fed from, a composite service area including all of the service areas covered by the beams in the group. The objective of such a system would be to initiate widespread service at a cost much lower than if separate satellites were used to serve each beam in the group.

In 1990, the then IFRB adopted a Rule of Procedure which extended the beam group concept to the Regions 1 and 3 BSS Plan. However, the Rule of Procedure also changed the concept in two significant ways. It precluded use of the same channel in the different beams of the group, although this was expressly permitted in the Region 2 Plans, and for the feeder-link Plan in Regions 1 and 3, and it permitted a group to include beams from more than a single orbital position.

However, this extension to multiple orbital locations, although providing flexibility to the members of the group, can lead to negative consequences, and suitable limitations have to be introduced to avoid them. The negative consequences include:

- inefficient use of the orbit-spectrum resource because two or more orbital positions are used to provide the same number of channels that could be provided from a single position;
- the opportunity to "warehouse" orbital positions because all of the channels associated with the multiple positions in the group, including those not in use at a given position, must be protected from interference;
- the possibility that administrations which agree to a proposed modification may not be identified as affected by subsequent modifications grouped with the first.

Administrations are invited to consider this issue in order to enable WRC-97 to review the scope of this concept in Regions 1 and 3 for both Appendices 30 and 30A, and ensure that the above potential negative consequences are avoided. This could involve consideration of the following questions:

- Should groups be used in the Plan modification procedure or limited to the Plan established at a Conference?
- Should groups be limited to beams of the same administration, or can they include the beams of different administrations?
- Should groups be limited to beams at the same orbital position, or can they include beams at different orbital positions?
- If groups involving multiple orbital positions are allowed, should their use be limited to the modification procedure, with a unique orbital position to be selected at the end of the procedure?

SATELLITE CLUSTER/ORBITAL OFFSETS

EUR/5/143

b) Beam group and satellite cluster/orbital offsets

The concepts of beams groups and satellite cluster concepts need to be defined adequately and appropriate safeguards established to avoid any negative consequences that the introduction of these concepts in Regions 1 and 3 Plans may have.

USA/30/179

ADD 4.1.2 The concept of a beam group shall involve only one nominal orbital position in Region 1 or 3 or a single cluster as defined in Section 4.13.1 of Annex 3 of Appendix **30A** in Region 2.

Reasons: To preclude inefficient utilization of orbital positions.

IRN/44/30

14 Satellite cluster concept/orbital offset

The cluster concept is defined for Regions 1 and 3 in Appendix 30A (see Section 3.15 of Annex 3 of this Appendix).

However, this concept is not actually used in the development of Regions 1 and 3 BSS and feeder-link Plans except for the inclusion of an orbital position offset of 0.4 degrees for two beams in the Regions 1 and 3 feeder-link Plans to result in a specific interference situation.

IRN/44/30

Should this concept be used for the revision of Regions 1 and 3 plans, it is imperative to clearly determine the orbital positions and satellites which are inside the cluster and its application shall be limited to the notification procedure referred to in Article 5 of Appendices 30 and 30A.

In that case, a change to orbital position within that already determined cluster does not result in modification of the Plan and consequently does in no way provide any protection to the modified (offset) orbital position.

To secure such protection the procedure of Article 4 shall be successfully applied.

EXTRACT OF SECTION 6.5.2.3 OF THE CPM-97 REPORT ON SATELLITE CLUSTER CONCEPT/ORBITAL OFFSETS

f) Satellite cluster concept/orbital offsets

As defined for, and incorporated in, the BSS and feeder-link Plans for Region 2 (see Sections 4.13 - 4.13.2 and Figure 9 of Annex 3 of Appendix 30A), "a cluster is formed by two or more satellites separated by 0.4 degrees and located at two nominal orbital positions as specified in the Plan; one position for right-hand polarized channels and the other position for left-hand polarized channels". The Region 2 Plan is based on the use of such a cluster for each beam having cross-polarized adjacent channels, so that the cross-polar discrimination of the feeder-link earth station antenna, which is reduced during rain, will be augmented by the angular discrimination of the antenna. Without this additional discrimination, the use of adjacent channels in a single beam may be seriously degraded during rain. However, satellites within a cluster may be located at any orbital position within the cluster, requiring only the agreement of the other administrations having satellites sharing the same cluster.

A similar concept was defined for Regions 1 and 3 (see Section 3.15 of Annex 3 of Appendix 30A). However, the cluster concept was not actually used in the development of the Regions 1 and 3 BSS and feeder-link Plans except for the inclusion of an orbital position offset of 0.4 degrees for two beams in the Regions 1 and 3 feeder-link Plan to resolve a specific interference situation. Further, the Regions 1 and 3 Plan did not consider rain attenuation and rain depolarization factors. It is noted that paragraph 5.2.1 c) of Article 5 of Appendix 30A does provide for the use of the cluster concept for Regions 1 and 3 under the conditions specified in Section 3.15 of Annex 3 to Appendix 30A. On the other hand, paragraph 5.2.1 c) of Article 5 of Appendix 30, which refers to paragraph B of Annex 7 of Appendix 30, restricts the use of the cluster concept under Appendix 30 to Region 2 administrations. In either case, to change an orbital position within a cluster under the above provisions of Article 5 in all Regions does not result in modification of the Plan and therefore does not convey protection to the changed position. To secure such protection, the Article 4 modification procedure must be applied.

Administrations are invited to consider the further use in Regions 1 and 3 of the cluster concept and its implications which, in any case, will require modifications to the text of Appendices 30 and 30A to provide a consistent set of provisions.

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/50-E
13 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

DRAFTING GROUP 4A4

COMPOSITE PROPOSALS

AGENDA ITEM 1.2

APPENDIX S5

Identification of Administrations with Which Coordination Is to Be Effected or Agreement Sought Under the Provisions of Article S9

EUR/5/3

As outlined in the CPM Report, in the case of earth stations or terrestrial stations subject to S9.15 to S9.19, the rights are starting from the date of dispatch of Appendix **S4** information and Section 1 of Appendix **S5** should be amended accordingly. In addition to the possible modifications to Appendix **S5** identified in the CPM Report, it may be necessary to clearly identify all the cases of recorded assignments which may need to be protected (including under **S9.41**), as well as the fact that the right for an assignment to be taken in consideration under one coordination procedure arise from it having initiated previously a given procedure and not any possibly unrelated procedure. A possible way to clarify this would be through amendments to Table **S5-1**. Proposals for such amendments will be presented in an addendum to this contribution.

KEN/UGA/TZA/47/8

The position of the review and modification should be upheld, upon clarification in S13.4.

KEN/70/9

Appendix S5

The Administration of Kenya concurs with the modifications of this Article that have been proposed by CPM-97.

F/36/1
MOD

1. For the purpose of effecting coordination under Article **S9**, except in the case under No. **S9.21**, and for identifying the administrations with which coordination is to be effected, the frequency assignments to be taken into account are those in the same frequency band as the planned assignment, pertaining to the same service or to another service to which the band is allocated with equal rights or a higher category[1] of allocation, which might affect or be affected, as appropriate, and which are:

a) in conformity with No. **S11.31**[1]; and

b) either recorded in the Master Register with a favourable finding with respect to No. **S11.32**; or

c) recorded in the Master Register with an unfavourable finding with respect to No. **S11.32** and a favourable finding with respect to No. **S11.32A** or No. **S11.33**, as appropriate; or

~~*d)* coordinated under the provisions of Article S9; or~~

ed) for coordination requests under Nos. **S9.7**, **S9.12** and **S9.13**, respectively, already coordinated under Nos. **S9.7**, **S9.12** or **S9.13**, and **S9.12**, respectively, or included in the coordination procedure with effect from the date of receipt[2] by the Bureau, in accordance with No. **S9.34**, of the ~~basic~~mandatory characteristics as specified in Appendix **S4**, for the application of Nos. **S9.7**, **S9.12** or **S9.13**, and **S9.12**, respectively; or

e) for coordination requests between administrations under Nos. **S9.15**, **S9.16**, **S9.17**, **S9.17A** and **S9.18**, respectively, already coordinated under Nos. **S9.16**, **S9.15**, **S9.18**, **S9.17A** and **S9.17**, respectively, or included in the coordination procedure with effect from the date of dispatch, in accordance with No. **S9.29**, of the appropriate coordination data listed in Appendix **S4**, for the application of Nos. **S9.16**, **S9.15**, **S9.18**, **S9.17A** and **S9.17**, respectively; or

ebis) for coordination requests under Nos. **S9.8**, **S9.9**, in conformity with a world or regional allotment or assignment plan and the associated provisions, or for which the procedure of Section **T4** of Article **S10** has been initiated, with effect from the date of receipt by the Bureau, in accordance with No. **T4.8** of Article **S10**, of the complete information as specified in Appendix **S4**; or

NOTE - *ebis)* applies only in the case of Approach 2.

eter) for coordination requests under No. **S9.19**, included in Part 1 of the Appendix **S30** Plan or already coordinated under No. **S9.17**, or included in the coordination procedure with effect from the date of dispatch, in accordance with No. **S9.29**, of the appropriate coordination data listed in Appendix **S4**, for the application of **S9.17**; or

B/49/2
MOD

1. For the purpose of effecting coordination under Article **S9**, except in the case under No. **S9.21**, and for identifying the administrations with which coordination is to be effected, the frequency assignments to be taken into account are those ~~in the same frequency band as the planned assignment,~~ pertaining to the same service or to another service to which the band is allocated with equal rights or a higher category[2] of allocation, which might affect or be affected, as appropriate, and which are:

a) in conformity with No. **S11.31**[2]; and

b) either recorded in the Master Register with a favourable finding with respect to No. **S11.32**; or

c) recorded in the Master Register with an unfavourable finding with respect to No. **S11.32** and a favourable finding with respect to No. **S11.32A** or No. **S11.33**, as appropriate; or

d) coordinated under the provisions of Article **S9**; or

IAP/40/124
MOD

1. For the purpose of effecting coordination under Article **S9**, except in the case under No. **S9.21**, and for identifying the administrations with which coordination is to be effected, the frequency assignments to be taken into account are those ~~in the same frequency band as the planned assignment,~~ pertaining to the same service or to another service to which the band is allocated with equal rights or a higher category[1] of allocation, which might affect or be affected, as appropriate, and which are:

a) in conformity with No. **S11.31**[3]; and

b) either recorded in the Master Register with a favourable finding with respect to No. **S11.32**; or

c) recorded in the Master Register with an unfavourable finding with respect to No. **S11.32** and a favourable finding with respect to No. **S11.32A** or No. **S11.33**, as appropriate; or

d) coordinated under the provisions of Article **S9**; or

B/49/3
MOD
(CPM-97)

e) included in the coordination procedure with effect from the date of receipt[3] by the Bureau, in accordance with No. **S9.34**, of the basic characteristics as specified in Appendix **S4**, or from the date of dispatch, in accordance with No. **S9.29** of the appropriate information listed in Appendix **S4**; or

ASP/14/12
MOD

e) included in the coordination procedure with effect from the date of receipt[3] by the Bureau, in accordance with No. **S9.34**, of ~~the basic~~those characteristics ~~as~~ specified in Appendix **S4** as mandatory or required, or from the date of dispatch, in accordance with No. **S9.29** of the appropriate information listed in Appendix **S4**; or

IAP/40/125
MOD

e) included in the coordination procedure with effect from the date of receipt[1] by the Bureau, in accordance with No. **S9.34**, of the basic characteristics as specified in Appendix **S4** or from the date of dispatch, in accordance with No. **S9.29** of the appropriate information listed in Appendix **S4**; or

B/49/4
ADD
(CPM-97)

ebis) where appropriate, in conformity with a world or regional allotment or assignment plan and the associated provisions;

IAP/40/126
ADD

ebis) where appropriate, in conformity with a world or regional allotment or assignment plant and the associated provisions;

IAP/40/127
MOD

f) for terrestrial radiocommunication stations or earth stations operating in the opposite direction of transmission[2], in addition, operating in accordance with these Regulations, or to be so operated prior to the date of bringing the earth station assignment into service, or within the next three years from the date of dispatch of coordination data under No. **S9.29**, whichever is the longer, or from the date of the publication referred to in No. **S9.38**, as appropriate.

