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Documents of the World Radiocommunication Conference (WRC-95) (Geneva, 1995)

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- This PDF includes Document DL No. 1-17
- The complete set of conference documents includes Document No. 1-327, DL No. 1-17, DT No. 1-114



WRC-95

WORLD
RADIOCOMMUNICATION
CONFERENCE

Document DL/1-E
23 October 1995
Original: English

GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

**AGENDA OF THE
MEETING OF HEADS OF DELEGATIONS**

Monday, 23 October 1995, at 0930 hrs

(Room II)

	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



WRC-95

WORLD
RADIOCOMMUNICATION
CONFERENCE

Document DL/2-E
23 October 1995
Original: English
French
Spanish

GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

STEERING COMMITTEE

Draft

GENERAL SCHEDULE OF THE WORK OF THE CONFERENCE

Week 1 (23 - 27 October)

Organisation and commencement of work in Committees and Working Groups

Week 2 (30 October - 3 November)

Continuation of work in Committees and Working Groups

Friday 3 - End of work of the Working Group of the PL

Week 3 (6 - 10 November)

Continuation of work in Committees and Working Groups

Friday 10 - End of work of Working Groups of Committee 4

Week 4 (13 - 17 November)

Monday 13 - End of work of Working Groups of Committee 5

Tuesday 14 - End of work of Committee 4

End of work of Committee 5

Report of Committee 2

Report of Committee 3

Wednesday 15 - First reading by Plenary of last texts of the Final Acts

Thursday 16 - Second reading by Plenary of last texts of the Final Acts

Friday 17 - 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



Chairman, Drafting Group 4B1

**SUMMARY OF THE CURRENT STATUS OF THE WORK OF 4B1
(RESOLUTION 46)**

1. Footnote 1 in the Title of the Annex to Resolution 46

1.1 Application to earth stations in relation to terrestrial stations

It is understood that this part of the footnote ("where a pfd limit at the border of the territory of another administration (for an earth station) ... is exceeded") might have been intended to refer to the content of footnotes RR 608A and 608B, where the only reference to a pfd limit applicable to earth stations under Resolution 46 appears.

However, these two footnotes (608A and 608 B) are worded as absolute limits, rather than coordination thresholds.

Consequently, there is no scope for the application of the provision concerning earth stations in the footnote of the Title to the Annex to Resolution 46, and it should therefore be deleted.

There is agreement that the need for coordination between two administrations concerning the use of a frequency assignment by an earth station should be based either on a coordination distance (as currently implemented in Section III of Resolution 46, with possibly a reduced value for this distance) or on a method similar to that in Appendix 28. UK and USA were requested to develop a proposal along these lines, taking into account that Appendix 28 currently does not apply under 1 Ghz and that the need for a coordination distance would still exist in the case of aeronautical mobile earth stations.

1.2. Application to space stations

The remaining part of the footnote, relating to the space station coordination, should be transferred to Section II, under paragraph 2.5. In order to simplify Article 8, elimination of the sentence "coordination of space stations of the MSS with respect to terrestrial services is required only if the pfd produced at the surface of the Earth's surface exceeds the limits in N°2566" should be envisaged (Liaison with Committee 5 needed).

2. Case of no response under 2.8B b)

The BR's explanation that the RRB rule of procedure on this point was based on similar provisions in Article 14 and Appendix 30.

It was also noted, however, that the text under 2.8B b) (in the CPM report) was taken out of context from a provision in Article 11 where the assistance of the Bureau has been requested and no reply was provided to the Bureau by the affected administration. On the other hand, how could assistance of the Bureau be requested when the list of affected administration is opened ?

The possible solution to this problem, as contained in J/22/70) was noted. However, it would lead to twice the same process as under the current procedure, with no change in the type of warning sent to the affected administrations.

Another solution was identified in which a circular telegram would be sent to all administrations one month prior to the expiry date in order to attract their attention on the consequence of a lack of reply. This solution was retained as the nominal one for the development of the procedure.

The need to provide assurance on both sides was highlighted.

Taking into account the impossibility for the "terrestrial" administration to assess the potential for interference into the space station, the need for the "space" administration to make this assessment was mentioned.

3. Applicability of Resolution 46 to all the services sharing the same band with equal status

The RRB Rule of procedure on this point was supported, on the basis of the need for equity to all services sharing the same band with an equal status.

4. Treatment of GSO in the Title and in Section 2.2

The rationale provided in EUR/5/46-47 was presented. There was general agreement on this point, but the Russian Federation reserved its position until more progress has been made on the development of the new procedure.

5. Time limits

4B1 reviewed the time limits used in establishing the relative priorities between the various earth and terrestrial stations that may be involved in the coordination procedure. The conclusion was as follows:

- the provisions between earth stations should be separated from those between earth and terrestrial stations.
- a 3 years time limit should be included in 3.7 and 3.7.1 in all cases concerning earth stations
- concerning terrestrial stations, a 3 months time limit should apply in 3.7 and 3 years in 3.7.1.

It was agreed that 2.5.5 should be completed as proposed in EUR/5/47, to start the 3 year period in which terrestrial stations can be considered in the coordination at the time of publication of the RES46/C circular, which is referred to in 2.7.2.

Application of time limits to terrestrial stations under section II might be envisaged in the same fashion as currently foreseen under 3.7. and 3.7.1.

It was agreed that the implications of footnote 1 under 1.1, which refers to RR 1550, should be reviewed since RR 1550 refers back to Article 11, and not to Resolution 46. This could be addressed under Section V, where an alternative to RR 1550 should be included, taking into account CR/39, which supersedes the December 1994 Rule of Procedure on this point.

Upon receipt of the RES46/C special section, a six month period is foreseen in the current procedure in order for the administrations affected to make themselves known.. Under the Article S9 procedure, a uniform period of 4 months is being considered. In order to allow smooth incorporation of Resolution 46 within the generic procedure of Article S9 at the appropriate time, the same period should be considered [four months].

6. Application of the methods and criteria adopted by the Radiocommunication Assembly

6.1. Coordination Region (doc 8/45)

The Japanese proposal in J/22/63 was noted, and it was agreed that such a reference might be inserted under paragraph 2.5, taking into account the comments from the BR on the applicability of Annex 1 to document 8/45.

6.2. Identification in the affected administrations within the Res46/C special section

In order to reduce the unnecessary workload for the Bureau, and as a simplification to the flowchart given in page 104 of the CPM report, it was agreed that, in the footnote to 2.7.2, the Bureau should only be requested to indicate the administrations having recorded assignments overlapping with the assignment proposed. This would allow to apply the pfd, FDP and SCP calculations only to those assignments for which administrations will have raised concerns during the relevant period after the RES46/C publication.

6.3. Application of the pfd, FDP and SCP methods

At the end of the [four] months period mentioned in 2.8, any administration which considers itself as affected should :

- either base its disagreement on its assignments which have been recorded in the MIFR
- or provide the specific parameters of its assignments currently in use or planned to be used within the next three years.

If these specific parameters are not communicated, for example because the exact location is not known or because the information is classified, it shall be assumed, for the purpose of assessing the need for coordination, that these assignments can be implemented anywhere on the territory of that administration, with the typical parameters mentioned in the relevant ITU-R recommendation.

On this basis, the BR will apply the pfd, FDP and/or SCP methods, as appropriate, to determine the need to effect coordination with that administration.

7. Assistance of the Bureau

In the CPM text, assistance of the Bureau is dealt with under ADD 1, by referring to the applicable parts of Article 11. However, these parts cross-reference other parts of Article 11 rather than the corresponding parts of Resolution 46. Two options are therefore possible :

- consider the general text proposed in Article S13, when this has been approved by WG 4B,
or
- insert the complete text of Article 11 at the appropriate four places under Sections I, II, III and IV, with the appropriate cross-references.

8. Need to restart the Advance publication

Paragraph 1.2 will need updating on the basis of the decision to be taken by WG 4B in relation to the corresponding point under Article S9.

PROPOSED NEW DRAFT TO ANNEX TO RESOLUTION No. 46 (WARC-92)

COMMENTS

Interim Procedures for the Coordination and Notification of Frequency Assignments of [Non-Geostationary] Satellite Networks in Certain Space Services and the Other Services to Which the Bands are Allocated¹

The text of Footnote 1 should be reviewed by WRC-95.

~~¹ Sections I, II and III apply to terrestrial services only in the case where a power flux-density limit at the surface of the Earth (for a space station) or at the border of the territory of another administration (for an earth station) specified in a provision of the Radio Regulations is exceeded.~~

Footnote not applicable to earth stations (RR 608A and 608B are the only cases of pfd limits for earth stations and contain absolute limits), relocated in Section 2.5 for space stations.

Section A. General Information

A.1 The assistance of the ~~IFRB~~ BR can be requested in the application of the provisions of this annex.

ADD1:

The following provisions shall apply: RR 1054 to 1054C under Section I, RR 1088 to 1103 under Section II, RR 1130 to 1144 under Section III in relation to terrestrial stations and earth stations operated in the opposite direction of transmission, and RR 1168 to 1181 under Section IV.

Reference to Article 11 sections where assistance to the BR is described in more specific terms. (Type 2). To be reviewed after adoption of Article S13

A.2 In the absence of specific provisions relating to the evaluation of the interference, the calculation methods and the criteria should be based on relevant ~~CCIR~~ ITU-R Recommendations agreed by the administrations concerned either as a result of Resolution 703 (Rev. WARC-92) or otherwise. In the event of disagreement on a ~~CCIR~~ ITU-R Recommendation or in the absence of such Recommendations, the methods and criteria shall be agreed between the administrations concerned. Such agreements shall be concluded without prejudice to other administrations.

A.3 When applying the provisions of this Resolution for non-geostationary-satellite networks, administrations should provide the following information in addition to that of Appendix 3 or Appendix 4:

MOD 1:

- ~~i) right ascension of the ascending node;~~
- ~~ii) argument of perigee;~~
- ~~iii) active service arc.~~

(Type 6)

- i) Orientation of the satellite transmitting and receiving antenna beams and their radiation pattern.
- ii) Type of modulation and multiple access.
- iii) Appropriate information required to calculate the affected region due to the MSS space stations [as defined in Annex 7].
- [iv) Maximum and average beam-peak e.i.r.p./4 kHz and e.i.r.p./1 MHz for each beam.]
- v) The satellite antenna gain $G(\theta_e)$ as a function of elevation angle at a fixed point on the Earth. (To be provided either as part of Appendix 3 or as a formula to convert existing Appendix 3 data.)
- vi) The spreading loss (for a non-GSO satellite) as a function of elevation angle. (To be determined by equations or provided in graphical form.)

To be referred to Committee 5 (unclear)

<p>vii) New data elements required to properly characterize non-GSO satellites:</p> <p><u>N_p</u> = Number of orbital planes</p> <p><u>N_s</u> = Number of satellites in each orbital plane</p> <p><u>Ω_j</u> = Right ascension of the ascending node for the j-th orbital plane, measured counter clockwise in the equatorial plane from the direction of the vernal equinox to the point where the satellite makes its south-to-north crossing of the equator ($0^\circ \leq \Omega_j < 360^\circ$).</p> <p><u>$i_j$</u> = Inclination angle for the j-th orbital plane with respect to the reference plane, which is taken to be the Earth's equatorial plane ($0^\circ \leq i_j < 180^\circ$).</p> <p><u>$\omega_i$</u> = Initial phase angle of the i-th satellite in its orbital plane at reference time $t=0$, measured from the point of ascending node ($0^\circ \leq \omega_i < 360^\circ$).</p> <p><u>$a$</u> = Semi-major axis.</p> <p><u>e</u> = eccentricity (for circular orbit, $e=0$).</p> <p><u>ω_p</u> = argument of perigee, measured in the orbital plane, in the direction of motion, from the ascending node to perigee ($0^\circ \leq \omega_p < 360^\circ$)</p>	(Type 6)
<p>Section I. Procedures for the Advance Publication of Information on Planned Satellite Networks</p> <p><i>Publication of Information</i></p> <p>1.1 An administration (or one acting on behalf of a group of named administrations) which intends to bring into use a satellite network within a satellite system shall, prior to the coordination procedure described in paragraphs 2.1 and 2.2, send to the International Frequency Registration Bureau Board, not earlier than six years¹ and preferably not later than two years before the date of bringing into service of each satellite network, the information listed in Appendix 4.</p> <p>[¹ See also No. 1550.]</p> <p>1.2 Amendments to the information sent in accordance with the provisions of paragraph 1.1 shall also be sent to the Bureau Board as soon as they become available. Modifications which are of such a nature as to change significantly the character of the network may require recommencing the advance publication procedure. [.....]</p> <p>1.3 On receipt of the complete information sent under paragraphs 1.1 and 1.2, the Bureau Board shall publish it in a special section of its weekly circular within three months and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram. The circular telegram shall indicate the frequency bands to be used and, in the case of a geostationary satellite, the orbital location of the space station. When the Board 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.</p>	<p><u>Reference to RR 1550 is inadequate since it refers back to RR 1044 rather than this provision. Modification of Section V should also be considered in relation to this point.</u></p> <p><u>An addition to this point may need to be added following WG 4B conclusions on the similar provision in Article S9.</u></p>

Comments on Published Information

1.4 If, after studying the information published under paragraph 1.3, any administration is of the opinion that interference which may be unacceptable may be caused to assignments of its existing or planned satellite networks or to assignments to its existing or planned terrestrial radiocommunication stations, it shall, within four months after the date of the weekly circular containing the complete information listed in Appendix 4, send the administration concerned its comments on the particulars of the interference to its existing or planned satellite systems or to its existing or planned terrestrial stations. A copy of these comments shall also be sent to the Bureau Board. If no such comments are received from an administration within the period mentioned above, it may be assumed that the administration has no basic objections to the planned satellite network(s) of the system on which details have been published.