B/49/5
MOD
(CPM-97)

f) for terrestrial radiocommunication stations or earth stations operating in the opposite direction of transmission[4], in addition, operating in accordance with these Regulations, or to be so operated prior to the date of bringing the earth station assignment into service, or within the next three years from the date of dispatch of coordination data under No. **S9.29**, whichever is the longer, or from the date of the publication referred to in No. **S9.38**, as appropriate.

F/36/1
MOD

2. For the application of No. **S9.21**, the agreement of an administration may be required with respect to the frequency assignments in the same frequency band as the planned assignment, pertaining to the same service or to another service to which the band is allocated with equal rights or a higher category of allocation, which ~~may be affected~~might affect or be affected, as appropriate, and:

a) in cases involving a station in a space radiocommunication ~~station~~service with respect to ~~another space radiocommunication station~~any other station or involving a terrestrial radiocommunication station with respect to an earth station:

i) which are in conformity with No. **S11.31**, and comply with the relevant conditions listed in Section 1, paragraphs *b)* to *f)*; or

~~— are recorded in the Master Register, or~~

~~– are notified to the Bureau, or~~

~~– for which information under No. **S9.34** has been received by the Bureau; or~~

ii) for which the procedure under No. **S9.21** has been initiated, with effect from the date of receipt by the Bureau, in accordance with No. **S9.34**, of the basic characteristics as specified in Appendix **S4**; or

~~*b) for terrestrial radiocommunication stations operating in accordance with these Regulations, or to be so operated prior to the date of bringing the earth station assignment into service, or within the next three years, whichever is the longer; or*~~

c~~*b)*~~ for terrestrial radiocommunication stations operating in accordance with these Regulations, or to be so operated prior to the date of bringing the other terrestrial station assignment into service, or within the next three months, whichever is the longer;

3. For each of the frequency assignments to ~~an individual~~a station ~~or to a satellite network~~ mentioned in paragraphs 1 and 2 above, the level of interference shall be determined using the method referred to in Table S5-1 which is appropriate to the particular case.

4. The assignment is considered to ~~cause or suffer interference~~affect or be affected, as appropriate, and coordination must be sought under the procedure of Article **S9**, if:

a) the ~~interference level exceeds the~~ threshold levels given in Table S5-1 are exceeded; ~~or~~and

b) the condition specified in Table S5-1 is applicable.

5. Threshold values to determine whether coordination under No. **S9.11A** is required are given in Table S5-2.

6. No coordination is required:

a) when the use of a new frequency assignment will not cause or suffer, as appropriate, in respect of any service of another administration, an increase in the level of interference above the threshold calculated in accordance with the method referred to in Tables S5-1 and S5-2; or

NOTE - Table S5-1A should be renumbered Table S5-2.

b) when the characteristics of a new or a modified frequency assignment or a new earth station are within the limits of those of a frequency assignment which has previously been coordinated; or

c) to change the characteristics of an existing assignment in such a way as not to increase the interference to or from, as appropriate, the assignments of other administrations; or

d) for assignments to stations comprising a satellite network in relation to assignments of other satellite networks:

i) for a new frequency assignment to a receiving station, when the notifying administration states that it accepts the interference resulting from the frequency assignments referred to in No. **S9.27**; or

ii) between earth stations using frequency assignments in the same direction (either Earth-to-space or space-to-Earth); or

e) for assignments to earth stations in relation to terrestrial stations or earth stations operating in the opposite direction of transmission, when an administration proposes:

i) to bring into use an earth station the coordination area of which does not include any of the territory of any other country;

ii) to operate a mobile earth station. However, if the coordination area associated with the operation of such a mobile earth station includes any of the territory of another country, the operation of such a station shall be subject to agreement on coordination between the administrations concerned. This agreement shall apply to the characteristics of the mobile earth station(s), or to the characteristics of a typical mobile earth station, and shall apply to a specified service area. Unless otherwise stipulated in the agreement, it shall apply to any mobile earth stations in the specified service area provided that interference caused by them shall not be greater than that caused by a typical earth station for which the technical characteristics appear in the notice and have been or are being submitted in accordance with Section I of Article **S11**; or

iii) to bring into use a new frequency assignment to a receiving earth station and the notifying administration states that it accepts the interference resulting from existing and future terrestrial station assignments or assignments to earth stations operating in the opposite direction of transmission. In such case, administrations responsible for the terrestrial stations or earth stations operating in the opposite direction of transmission are not required to apply the provisions of No. **S9.18** or No. **S9.17A** of Article **S9** respectively:

f) to bring into use an assignment to a terrestrial station or an earth station operating in the opposite direction of transmission which is located, in relation to an earth station, outside the coordination area of that earth station; or

g) to bring into use an assignment to a terrestrial station or an earth station operating in the opposite direction of transmission within the coordination area of an earth station, provided that the proposed assignment to a terrestrial station or an earth station operating in the opposite direction of transmission is outside any part of a frequency band coordinated for reception by that earth station.

F/36/1
MOD

Coordination process	*Scope (as per CPM proposal)*	*Reciprocal process*
S9.7	*Non-planned GSO satellite network with respect to any other non-planned GSO satellite network, except* ***S9.17A***	***S9.7***
S9.8	*Non-planned transmit GSO space station with respect to planned AP30 BSS GSO*	***T4.8***
S9.9	*Non-planned GSO space station with respect to AP30A GSO BSS feeder link, except* ***S9.17A***	***T4.8***
S9.11	*Non-planned BSS space station with respect to terrestrial*	***Not applicable***
S9.12	*Non-GSO satellite network with respect to any other GSO or non-GSO satellite network, except* ***S9.17A***	***S9.12 or S9.13***
S9.13	*GSO satellite network with respect to any non-GSO satellite network, except* ***S9.17A***	***S9.12***
S9.14	*GSO or non-GSO space station with respect to terrestrial*	***Not applicable***
S9.15	*Specific or typical earth station of a non-GSO network with respect to terrestrial*	***S9.16***
S9.16	*Transmit terrestrial with respect to non-GSO earth station*	***S9.15***

S9.17	*Specific earth station or typical mobile earth station* above 1 GHz, with respect to terrestrial stations, except* ***S9.15***	***S9.18*** *(with respect to non-BSS earth stations)* ***S9.19*** *(with respect to BSS earth stations)*
S9.17A	*Specific earth station with respect to other earth stations operating in the opposite direction of transmission*	***S9.17A***
S9.18	*Transmit terrestrial with respect to an earth station, except* ***S9.16*** *and* ***S9.19***	***S9.17***
SUP S9.18A	*N/A*	*N/A*
S9.19	*Transmit terrestrial with respect to Part 1 of Appendix* ***S30*** *Plan*	***N/A (See MOD S5.487 and MOD S5.490)***
	Transmit terrestrial with respect to BSS non-planned earth station	***S9.17***
	Transmit terrestrial with respect to BSS earth stations using assignments included in Part 2 of Appendix ***S30*** *or for which complete information under* ***T4.8*** *has been received by the Bureau*	***S9.17***

Failure to identify clearly these rights under Appendix **S5** could affect the fundamental rights of administrations.

It is assumed that Part 1 of the Appendix **S30** Plan will contain the assignments corresponding to the minimum guaranteed capacity for each country. It is important to distinguish these assignments from those which have been or will be included in the Plan as a result of application of the Plan modification procedure, since this procedure does not include provisions to coordinate the protection of these assignments from assignments in other services previously communicated to the Bureau. These assignments cannot therefore enjoy the protection afforded to assignments in Part 1 of the Plan, but may acquire this protection through the application of No. **S9.17**, subject to the existence of corresponding assignments in Part 2 of the Plan or for which the Plan modification procedure has been initiated.

---

* In order to enable coordination of BSS earth stations with terrestrial stations, there may be a need to include, under No. **S9.17**, the coordination of typical BSS receiving earth stations.

f) for terrestrial radiocommunication stations or earth stations operating in the opposite direction of transmission[1], in addition, operating in accordance with these Regulations, or to be so operated prior to the date of bringing the earth station assignment into service, or within the next three years from the date of dispatch of coordination data under No. **S9.29**, whichever is the longer, or from the date of the publication referred to in No. **S9.38** or No. **T4.8**, as appropriate.

NOTE - Text as proposed in the CPM Report, with the addition of the reference to No. **T4.8**, in order to provide similar status for modifications to the Appendix 30 Plan and for non-planned BSS or Resolution 46 space stations.

TABLE S5-1

Technical conditions for coordination
(see Article **S9**)

	Reference of Article S9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/Condition	Calculation method	Remarks
B/49/6 MOD (CPM-97)						
B/49/7 MOD (CPM-97)	No. **S9.7** GSO/GSO	A station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, ~~for~~ in any space radiocommunication service in a frequency band and in a region where this service is not subject to a Plan, with the exception of the coordination under No **S9.17A**.	Any frequency band allocated to a space service, where this service is not subject to a Plan, ~~except those mentioned in the plans of Appendices S30, S30A and S30B~~	Value of $\Delta T/T$ exceeds 6%	Appendix **S8**	
B/49/8 SUP	No. **S9.8** GSO/GSO					
B/49/9 SUP	No. **S9.9** GSO/GSO					

B/49/10 MOD (CPM-97)	No. **S9.11** GSO/terrestrial	A space station in the broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and ~~in which there is no plan for~~where the broadcasting-satellite service is not subject to a plan, in respect of terrestrial services~~;~~	620 - 790 MHz 1 452 - 1 492 MHz 2 310 - 2 360 MHz 2 520 - 2 655 MHz 2 655 - 2 670 MHz 12.5 - 12.75 GHz (R3) 17.~~3~~7 - 17.8 GHz (R2) 21.4 - 22 GHz (R1, R3) 40.5 - 42.5 GHz 84 - 86 GHz	Condition: Bandwidths overlap	Check by using the assigned frequencies and bandwidths	
B/49/11 MOD (CPM-97)	No. **S9.14** Non-GSO/terrestrial, GSO/terrestrial	For a space station in a satellite network in the frequency bands for which a footnote refers to **S9.11A** in respect of stations of terrestrial services where threshold(s) is (are) exceeded	See Table **S5-1A**	For a non-GSO space station: See ~~Table S5-2~~**Section 1 of Annex 1**	See ~~Table S5-2~~**Section 1 of Annex 1**	
B/49/12 MOD (Mod CPM-97)	No. **S9.17** GSO, non-GSO/terrestrial	A specific earth station or a typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services in ~~relation to~~ respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country with the exception of the coordination under No. **S9.15** and Appendix **S30A**	Any frequency band allocated to a space service, except those mentioned in the plans of Appendix **S30A**	The coordination area of the earth station covers the territory of another administration	Appendix **S7** (For earth stations in the radiodetermination-satellite service (RDSS) in the bands 1 610 - 1 626.5, 2 483.5 - 2 500 and 2 500 - 2 516.5 MHz, see Remarks column) 1) The coordination area of aircraft earth stations is determined by increasing the service area by 1 000 km with respect to the aeronautical mobile service (terrestrial) or 500 km with respect to terrestrial services other than the aeronautical mobile service.	NOTE - For RDSS earth stations, a uniform coordination distance of 400 km corresponding to an airborne earth station shall be used. In cases where the earth stations are all ground-based, a coordination distance of 100 km shall be used.

	No. **S9.17** GSO, non-GSO/ terrestrial (cont.)				2) For receiving earth stations in the meteorological-satellite service in frequency bands shared with the meteorological aids service, the coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius.	~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendix 30A is suspended pending the decision of WRC-97 on revision of Appendix 30A~~.
B/49/13 MOD (Mod CPM-97)	No. **S9.17A** GSO, non-GSO/ GSO, non-GSO	A specific earth station in respect of other earth stations operating in the opposite direction of transmission in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission~~, where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station~~, with the exception of the frequency bands subject to Appendix **S30A** Plans	Any frequency band allocated to a space service	The coordination area of the earth station covers the territory of another administration or the earth station is located within the coordination area of an ~~coordinated~~ earth station	i) For bands in Table **S5.1A**, see Section 2 of Annex 1 ii) See Recommendations ITU-R IS.847, IS.848 and IS.849	~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices 30 and 30A is suspended pending the decision of WRC-97 on revision of Appendices 30 and 30A.~~

B/49/14 MOD (CPM-97)	No. **S9.18** terrestrial/GSO, non-GSO	Any transmitting station of a terrestrial service in the bands mentioned in No. **S9.17** within the coordination area of an earth station in a frequency band allocated with equal rights to terrestrial and space radiocommunication services, with the exception of the coordination under **S9.16 and S9.19**	Any frequency band allocated to a space service~~, except those mentioned in Appendices S30 and S30A~~.	Transmitting terrestrial station is situated within the coordination area of an~~already coordinated~~ receiving earth station	See remarks	The coordination area of the affected earth station has already been determined using the calculation method of No. **S9.17**
B/49/15 MOD (Mod CPM-97)	No. **S9.19** terrestrial/GSO	A transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the ~~BSS~~broadcasting-satellite service except where this service is subject to the Appendix **S30** Plan.	~~11.7 - 12.2 GHz (R3)~~ ~~11.7 - 12.5 GHz (R1)~~ ~~12.2 - 12.7 GHz (R2)~~ ~~and the~~ bands listed in No. **S9.11**	i) Necessary bandwidths overlap; and ii) the pfd of the terrestrial station at the edge of the ~~BSS~~broadcasting-satellite service area exceeds the permissible level	i) Check by using the assigned frequencies and bandwidths ii) ~~Annex 3 to Appendix S30 for bands covered by that Appendix~~	~~See also Article 6 of Appendix S30~~ ~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices 30 and 30A is suspended pending the decision of WRC-97 on revision of Appendices 30 and 30A.~~

	Reference of Article S9	Case	Frequency bands and Region of the service for which coordination is sought	Threshold/Condition	Calculation method	Remarks
IAP/40/128 MOD (CPM-97)						
IAP/40/129 MOD (CPM-97)	No. **S9.7** GSO/GSO	A station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, in any space radiocommunication service in a frequency band and in a region where this service is not subject to a Plan, with the exception of the coordination under No. **S9.17A**	Any frequency band allocated to a space service, where this service is not subject to a Plan ~~except those mentioned in the plans of Appendices S30, S30A and S30B~~	Value of Δ T/T exceeds 6%	Appendix **S8**	
IAP/40/130 SUP	No. **S9.8** GSO/GSO					
IAP/40/131 SUP	No. **S9.9** GSO/GSO					

IAP/40/132 MOD (Mod CPM-97)	No. **S9.11** GSO/terrestrial	A space station in the ~~BSS~~broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and ~~in which there is no plan for~~where the ~~BSS~~broadcasting-satellite service is not subject to a plan, in respect of terrestrial services;	620 - 790 MHz 1 452 - 1 492 MHz 2 310 - 2 360 MHz 2 520 - 2 655 MHz 2 655 - 2 670 MHz 12.5 - 12.75 GHz (R3) 17.~~3~~7 - 17.8 GHz (R2) 21.4 - 22 GHz (R1, R3) 40.5 - 42.5 GHz 84 - 86 GHz	Condition: Bandwidths overlap	Check by using the assigned frequencies and bandwidths	
IAP/40/133 MOD (CPM-97)	No. **S9.14** Non-GSO/ terrestrial, GSO/ terrestrial	For a space station in a satellite network in the frequency bands for which a footnote refers to **S9.11A** in respect of stations of terrestrial services where threshold(s) is (are) exceeded	See Table S5-1A	For a non-GSO space station: See ~~Table S5-2~~Section 1 of Annex 1	See ~~Table S5-2~~ Section 1 of Annex 1	
IAP/40/134 MOD	No. **S9.17** GSO, non-GSO/ terrestrial	A specific earth station or a typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services in relation to terrestrial stations, where the coordination area of the earth station includes the territory of another country with the exception of the coordination under No. S9.15 and Appendix **S30A**	Any frequency band allocated to a space service, except those mentioned in the plans of Appendix **S30A**	The coordination area of the earth station covers the territory of another administration	Appendix **S7** (For earth stations in the radiodetermination-satellite service (RDSS) in the bands 1 610 - 1 626.5, 2 483.5 - 2 500 and 2 500 - 2 516.5 MHz, see Remarks column) 1) The coordination area of aircraft earth stations is determined by increasing the service area by 1 000 km with respect to the aeronautical mobile service (terrestrial) or 500 km with respect to terrestrial services other than the aeronautical mobile service	*Note* – For RDSS earth stations, a uniform coordination distance of 400 km corresponding to an airborne earth station shall be used. In cases where the earth stations are all ground-based, a coordination distance of 100 km shall be used. ~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendix S30A is suspended pending the decision of WRC-97 on revision of Appendix S30A~~

	No. **S9.17** GSO, non-GSO/ terrestrial *(cont.)*				2) For receiving earth stations in the meteorological-satellite service in frequency bands shared with the meteorological aids service, the coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius	
IAP/40/135 MOD	No. **S9.17A** GSO, non-GSO/ GSO, non-GSO	A specific earth station in respect of other earth stations operating in the opposite direction of transmission in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission~~, where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station~~, with the exception of the frequency bands subject to Appendix **S30A** Plans	Any frequency band allocated to a space service	The coordination area of the earth station covers the territory of another administration or the earth station is located within the coordination area of an ~~coordinated~~ earth station	i) For bands in Table S5.1A, see Section 2 of Annex 1 ii) See Recommendations ITU-R IS.847, IS.848 and IS.849	~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices S30 and S30A is suspended pending the decision of WRC-97 on revision of Appendices S30 And S30A.~~

IAP/40/136 MOD (CPM-97)	No. **S9.18** terrestrial/GSO, non-GSO	Any transmitting station of a terrestrial service in the bands mentioned in No. **S9.17** within the coordination area of an earth station in a frequency band allocated with equal rights to terrestrial and space radiocommunication services, with the exception of the coordination under **S9.16** and **S9.19**	Any frequency band allocated to a space service~~, except those mentioned in Appendices S30 and S30A~~	Transmitting terrestrial station is situated within the coordination area of ~~an already coordinated~~ a receiving earth station	See remarks	The coordination area of the affected earth station has already been determined using the calculation method of No. **S9.17**
IAP/40/137 MOD	No. **S9.19** terrestrial/GSO	A transmitting of a terrestrial service in a frequency band shared on an equal primary basis with the ~~BSS~~ broadcasting-satellite service except where this service is subject to the Appendix **S30** Plan	~~11.7 - 12.2 GHz (R3)~~ ~~11.7 - 12.5 GHz (R1)~~ ~~12.2 - 12.7 GHz (R2)~~ ~~and the~~ bands listed in No. **S9.11**	i) Necessary bandwidths overlap; and ii) the pfd of the terrestrial station at the edge of the ~~BSS~~ broadcasting-satellite service area exceeds the permissible level	i) Check by using the assigned frequencies and bandwidths ii) ~~Annex 3 to Appendix S30 for bands covered by that Appendix~~	~~See also Article 6 of Appendix S30~~ ~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices S30 And S30A is suspended pending the decision of WRC 97 on revision of Appendices S30 And S30A.~~

	Reference of Article S9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/Condition	Calculation method	Remarks
CUB/66/32 MOD (CPM-97)						
CUB/66/33 MOD (Mod CPM-97)	No. **S9.7** GSO/GSO	A station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, ~~for~~in any space radiocommunication service in a frequency band and in a region where this service is not subject to a Plan, with the exception of the coordination under No **S9.17A**	Any frequency band allocated to a space service, where this service is not subject to a Plan, ~~except those mentioned in the plans of Appendices S30, S30A and S30B~~	Value of $\Delta T/T$ exceeds 6%	Appendix **S8**	
CUB/66/34 SUP	No. **S9.8**					
CUB/66/35 SUP	No. **S9.9**					