1.4A An administration sending information under paragraphs 1.1 and 1.2 shall, if requested by an administration receiving information published under paragraph 1.3, provide the technical methods and criteria it proposes to use for the evaluation of the interference.

1.4B An administration receiving information published under paragraph 1.3, may provide to the administration sending information under paragraphs 1.1 and 1.2 the technical methods and criteria it proposes to use for the evaluation of the interference.

Resolution of Difficulties

1.5 An administration receiving comments sent in accordance with paragraph 1.4 and administrations sending such comments shall endeavour to resolve any difficulties that may arise and shall provide any additional information that may be available.

1.5A In case of difficulties arising,

the administration responsible for the planned network shall first explore all possible means of meeting its requirements without considering the possibility of adjustment to stations or networks of other administrations. If no such means can be found, the administration concerned may then request other administrations, either bilaterally or multilaterally, to mutually help resolve these difficulties.

1.5B An administration receiving a request under paragraph 1.5A shall, in consultation with the requesting administration, explore all possible means of meeting the latter's requirements.

1.5C If, after following the procedure described in paragraphs 1.5A and 1.5B, there are unresolved difficulties, the administrations concerned shall jointly make every possible effort to resolve these difficulties by means of mutually acceptable adjustments.

Results of Advance Publication

1.6 An administration on behalf of which details of planned satellite networks have been published in accordance with the provisions of paragraphs 1.1 to 1.3 shall, after the period of four months specified in paragraph 1.4, inform the Bureau Board whether or not comments provided for in paragraph 1.4 have been received and of the progress made in resolving any difficulties. Additional information on the progress made in resolving any remaining difficulties shall be sent to the Bureau Board at intervals not exceeding six months prior to the commencement of coordination or the sending of the notices to the Bureau Board. The Bureau Board shall publish this information in the special section of its weekly circular.

1.7 When, upon expiry of a period of six years plus the extension provided for in No. 1550 after the date of the publication of the special section referred to in paragraph 1.3, the administration responsible for the network has not submitted the Appendix 3 information for coordination under paragraph 2.1 or paragraph 2.2 or notification under No. 1488, as appropriate, the information published under paragraph 1.3 shall be cancelled after the administration concerned has been informed.

Commencement of Coordination or Notification Procedures

1.8 When communicating to the Bureau Board the information referred to in paragraph 1.1, an administration may, at the same time or at a later time, communicate:

- 1.8A the information required for the network coordination of a frequency assignment to a station of a satellite network in accordance with the provisions of paragraph 2.6, or
- 1.8B the information required for notification of a frequency assignment to a station of a satellite network when coordination for that assignment is not required.
- 1.8C Such coordination or notification information, as the case may be, shall be considered as having been received by the Bureau Board not earlier than six months after the date of receipt of the information referred to in paragraph 1.1.

Section II. Coordination of Frequency Assignments to a Station of a Satellite Network

Requirement for Coordination

2.1 Before an administration (or one acting on behalf of one or more named administrations) notifies to the BureauBoard or brings into use any frequency assignment to a station of a [~~non-geostationary~~] satellite network, it shall effect coordination of the assignment with any other administration whose assignment to a station in a geostationary-satellite network, or whose assignment to a station of a non-geostationary-satellite network or whose assignment to a terrestrial station might be affected.

This paragraph 2.1 could be made general for the sake of simplifying the footnotes calling Resolution 46.

MOD 2:

2.2 Before an administration (or one acting on behalf of one or more named administrations) notifies to the BureauBoard or brings into use any frequency assignment to a station of a geostationary-satellite network, it shall effect coordination of the assignment with any other administration whose assignment to a station of a non-geostationary-satellite network might be affected.

This paragraph 2.2 could be merged with 2.1 for the sake of simplifying the footnotes calling Resolution 46.

2.3 Coordination under paragraphs 2.1 and 2.2 may be effected for a satellite network using the information relating to the space station, including its service area, and the parameters of one or more typical earth stations which may be located in all or part of the space station service area.

2.4 If a frequency assignment is brought into use before the commencement of the coordination procedure of paragraphs 2.1 or 2.2, when this coordination is required, the operation in advance of the receipt by the BureauBoard of the Appendix 3 information shall in no way afford any priority of the date.

2.5 Frequency assignments to be taken into account in the application of paragraphs 2.1 and 2.2 are those with a frequency overlap with 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 (see Nos. 420 to 425 and 435), and which:

for space services, are:

2.5.1 in conformity with No. 1503, and

2.5.2 either recorded in the Master Register, or coordinated under the provisions of this Section or of Section II of Article 11, or

2.5.3 included in the coordination procedure with effect from the date of receipt by the BureauBoard, in accordance with paragraph 2.6 or No. 1074 or 1074A of Article 11, of the relevant information as specified in Appendix 3 and paragraph A3 above, as appropriate;

or, for terrestrial services, are:

2.5.4 recorded in the Master Register with a favourable finding with respect to No. 1240, or

2.5.5 not notified but in use or planned to be brought into use within the ~~next~~ three years following the date of the publication referred to in paragraph 2.7.2.

The date from which this three year period is calculated should be clearly indicated ~~(see Article 11).~~

ADD 2:

2.5.6 Coordination of space services (space-to-Earth) with the terrestrial services of an administration is required only if the power flux density radiated over the territory of this administration exceeds the threshold levels appearing in [RR 2566][Article 28]

~~f~~Coordination of space services (Earth- to space-space-to-Earth) with the Fixed Service of an administration [in the bands [...]] is ~~not~~ required only if :~~]~~*

[2.5.6.7. the frequency assignments referred to in 2.5.4 and-or 2.5.5 use analogue modulation and the power flux density (pfd) radiated over the territory of this administration into these frequency assignments does-not-exceeds the thresholds specified in [RR 2566.1], or

[2.5.7.8. the frequency assignments referred to in 2.5.4 and-or 2.5.5 use digital modulation and the Fractional degradation in Performance (FDP) caused into reference digital Fixed Service assignments located in the territory of this administration does-not-exceeds the thresholds specified in [RR 2566.1], or

[2.5.8.9. the application of the simulation method described in [SCP-] to Fixed Service frequency assignments located within the territory of this administration, leads to an interference level which does-not-exceeds the thresholds specified in []]

* The WRC-95 would need to consider these modifications from the viewpoint of the need for these provisions and, if needed, the way to express the reference either as a provision of the radio Regulations, or as an ITU-R Recommendation.

Relocation of the footnote in the Title of the Annex to Resolution 46, and of similar text in the Article 8 footnotes calling for Resolution 46.

(type 4).

The application of 2.5.8 could lead to difficulties for developing countries. The difficulties that might be experienced by developing countries in the application of 2.5.9 can be overcome by submitting to the BR the specific parameters of the assignments concerned, or when those cannot be made available to the BR, by having the BR applying the method on typical parameters.

ADD 3:

2.5.109 No coordination under 2.1 or 2.2 is required:

- a) when an administration proposes to notify or bring into use, within the service area of a satellite network, a typical earth station or an earth station which would not cause or suffer interference of a level greater than the typical earth station;
- b) when the interference resulting from a modification to a frequency assignment which has previously been coordinated will not exceed that value agreed during coordination;
- c) when an administration proposes to notify or bring into use a new earth station which would not cause or suffer interference of a level greater than that which would be caused by an earth station belonging to the same satellite network and whose characteristics have been published in accordance with 2.7.2, or notified to the Bureau without coordination in those cases where coordination was not required;
- d) when, for a new frequency assignment to a receiving station, the notifying administration states that it accepts the interference resulting from the frequency assignments referred to in 2.5.1 to 2.5.3.
- e) between earth stations using frequency assignments in the same direction (either Earth-to-space or space-to-Earth).

Additions from RR 1066 to 1071 (type 1/2).

[This paragraph 2.5.10 should be reviewed to make sure that these provisions, taken from Article 11, also apply in the case of coordinating with terrestrial services.]

Coordination Data

2.6 The administration seeking coordination shall send to the BureauBoard the information listed in Appendix 3 and paragraph A3 above, as appropriate.

2.7 On receipt of the complete information referred to in paragraph 2.6, the BureauBoard shall:

2.7.1 examine this information with respect to its conformity with No. 1503; the date of its receipt shall be considered as the date from which the assignment will be taken into account for coordination;

2.7.2 publish in the special section of its weekly circular, within three months, the information received under paragraph 2.6 and the result of the examination under paragraph 2.7.1¹. When the BureauBoard 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.

2.7.3 include in the special section mentioned in paragraph 2.7.2 the names of the administrations having frequency assignments complying with the provisions of paragraphs 2.5 and 2.5.1, 2.5.2, 2.5.3 and 2.5.4, as applicable.

Purpose : avoid unnecessary workload for the Bureau by postponing the pfd, FDP and SCP calculations to the next phase of the procedure, after the concerned administrations have commented.

MOD 3 :

~~1 To help administrations identify services that may be affected, the BureauBoard shall also publish a list of administrations whose assignments comply with paragraphs 2.5 and 2.5.1 to 2.5.3 or paragraphs 2.5.1 and 2.5.4, and yet do not comply with paragraphs 2.5.6, 2.5.7 or 2.5.8.~~

(Type 4).

Examination of Coordination Data and Agreement Between Administrations

2.8 On receipt of the special section referred to in paragraph 2.7.2, an administration shall promptly examine the matter with regard to interference which would be caused to the frequency assignments of its network or terrestrial stations, or caused by these assignments. In so doing, it shall have regard to the proposed date of bringing into use of the assignment for which coordination is sought. It shall then, within ~~six~~ [four] months from the date of the relevant weekly circular, notify the administration seeking coordination of its agreement. If, however, the administration with which coordination is sought does not agree, it shall, within the same period, send to the administration seeking coordination the technical details of the networks or information on the terrestrial stations concerned upon which its disagreement is based, including the characteristics contained in Section C of Appendix 1 or Appendix 3 and in paragraph A3, as appropriate, which have not previously been notified to the BureauBoard, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem. A copy of these comments shall also be sent to the BureauBoard. If the administration concerned has notified its disagreement within the same period, but the information on the fixed service stations upon which its disagreement is based cannot be provided, it shall be assumed that typical parameters, as assumed in [SCP], can be used to determine the need for coordination with this administration.

Addition aimed at facilitating the application of the SCP method when developing countries are involved or when the relevant information cannot be provided.

<p>2.8A Affected administrations, as well as the administration seeking coordination, shall make all possible mutual efforts to overcome the difficulties in a manner acceptable to the parties concerned.</p> <p><u>2.8.A1 One month prior to the expiry of the [four] month period mentioned in paragraph 2.8, the Bureau shall dispatch a circular telegram to all administrations, bringing the matter to their attention.</u></p> <p><u>ADD 4:</u></p> <p><u>2.8 B When an administration has not responded either to the notifying administration or to the Bureau within the period of six [four] months referred to in paragraph 2.8, it shall be deemed that this administration has undertaken :</u></p> <p><u>a) that no complaint will be made in respect of any harmful interference affecting the services rendered by its space radiocommunication or terrestrial stations which may be caused by the use of the assignment to a station of the satellite network for which coordination was requested;</u></p> <p><u>b) that its space radiocommunication or terrestrial stations will not cause harmful interference to the satellite network assignment for which coordination was requested.}</u></p> <p><i>Results of Coordination</i></p> <p>2.9 An administration which has initiated a coordination procedure under the provisions of paragraphs 2.1 to 2.6 shall communicate to the Bureau<u>Board</u> the names of the administrations with which agreement has been reached. The Bureau<u>Board</u> shall publish this information in the special section of its weekly circular.</p>	<p><u>This provision is intended to attract the administrations attention on the consequences in the case of no reply (see 2.8B).</u></p> <p>Addition similar to RR 1142 to 1144, to reflect the RRB Rule of Procedure on Res 46 (Type 3), with the specific difference that the lack of response to the Bureau, rather than to the requesting administration, triggers this situation.</p> <p>Provision 2.8 B b) could have far reaching consequences and needs to be reviewed.</p>
<p>2.10 An administration which has sought coordination, as well as any administration which has complied with the provisions of paragraph 2.8, shall communicate to the Bureau<u>Board</u> any modifications to their published characteristics of their respective networks or stations that were required to reach agreement on the coordination. The Bureau<u>Board</u> shall publish this information in accordance with paragraph 2.7.2, indicating that these modifications resulted from the joint efforts of the administrations concerned to reach agreement on the coordination.</p>	
<p><i>Notification of Frequency Assignments in the Event of Continuing Disagreement</i></p> <p>2.11 In the event of continuing disagreement between an administration seeking to effect coordination and any administration with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the Bureau<u>Board</u> has been requested, defer the submission of its notice concerning the proposed assignment by eight months from the date of publication of the special section referred to in paragraph 2.7.2, taking into account the provisions of No. 1496. When the assistance of the Bureau<u>Board</u> has been requested, the submission of the notice shall be deferred for a further three months.</p>	

MOD 4 :

**Section III. Coordination of Frequency Assignments to Earth Stations
of a Non-Geostationary Satellite Network in Relation to Terrestrial
Stations and of a Satellite Network in Relation to other earth
stations in the opposite direction of transmission**

Requirement for Coordination

3.1 Before an administration notifies to the ~~Bureau~~Board or brings into use any frequency assignment to a fixed earth station or to typical earth stations in a particular band allocated with equal rights to space and terrestrial radiocommunication services, it shall effect coordination of the assignment with each administration whose territory lies wholly or partly within the coordination area¹. The request for coordination may specify all or some of the frequency assignments to the associated space station, but thereafter each assignment shall be dealt with individually.

¹ The coordination area is defined as the service area in which it is intended to operate the typical earth stations, extended in all directions by a coordination distance of [500 km], or as a circular zone with a radius of [500 km] centred on the coordinates of the fixed earth station. For a service area in which aircraft earth stations operate, the coordination area is the service area extended in all directions by a coordination distance of [1 000 km].

This section also applies to GSO networks (Type 1) and is proposed to be modified to include the case of feeder link earth stations in relation to other earth stations operating in the opposite direction of transmission (Type 5).

See section....

ADD 5 :**3.1.1**

No coordination under paragraph 3.1 is required when an administration proposes:

3.1.2

a) to bring into use an earth station the coordination area of which does not include any of the territory of any other country;

3.1.3

b) to change the characteristics of an existing assignment in such a way as not to increase the interference to or from the terrestrial radiocommunication stations of other administrations or the earth station of other administrations operating in the opposite direction of transmission.

3.1.4

c) 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 earth station assignments operating in the opposite direction of transmission. In such case, administrations responsible for the terrestrial stations or the earth stations, are not required to apply the provisions of Section IV or Section III respectively, of this Article.

Addition from RR 1108 to 1111A
(Type 2)

(Also type 5)

(Also Type 5)

Coordination Data

3.2 For the purpose of effecting coordination, the administration requesting coordination shall send to each administration concerned under paragraph 3.1 all pertinent information concerning the proposed frequency assignment as listed in Appendix 3, and an indication of the approximate date on which it is planned to begin operations. A copy of this information with the date of dispatch of the request for coordination shall also be sent to the Bureau Board for information.

Acknowledgement of Receipt of Coordination Data

3.3 An administration with which coordination is sought under paragraph 3.1 shall immediately acknowledge receipt of the coordination data.

Examination of Coordination Data and Agreement Between Administrations

3.4 On receipt of the coordination data, an administration shall, having regard to the proposed date of bringing into use of the assignment for which coordination was requested, promptly examine the matter with regard to both:

MOD 5

3.4.1 interference which would affect the service rendered by its terrestrial radiocommunication stations or by its earth stations in the opposite direction of transmission, operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing into service of the earth station assignment, or within the next three years, whichever is the longer, and

(Type 5)

MOD 6

3.4.2 interference which would be caused to reception at an earth station by the service rendered by its terrestrial radiocommunication stations or by its earth stations in the opposite direction of transmission, operating in accordance with the Convention and these Regulations, or to be so operated prior to the planned date of bringing into service of the earth station assignment, or within the next three years, whichever is the longer

(Type 5)

3.5 The administration with which coordination is sought shall, within four months from dispatch of the coordination data:

3.5.1 notify the administration requesting coordination of its agreement with a copy to the Bureau Board, indicating, where appropriate, the part of the allocated frequency band containing the coordinated frequency assignments; or

<p>MOD 7</p> <p><u>3.5.2. Send to that administration a request for inclusion in coordination of the terrestrial radiocommunication stations or the earth stations in the opposite direction of transmission mentioned in 3.4.1 and 3.4.2 : or</u></p> <p>3.5.23 notify that administration of its disagreement.</p> <p>MOD 8 :</p> <p>3.6 In the cases mentioned in paragraphs 3.5.2 and 3.5.3, the administration with which coordination is sought shall send to the administration requesting coordination a diagram drawn to an appropriate scale indicating the location of those terrestrial radiocommunication stations or earth stations in the opposite direction of transmission which are or will be within the coordination area, together with all other relevant basic characteristics using Appendix 1 or Appendix 3, as appropriate, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.</p> <p>3.7 When the administration with which coordination is sought sends to the administration seeking coordination the information required in the case of paragraph 3.5.23, a copy thereof shall also be sent to the <u>Bureau Board</u>. <u>The Bureau shall consider as notifications in accordance with Section I of Article 12 or Section I of Article 13, as appropriate, only that information relating to existing radiocommunication stations, or to those to be brought into use within the next three [months][years].</u></p>	<p>Addition taken from RR 1123. This case has been omitted in Resolution 46, although it is the only one to provide for the case of a terrestrial station to be put in service between the next 3 months and the next 3 years (Type 1)</p> <p>(Type 1)</p> <p>(Type 5)</p> <p>Addition from RR 1126 and RR 1536 (Type 1).</p>
<p>ADD 6 :</p> <p><u>3.7.1</u></p> <p><u>When an agreement on coordination is reached, as a consequence of paragraphs 3.5 to 3.7, the administration responsible for the terrestrial stations or the earth stations in the opposite direction of transmission, may send to the Bureau the information concerning those stations covered by the agreement which are intended to be notified in accordance with Section I of Article 12 or Section I of Article 13, as appropriate. The Bureau shall consider as notifications in accordance with those Sections only that information relating to existing radiocommunication stations or to those to be brought into use within the next three years.</u></p> <p>ADD 7</p> <p><u>The periods referred to in paragraphs 3.4.1 and 3.4.2 may be extended by agreement between the administrations concerned in order to take planned terrestrial and space networks into account. The earth station to earth station coordination may commence five and a half years before bringing into use these stations.</u></p>	<p>Addition from RR 1127 in order to avoid "paper" terrestrial stations (Type 1), with suitable modifications to accommodate earth stations in the opposite direction of transmission (Type 5).</p> <p>Addition from mRR1120 (Type 1). The period of application of the coordination between two earth stations operating in opposite directions of transmissions needs to be reviewed.</p>
<p><i>Notification of Frequency Assignments in the Event of Continuing Disagreement</i></p> <p>3.8 In the event of continuing disagreement between an administration seeking to effect coordination and an administration with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the <u>Bureau Board</u> has been requested, defer the submission of its notice concerning the proposed assignment by six months from the date of the request for coordination, taking into account the provisions of No. 1496. When the assistance of the <u>Bureau Board</u> has been requested, the submission of the notice shall be deferred for a further three months.</p>	

**Section IV. Coordination of Frequency Assignments to
Terrestrial Stations for Transmission in Relation to Earth Stations
of a Non-Geostationary Satellite Network**

Requirement for Coordination

4.1 Before an administration notifies to the ~~Bureau~~Board, or brings into use any frequency assignment to a terrestrial station for transmission within the coordination area¹ of an earth station of a non-geostationary satellite network, in a band allocated with equal rights to terrestrial radiocommunication services and space radiocommunication services (space-to-Earth), it shall effect coordination of the proposed assignment with the administration responsible for the earth stations with respect to the frequency assignments:

¹ The coordination area is defined as the service area in which it is intended to operate the typical earth stations, extended in all directions by a coordination distance of [500 km], or as a circular zone with a radius of [500 km] centred on the coordinates of the fixed earth station. For a service area in which aircraft earth stations operate, the coordination area is the service area extended in all directions by a coordination distance of [1 000 km].

4.1.1 which are in conformity with No. 1503; and

4.1.2 for which coordination has been agreed under paragraph 3.5.1, or

ADD 8 :

4.1.3 which are to be taken into account for coordination with effect from the date of communication of the information referred to in paragraph 3.1.

See section ...

Addition from RR 1151
(Type 1)

ADD 9 :

4.1.7

(2) No coordination under paragraph 4.1 is required when an administration proposes:

4.1.8

a) to bring into use a terrestrial station which is located, in relation to an earth station, outside the coordination area;

4.1.9

b) to change the characteristics of an existing assignment in such a way as not to increase the interference to the earth stations of other administrations;

4.1.10

c) to bring into use a terrestrial station within the coordination area of an earth station, provided that the proposed terrestrial station assignment is outside any part of a frequency band coordinated under 3.5.1 for reception by that earth station.

Addition from RR 1155 to 1158
(Type 2)

Coordination Data

4.2 For the purpose of effecting coordination, the administration requesting coordination shall send to each administration concerned under paragraph 4.1 all pertinent information. The request for coordination may specify all or some of the frequency assignments expected to be used within the next three years by stations of a terrestrial network wholly or partly within the coordination area of the earth stations. Thereafter each assignment shall be dealt with individually.

Acknowledgement of Receipt of Coordination Data

4.3 An administration with which coordination is sought under paragraph 4.1 shall immediately acknowledge receipt of the coordination data.

Examination of Coordination Data and Agreement Between Administrations

4.4 On receipt of the coordination data, the administration with which coordination is sought shall promptly examine the matter with regard to interference which would affect the services rendered by its earth stations covered by paragraph 4.1, which are operating or are to be operated within the next three years.

4.5 The administration with which coordination is sought shall, within an overall period of four months from dispatch of the coordination data, either notify the administration requesting coordination of its agreement to the proposed assignment or, if this is not possible, indicate the reasons for its objection and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

Notification of Frequency Assignments in the Event of Continuing Disagreement

4.6 In the event of continuing disagreement between an administration seeking to effect coordination and an administration with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the Bureau Board has been requested, defer the submission of its notice concerning the proposed assignment by six months from the date of the request for coordination, taking into account the provisions of Nos. 1230 and 1496. When the assistance of the Bureau Board has been requested, the submission of the notice shall be deferred for a further three months.