CUB/66/36 MOD (Mod CPM-97)	No. **S9.11** GSO/terrestrial	A space station in the broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and ~~in which there is no plan for~~where the broadcasting-satellite service is not subject to a plan, in respect of terrestrial services;	620 - 790 MHz 1 452 - 1 492 MHz 2 310 - 2 360 MHz 2 520 - 2 655 MHz 2 655 - 2 670 MHz 12.5 - 12.75 GHz (R3) 17.~~3~~7- 17.8 GHz (R2) 21.4 - 22 GHz (R1, R3) 40.5 - 42.5 GHz 84 - 86 GHz	Condition: Bandwidths overlap	Check by using the assigned frequencies and bandwidths	
CUB/66/37 MOD (CPM-97)	No. **S9.13** GSO/Non-GSO	A station in a satellite network using the geostationary-satellite orbit in the frequency bands for which a footnote refers to **S9.11A** in respect of any other satellite network using a non-geostationary-satellite orbit, with the exception of the coordination under **S9.17A**	See Table **S5-1A**	Condition: Bandwidths overlap	Check by using the assigned frequencies and bandwidths	
CUB/66/38 MOD (CPM-97)	No. **S9.14** Non-GSO/ terrestrial, GSO/terrestrial	A space station in a satellite network in the frequency bands for which a footnote refers to **S9.11A** in respect of stations of terrestrial services where threshold(s) is (are) exceeded	See Table **S5-1A**	For a non-GSO space station: See ~~**Table S5-2**~~**Section 1 of Annex 1**	See ~~**Table S5-2**~~**Section 1 of Annex 1**	

CUB/66/39 MOD (Mod CPM-97)	No. **S9.16** terrestrial/ non-GSO	A transmitting station of a terrestrial service within the coordination area of an earth station in a non-geostationary-satellite network in frequency bands for which a footnote refers to **S9.11A**	See Table **S5-1A**	Transmitting terrestrial station is situated within the coordination area of a receiving earth station ~~which has already been coordinated~~	See Section 2 of Annex 1	The coordination area of the affected earth station has already been determined using the calculation method of No. **S9.15**
CUB/66/40 MOD (Mod CPM-97)	No. **S9.17** GSO, non-GSO/ terrestrial	A specific earth station or a typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services in ~~relation to~~ respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country, except coordination under No. **S9.15** and that provided for under Article 4 of Appendix **S30** and Articles 4 and 5 of Appendix **S30A**	Any frequency band allocated to a space service not subject to a footnote referring to **S9.11A**, except ~~those mentioned in the plans of Appendix S30~~: 11.7 - 12.5 GHz (R1) 11.7 - 12.2 GHz (R3) 12.2 - 12.7 GHz (R2) 14.5 - 14.8 GHz (R1, R3)	The coordination area of the earth station covers the territory of another administration	Appendix **S7** (For earth stations in the radiodetermination-satellite service (RDSS) in the bands 1 610 - 1 626.5, 2 483.5 - 2 500 and 2 500 - 2 516.5 MHz, see Remarks column) 1) The coordination area of aircraft earth stations is determined by increasing the service area by 1 000 km with respect to the aeronautical mobile service(terrestrial) or 500 km with respect to terrestrial services other than the aeronautical mobile service.	*Note: For RDSS earth stations, a uniform coordination distance of 400 km corresponding to an airborne earth station shall be used. In cases where the earth stations are all ground-based, a coordination distance of 100 km shall be used.* ~~The application of these provisions with respect to the bands and services of Articles 6 and 7 ofAppendix 30A is suspended pending the decision of WRC-97 on revision of Appendix 30A.~~

	No. **S9.17** GSO, non-GSO/ terrestrial *(cont.)*				2) For receiving earth stations in the meteorological-satellite service in frequency bands shared with the meteorological aids service, the coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius.	
CUB/66/41 MOD (Mod CPM-97)	No. **S9.17A** GSO, non-GSO/ GSO, non-GSO	A specific earth station in respect of other earth stations operating in the opposite direction of transmission in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission, where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of an ~~coordinated~~ earth station	Any frequency band allocated to a space service, except: 17.7 - 18.1 GHz (R1 and R3) 17.3 - 17.8 GHz (R2)	The coordination area of the earth station covers the territory of another administration or the earth station is located within the coordination area of an ~~coordinated~~ earth station	i) for bands in Table **S5-1A**, see Table **S5-2** ii) see Recommendations ITU-R IS.847, IS.848 and IS.849	~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices 30 and 30A is suspended pending the decision of WRC-97 on revision of Appendices 30 and 30A.~~

CUB/66/42 MOD (Mod CPM-97)	No. **S9.18** terrestrial/GSO, non-GSO	Any transmitting station of a terrestrial service in the bands mentioned in No. **S9.17** within the coordination area of ~~an~~ receiving earth station in a frequency band allocated with equal rights to terrestrial and space radiocommunication services, with the exception of the coordination under **S9.16 and S9.19** and that provided for under Article 6 of Appendix **S30**	Any frequency band allocated to a space service not subject to a footnote referring to **S9.11A**, except: ~~those mentioned in Appendices S30 and S30A.~~ 620 - 790 MHz 1 452 - 1 492 MHz 2 310 - 2 360 MHz 2 520 - 2 655 MHz (R1) 2 535 - 2 655 MHz (R3) 2 655 - 2 670 MHz (R1) 11.7 - 12.5 GHz (R1) 11.7 - 12.2 GHz (R3) 12.2 - 12.7 GHz (R2) 21.4 - 22 GHz (R1, R3) 40.5 - 42.5 GHz 84 - 86 GHz	Transmitting terrestrial station is situated within the coordination area of ~~an already coordinated~~ receiving earth station	See remarks	The coordination area of the affected earth station has already been determined using the calculation method of No. **S9.17**
CUB/66/43 MOD (Mod CPM-97)	No. **S9.19** terrestrial/GSO	A transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the BSS, unless the BSS is subject to a Plan	~~11.7 - 12.2 GHz (R3)~~ ~~11.7 - 12.5 GHz (R1)~~ ~~12.2 - 12.7 GHz (R2)~~ ~~and t~~The bands listed in No. **S9.11**	i) Necessary bandwidths overlap; and ii) the pfd of the terrestrial station at the edge of the BSS service area exceeds the permissible level	i) Check by using the assigned frequencies and bandwidths ~~ii) Annex 3 to Appendix S30 for bands covered by that Appendix~~	~~See also Article 6 of Appendix S30~~ ~~The application of these provisions with respect to the bands and services of Articles 6 and 7 of Appendices 30 and 30A is suspended pending the decision of WRC-97 on revision of Appendices 30 and 30A.~~

Proposed changes to Appendix S5

1 Add item *d)* in paragraph 1 of Appendix S5:

ADD *d)* received by the Bureau for notification in bands where **S9.11A** applies and examination under **S11.32** was not required as of the date of receipt of that notice; or

Reasons: To align to Section 2.5.3 of Annex 1 to Resolution 46 (Rev.WRC-95).

2 Re-label current items *d)* through *f)* of paragraph 1 in Appendix S5, accordingly.

Reasons: Consequential change to 1.

3 Modify item 6. *b)* as follows:

6. No coordination is required:

MOD *b)* when the characteristics of a new or a modified frequency assignment or a new earth station are within the limits of those of a frequency assignment which has previously been coordinated or notified to the Bureau without coordination in those cases where examination under **S11.32** was not required as of the date of receipt of that notice; or

Reasons: Consequential to the addition of item *d)* above.

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS
* * * * * * * * * * *

CMR-97 CONFÉRENCE MONDIALE DES RADIOCOMMUNICATIONS

Document DL/52-F/E/S
14 novembre 1997
Original: anglais

GENÈVE, 27 OCTOBRE – 21 NOVEMBRE 1997

GROUPE DE TRAVAIL 4C

Proposition de texte de remplacement pour le paragraphe 8 de l'Annexe au DT/112

8. D'autres techniques de modulation assurant une utilisation efficace du spectre et recommandées par l'UIT-R, notamment numériques, peuvent également être adoptées dans les bandes d'ondes décamétriques comprises entre 5 900 kHz et 26 100 kHz, attribuées au service de radiodiffusion.

* * * * * * * * * * *

WORKING GROUP 4C

Proposed replacement text for paragraph 8 of the Annex of DT/112:

8. Other spectrum-efficient modulation techniques recommended by ITU-R, including digital, can also be introduced in the HF bands between 5900 kHz and 26100 kHz allocated to the broadcasting service.

GRUPO DE TRABAJO 4C

Propuesta de sustitución del texto relativo al párrafo 8 del anexo al DT/112:

8. En las bandas de ondas decamétricas entre 5 900 kHz y 26 100 kHz atribuidas al servicio de radiodifusión también pueden introducirse otras técnicas de modulación eficaces desde el punto de vista de la utilización del espectro recomendadas por el UIT-R, incluidas las técnicas digitales.

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/54-E
15 November 1997
Original: English only

AD HOC 6 OF WORKING GROUP 4D

Note by the Chairman of Working Group 4D Ad Hoc 6

PROGRESS ON APPLYING THE CONCEPT OF GROUPING IN THE PLANS OF APPENDICES 30 AND 30A

1 Introduction

Working Group 4D Ad Hoc 6 met on November 14 to consider the application of the concept of Grouping in the Plans of Appendices 30 and 30A. The agenda of that meeting can be found in DL/53. Documents used included DL/48 and DT/93. The group considered:

- general considerations of grouping from a single orbit location;
- specific requests to modify the Plans when grouping from a single orbit location is requested; and
- specific requests to modify the Plans when grouping from a more than one orbit location is requested.

2 Grouping from a Single Orbit Location: General Considerations

Three possible ways of considering multiple assignments within the concept of grouping were considered:

1 grouping of different assignments in one or more beams, in which only one one assignment of the group could be used at one time; and

2 grouping of different assignments in different beams, where the same signal was transmitted in all beams, and the signals in the different beams were coherent with respect to each other; and

3 grouping of different assignments in different beams, where different signals, or the same signal without coherancy between the different signals, were transmitted in different beams.

• For reasons of economy, this document is printed in a limited number of copies. Participants are therefore kindly asked • to bring their copies to the meeting since no others can be made available.

One possible application of the first type of grouping is that in which an administration "groups" two different applications in a single beam, transmission of an analogue television signal and transmission of a digital television signal, at the same frequency. Both applications cannot be implemented simultaneously. The administration would group the two proposed assignments to keep open the option of transmitting either an analogue or a digital signal, but not both.

An application of the second type of grouping is that in which the administration or administrations wish to transmit the exact same signal in more than one beam, with signals that are coherent with respect to each other. This is equivalent to transmitting a single signal in all beams of the group with a complex or "shaped-beam" antenna. That was the application in mind when Section 10.2 of Appendix 30 and Section 9.2 of Appendix 30A was approved in 1983 by RARC-83 for the Region 2 portion of the Plan.

A third possible application of grouping considered by 4D Ad Hoc 6 was that in which different signals would be transmitted in different beams of the "group". In that application the effect of such multiple signals on another Plan assignment X should be determined on a power-addition basis in the same way as separate assignments would have on that other assignment X. After careful consideration, it was concluded that this application of considering the implementation of different transmissions in different beams from the same orbit location does not fall within the context of grouping as found in Section 10.2 of Appendix 30 or Section 9.2 of Appendix 30A. Rather, such an implementation can be considered simply as multiple assignments in the normal way.

2.1 Inclusion of the Concept of Grouping in the Regions 1 and 3 Portion of Appendices 30 and 30A

Two views were expressed in the first meeting of 4D Ad Hoc 6:

1 The text of Section 10.2 of Appendix 30 and Section 9.2 of Appendix 30A should be applied in the Regions 1 and 3 portion of the Plans, for the first two types of application described above; and

2 The text of Section 10.2 of Appendix 30 and Section 9.2 of Appendix 30A should be applied in the Regions 1 and 3 portion of the Plans, for only the first application described above.

3 Consideration of How the Bureau Should Process Article 4 Modification Reguests in Which Grouping at a Single Orbit Location is Proposed, in the Interval Between the 1997 and 1999 Conferences

Three types of Plan modification requests are considered in this context:

1 Article 4 Plan modification requests that have been published by the Bureau, but which have not completed coordination;

2 Article 4 Plan modification requests which have been received by the Bureau, but which have not as of November 21 been published; and

3 Article 4 Plan modification requests which may be submitted to the Bureau at some future date between the end of WRC-97 and the beginning of WRC-99.

There were two views initial expressed on this question:

1 the Bureau should process Article 4 Plan modification requests as they have been doing to date; and

2 consideration of this question should be undertaken only when the question of grouping in Regions 1 and 3, at either a single orbit location or at multiple orbit locations, is clarified by WRC-97.

There was no resolution of these two views at the first meeting.

4 Consideration of How the Bureau Should Process Article 4 Modification Requests in Which Grouping at Multiple Orbit Locations is Proposed, in the Interval Between the 1997 and 1999 Conferences

There was initial consideration of this matter, but no conclusions were reached. One administration suggested that the second alternative in Section 3 above should also apply in this situation.

As well, there was considerable discussion, but no conclusions were reached, on whether the concept of grouping at more than one orbit location within a 0.4° arc should be considered differently from grouping at more widely spaced orbital locations.

Robert BOWEN
Chairman, Ad Hoc 6 of WG 4D

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/55-E

AD HOC 6/WG 4D-2

AD HOC 6 OF WORKING GROUP 4D

AGENDA

OF THE

SECOND MEETING OF AD HOC 6 OF WG 4D

Saturday 15 November 1997, at 1430 hours

(Room VIII)

Documents

1 Approval of the Agenda

2 Consideration of results of First Meeting

3 Consideration of grouping at a single orbital position

- 3.1 General considerations
- 3.2 Consideration of specific requests to modify the current Plans

4 Consideration of specific requests to modify the current Plans when grouping at multiple orbit locations are involved

- 4.1 Within a 0.4° arc on the geostationary orbital arc
- 4.2 At more widely spaced orbital locations

5 Other business

R. BOWEN
Chairman, Ad Hoc 6/WG 4D

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/56-E
17 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Working Group 4D

FINAL REPORT BY THE CHAIRMAN OF AD-HOC GROUP 5 OF WORKING GROUP 4D

Technical Parameters of the Plan
Annex 5 of App. 30 (S30) and Annex 3 of App. 30A (S30A)

1. Task and working documents

Ad-hoc Group 5 was set up to up-date Annex 5 of Appendix 30 (S30) and Annex 3 of Appendix 30A (S30A) in accordance with the terms of reference contained in Doc. DT/107 (Rev.1). The Ad-hoc Group held five meetings between 12 and 15 November 1997.

The task of the Group was

- to verify that the provisions of Annex 5 to Appendix 30 (S30) and Annex 3 to Appendix 30A (S30A) related to Regions 1 and 3 data are consistent with the decisions of the Conference and that they reflect the basis of the replanification undertaken by this Conference,
- to check that parameters for Region 2 are correctly reproduced or currently contained in Annexes 5 and 3 of Appendices S30 and S30A, respectively,
- to identify, within DT/5, those areas of Annexes 5 (Appendix S30) and 3 (Appendix S30A) which shall be taken into account when processing Article 4 submissions,
- to prepare the draft final version of Annexes 5 (Appendix S30) and 3 (S30A).

In addition to the assigned working document DT/5, submitted by the Director, Radiocommunication Bureau, the Group considered Document 170 (Rev. 1) and proposals in EUR/5/195 and EUR/5/196. CMR/97/4 (the CPM-Report), EUR/5/149, EUR/5/194 and IRN/44/31 were also pointed out to the Group as being relevant to the work.

2. Achieved Results

The Group finalized the examination and updating of Document DT/5. The draft final version is submitted in Doc. DT/5 (Rev.1) for consideration by Working Group 4D.

Parallel to the revision of Doc. DT/5, a list was established (Add. 1 to DT/5 (Rev.1) which summarizes all suggested changes which were agreed within the Ad-hoc Group. The list also identifies those areas of the Annexes which should become mandatory for assessing systems submitted in accordance with Article 4 of Appendices 30 and 30A.

In most cases the Group could agree on a cleared text and on its categorization as either mandatory, optional or informative. There are a few remaining cases (including the titles of the examined Annexes) were either text or identification remained under discussion. These cases are marked with squared brackets in Doc. DT/5 as well as in the associated summary list given in Add. 1 to Doc. DT/5. These cases are especially brought to the attention of WG 4D. In principle, they all have to do with the possible application of existing or future ITU-R Recommendations (some of them to be incorporated by reference) for interference analyses of Article 4 submissions, which apply "non-standard" parameters.

3. Final remarks

Doc. DT/5 contains some new ideas for protecting the Plan assignments. The protection ratios of Article 4 submissions, which apply technical parameters different from those the Plan is generally based upon, should be adjusted as a function of submitted e.i.r.p., antenna diagram, location of test point and signal bandwidth. The Group was of the opinion that the inclusion of such a method would be premature at this point in time but felt that in order not to loose track of these ideas ITU-R should be requested to carry out pertinent studies. However, given the mandate of the Ad-hoc Group, no distinct text was developed in this regard.

In revising the texts, the Group was guided by the decision of WG 4D, to apply, for future plan modifications the EPM and not the OEPM method. With respect to the possible inclusion of a single entry C/I criterion, discussions within WG 4D have not yet taken place. Depending on the decisions which will be taken, the sections on protection ratios may need additional text.

In general, the Group has not introduced changes of substance to text relevant for Region 2 but has accepted those already undertaken by PXT Group.

4. Acknowledgments

Doc. DT/5 was only available by 7 November 1997. Ad-hoc Group 5 of Working Group 4D hold five long meetings in order to finalize the examination of this document. A list of the ITU-R Recommendations to be incorporated by reference stills needs, however, to be assembled.

In a spirit of constructive cooperation, the Group could finalize agreement on most of the items (text and categorization). The Chairman would like to thank the members of the Ad-hoc Group for their continued support without which the work could not have been concluded.

Christoph Dosch

Chairman Ad Hoc 5 of WG 4D

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Document DL/57-E
17 November 1997
English only

WORKING GROUP 4D

Chairman, Ad Hoc 5 to WG4D

List of ITU-R Recommendations

to be in incorpored by reference

in Annex 5 of Appendix 30 (S30) and in

Annex 3 of Appendix 30A (S30A)

a) Annex 5 of Appendix 30 (S30)

Number	Title
P.618-5	PROPAGATION DATA AND PREDICTION METHODS REQUIRED FOR THE DESIGN OF EARTH-SPACE TELECOMMUNICATION SYSTEMS
F.405-1	PRE-EMPHASIS CHARACTERISTICS FOR FREQUENCY MODULATION RADIO-RELAY SYSTEMS FOR TELEVISION
BO.1212	CALCULATION OF TOTAL INTERFERENCE BETWEEN GEOSTATIONARY-SATELLITE NETWORKS IN THE BROADCASTING-SATELLITE SERVICE
BO.1297	PROTECTION RATIOS TO BE USED FOR PLANNING PURPOSES IN THE REVISION OF THE APPENDICES 30 AND 30A PLANS IN REGIONS 1 AND 3 (Q. 85-1/11)
BO.1293	PROTECTION MASKS AND ASSOCIATED CALCULATION METHODS FOR INTERFERENCE INTO BROADCAST SATELLITE SYSTEMS INVOLVING DIGITAL EMISSIONS
BO.1213	REFERENCE RECEIVING EARTH STATION ANTENNA PATTERNS FOR PLANNING PURPOSES TO BE USED IN THE REVISION OF THE WARC BS-77 BROADCASTING-SATELLITE SERVICE PLANS FOR REGIONS 1 AND 3

b) Annex 3 of Appendix 30A (S30A)

Number	Title
P.618-5	PROPAGATION DATA AND PREDICTION METHODS REQUIRED FOR THE DESIGN OF EARTH-SPACE TELECOMMUNICATION SYSTEMS
P.838	SPECIFIC ATTENUATION MODEL FOR RAIN FOR USE IN PREDICTION METHODS
P.841	CONVERSION OF ANNUAL STATISTICS TO WORST-MONTH STATISTICS
BO.1293	PROTECTION MASKS AND ASSOCIATED CALCULATION METHODS FOR INTERFERENCE INTO BROADCAST SATELLITE SYSTEMS INVOLVING DIGITAL EMISSIONS
BO.1297	PROTECTION RATIOS TO BE USED FOR PLANNING PURPOSES IN THE REVISION OF THE APPENDICES 30 AND 30A PLANS IN REGIONS 1 AND 3 (Q. 85-1/11)
BO.1295	REFERENCE TRANSMIT EARTH STATION ANTENNA OFF-AXIS E.I.R.P. PATTERNS FOR PLANNING PURPOSE TO BE USED IN THE REV. OF THE APP.30A PLANS AT 14 GHz & 17 GHz IN REGIONS 1 & 3 (Q, 218/11) (3)
BO.1296	REFERENCE RECEIVE SPACE STATION ANTENNA PATTERNS FOR PLANNING PURPOSE TO BE USED FOR ELLIPTICAL BEAMS IN THE REV. OF THE APP. 30A PLANS AT 14 GHz & 17 GHz IN REGIONS 1 & 3 (Q. 218/11) (3)
BO.1212	CALCULATION OF TOTAL INTERFERENCE BETWEEN GEOSTATIONARY-SATELLITE NETWORKS IN THE BROADCASTING-SATELLITE SERVICE

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/58-E
17 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 1 OF THE PLENARY

Note by the Chairman of Working Group 1 of the Plenary

The following table has been prepared to indicate the agenda topic headings proposed for WRC-99 and WRC-01.