Section V. Notification of Frequency Assignments

Notification of Assignments to Space Stations and Earth Stations

- 5.1 An administration shall, for the purpose of notifying an assignment to the BureauBoard, apply the provisions of Article 13. When applying the provisions of Article 13 to frequency assignment notices relating to space stations and earth stations covered by this Resolution, the BureauBoard shall:
- 5.1.1 in applying No. 1504, also examine the notice with respect to its conformity with the provisions of paragraphs 2.1 or 2.2 relating to coordination of the use of the frequency assignment with the other administrations concerned;
 - 5.1.2 in applying No. 1505, also examine the notice with respect to its conformity with the provisions of paragraph 3.1 relating to coordination of the use of the frequency assignment with the other administrations concerned;
 - 5.1.3 in applying No. 1506, also examine the notice with respect to the probability of harmful interference when the coordination under paragraph 2.1 or 2.2 has not been successfully effected;
 - 5.1.4 in applying No. 1509, also examine the notice with respect to the probability of harmful interference when the coordination under paragraph 3.1 has not been successfully effected;
 - 5.1.5 not apply Nos. 1515 and 1516.
- 5.2 The examination under paragraph 5.1.3 or 5.1.4 shall take into account the frequency assignments for transmission or reception already recorded in the Master Register

Notification of Assignments to Terrestrial Stations

- 5.3 An administration shall, for the purpose of notifying an assignment to the BureauBoard, apply the provisions of Article 12. When applying the provisions of Article 12 the BureauBoard shall, in application of No. 1353, examine frequency assignment notices relating to terrestrial stations covered by this Resolution with respect to their conformity with the provisions of paragraph 4.1 relating to coordination of the use of the frequency assignment with the other administrations concerned



AD HOC GROUP 4B2

Report by the Chairman of Drafting Group 4B2

Further to the discussion held in Working Group 4B on 24 October 1995, the following is a summary of conclusions reached at that meeting.

1 Article S7 of the VGE Report

S7.1 NOC

S7.2 NOC

S7.3 [b) effecting a modification to the world plan (see Article S10);
VGE Note 1]

S7.4 NOC

S7.5 NOC

S7.5bis

F/54/2

ADD S7.5bis

If a frequency assignment is brought into use before commencement of the coordination procedure under Article S9, when coordination is required, or before notification when coordination is not required, the operation in advance of the application of the procedure shall, in no way, afford any priority of the date.

Reasons: Transfer from No. S9.6.2 and clarification to also cover non-GSO systems which begin operation before notification.

VGE Note 1

F/54/1B

SUP

VGE Note 1.

Reasons: Consequential to proposal on S10, see Document 5, EUR/5/24.

S7.6

RUS/7/6

MOD S7.6

If ~~it is~~they are requested by any administration, particularly by the administration of a country in need of special assistance, the Bureau and the Bureau Board shall use such means at ~~its~~their disposal as are appropriate in the circumstances and shall render the assistance requested in the application of the procedures of this Chapter.

Reasons: The word "Board" is added in order to clarify that administrations should be provided with assistance in the application of the procedures not only by the Radiocommunication Bureau but also by the Radio Regulations Board, and to bring the provision into line with No. S7.5.

S7.7 NOC

S7.8 NOC

2 Article S8

S8.1 NOC

S8.1.1 NOC

S8.2

EUR/5/19

MOD S8.2

A frequency assignment shall have the right to international protection from harmful interference when it is recorded in the Master Register with the indication that it is in accordance with a frequency allotment or assignment plan adopted by a Conference or as modified following successful application of the procedure, as applicable, for modification of the relevant plan. This protection shall be afforded to allotments or assignments appearing in a world-~~or a regional~~ plan, to the extent provided by these Regulations ~~and the relevant agreement. In the case of a regional plan, such protection shall be limited to the countries which are parties to the relevant regional agreement; relations between parties and non parties are governed by the provision of these Regulations.~~ The right to international protection from harmful interference shall also be afforded to any assignment which is recorded in the Master Register with a favourable finding as a result of the successful application of Article S9. The right to international protection from harmful interference shall also be afforded to any frequency assignment to a station in the fixed service in the high frequency bands selected in accordance with Nos. S11.16 and S13.5 of Articles S11 and S13 respectively.

S8.3

USA/9/16

MOD S8.3

Any frequency assignment recorded in the Master Register with an indication that it is in accordance with the Table of Frequency Allocations and the associated provisions ~~VGE Note 2~~ of these Regulations other provisions of the Radio Regulations with the exception of those provisions relating to the probability of harmful interference shall have the right to international recognition. For such an assignment, this right means that other administrations shall take it into account when making their own assignments in order to avoid harmful interference. The right to international recognition shall also be afforded to any frequency assignment to a station in the fixed service in the appropriate bands between 3 000 kHz and 27 000 kHz with class of operation B.

EUR/5/20

MOD S8.3

Any frequency assignment recorded in the Master Register with an indication that it is in accordance with the Table of Frequency Allocations and the associated provisions ~~VGE Note 2~~ of these Regulations shall have the right to international recognition. For such an assignment, this right means that other administrations, recognizing Nos. S4.2 and S4.3 in particular, shall take it into account when making their own assignments in order to avoid harmful interference.

EUR/5/21

ADD S8.3.1

¹ The "associated provisions" shall be identified and included in the Rules of Procedure.

* Conclusion on S8.3 will be similarly reflected in S8.4.

S8.4

MOD based on the decision taken in S8.3 so far as the expression "associated provision" is concerned.

S8.5

S8.5 A non-conforming assignment, as defined in No. **S8.4**, shall neither cause harmful interference to any of the assignments described in Nos. **S8.2** and **S8.3** nor claim protection from harmful interference from any such assignment. In the event of a complaint of harmful interference to any assignment described in Nos. **S8.2** and **S8.3** from a non-conforming assignment the administration which notified the latter shall immediately investigate and eliminate the interference.

S8.6

ARG/8/19

ADD S8.6

For all world or regional frequency allotment or assignment plans contained in Appendices to these Regulations, or adopted by world ~~or regional~~ conferences convened by the Union, the Bureau shall maintain master copies of the plans, incorporating any agreed modifications, and shall provide such copies in an appropriate form for publication by the Secretary-General when justified by circumstances.

To be transferred to Article S13.

**WRC-95**

WORLD
RADIOCOMMUNICATION
CONFERENCE

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25 October 1995
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GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

Article S9

- A.S9.1 NOC
- A.S9.2 NOC
- A.S9.3 SUP*
- [A.S9.4 SUP**]

S9.1

F/54/16

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 one⁵ acting on behalf of a group of named administrations, shall prior to the coordination procedure described in Section II 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 in cases where coordination under Section II of Article S9 is not required 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 complete information for advance publication in cases where coordination under Section II of Article S9 is required and six months after the date of publication of the advance publication information in cases where coordination under Section II of Article S9 is not required.

* Pending the results on Resolution 46.

** Pending decision on Article S10.

Reasons: Clarification: (1) incorporation of the substance of the first sentence of S9.5; (2) treatment of non-GSO network without coordination procedure (see also No. 1058C).

USA/9/18
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 one⁵ acting on behalf of a group of named administrations, shall prior to the coordination procedure described in Section II 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 introduction 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. In the case where coordination is not required by Section II, notification shall be considered as received by the Bureau not earlier than six months after the date of publication of the advance publication information.

S9.1.1

⁵ 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.

S9.2

RUS/7/7
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. Modifications which are of such nature as to significantly change the character of the network may require recommencing the advance publication procedure. A list of modifications which are of such nature as to significantly change the character of the network is given in the Rules of Procedure.

F/54/17
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. Modifications which ~~are of such nature as to significantly change the character of~~ involve the use of an additional frequency band to the network ~~may~~ shall require recommencing the advance publication procedure.

Reasons: Clarification taking into account the existing Rules of Procedure (Part A1, AR11, No. 1043).

S9.2A

F/54/18

ADD S9.2bis

If the information is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification and information not provided.

Reasons: This provision exists in the current Radio Regulations and should not be transferred to the Rules of Procedure. Indeed, the processing of incomplete advance publication information is crucial for initiating the registration procedure because of the relation between the receipt of complete advance publication information and the date on which networks are then taken into consideration either for purposes of the coordination process in those cases where a formal coordination might be required or for notification when no formal coordination is required (e.g. non-GSO satellite networks or systems in frequency bands not subject to Resolution 46).

S9.3

F/54/20A

MOD S9.3

Upon receipt of the Weekly Circular containing information published under No. **S9.1**, if an administration believes that interference which may be unacceptable may be caused to its existing or planned satellite or terrestrial¹bis networks or systems it shall within four months of the date of the Weekly Circular ~~communicate its comments and shall, at the same time, give to the publishing administration its comments on the~~ particulars of the interference foreseen to its existing or planned ~~satellite~~ systems. A copy of these comments shall also be sent to the Bureau.¹ Thereafter both administrations shall endeavour to cooperate in joint efforts to resolve any difficulties, ~~with if necessary requested by either of the parties, with the~~ assistance of the Bureau, and shall exchange any additional relevant information that may be available. If no such comments are received from an administration within the period mentioned above, it may be assumed that the administration has no basic objections to the planned satellite network(s) of that system on which details have been published.

S9.3.1bis

F/54/21

ADD S9.3.1bis

Terrestrial networks or systems to be taken into account are only those for which the requirement to coordinate is included in a footnote of the Table of Frequency Allocations referring to No. **S9.11bis** and S9.21.

Reasons:

- 1 Particulars of the foreseen interference are also required for terrestrial networks or systems, however restricted to Resolution 46 bands.
- 2 To provide for simple bilateral contact between the parties involved unless at least one wishes otherwise.
- 3 At this stage of the procedure, only comments on the particulars of the interference can be provided due to the general nature of the information available.
- 4 The last sentence of No. 1047 might be reintroduced in S9.3 as useful information for administrations.

S9.4

RUS/7/9

MOD S9.4

In the case of difficulties, the administration responsible for the planned network shall explore all possible means to resolve the difficulties without considering the possibility of adjustment to networks of other administrations, especially existing networks whose frequency assignments are recorded in the Master Register. If no such means can be found, the administration responsible for the planned network 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.

USA/9/22

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, the administration responsible for the planned network 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. A further report, if necessary, should be provided prior to the commencement of coordination or the sending of notices to the Bureau. The Bureau shall publish this information verbatim in the Special Section of its Weekly Circular.

F/54/22

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, the administration responsible for the planned network 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. S9.2ter shall after the period of four months inform the Bureau of the progress made in resolving any difficulties. A further report, if necessary shall be provided prior to the commencement of coordination or the sending of notices to the Bureau.

Reasons: Reintroduction of No. 1056.

S9.5

F/54/23

MOD S9.5

~~Action under No. S9.1 shall be taken not earlier than six years and preferably not later than two years before the planned date of introduction of the network or system (see also No. S11.43). A response under No. S9.3 shall be made as soon as possible and in any case within four months after the publication of the relevant Weekly Circular. The Bureau shall inform all administrations of the list of administrations having sent comments under No. S9.3 and provide a summary of the comments received. These measures shall be taken 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. (See also S11.47.)~~

Reasons:

- 1 Consequential to MOD S9.1; duplication with S9.3.
- 2 Reintroduction of RES46/B or AR11/B type circulars. Information of interest particularly in the registration cases for which there is no requirement for formal coordination before the notification.
- 3 Transfer to S9.5bis for sake of clarification.

S9.5A

B/17/26

ADD S9.5A

When, upon expiry of a period of six years plus the extension provided for in No. S11.44 after the date of the publication of the Weekly Circular referred to in No. S9.1, the administration responsible for the network has not submitted the Appendix S4 information for coordination under No. S9.29 or for notification under No. S11.2, as appropriate, the information published under No. S9.1 shall be cancelled after the administration concerned has been informed.

F/54/24

ADD S9.5bis

The procedure of Section I shall be taken 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.

Reasons: Clarification.



GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

AD HOC GROUP 5C1

TOPICS TO BE CONSIDERED BY AD HOC GROUP 5C1

- A. Feeder Links in Frequency Bands from 4 GHz to 8 GHz
- A.1. Feeder Links in Bands Around 5 GHz (Summary of Proposals)
- A.1.1. Bands to be Designated for Non-GSO/MSS Feeder Links

FREQUENCY BAND (MHz)	PROPOSAL	COMMENTS
5150-5250 (↑)	EUR/5/57,59	
	ANNEX 1 TO CAN/18	not explicit
	J/22/96,97,100	
	THA/57/5	
	CHN/62/38B	
	CME/73/3	
5150-5250 (↑ ↓)	RUS/7/34,37	
5100-5250 (↑)	MEX/80/10	
5090(1)-5250 (↑)	USA/9/175,177,179,180	5090-5150: no new assignments after 2010; secondary after 2015
	B/17/173,174,175,177	
	AUS/19/12A,12B,12D	5091-5150: secondary after 2015
	KOR/44/3A,3B,3C,4,5	5090-5150: secondary after 2015
<p>NOTE 1 Proposals MLI/30/8, SEN/39/7 and ICAO (Doc. 24, sections 2.4.5.1, 2.4.5.2) propose that allocations remain unchanged in 5000-5150 and that any additional allocation in 5150-5250 only enter into force after sharing criteria have been developed.</p> <p>NOTE 2 Proposal NZL/29/5 states that use of the 5 GHz band for feeder links is acceptable.</p> <p>NOTE 3 Proposal PHL/75/8 supports RR provision No.796 (MLS precedence in 5000-5250 MHz).</p>		

A.1.2. RR 2613

Most proposals state that RR 2613 does not apply in the allocations to be designated for use by non-GSO/MSS feeder links. However, Docs. J/22, KOR/44, CHN/62, MEX/80 do not refer to RR2613. Proposals which address the definition of the GSO/FSS networks with respect to which RR 2613 is waived are:

EUR/5/59: ADD 797C - GSO/FSS networks received by the ITU-BR after [xx November 1995].

CME/73/3: ADD 797C - GSO/FSS networks advanced published after 17 November 1995.

A.1.3. Aeronautical Mobile-Satellite (R) Service (Footnote 733)

USA/9/176: MOD 733 - AMS(R)S allocation limited to 5000-5150 MHz.

A.1.4. Precedence of MLS (Footnote 796)

Proposals are consequential to those in A.1.1.

A.1.5. Fixed-Satellite Service and Inter-Satellite Service Used in Conjunction with the Aeronautical Radionavigation and/or Aeronautical Mobile (R) Service (Footnote 797)

USA/9/178: MOD 797 - allocation limited to 5000-5150 MHz.

CAN/18/Annex 1: SUP 797

J/22/98: MOD 797 - stations brought into use after 17 November 1995 shall not claim protection or cause harmful interference.

A.1.6. Radiodetermination-Satellite Service (space-to-Earth) in the Band 5150-5216 MHz (Footnote 797A)

EUR/5/58: MOD 797A - Radiodetermination-Satellite Service feeder links brought into use after [xx November 1995] shall claim protection or cause harmful interference.

RUS/7/36: MOD 797A - Non-GSO/MSS feeder links shall not cause harmful interference to Radiodetermination-Satellite Service feeder links brought into use before xx November 1995 or to aeronautical radionavigation systems operating in 5000-5150 MHz.

B/17/176: SUP 797A

AUS/19/12C: SUP 797A

J/22/99: MOD 797A - Radiodetermination-Satellite Service space stations brought into use after [xx November 1995] shall claim protection or cause harmful interference.

A.1.7. Mobile Service in the Band 5150-5250 MHz (Footnote 797B)

No proposals for change

A.2. Feeder Links in Bands Around 6/7 GHz (Summary of Proposals)

A.2.1. Bands to be Designated for Non-GSO/MSS Feeder Links

FREQUENCY BAND (MHz)	PROPOSAL	ASSOCIATED CONDITIONS
7025-7075 (↓ ↑)	RUS/7/39	RUS/7/40,41,42
6975-7075 (↓)	J/22/101	J/22/102,103
	THA/57/5	
	CHN/62/40A,40B	
	CME/73/5	
	MEX/80/11	
6625-6725 (↓)	CAN/18/Annex 1	ADD 809A, 809B
6875-7075 (↓)	B/17/179	B/17/180,181
	KOR/44/6A,6B	KOR/44/6C
6825-7075 (↓)	EUR/5/60	
6725-7075 (↓)	INS/56/5	
6700-7075 (↓)	AUS/19/13A	AUS/19/13B,14
6650-7075 (↓)	USA/9/182	USA/9/183,184,185
<p><u>NOTE 1</u> Proposal NZL/29/5 states that use of the 6/7 GHz band for feeder links using reverse band working is acceptable.</p> <p><u>NOTE 2</u> Proposal PHL/75/7 supports reverse band working in the 6/4 GHz band.</p>		

B. Feeder Links in Frequency Bands from 8 GHz to 15 GHz

B.1. Bands to be Designated for Non-GSO/MSS Feeder Links

FREQUENCY BAND (MHz)	PROPOSAL	ASSOCIATED CONDITIONS
NONE	RUS/7/p.15	
	J/22/1	
	THA/57/6	
10.70-10.95 (↑)	AUS/19/16A	AUS/19/16B,16C
11.20-11.45 (↑)		
	USA/9/186	USA/9/187,188,189
12.75-13.25 (↓)	USA/9/190	USA/9/191,192
<p>NOTE 1 USA/9/Addendum 13 states that the band 13.75-14.00 GHz is not viable for space-to-Earth non-GSO/MSS feeder links.</p>		

J. ALBUQUERQUE
 Chairman of Ad hoc Group 5C1, # 400



WRC-95

WORLD
RADIOCOMMUNICATION
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**Addendum 1 to
Document DL/7-E
30 October 1995
Original: English only**

GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

AD HOC GROUP 5B1

Chairman, ad hoc Group 5B1

PROPOSALS ON TECHNICAL CONSTRAINTS (AGENDA ITEM 2.1.a)

Please replace Annex 4 to Document DL/7 by the attached Annex 4 and add the following new Annexes 5, 6 and 7.

ANNEX 4 Article [28] S21

EUR/5/42, B/17/161-164, CAN/18/45, 46, 49, 50, IRN/25/16, CPM Report
(Chapter 2, Section I, Part A.2, § 1.4.8 and § 1.4.9)

For reference: page 47 of EUR/5

ANNEX 5 Comparison of proposals relating to RR731E

ANNEX 6 Comparison of proposals relating to RR746B

ANNEX 7 Comparison of proposals relating to RR753F

M. Murotani (Box 230)
Chairman of ad hoc Group 5B1

- 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.

EUR/5/42
ADD 2556.1

(See table.)

Reasons: See EUR/5/40.

Frequency Band (MHz)	Service to be protected	Coordination Threshold Factors				
		Geostationary Space Stations		Non-Geostationary Space Stations		
		pfd calculation factors (NOTE 2)		pfd calculation factors (NOTE 2)		FDP (in 1 MHz) (NOTE 1)
		P dB(W/m ²) in 4 kHz	r dB/deg	P dB(W/m ²) in 4 kHz	r dB/deg	
2 160 - 2 200	Fixed service analogue	-152	0.5	-147	0.5	
2 483.5 - 2 500		-152	0.5	-150	0.65	
2 160 - 2 200	Fixed service digital	-152	0.5			25 %
2 483.5 - 2 500		-152	0.5	-150	0.65	
2 160 - 2 200	Other terrestrial services	-152	0.5	-152	0.5	
2 483.5 - 2 500		-152	0.5	-152	0.5	

NOTE 1 – The definition for calculation of FDP (Fractional Degradation in Performance) is contained in the relevant ITU-R Recommendations.

NOTE 2 – The following formulae are used for pfd:

$$P \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 0^\circ \leq \delta \leq 5^\circ$$

$$P + r(\delta-5) \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 5^\circ < \delta < 25^\circ$$

$$P + 20r \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 25^\circ \leq \delta \leq 90^\circ$$

The limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

B/17/161
ADD

TABLE [AR28bis]

PFD or FDP thresholds for non-GSO MSS satellites

Frequency band	Service	Limit in dB(W/m ² /4 kHz) for angle of arrival δ above the horizontal plane		
		0° - 5°	5° - 25°	25° - 90°
1 492 - 1 525	Mobile-satellite	-152 ^{6,7}	-152 + 0.5 (δ -5) ^{6,7}	-142 ^{6,7}
2 160 - 2 170 (R2)	Mobile-satellite	-147 ⁷	-147 + 0.5 (δ -5) ⁷	-137 ⁷
2 170 - 2 200	Mobile-satellite	-147 ⁷	-147 + 0.5 (δ -5) ⁷	-137 ⁷
2 483.5 - 2 500	Mobile-satellite	-150 ⁸	-150 + 0.65 (δ -5) ⁸	-137 ⁸

Reasons: To take into account the results of the work of the ITU-R in the cases of the bands 1 492 - 1 525 MHz, 2 160 - 2 200 MHz and 2 483.5 - 2 500 MHz.

B/17/162

ADD S21.16.6

⁶ The power-flux density values to protect analogue systems is to be determined for this band for each non-geostationary mobile-satellite system proposed. Until such time as the new values are available, the values given in this box will apply.

Reasons: Same as in proposal **B/17/161**.

B/17/163

ADD S21.16.7

⁷ The power flux-density values specified for the bands 1 492 - 1 530 MHz and 2 160 - 2 200 MHz provide full protection for analogue radio-relay systems from a non-geostationary mobile-satellite system employing narrow-band TDMA/FDMA techniques. For digital radio-relay systems an FDP (fractional degradation of performance) value of 25% is applicable. The method for calculating the FDP for a fixed service network is contained in the ITU-R Recommendations.

Reasons: Same as in proposal **B/17/161**.

B/17/164

ADD S21.16.8

⁸ The power flux-density values given in this box provide full protection for analogue radio-relay systems from multiple non-geostationary mobile-satellite systems employing CDMA techniques. These power flux-density values will not provide full protection for existing digital fixed systems in all cases.

However, these power flux-density values are considered to provide adequate protection for digital fixed systems designed to operate in this band,

where high power ISM and possible low power applications are expected to produce a relatively high interference environment.

Reasons: Same as in proposal **B/17/161**.

CAN/18/45

ADD 2560A

(2bis)Coordination threshold:

a) Coordination is required with the fixed service if the power-flux density at the Earth's surface produced by emissions from a space station of a non-geostationary system, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, exceeds the following values:

-150 dB(W/m²) in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

-150 + 0.65 (δ-5) dB(W/m²) in any 4 kHz band for angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane;

-137 dB(W/m²) in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These values relate to the power-flux density which would be obtained under assumed free-space propagation conditions.

CAN/18/46

ADD 2560B

b) The coordination thresholds given in No. **2560A** apply in the frequency band 2 483.5 - 2 500 MHz to the mobile-satellite service (space-to-Earth) and the radiodetermination-satellite service (space-to-Earth).

Reasons: To implement the findings of CPM-95 (see Section 3.6.4.8, Chapter 2, Section 1, Part C of the CPM-95 Report).

NOTE – Canada is considering the possibility of creating a single provision in **Article 28**, **Article S21** and **Appendix S5** which would encompass such coordination thresholds as provisions distinct from the regular pfd limits of the current **Article 28**.

Consequential modifications to Article S21 and Table [AR28]

TABLE [AR28]

**CAN/18/49
MOD**

Frequency band	Service	Limit in dB(W/m ²) for angle of arrival above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
.....					
<u>2 483.5 - 2 500</u>	<u>Mobile-Satellite (S-E)</u> <u>Radiodetermination -Satellite (S-E)</u>	<u>-150</u> ⁶	<u>-150 + 0.65 (δ - 5)</u> ⁶	<u>-137</u> ⁶	<u>4 kHz</u>
.....					

CAN/18/50

ADD S.21.16.6

⁶ These values are to be used to determine whether coordination is required between the non-geostationary space stations and stations in the fixed or mobile services.

Reasons: Implement the findings of CPM-95 (see CPM-95 Report, Section 3.6.4.8, Chapter 2, Section 1, Part C).

IRN/25/16
ADD 2556.1

Frequency band (MHz)	Service to be protected	Coordination threshold factors				
		Geostationary space stations		Non-geostationary space stations		
		pfd calculation factors (NOTE 2)		pfd calculation factors (NOTE 2)		FDP (in 1 MHz) (NOTE 1)
		P dB (W/m ²) in 4 kHz	r dB/deg	P dB (W/m ²) in 4 kHz	r dB/deg	
2 160 - 2 200	Fixed service	-152	0.5	-147	0.5	
2 483.5 - 2 500	analogue	-152	0.5	-150	0.65	
2 160 - 2 200	Fixed service	-152	0.5			25 %
2 483.5 - 2 500	digital	-152	0.5	-150	0.65	
2 160 - 2 200	Other terrestrial services	-152	0.5	-152	0.5	
2 483.5 - 2 500		-152	0.5	-152	0.5	

NOTE 1 – The definition for calculation of FDP (fractional degradation in performance) is contained in the relevant ITU-R Recommendations.