Proposed topics for Agendas of the Future Conferences

Subject	WRC-99	WRC-01	Future WRC	Comments
Appendix S2		X		
Appendix S3 (Recommendation 66 (Rev.WRC-97))	X			
Appendix S7	X			
Article S25		X		
BSS Plans 12 GHz (Resolution **COM4-XB**)	Separate preparation and planning conference			
BSS Sound (Resolution **No.528**)			X	
Further simplification of the RR Resolution No.26 Resolutions No.27 and No.28 Appendix S4	X			
GSO FSS/MSS Quasi GEO orbit Allocation 14.5-14.8 GHz band to FSS in Region 3 Sharing FSS and FS in the 19 GHz band (Res.**No 119**) Resolution **COM5-16** Resolution **COM5-17**	X	 X X		
HAPS (Resolution **COM5-7,**)	X			
HDFS (Resolution **COM5-11, COM5-12**)	X			
HF Broadcasting 4/10 MHz and Amateur 7 MHz Resolution **No.517 (Rev. WRC-97)** Resolution **COM4-14** Resolution **COM4-16**	X			
IMT 2000 Additional spectrum Control channel	X			
Maritime mobile service GMDSS provisions Resolution **COM4-5** Resolution **COM4-11**		 X X X		

Subject	WRC-99	WRC-01	Future WRC	Comments
MF(Mobile/Radionav.)/ HF(Aero/Maritime)				
Allocation matters	X			
Freq./Channel arrangements (Resolution **COM4-10**)		X		
including safety (Resolution **COM4-9**)	X			
frequency adaptive systems			X	
Mobile satellite service				
Maritime mobile satellite service in 4/6 GHz FSS bands	X			
Resolution **No.215 (Rev.WRC-97)**				
Resolution **COM5-2**	X			
Resolution **COM5-10**				
Resolution **COM5-22**				
Resolution **COM5-24**				
NGSO MSS below 1 GHz			X	
Resolution **No.214 (Rev.WRC-97)**				
Resolution **COM5-14**				
Resolution **COM5-15**				
Resolution **COM5-25**				
NON GSO FSS/MSS				
Resolution **No.121 (Rev.WRC-97)**				
Resolution **COM5-23**				
Resolution **COM5-8**				
Quasi GEO orbit	X			
Radiolocation service in the bands around 3 GHz and 5.5 GHz		X		
Radionavigation satellite service	X			
new allocations				
space-to-space				
other services				
Space services				
Resolution **COM5-1**	X			
Resolution **COM5-13**				
Worldwide allocation 18.6-18.8 GHz for EESS and SRS				
Allocations to SRS and ISS in 32-32.3 GHz band		X		
VHF new technology (Resolution **COM4-3**)	X			
Wideband telemetry in the band between 3 and 30 GHz		X		

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/59E
17 November 1997
Original: Spanish

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

Ref. DT/141

WORKING GROUP 4D
AD HOC 4

TABLE **S22-1(Rev.1)**

Frequency band allocated to the BSS	**Equivalent pfd dB(W/m²)**	**Percentage of time during which pfd level may not be exceeded**	**Reference antenna radiation pattern**	**Reference bandwidth (MHz)**
11.7 - 12.5 GHz in Region 1, 11.7 - 12.2 GHz and 12.5 - 12.75 GHz in Region 3	[-145] [-132]	99.7% 100%	Recommendation ITU-R BO.1213 (for Regions 1 and 3)	27
12.2 - 12.7 GHz and ~~17.3 - 17.8 GHz~~ in Region 2	~~[-144]~~ -148.5 ~~[-131]~~ -132.5	99.7% 100%	Section 3.7.2 of Annex 5 to Appendix **30** for Region 2	~~27~~ 24
17.3-17.8 GHz	For further study			

The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within a non-geostationary system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary-satellite orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

- N is the number of non-geostationary space stations visible from the point considered at the Earth's surface, with an elevation angle greater than or equal to 0°;
- i is the index of the considered non-geostationary space station;
- pfd_i is the power flux-density produced at the point considered at the Earth's surface in dB(W/m^2) in the reference bandwidth;

- θ_i is the angle between the direction considered towards the geostationary-satellite orbit and the direction of the interfering space station in the non-geostationary system;
- $G_r(\theta_i)$ is the gain of the receive reference antenna to be considered as part of a geostationary-satellite network;
- G_{max} is the maximum gain of the above receive reference antenna;
- *epfd* is the computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

These values have been calculated so as to offer BSS services approximately the same protection as they currently enjoy for sharing with other services. In this case, the degradation which would be introduced by non-GSO systems would be around a 0.5 per cent noise increase (approximately 0.03 dB of degradation in C/N) on the basis of the reference parameters in the Plans.

The fact that the epfd values are still under study is attributable primarily to the concerns of a number of administrations which operate or plan to operate BSS systems which do not use parameters that are in conformity with what is laid down in the corresponding Plans for Regions 1, 2 and 3. In such cases, some administrations are of the opinion that some of the following criteria should be used, which are based on the premise that the OEPM of a Plan modification would be 0 dB. This premise has to be verified.

- Increase in the interference-to-noise ratio (ΔI/N) up to around 0.5 per cent. In this case, the required epfd values would be between -148.8 dB(W/m^2/27 MHz) and -156.9 dB(W/m^2/27 MHz).
- Increase in degradation of the equivalent protection margin (ΔEPM) up to 0.25 dB. In this case, the epfd limits would be within the range -148.8 dB(W/m^2/27 MHz) and -158 dB(W/m^2/27 MHz).

Furthermore, some administrations are of the opinion that more detailed knowledge is required of the statistical mechanism for aggregate interference for multiple non-GSO FSS systems.

b) Proposal for the protection of BSS feeder links

The aggregate power flux-density produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-2** for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in this table.

TABLE **S22-2(Rev.1)**

Frequency band	**Aggregate pfd dB(W/m²)**	**Percentage of time during which pfd level may not be exceeded**	**Reference bandwidth (MHz)**
[14.5 - 14.8 GHz] in Regions 1, 2 and 3 (outside Europe)	~~[-119]~~	~~99.97%~~	27
	~~[-115]~~	100%	
17.3 - 18.1 GHz in Regions 1, 2 and 3	-125		

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

CMR-97 CONFÉRENCE MONDIALE DES RADIOCOMMUNICATIONS

Document DL/59-F
17 novembre 1997
Original: espagnol

GENÈVE, 27 OCTOBRE – 21 NOVEMBRE 1997

Ref. DT/141

GROUPE AD HOC 4 DU GROUPE DE TRAVAIL 4D

TABLEAU **S22-1(Rev.1)**

Bande de fréquences attribuée au SRS	**Puissance surfacique dB(W/m²)**	**Pourcentage de temps pendant lequel le niveau de puissance surfacique ne peut pas être dépassé**	**Diagramme de rayonnement de l'antenne de référence**	**Largeur de bande de référence (MHz)**
11,7 - 12,5 GHz en Région 1 11,7 - 12,2 GHz et 12,5 - 12,7 GHz en Région 3	[-145] [-132]	99,7% 100%	Recommandation UIT-R BO.1213 (pour les Régions 1 et 3)	27
12,2 - 12,7 GHz ~~17,3 - 17,8 GHz~~ en Région 2	~~[-144]~~ -148,5 ~~[-131]~~ -132,5	99,7% 100%	Section 3.7.2 de l'annexe 5 de l'appendice **30** pour la Région 2	~~27~~ 24
17,3-17,8 GHz	A l'étude			

La puissance surfacique équivalente est définie comme étant la somme des puissances surfaciques produites en un point de la surface de la Terre par toutes les stations spatiales d'un système non géostationnaire, compte tenu de la discrimination hors axe d'une antenne de réception de référence que l'on suppose pointée en direction de l'orbite des satellites géostationnaires. Elle est calculée à l'aide de la formule suivante:

$$epfd = 10.\log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{\max}}\right]$$

où:

- N est le nombre de stations spatiales non géostationnaires visibles depuis le point considéré à la surface de la Terre et dont l'angle d'élévation est supérieur ou égal à 0°;
- i est l'indice de la station spatiale non géostationnaire considérée;
- pfd_i est la puissance surfacique produite au point considéré à la surface de la Terre, en dB (W/m²) dans la largeur de bande de référence;

- θ_i est l'angle entre la direction considérée vers l'orbite des satellites géostationnaires et la direction de la station spatiale brouilleuse du système non géostationnaire;
- $G_r(\theta_i)$ est le gain de l'antenne réceptrice de référence considérée comme faisant partie d'un réseau géostationnaire;
- G_{max} est le gain maximal de l'antenne réceptrice de référence susmentionnée;
- *epfd* est la puissance surfacique équivalente calculée en dB(W/m^2) dans la largeur de bande de référence.

Ces valeurs ont été calculées dans l'optique d'offrir au service du SRS approximativement la même protection que celle dont ils bénéficient actuellement pour le partage avec d'autres services. Dans ce cas, la dégradation qu'introduiraient les systèmes non géostationnaires correspondrait à une dégradation du rapport C/N de 0,03 dB (environ 0,5% d'augmentation du bruit) sur la base des paramètres de référence du Plan.

Si les valeurs de epfd sont si basses, cela tient surtout à la préoccupation de plusieurs administrations qui exploitent ou projettent d'exploiter des systèmes du SRS et qui n'utilisent pas des paramètres conformément aux Plans correspondants des Régions 1, 2 et 3. Dans ce cas, certaines administrations sont d'avis qu'il faudrait utiliser l'un des critères indiqués ci-après, qui reposent sur l'hypothèse que la MPGE d'une modification du Plan serait de 0 dB. Cette supposition devrait être vérifiée:

- Une augmentation du rapport brouillage sur bruit (ΔI/N) jusqu'à environ 0,5%. Dans ce cas, les valeurs de puissance surfacique équivalente nécessaires seraient comprises entre -148,8 dB(W/m^2/27 MHz) et -156,9 dB(W/m^2/27 MHz).
- Une augmentation de la dégradation de la marge de protection équivalente (ΔMPE) jusqu'à 0,25 dB. Dans ce cas, les limites de la puissance surfacique équivalente seraient situées entre -148,8 dB(W/m^2/27 MHz) et -158 dB(W/m^2/27 MHz).