NOTE 2 – The following formulae are used for pfd:

$$P \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 0^\circ \leq \delta \leq 5^\circ$$

$$P + r(\delta-5) \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 5^\circ < \delta < 25^\circ$$

$$P + 20r \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 25^\circ \leq \delta \leq 90^\circ$$

The limits relate to the power-flux density which would be obtained under assumed free-space propagation conditions.

Reasons: See IRN/25/15.

CPM Report (Chapter 2, Section I, Part A.2)

1.4.8 Sharing with the mobile service (FPLMTS)

MSS (space-to-Earth) and (Earth-to-space) networks cannot share frequencies with the terrestrial component of FPLMTS in the same and adjacent geographic areas. However, sharing with MSS (space-to-Earth) may be feasible in a non-co-frequency, co-coverage environment.

1.4.9 Sharing with other mobile services

The criteria under development for sharing between the MSS (space-to-Earth) and receiving stations in the fixed service may also adequately protect mobile services, although further study is needed. Some systems in the mobile service (e.g. transportable equipment used for

electronic new gathering) appear to be similar to certain types of fixed systems (e.g. point-to-multipoint systems). It is noted that in RR Article 28 (pfd limits on transmitting space stations) and Appendix 28 (parameters for calculation of coordination area), no distinction is made between systems in the terrestrial services (e.g. fixed and mobile). Thus, for the time being, it is reasonable to assume that sharing between general mobile services and the MSS is no more constraining than sharing between MSS and the fixed service.

FOR REFERENCE (extract from EUR/5):

C Revision of Resolution 46

...

Background

...

Above 1 GHz, Resolution **46** applies in the following bands (space-to-Earth):

- 1 492 - 1 525 MHz (No. **723C**)
- 1 525 - 1 530 MHz (No. **726D**)
- 1 530 - 1 559 MHz (No. **726D**)
- 1 613.8 - 1 626.5 MHz (No. **731F**, secondary)
- 2 160 - 2 200 MHz (No. **746B**)
- 2 483.5 - 2 500 MHz (No. **753F**)
- 2 670 - 2 690 MHz (No. **746A**, plus Article **14** until 2005)
- 2 655 - 2 670 (No. **766**, plus Article **14**)

In all these allocations to MSS above 1 GHz, Section II paragraph 2.2 of Resolution **46** applies in case of exceedance of pfd levels, except in the band 1 530 - 1 559 (original Inmarsat bands), where there is no pfd threshold since the band is not shared on an equal status with terrestrial services, 1 613.8 - 1 626.5 MHz (secondary status) and 2 655 - 2 690 MHz (under Article **14** at least until 2005).

In summary, in the bands in which the use of the MSS is not limited by a secondary status or by Article 14, and which are shared on an equal basis with terrestrial services, coordination with terrestrial services under Section II paragraph 2.2 of Resolution **46** is foreseen in case of pfd threshold exceedance. The validity of this provision is therefore a general one and the title of Resolution **46** should be amended to reflect this situation.

If this amendment is decided by WRC-95, a consequential change would be the simplification of Nos. Nos. **723C**, **726D**, **746B** and **753F** by deletion of the sentence: "In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution **46** (WARC-92) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations."

ANNEX 5

Comparison of proposals relating to RR731E

1. First sentence

1.1 B/17/142 proposes the deletion of "and by the radiodetermination-satellite service (Earth-to-space)".

1.2 Change from "Resolution 46 (WARC-92) to "Resolution 46 (WRC-95) is editorial.

2. Second sentence

2.1 B/17/142 proposes the change from "either of the services" to "this service".

2.2 Change from "an e.i.r.p." to "a peak e.i.r.p." is unanimous.

2.3 USA/9/156 proposes the addition of "(No. 953 applies)".

3. Third sentence

3.1 Six contributions propose the change from "a value" to "a mean value".

3.2 RUS/7/28 proposes the change from "a value of -3 dB (W/4 kHz) is applicable" to "the mean e.i.r.p. density of a mobile earth station shall not exceed -3 dB (W/4 kHz)".

4. Fourth sentence

4.1 USA/9/156 and B/17/142 propose SUP.

4.2 EUR/5/39 proposes a modified text.

4.3 RUS/7/28, CAN/18/20, IND/41/149 and CHN/52/32 propose NOC.

ANNEX 6

Comparison of proposals relating to RR746B

1. It seems that AUS/19/10 is covered by one of the other proposals.
2. First sentence
 - 2.1 Some contributions propose amendments to "allocated frequency bands" and "date of entry". But they will not be considered by 5B1.

The report from 5B1 to WG 5B will contain the following Note:

[Note to WG 5B - Some proposals on RR746B contained amendments to "allocated frequency bands" and "date of entry". But Ad Hoc Group 5B1 did not consider them. The conclusion of WG 5B on these matters may lead to consequential amendments to RR746B.]

- 2.2 Change from "Resolution 46 (WARC-92)" to "Resolution 46 (WRC-95) is editorial.
3. Second sentence
 - 3.1 J/22/95 proposes SUP
 - 3.2 Change of "coordination of space stations"
EUR/5/40, CHN/62/37 "coordination of transmitting space stations"
B/17/171 "coordination of assignments to transmitting space stations"
 - 3.3 EUR/5/40, B/17/171, IRN/25/14 and CHN/62/37 propose the addition of "under Resolution 46 (WRC-95)" after "the mobile-satellite service".
 - 3.4 B/17/171 and CHN/62/37 propose the addition of "assignments to receiving stations of" before "terrestrial services".
 - 3.5 Threshold values

EUR/5/40, IRN/25/16:	identical with Rec. IS.1141 [Doc. 2/6] for non-GSO satellites and with Rec. ITU-R IS.1142 [Doc. 2/7] for GSO satellites, with additional pfd limits for "other terrestrial services"
USA/9/170, KOR/44/1E:	identical with Rec. ITU-R IS.1141 [Doc. 2/6] for non-GSO satellites, but no threshold for GSO satellites (sharing with mobile service not discussed)
B/17/171:	the threshold values for non-GSO satellites are proposed in B/17/161-164 (Article 28)
 - 3.6 Approach for defining thresholds

Reference to Article 28: EUR/5/40, B/17/171, IRN/25/14 [Note 1 by the Chairman of 5B1 - The definition for calculation of FDP proposed in Article 28 seems ambiguous]

Reference to Rec. ITU-R IS.1141: USA/9/170, KOR/44/1E [Note 2 by the Chairman of 5B1 - Rec. ITU-R IS.1141 applies only to sharing between non-GSO satellites and FS]

Relevant provisions of RR: CHN/62/37

[Note 3 by the Chairman of 5B1 - In case of "incorporation by reference", ad hoc Group 5B1 has been requested by the Chairman of Committee 5 to prepare two alternative texts, one based on, and another not based on "incorporation by reference".]

[Note 4 by the Chairman of 5B1 - Note 2 of Rec. ITU-R IS.1141 [Doc. 2/6] is not appropriate from the regulatory standpoint, because a further reference to Rec. ITU-R F.1108 is not desirable. It seems that the following three Recommendations are required to calculate FDP:

Rec. ITU-R F.1108-1: methodology for FDP calculation

Rec. ITU-R IS.1143 [Doc.2/8]: FS system parameters

Rec. ITU-R F.699-3: FS antenna reference radiation pattern

In addition, it is noted that Rec. ITU-R F.1108-1 deals only with point-to-point radio-relay systems. It should be decided whether FDP in Rec. ITU-R IS.1141 should be calculated also for point-to-multipoint FS systems.]

[Note 5 by the Chairman of 5B1 - A case study for incorporating Rec. ITU-R IS.1141 by reference reveals the need of the following principle:

"An ITU-R Recommendation which may be incorporated into the Radio Regulations by reference shall not rely on other ITU-R Recommendations for its application, but shall contain all the information necessary for its application".

This may be communicated from Committee 5 to Committee 4.]

4. Third sentence

4.1 Change from "Resolution 46 (WARC-92)" to "Resolution 46 (WRC-95)" is editorial.

4.2 [Note 6 by the Chairman of 5B1 - Revision by Committee 4 of Resolution 46 may lead to renumbering of the referenced provisions].

5. Fourth sentence

5.1 J/22/95 proposes a new fourth sentence.

5.2 CHN/62/37 proposes a new fourth sentence.

ANNEX 7

Comparison of proposals relating to RR753F

1. First sentence
 - 1.1 B/17/159 proposes the deletion of "and the radiodetermination-satellite".
 - 1.2 Change from "Resolution 46 (WARC-92)" to "Resolution 46 (WRC-95)" is editorial.
 2. Second sentence
 - 2.1 B/17/159 proposes the deletion of "and radiodetermination-satellite".
 - 2.2 USA/9/174 proposes the addition of "per station".
 - 2.3 Threshold values

USA/9/174: GSO	single set of values in RR753F for both GSO and non-satellites and for all types of terrestrial services
EUR/5/41, B/17/159, IRN/25/15:	reference to Article 28 (the values are identical with Rec. ITU-R IS.1141 for non-GSO satellites and with Rec. ITU-R IS.1142 for GSO satellites)
KOR/44/2B:	reference to Rec. ITU-R IS.1141 [Note - Rec. ITU-R IS.1141 applies only to non-GSO satellites]
CAN/18/45-50:	no proposal to modify RR753F but a proposal to add provisions in Article 28 (the values are identical with USA/9/174)
 3. Third sentence

See § 4 of Annex 6.
 4. Fourth sentence

USA/9/174 proposes a new fourth sentence.
-



WRC-95

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AD HOC GROUP 5B1

Chairman, ad hoc Group 5B1

PROPOSALS ON TECHNICAL CONSTRAINTS (AGENDA ITEM 2.1.a))

Please find attached herewith the texts of the proposals related to the work of ad hoc Group 5B1.

Annex 1 RR 731E

EUR/5/39, RUS/7/28, USA/9/156, B/17/142, CAN/18/20, IND/41/149, CHN/62/32 CPM Report (Chapter 2, Section I, Part A.2, § 1.3.1) (for information only).

Annex 2 RR 746B

EUR/5/40, USA/9/170, B/17/171, AUS/19/10, J/22/95, IRN/25/14, KOR/44/1E, CHN/62/37 CPM Report (Chapter 2, Section I, Part A.2, § 1.3.1) (for information only).

Annex 3 RR 753F

EUR/5/41, USA/9/174, B/17/159, IRN/25/15, KOR/44/2B CPM Report (Chapter 2, Section I, Part A.2, § 1.3.1) (for information only).

Annex 4 Article [28] S21

B/17/161-164, CAN/18/45, 46, 49, 50, IRN/25/16.

NOTE – The following proposals relating to "sharing studies" and "radio astronomy" are not included in this document. EUR/5/43, B/17/165, 166, ALG/23/4, IND/41/151.

M. MUROTANI
Chairman of ad hoc Group 5B1

Annexes: 4

ANNEX 1

EJR/5/39

MOD 731E
S5.364

The use of the band 1 610 - 1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~WARC-95). A mobile earth station operating in either of the services in this band shall not produce an peak e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. [732] S5.366, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a mean value of -3 dB(W/4 kHz) is applicable. Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radio-navigation service, and stations operating in accordance with the provisions of No. [732] S5.366 ~~and stations in the fixed service operating in accordance with the provisions of No. S5.359.~~

Reasons: In order to ease the regulatory constraints on the mobile-satellite service in the band 1 610 - 1 626.5 MHz.

RJS/7/28

MOD 731E
WARC-92
S5.364

The use of the band 1 610 - 1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~). A mobile earth station operating in either of the services in this band shall not produce an peak e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. [732] S5.366, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a value of the mean e.i.r.p. density of a mobile earth station shall not exceed -3 dB(W/4 kHz) ~~is applicable~~. Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. [732] S5.366 and stations in the fixed service operating in accordance with the provisions of No. [730] S5.359.