De plus, certaines administrations estiment qu'il faudrait connaître plus en détails le mécanisme statistique du brouillage combiné de plusieurs systèmes non OSG du SFS.

b) Proposition concernant la protection des liaisons de connexion du SRS

La puissance surfacique cumulative produite en un point quelconque de l'orbite des satellites géostationnaires, par les émissions de toutes les stations terriennes d'un système non géostationnaire du service fixe par satellite, pour toutes les conditions et pour toutes les méthodes de modulation, ne doit pas dépasser les limites indiquées dans le Tableau **S22-2** pendant les pourcentages de temps spécifiés. Ces limites s'entendent de la puissance surfacique que l'on obtiendrait dans des conditions de propagation en espace libre à l'intérieur de la largeur de bande de référence spécifiée dans ce Tableau.

TABLEAU S22-2(Rev.1)

Bande de fréquences	Puissance surfacique cumulative en dB(W/m^2)	Pourcentage de temps pendant lequel le niveau de puissance surfacique ne peut pas être dépassé	Largeur de bande de référence (MHz)
[14,5 - 14,8 GHz] en Régions 1,2 et 3 (en dehors de l'Europe)	~~[-119]~~	~~99,97%~~	27
	~~[-115]~~	100%	
17,3 - 18,1 GHz en Régions 1, 2 et 3	-125		

La puissance surfacique cumulative est définie comme étant la somme des puissances surfaciques produites en un point de l'orbite des satellites géostationnaires par toutes les stations terriennes d'un système non géostationnaire. Elle est calculée à l'aide de la formule suivante:

$$apfd = 10.\log_{10}\left[\sum_{i=1}^{N} 10^{P_i(t)/10.} \frac{G_t(\theta_i)}{4.\pi.d_i^{\,2}}\right]$$

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

CMR-97 CONFERENCIA MUNDIAL DE RADIOCOMUNICACIONES

Documento DL/59-S
17 de noviembre de 1997
Original: español

GINEBRA, 27 DE OCTUBRE – 21 DE NOVIEMBRE DE 1997

Ref. DT/141

GRUPO AD HOC 4 DEL GRUPO DE TRABAJO 4D

CUADRO S22-1(Rev.1)

Banda de frecuencias atribuida al SRS	dfp equivalente en dB(W/m^2)	Porcentaje de tiempo durante el cual no puede sobrepasarse el nivel de dfp	Diagrama de radiación de la antena de referencia	Anchura de banda de referencia (MHz)
11,7 - 12,5 GHz en la Región 1, 11,7 - 12,2 GHz y 12,5 - 12,75 GHz en la Región 3	[-145] [-132]	99,7% 100%	Recomendación UIT-R BO.1213 (para las Regiones 1 y 3)	27
12,2 - 12,7 GHz y ~~17,3 - 17,8 GHz~~ en la Región 2	~~[-144]~~ -148,5 ~~[-131]~~ -132,5	99,7% 100%	Punto 3.7.2 del anexo 5 del apéndice **30** para la Región 2	~~27~~ 24
17,3-17,8 GHz	En estudio			

La densidad de flujo de potencia equivalente se define como la suma de las densidades de flujo de potencia producidas en un punto de la superficie de la Tierra por todas las estaciones espaciales de un sistema de satélites no geoestacionarios, teniendo en cuenta la discriminación fuera del eje de una antena receptora de referencia que se supone apuntada hacia la órbita de los satélites geoestacionarios. La densidad de flujo de potencia equivalente se calcula mediante la siguiente fórmula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

siendo:

- N, el número de estaciones espaciales no geoestacionarias visibles desde el punto considerado en la superficie de la Tierra, con un ángulo de elevación superior o igual a 0°;
- i, el índice de la estación espacial no geoestacionaria considerada;
- dfp_i, la densidad de flujo de potencia producida en el punto considerado en la superficie de la Tierra en dB(W/m^2) en la anchura de banda de referencia;

- θ_i, el ángulo entre la dirección considerada hacia la órbita de los satélites geoestacionarios y la dirección de la estación espacial interferente en el sistema de satélites no geoestacionarios;
- $G_r(\theta_i)$, la ganancia de la antena receptora de referencia que se ha de considerar como parte de una red geoestacionaria;
- $G_{máx}$, la ganancia máxima de la mencionada antena receptora de referencia;
- *dfpe*, la densidad de flujo de potencia equivalente calculada en dB(W/m^2) en la anchura de banda de referencia.

Estos valores han sido calculados sobre la base de ofrecer la misma protección aproximadamente a los servicios SRS que ahora disfrutan para la compartición con otros servicios. En este caso, la degradación que introducirían los sistemas no-OSG sería aproximadamente del 0,5% de incremento del ruido (aproximadamente 0,03 dB de degradación de C/N) sobre la base de los parámetros de referencia de los Planes.

Las razones de que los valores de dfpe estén aún bajo estudio, se deben principalmente a la preocupación de varias administraciones que operan o están planificando sistemas SRS que no utilizan parámetros estándar de acuerdo con lo supuesto en los Planes correspondientes de las Regiones 1, 2 y 3. En estos casos, algunas administraciones son de la opinión que deberían utilizarse algunos de los siguientes criterios, que se basan en la suposición que el OEPM de una modificación en el Plan sería de 0 dB. Esta suposición tendría que ser verificada.

- Incremento de la relación interferencia a ruido (ΔI/N) hasta un valor aproximado del 0,5%. En este caso, los valores de densidad de flujo de potencia equivalente que se requerirían estarían comprendidos entre -148,8 dBW/m^2/27 MHz y -156,9 dBW/m^2/27 MHz.
- Incremento en la degradación del margen de protección equivalente (ΔEPM) hasta 0,25 dB. En este caso, los límites de densidad de flujo de potencia equivalente estarían en el rango -148,8 dBW/m^2/27 MHz y -158 dBW/m^2/27 MHz.

Asimismo, algunas administraciones opinan que se deberían conocer más detalles sobre el mecanismo estadístico de la interferencia combinada de múltiples sistemas no-OSG del SFS.

b) Propuesta para la protección de enlaces de conexión del SRS

La densidad de flujo de potencia total[1] producida en un punto de la órbita de los satélites geoestacionarios por las emisiones procedentes de todas las estaciones terrenas de un sistema de satélites geoestacionarios del servicio fijo por satélite, para todas las condiciones y todos los métodos de modulación, no deberá rebasar los límites indicados en el cuadro **S22-2** para los porcentajes de tiempo especificados. Estos límites se refieren a la densidad de flujo de potencia que se obtendría en condiciones de propagación en el espacio libre en la anchura de banda de referencia especificada en este cuadro.

CUADRO S22-2(Rev.1)

Banda de frecuencia	**dfp combinada en dB(W/m^2)**	**Porcentaje de tiempo durante el cual no se puede rebasar el nivel de dfp**	**Anchura de banda de referencia (MHz)**
[14,5 - 14,8 GHz] en las Regiones 1, 2 y 3 (fuera de Europa) 17,3 - 18,1 GHz en las Regiones 1, 2 y 3	~~[-119]~~ ~~[-115]~~ -125	~~99,97%~~ 100%	27

INTERNATIONAL TELECOMMUNICATION UNION

WRC-97 WORLD RADIOCOMMUNICATION CONFERENCE

Document DL/60E
17 November 1997
English only

GENEVA, 27 OCTOBER – 21 NOVEMBER 1997

WORKING GROUP 4D

Ref. Document DT/127

The symbol in the status column refers to the stage of processing of the coordination or notification information in the Bureau. The meaning of the symbols is as follows:

C - a published coordination request (note that it is not possible to show the state of the coordination (in course, complete)

C* - a coordination request received by the Bureau but not yet published (note that, in some cases both symbols C and C* apply to the same network; this means that a modification to an already published coordination request has been received and this modification has not yet been published),

N - the relevant assignments are recorded the MIFR,

N* - a notification received under Article 13 and for which the examination with respect to its recording in the MIFR is not yet complete.

The date of receipt shown for those cases with symbol C* is the definitive date of receipt in accordance with RR1064.

ADM	STATION	POS	DATEREC	STATUS
AUS	AUSSAT A 152E	152.00	19.03.91	C
AUS	AUSSAT A 152E	152.00	18.01.95	N
AUS	AUSSAT A 152E PAC	152.00	19.03.91	C
AUS	AUSSAT A 156E	156.00	28.06.91	N
AUS	AUSSAT A 156E PAC	156.00	11.03.91	C
AUS	AUSSAT A 156E PAC	156.00	10.11.93	N
AUS	AUSSAT A 160E	160.00	24.01.96	N
AUS	AUSSAT A 160E PAC	160.00	11.03.91	C
AUS	AUSSAT A 160E PAC	160.00	18.01.95	N
AUS	AUSSAT A 164E	164.00	28.06.91	N
AUS	AUSSAT A 164E PAC	164.00	03.12.86	C
AUS	AUSSAT A 164E PAC	164.00	28.06.91	N
AUS	AUSSAT A 164E PAC	164.00	28.06.91	N
AUS	AUSSAT B 152E	152.00	03.07.97	C*
AUS	AUSSAT B 152E MOB	152.00	21.04.95	C
AUS	AUSSAT B 152E MXL	152.00	21.04.95	C
AUS	AUSSAT B 156E	156.00	11.06.90	C
AUS	AUSSAT B 156E	156.00	20.07.95	N
AUS	AUSSAT B 156E MC	156.00	30.05.90	C
AUS	AUSSAT B 156E MC	156.00	20.07.95	N
AUS	AUSSAT B 156E MOB	156.00	18.06.91	C
AUS	AUSSAT B 156E MOB	156.00	22.05.96	N*
AUS	AUSSAT B 156E MXL	156.00	18.05.95	C
AUS	AUSSAT B 156E NZ	156.00	31.05.90	C
AUS	AUSSAT B 156E NZ	156.00	20.07.95	N
AUS	AUSSAT B 156E R	156.00	18.05.95	C
AUS	AUSSAT B 156E R	156.00	24.06.97	N
AUS	AUSSAT B 160E	160.00	11.06.90	C
AUS	AUSSAT B 160E	160.00	10.11.93	N
AUS	AUSSAT B 160E MC	160.00	30.05.90	C
AUS	AUSSAT B 160E MC	160.00	10.11.93	N
AUS	AUSSAT B 160E MOB	160.00	18.06.91	C
AUS	AUSSAT B 160E MXL	160.00	18.05.95	C
AUS	AUSSAT B 160E NZ	160.00	31.05.90	C
AUS	AUSSAT B 160E NZ	160.00	10.11.93	N
AUS	AUSSAT B 160E R	160.00	18.05.95	C
AUS	AUSSAT B 160E R	160.00	24.06.97	N
AUS	AUSSAT B 164E	164.00	08.05.96	C
AUS	AUSSAT B 164E MOB	164.00	08.05.96	C
AUS	AUSSAT B 164E MXL	164.00	08.05.96	C
CHN	APSTAR-2	134.00	08.08.94	C
CHN	APSTAR-3	93.00	08.08.94	C
CHN	APSTAR-4	77.00	08.08.94	C
CHN	ASIASAT-AK1	122.00	01.04.92	C
CHN	ASIASAT-AKX	122.00	16.11.95	C
CHN	ASIASAT-BK1	116.00	01.04.92	C
CHN	ASIASAT-BKX	116.00	16.11.95	C
CHN	ASIASAT-CK1	105.00	01.04.92	C
CHN	ASIASAT-CKX	105.00	15.11.95	C
CHN	ASIASAT-DK1	77.00	01.04.92	C
CHN	ASIASAT-DKX	77.00	18.09.96	C*
CHN	ASIASAT-EK1	100.00	01.04.92	C
CHN	ASIASAT-EKX	100.00	15.11.95	C
CHN	CHINASAT-13	81.50	26.05.97	C*
CHN	CHINASAT-6	110.50	14.05.97	C*

ADM	STATION	POS	DATEREC	STATUS
CHN	DFH-3A-OA	87.50	12.01.97	C*
CHN	DFH-3A-OB	110.50	12.01.97	C*
CHN	DFH-3A-OC	98.00	12.01.97	C*
CHN	DFH-3A-OD	130.00	12.01.97	C*
CHN	DFH-3-OC	87.00	23.04.96	C
CHN	DFH-3-OC	87.00	17.06.96	C*
CHN	DFH-4-OA	125.00	12.01.97	C*
CHN	DFH-4-OB	103.00	12.01.97	C*
CHN	DFH-4-OC	135.50	12.01.97	C*
CHN	DFH-4-OD	115.50	12.01.97	C*
CHN	DFH-4-OE	121.00	12.01.97	C*
CHN	DFH-4-OF	101.50	12.01.97	C*
F	RADIOSAT-5B	-7.00	22.12.95	N*
F	TDF-1	-19.00	03.01.89	N
G	BSB-1	-31.00	09.10.84	C
G	BSB-1	-31.00	25.09.90	N
G	GESATCOM-A1	97.00	06.06.97	C*
G	GESATCOM-A4	108.20	06.06.97	C*
G	SKYSAT-A1	118.00	05.02.95	C
G	SKYSAT-A1	118.00	02.09.96	C*
G	SKYSAT-A2	121.00	05.02.95	C
G	SKYSAT-A2	121.00	02.09.96	C*
G	SKYSAT-A3	124.00	05.02.95	C
G	SKYSAT-A3	124.00	02.09.96	C*
G	SKYSAT-B1	133.00	05.02.95	C
G	SKYSAT-B1	133.00	02.09.96	C*
G	SKYSAT-B2	97.00	05.02.95	C
G	SKYSAT-B2	97.00	02.09.96	C*
G	SKYSAT-B3	137.00	05.02.95	C
G	SKYSAT-B3	137.00	02.09.96	C*
G	SKYSAT-B4	141.00	05.02.95	C
G	SKYSAT-B4	141.00	02.09.96	C*
G	SKYSAT-C1	80.00	26.01.96	C
G	SKYSAT-C2	90.00	26.01.96	C
G	SKYSAT-C3	101.00	26.01.96	C
G	SKYSAT-C4	104.00	26.01.96	C
G	SKYSAT-C5	169.00	26.01.96	C
IND	INSAT-EK103	103.00	11.11.96	C*
IND	INSAT-EK111.5	111.00	11.11.96	C*
IND	INSAT-EK48	48.00	11.11.96	C*
IND	INSAT-EK55	55.00	11.11.96	C*
IND	INSAT-EK74	74.00	11.11.96	C*
IND	INSAT-EK83	83.00	11.11.96	C*
IND	INSAT-EK93.5	93.00	11.11.96	C*
INS	PALAPA PAC-1 CKU	134.00	24.10.95	C
INS	PALAPA PAC-2 CKU	139.00	24.10.95	C
INS	PALAPA PAC-3 CKU	144.00	24.10.95	C
INS	PALAPA-C1-K	113.00	16.03.97	C*
INS	PALAPA-C1-K	113.00	07.11.97	C*
INS	PALAPA-C2-K	108.00	16.03.97	C*
INS	PALAPA-C2-K	108.00	07.11.97	C*
INS	PALAPA-C3-K	118.00	16.03.97	C*
INS	PALAPA-C3-K	118.00	07.11.97	C*
INS	PALAPA-C5	71.00	29.07.96	C*
INS	PALAPA-C6	76.00	29.07.96	C*
INS	PALAPA-C7	81.00	29.07.96	C*

ADM	STATION	POS	DATEREC	STATUS
J	JCSAT-1	150.00	03.01.94	C
J	JCSAT-1	150.00	31.05.95	N
J	JCSAT-1R	150.00	28.10.94	C
J	JCSAT-1R	150.00	06.12.96	C*
J	JCSAT-2	154.00	03.01.94	C
J	JCSAT-2	154.00	31.05.95	N
J	JCSAT-2R	154.00	28.10.94	C
J	JCSAT-2R	154.00	06.12.96	C*
J	JCSAT-3A	128.00	21.03.96	C
J	JCSAT-3A	128.00	06.12.96	C*
J	JCSAT-3A	128.00	29.06.95	N*
J	JCSAT-3B	124.00	21.03.96	C
J	JCSAT-3B	124.00	06.12.96	C*
J	MTSAT-135E	135.00	01.03.96	C
J	MTSAT-140E	140.00	01.03.96	C
J	MTSAT-145E	145.00	01.03.96	C
J	N-SAT-110	110.00	09.12.91	C
J	N-SAT-110	110.00	20.05.97	C*
J	N-SAT-128	128.00	21.03.96	C
J	N-SAT-128	128.00	04.09.95	N*
J	N-SAT-146	144.00	03.11.94	C
J	N-STAR-A	132.00	16.10.95	C
J	N-STAR-A	132.00	06.04.95	N*
J	N-STAR-B	136.00	16.10.95	C
J	N-STAR-B	136.00	04.10.95	N*
J	SJC-1	124.00	21.03.96	C
J	SJC-2	120.00	17.02.97	C
J	SJC-2	120.00	20.05.97	C*
J	SUPERBIRD-A	158.00	10.11.95	C
J	SUPERBIRD-A2	158.00	18.05.95	C
J	SUPERBIRD-B	162.00	10.11.95	C
J	SUPERBIRD-B2	162.00	18.05.95	C
J	SUPERBIRD-C	144.00	29.04.96	C
J	SUPERBIRD-C	144.00	28.07.97	N*
KOR	EASTSAT	164.00	05.02.96	C
KOR	KOREASAT-1	116.00	06.06.95	C
KOR	KOREASAT-1	116.00	06.06.95	C*
KOR	KOREASAT-1	116.00	07.11.96	C*
KOR	KOREASAT-1	116.00	27.02.96	N
KOR	KOREASAT-2	113.00	06.06.95	C
KOR	KOREASAT-2	113.00	01.04.97	N
LAO	L-STAR-1	75.00	02.05.96	C
LAO	L-STAR-2	103.00	02.05.96	C
LAO	L-STAR-3	116.00	02.05.96	C
LAO	L-STAR-4	126.00	02.05.96	C
LAO	L-STAR-5	87.00	02.05.96	C
LAO	L-STAR-6	97.00	02.05.96	C
MHL	ORION-AP-1	139.00	12.02.97	C*
MHL	ORION-AP-2	144.00	12.02.97	C*
MLA	MEASAT-1	91.50	09.11.97	C*
MLA	MEASAT-1	91.00	14.08.95	N*
MLA	MEASAT-2	148.00	19.09.94	C
MLA	MEASAT-2	148.00	21.10.97	C*
MLA	MEASAT-3	95.00	21.10.97	C*
MLA	MEASAT-3	95.00	09.11.97	C*

ADM	STATION	POS	DATEREC	STATUS
MLA	MEASAT-4	72.00	09.11.97	C*
MLA	MEASAT-AK 91.5	91.00	11.05.95	C
MLA	MEASAT-IK 91.5E	91.00	13.03.96	C
MLA	MEASAT-IK 95E	95.00	18.10.94	C
MLA	MEASAT-LA1	-89.50	09.11.97	C*
MLA	MEASAT-SA1	5.70	09.11.97	C*
MLA	MEASAT-SA2	9.00	09.11.97	C*
MLA	MEASAT-SA3	37.00	09.11.97	C*
MLA	MEASAT-SA4	46.00	09.11.97	C*
PAK	PAKSAT-1	38.00	27.04.96	C*
PAK	PAKSAT-2	41.00	27.04.96	C*
PAK	PAKSAT-C	30.00	27.04.96	C
PAK	PAKSAT-D	88.00	27.04.96	C
PAK	PAKSAT-E	101.00	27.04.96	C
PNG	PACSTAR-3	167.00	23.12.92	C
PNG	PACSTAR-3	167.00	04.10.96	C*
PNG	PACSTAR-4	-175.00	23.12.92	C
PNG	PACSTAR-4	-175.00	04.10.96	C*
SNG	ST-1A	88.00	16.04.96	C
SNG	ST-1A	88.00	13.10.97	C*
SNG	ST-1B	98.00	16.04.96	C
SNG	ST-1B	98.50	13.10.97	C*
SNG	ST-1C	110.00	16.04.96	C
SNG	ST-1D	55.00	21.06.93	C
SNG	ST-1E	68.00	21.06.93	C
SNG	ST-1F	70.00	21.06.93	C
THA	THAICOM-A2B	78.00	07.03.97	C
THA	THAICOM-A3B	120.00	07.03.97	C
THA	THAICOM-A4B	142.00	07.03.97	C
THA	THAICOM-A5B	123.00	07.03.97	C
THA	THAICOM-AK3	120.00	07.03.97	C
THA	THAICOM-AK4	142.00	24.10.94	C
THA	THAICOM-C1	50.00	16.11.94	C
THA	THAICOM-C2	126.00	16.11.94	C
TON	TONGASAT AP-KU-4	83.00	09.12.94	C
TON	TONGASAT C-1	170.00	07.04.92	C
UAE	EMARSAT-1B	54.00	16.04.96	C
UAE	EMARSAT-1B	54.00	12.08.96	C*
UAE	EMARSAT-1F	44.00	16.04.96	C
UAE	EMARSAT-1G	52.00	16.04.96	C
USA	USASAT-14G	169.00	04.02.93	C
USA	USASAT-14H	166.00	30.08.93	C
USA	USASAT-14I	68.00	07.08.95	C
USA	USASAT-14I	68.50	11.12.96	C*
USA	USASAT-14J	72.00	07.08.95	C
USA	USASAT-14K	172.00	25.08.97	C*
USA	USASAT-14M	126.00	08.04.97	C*
USA	USASAT-9A	-91.00	23.07.85	C
USA/IT	INTELSAT7 57E	57.00	30.05.97	C*
USA/IT	INTELSAT8 95E	95.00	25.04.97	C*