Reasons: In line with the recommendations in the CPM Report for more precise formulation of the requirements for shared use of frequencies with systems operating in accordance with No. [732] S5.366 of the Radio Regulations.

JSA/9/156

MOD 731E
S5.364

The use of the band 1 610 - 1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~WARC-95). A mobile earth

station operating in either of the services in this band shall not produce an peak e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. [132] S5.356 (No. 953 applies), unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a mean value of -3 dB(W/4 kHz) is applicable. ~~Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. [132] S5.356 and stations in the fixed service operating in accordance with the provisions of No. [133] S5.357.~~

Reasons: Inclusion of the terms "peak" and "mean" are to clarify how the e.i.r.p. density limit should be measured. The text proposed for deletion at the end of this provision is unnecessary to protect the primary allocation status of the identified services and creates confusion and ambiguity concerning the primary status of the mobile-satellite service in the 1 610 - 1 626.5 MHz band. The addition of text to reference No. 953 is to ensure that special measures to avoid harmful interference to safety communications are taken into account.

B/11/142

MOD 731E
S5.356

The use of the band 1 610 - 1 626.5 MHz by the mobile-satellite service (Earth-to-space) ~~and by the radiodetermination-satellite service (Earth-to-space)~~ is subject to the application of the coordination and notification procedures set forth in Resolution 45 (WARC-97/WRC-97). A mobile earth station operating in either of the ~~this~~ services in this band shall not produce an peak e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. [132] S5.356, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a mean value of -3 dB(W/4 kHz) is applicable. ~~Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. [132] S5.356 and stations in the fixed service operating in accordance with the provisions of No. [133] S5.357.~~

Reasons: A mean value of -3 dB (W/4 kHz) is required for the provision of the mobile-satellite service to lightweight handsets. It is also proposed that the mobile-satellite service operates on an equal basis with the aeronautical radionavigation service, the fixed service and those stations operating in accordance with the provisions of No. [132] S5.356. The reference to the radiodetermination-satellite service is also deleted for the reason in proposal B/11/141.

CAN/18/20

MOD 731E
S5.356

The use of the band 1 610 - 1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution 45 (WARC-97). A mobile earth station operating in either of the services in this band shall not produce an peak e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by

systems operating in accordance with the provisions of No. [732] S5.366, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a mean value of -3 dB(W/4 kHz) is applicable. Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radio-navigation service, stations operating in accordance with the provisions of No. [732] S5.366 and stations in the fixed service operating in accordance with the provisions of No. [73C] S5.359.

Reasons: This modification is consistent with the recommendations of the CPM-95 Report (Chapter 2, Section I, Part A.2, item 1.3.1), and is intended to clarify the method of measurement of the e.i.r.p. density applied to earth stations of the mobile-satellite and radionavigation services.

IND/41/149
MOD 731E
S5.364

The use of the band 1 610 - 1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-97~~WRC-95). A mobile earth station operating in either of the services in this band shall not produce an peak e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. [732] S5.366, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a mean value of -3 dB(W/4 kHz) is applicable. Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. [732] S5.366 and stations in the fixed service operating in accordance with the provisions of No. [73C] S5.359.

Reasons: To clarify the reference to peak and mean values of the e.i.r.p.

CHN/62/32
MOD 731E
S5.364

The use of the band 1 610 - 1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-97~~WRC-95). A mobile earth station operating in either of the services in this band shall not produce an peak e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. [732] S5.366, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a mean value of -3 dB(W/4 kHz) is applicable. Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. [732] S5.366 and stations in the fixed service operating in accordance with the provisions of No. [73C] S5.359.

Reasons: To clarify how the e.i.r.p. density limit should be measured.

CPM Report (Chapter 2, Section I, Part A.2)

1.3.1 Constraints on MSS Earth-to-space allocations

RR 731E

There is a need to clarify how the e.i.r.p. density limits given in RR 731E should be measured. In assessing whether the limit of RR 731E is exceeded, it is recommended that these limits should be understood to be a peak e.i.r.p. density of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of RR 732, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a mean value of -3 dB(W/4 kHz) is applicable.

In some MSS allocations subject to Resolution 46, the MSS service is subject to various regulatory constraints via footnotes which may qualify the status of the MSS with respect to other services. For example, RR 731E states that the MSS, a primary service in the Table of Frequency Allocations (Article 8 of the RR), "shall not cause harmful interference to or claim protection from," some of the other primary services. This situation is not unique, however, since there are similar cases in which one primary allocation should protect another primary allocation if required by a footnote to the entry in the Table. Further consideration of the impact of such footnotes qualifying some primary MSS allocations within the context of Resolution 46 coordination between primary services will be necessary.

ANNEX 2

EUR/5/40

MOD 746B*
S5.389

The use of the bands 1 970 - 2 010 MHz and 2 160 - 2 200 MHz by the mobile-satellite service shall not commence before 1 January ~~2005~~2000 and is subject to the application of the coordination and notification procedures set forth in Resolution ~~46 (WARC-92)~~WRC-95. In the band 2 160 - 2 200 MHz coordination of transmitting space stations of the mobile-satellite service under Resolution 46 (WRC-95) with respect to terrestrial services is required only ~~if the power flux density produced at the Earth's surface exceeds the limits in [No. 2566] Article S21, Table [AR28] if the limits in No. 2556.1 are exceeded.~~ In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution ~~46 (WARC-92)~~WRC-95 shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: The reference to No. 2566 is updated taking into account the latest work of TG 2/2 to develop new coordination triggers in MSS space-to-Earth allocations with respect to the fixed service. See ITU-R draft new Recommendations 2/6 and 2/7. A new Article 28 No. 2556.1 is proposed taking into account TG-2/2's proposed coordination thresholds.

USA/9/170

MOD 746B
S5.389

The use of the bands 1 970 - 2 010 MHz and 2 160 - 2 200 MHz by the mobile-satellite service shall not commence before 1 January 2005 and is subject to the application of the coordination and notification procedures set forth in Resolution ~~46 (WARC-92)~~WRC-95. In the band 2 160 - 2 200 MHz coordination of space stations of the mobile-satellite service with respect to terrestrial services is required only if the power flux-density or Fractional Degradation Percentage produced at the Earth's surface exceeds the ~~limits in No. 2566~~threshold in Recommendation ITU-R IS.[Document 2/6]. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution ~~46 (WARC-92)~~WRC-95 shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: The modification to No. 746B will facilitate the introduction of mobile-satellite systems in this band by providing updated technical coordination limits.

B/17/171

MOD 746B
S5.389

The use of the bands ~~1 970~~1 990 - 2 010 MHz and ~~2 160~~2 180 - 2 200 MHz by the mobile-satellite service shall not commence before 1 January ~~2005~~2000 (and the bands 1 970 - 1 990 MHz and 2 160 - 2 180 MHz not before 1 January 2005) and is subject to the application of the coordination and notification procedures set forth in Resolution ~~46 (WARC-92)~~WRC-95. In the band 2 160 - 2 200 MHz coordination of assignments to transmitting space stations of the mobile-satellite service under

* See also EUR/5/53.

Resolution 46 (WRC-95) with respect to assignments to receiving stations of terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in Article S21, Table [AR28]. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (~~WARC-92~~WRC-95) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: To make 2 x 20 MHz available to the mobile-satellite service in the 2 GHz frequency range by the year 2000.

AUS/19/10

The coordination threshold reference in No. 746B [S5.389] to "the limits in No. 2566" [S21.16] should be replaced by an appropriate reference based on ITU-R Recommendation IS.[Document 2/6].

J/22/95

MOD 746B
S5.389

The use of the bands 1 970 - 2 010 MHz and 2 160 - 2 200 MHz by the mobile-satellite service shall not commence before 1 January ~~2005~~2000 and is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~WRC-95). ~~In the band 2 160 - 2 200 MHz coordination of space stations of the mobile-satellite service with respect to terrestrial services is required only if the power flux density produced at the Earth's surface exceeds the limits in No. [2566] Article S21, Table [AR28].~~ In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (~~WARC-92~~WRC-95) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations. The use of the bands 1 970 - 2 010 MHz and 2 160 - 2 200 MHz by the mobile-satellite service does not preclude the use of these bands by other existing systems to which the frequencies within these bands are assigned before 17 November 1995.

Reasons: The CPM Report says that the frequency sharing between MSS (Earth-to-space) and FS is difficult. Since many fixed stations are used in these bands in the world, priority should be given to the existing services. Therefore, it is adequate to introduce MSS systems by using frequency segments which are lightly used by the FS, in order to avoid severe FS interference.

IRN/25/14

MOD 746B
S5.389

The use of the bands 1 970 - 2 010 MHz and 2 160 - 2 200 MHz by the mobile-satellite service shall not commence before 1 January 2005 and is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~WRC-95). In the band 2 160 - 2 200 MHz coordination of space stations of the mobile-satellite service under Resolution 46 (WRC-95) with respect to terrestrial services is required only if the power flux density produced at the Earth's surface exceeds the limits in [No. 2566] Article S21, Table [AR28] are exceeded. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of

Resolution ~~46 (WARC-92/WRC-95)~~ shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: The reference to [No. 2566] Article S21, Table [AR28] is updated taking into account the latest work of TG 2/2 to develop new coordination triggers in MSS space-to-Earth allocations with respect to the Fixed Service. See ITU-R draft new Recommendations 2/6 and 2/7. A new Article 28, No. 2556.1 is proposed, taking into account TG 2/2's proposed coordination thresholds.

KCR/44/1E
MOD 746B
S5.389

The use of the bands 1 970 - 2 010 MHz and 2 160 - 2 200 MHz by the mobile-satellite service shall not commence before 1 January ~~2005~~2000 and is subject to the application of the coordination and notification procedures set forth in Resolution ~~46 (WARC-92/WRC-95)~~. In the band 2 160 - 2 200 MHz coordination of space stations of the mobile-satellite service with respect to terrestrial services is required only if the power flux-density or fractional degradation in performance produced at the Earth's surface per space station exceeds the limits in ~~Article [2566] S21, Table [AR28]~~ITU-R IS Recommendation [Document 2/6]. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution ~~46 (WARC-92/WRC-95)~~ shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: This proposal is to facilitate the timely introduction of worldwide mobile-satellite services and to reduce the number of coordinations between the mobile-satellite service and fixed service, while providing adequate protection to the fixed service.

CHN/62/37
MOD 746B
WARC-92
S5.389

The use of the bands ~~1 970 - 2 010 MHz and 2 160 - 2 200 MHz~~ 1 980 - 2 010 MHz and 2 170 - 2 200 MHz in Regions 1 and 3 and 1 970 - 2 010 MHz and 2 160 - 2 200 MHz in Region 2 by the mobile-satellite service shall not commence before 1 January ~~2005~~2000 and is subject to the application of the coordination and notification procedures set forth in Resolution ~~46 (WARC-92/WRC-95)~~. In the band 2 160 - 2 200 MHz coordination of transmitting space stations of the mobile-satellite service under Resolution 46 (WRC-95) with respect to assignments to receiving stations of terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in ~~No. 2566~~. ~~In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (WARC-92) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.~~ the relevant provisions of the Radio Regulations. Before 1 January 2005, the use of the bands 1 970 - 2 010 MHz and 2 160 - 2 200 MHz by the mobile-satellite services shall not cause harmful interference to the use of these bands by, and shall not claim protection from harmful interference caused by other services to which these bands are allocated.

Reasons:

- 1 To advance the date of entry into force of allocations in the bands 1 980 - 2 010 MHz and 2 170 - 2 200 MHz to 1 January 2000 to satisfy the need of the MSS.
- 2 Resolution 46 (WARC-92) would be modified at WRC-95.
- 3 To emphasize the need to protect already existing FS systems in the 2 GHz band.

CPM Report (Chapter 2, Section I, Part A.2)

1.3.1 Constraints on MSS Earth-to-space allocations

RR 746B and RR 746C

The bands 1 970 - 1 980 MHz in Region 2, and 1 980 - 2 010 MHz in all Regions, are allocated to the MSS under RR 746B and RR 746C (see Part B of Section I).

ANNEX 3

EUR/5/41

MOD 753F
S5.402

The use of the band 2 483.5 - 2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92/WRC-95~~). Coordination of space stations of the mobile-satellite and radiodetermination-satellite services with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in [~~No. 2556~~] Article 571, Table [~~AR38~~] No. 2556.1. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (~~WARC-92/WRC-95~~) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: See EUR/5/40.

JSA/9/174

MOD 753F
S5.402

The use of the band 2 483.5 - 2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92/WRC-95~~). Coordination of space stations of the mobile-satellite and radiodetermination-satellite services with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface per space station exceeds ~~the limits in No. 2556.1~~:

- = -150 dB (W/m²) in any 4 kHz band for angles of arrival between 0 and 5° above the horizontal plane;
- = -150 + 0.65 (δ-5) dB (W/m²) in any 4 kHz band for angles of arrival δ (°) between 5 and 25° above the horizontal plane;
- = -137 dB (W/m²) in any 4 kHz band for angles of arrival between 25 and 90° above the horizontal plane.

These values relate to the power-flux density which would be obtained under assumed free-space conditions. See Recommendation ITU-R IS.1 Document 2/6. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (~~WARC-92/WRC-95~~) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations. Administrations are urged to take all practicable steps to prevent harmful interference to the radio astronomy service from emissions in the 2 483.5 - 2 500 MHz band, especially those caused by second-harmonic radiation that would fall into the 4 990 - 5 000 MHz band allocated exclusively to the radio astronomy service worldwide.

Reasons: As stated in the CPM-95 Report, this modification will reduce the number of coordinations required between the mobile-satellite service and the fixed service, while providing adequate protection to the fixed service systems in this band.

B/17/159

MOD 753F
S5.402

The use of the band 2 483.5 - 2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~WRC-95). Coordination of space stations of the mobile-satellite and radiodetermination-satellite services with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in Article S21, Table [AR28]. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (~~WARC-92~~WRC-95) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: Same as in proposal B/17/158.

IRN/25/15

MOD 753F
S5.402

The use of the band 2 483.5 - 2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~WRC-95). Coordination of space stations of the mobile-satellite and radiodetermination-satellite services with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in [No. 2566] Article S21, Table [AR28]. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (~~WARC-92~~WRC-95) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: See IRN/25/16.

KOR/44/2B

MOD 753F
S5.402

The use of the band 2 483.5 - 2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the application of the coordination and notification procedures set forth in Resolution 46 (~~WARC-92~~WRC-95). Coordination of space stations of the mobile-satellite and radiodetermination-satellite services with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface per space station exceeds the limits in Article ~~[2566]~~ S21, Table [AR28] ITU-R IS Recommendation [Document 2/6]. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (~~WARC-92~~WRC-95) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

Reasons: This modification is to reduce the number of coordinations between the mobile-satellite service and the fixed service, while providing adequate protection to the fixed service.

CPM Report (Chapter 2, Section I, Part A.2)

1.3.1 Constraints on MSS Earth-to-space allocations

RR 753F

The pfd thresholds currently applicable to MSS (space-to-Earth) in the 2 483.5 - 2 500 MHz band are those contained in RR 2566. These thresholds may be more stringent than is required to protect analogue terrestrial fixed services. Some MSS systems may plan to operate at slightly higher pfd's in order to provide the levels of capacity needed to meet service requirements. Raising the pfd thresholds may reduce the number of coordinations between MSS and FS systems, while still providing adequate protection to the analogue FS systems. With regard to protection of digital systems, refer to § 1.4.6.4a. For proposed new pfd levels in this band, refer to draft new Recommendation ITU-R IS.[Document 2/6].

ANNEX 4

B/17/161
ADD

TABLE [AR28bis]

Frequency band	Service	Limit in dB(W/m ² /4 kHz) for angle of arrival δ above the horizontal plane		
		0° - 5°	5° - 25°	25° - 90°
1 492 - 1 525	Mobile-satellite	-152 ^{6, 7}	-152 + 0.5 (δ -5) ^{6, 7}	-142 ^{6, 7}
2 160 - 2 170 (R1, R2)	Mobile-satellite	-147 ⁷	-147 + 0.5 (δ -5) ⁷	-137 ⁷
2 170 - 2 200	Mobile-satellite	-147 ⁷	-147 + 0.5 (δ -5) ⁷	-137 ⁷
2 483.5 - 2 500	Mobile-satellite	-150 ⁸	-150 + 0.65 (δ -5) ⁸	-137 ⁸

Reasons: To take into account the results of the work of the ITU-R in the cases of the bands 1 492 - 1 525 MHz, 2 160 - 2 200 MHz and 2 483.5 - 2 500 MHz.

B/17/162
ADD S21.16.6

⁶ The power-flux density values to protect analogue systems is to be determined for this band for each non-geostationary mobile-satellite system proposed. Until such time as the new values are available, the values given in this box will apply.

Reasons: Same as in proposal B/17/161.

B/17/163
ADD S21.16.7

⁷ The power flux-density values specified for the bands 1 492 - 1 530 MHz and 2 160 - 2 200 MHz provide full protection for analogue radio-relay systems from a non-geostationary mobile-satellite system employing narrow-band TDMA/FDMA techniques. For digital radio-relay systems an FDP (fractional degradation of performance) value of 25% is applicable. The method for calculating the FDP for a fixed service network is contained in the ITU-R Recommendations.

Reasons: Same as in proposal B/17/161.

B/17/164
ADD S21.16.8

⁸ The power flux-density values given in this box provide full protection for analogue radio-relay systems from multiple non-geostationary mobile-satellite systems employing CDMA techniques. These power flux-density values will not provide full protection for existing digital fixed systems in all cases. However, these power flux-density values are considered to provide adequate protection for digital fixed systems designed to operate in this band, where high power ISM and possible low power applications are expected to produce a relatively high interference environment.

Reasons: Same as in proposal B/17/161.

CAN/18/45
ADD 2560A

(2bis)Coordination threshold:

a) Coordination is required with the fixed service if the power-flux density at the Earth's surface produced by emissions from a space station of a non-geostationary system, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, exceeds the following values:

-150 dB(W/m²) in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

-150 + 0.65 (δ-5) dB(W/m²) in any 4 kHz band for angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane;

-137 dB(W/m²) in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These values relate to the power-flux density which would be obtained under assumed free-space propagation conditions.

CAN/18/46
ADD 2560B

b) The coordination thresholds given in No. **2560A** apply in the frequency band 2 483.5 - 2 500 MHz to the mobile-satellite service (space-to-Earth) and the radiodetermination-satellite service (space-to-Earth).

Reasons: To implement the findings of CPM-95 (see Section 3.6.4.8, Chapter 2, Section 1, Part C of the CPM-95 Report).

NOTE – Canada is considering the possibility of creating a single provision in **Article 28**, **Article S21** and **Appendix S5** which would encompass such coordination thresholds as provisions distinct from the regular pfd limits of the current **Article 28**.

Consequential modifications to Article S21 and Table [AR28]

TABLE [AR28]

Frequency band	Service	Limit in dB(W/m ²) for angle of arrival above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
.....					
<u>2 483.5 - 2 500</u>	<u>Mobile-Satellite (S-E)</u> <u>Radiodetermination -Satellite (S-E)</u>	<u>-150⁶</u>	<u>-150 + 0.65 (δ-5)⁶</u>	<u>-137⁶</u>	<u>4 kHz</u>
.....					

CAN/18/49
MOD

CAN/18/50

ADD S.21.16.6

⁶ These values are to be used to determine whether coordination is required between the non-geostationary space stations and stations in the fixed or mobile services.

Reasons: Implement the findings of CPM-95 (see CPM-95 Report, Section 3.6.4.8, Chapter 2, Section 1, Part C).

IRN/25/16
ADD 2556.1

Frequency band (MHz)	Service to be protected	Coordination threshold factors				
		Geostationary space stations		Non-geostationary space stations		
		pfd calculation factors (NOTE 2)		pfd calculation factors (NOTE 2)		FDP (in 1 MHz) (NOTE 1)
		P dB (W/m ²) in 4 kHz	r dB/deg	P dB (W/m ²) in 4 kHz	r dB/deg	
2 160 - 2 200	Fixed service	-152	0.5	-146	0.5	
2 483.5 - 2 500	analogue	-152	0.5	-150	0.65	
2 160 - 2 200	Fixed service	-152	0.5			25 %
2 483.5 - 2 500	digital	-152	0.5	-150	0.65	
2 160 - 2 200	Other terrestrial	-152	0.5	-152	0.5	
2 483.5 - 2 500	services	-152	0.5	-152	0.5	

NOTE 1 – The definition for calculation of FDP (fractional degradation in performance) is contained in the relevant ITU-R Recommendations.

NOTE 2 – The following formulae are used for pfd:

$$P \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 0^\circ \leq \delta \leq 5^\circ$$

$$P + r(\delta-5) \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 5^\circ < \delta < 25^\circ$$

$$P + 20r \text{ dB(W/m}^2\text{/4 kHz)} \quad \text{for } 25^\circ \leq \delta \leq 90^\circ$$

The limits relate to the power-flux density which would be obtained under assumed free-space propagation conditions.

Reasons: See IRN/25/15.



WORKING GROUP 4B

Note by the Chairman of Working Group 4B

ARTICLE S9

F/54/25A
MOD

[A.S9.II.1

Section II. Coordination Procedure²³

² These procedures ~~may be~~ are also applicable for earth stations of the earth exploration-satellite service, space research service, space operation service and radiodetermination-satellite service intended to be used while in motion or during halts at unspecified points.]

F/54/26

ADD A.S9.II.2

³ The word "coordination" as used throughout this Article refers also to the process of seeking an agreement of other administrations when required under No. **S9.21**.

Sub-Section IIA. Requirement and Request for Coordination

F/54/27A

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**:

NOC 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 networks or systems.

F/54/27B

SUP S9.6.2

F/54/28

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 all of any~~ space radiocommunication services and frequency bands except those covered by ~~a world plan~~ the plans of Appendices S30, S30A and S30B;

F/54/29

[MOD S9.8

- b)* for a transmitting space station of the fixed-satellite service using the geostationary-satellite orbit in a frequency band shared on an equal primary basis with the broadcasting-satellite service in respect of ~~space~~ stations of the latter service which are subject to the Appendix S30 plan;]

F/54/30

[MOD S9.9

- c)* for a transmitting space station of the fixed-satellite service using the geostationary-satellite orbit in a frequency band shared on an equal primary basis with the feeder links of the broadcasting-satellite service which are subject to the Appendix S30A plan;]

F/54/31

SUP S9.10

F/54/32

(MOD) S9.11

- ed) 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 the broadcasting-satellite service, in respect of terrestrial services;

F/54/33

ADD S9.11bis

- 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;

F/54/34

MOD S9.12

- fi) ~~for a station in a satellite network using a non-geostationary-satellite orbit in the frequency bands to which Resolution 46 applies~~ in respect of any other satellite network using a non-geostationary-satellite orbit, and in respect of any other satellite network using the geostationary-satellite orbit, with the exception of the coordination under No. S9.17bis;

* Application of these provisions is suspended pending the decision of WRC-97 on revision of Appendices 30 and 30A.

- F/54/35**
MOD S9.13 | **gii)** ~~for a station in a satellite network using the geostationary-satellite orbit in the frequency bands to which Resolution 46 applies~~ in respect of any other satellite network using a non-geostationary-satellite orbit;
- F/54/36A**
MOD S9.14 | **hiii)** ~~for a station in a satellite network using a non-geostationary-satellite orbit¹ in the frequency bands to which Resolution 46 applies~~ in respect of stations of terrestrial services where the pfd limit threshold value are exceeded ~~VGE Note 3~~;
- F/54/36B**
SUP | VGE Note 3.
- F/54/37**
ADD S9.14.1 | The provisions of No. **S9.14** shall also be applied to a transmitting space station in a satellite network using the geostationary-satellite orbit in respect of terrestrial stations under Nos. **S5.348, S5.354, S5.389, S5.402** and **S5.414**.
- F/54/38**
(ADD) S9.15 | **iv)** if either a specific earth station or typical earth station 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;
- F/54/39**
(ADD) S9.16 | **v)** if a transmitting or receiving station of a terrestrial service within the coordination area of an earth station in a non-geostationary satellite network;
- F/54/40A**
MOD S9.1517 | **if)** for any individual 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 and where the coordination area of the earth station includes the territory of another country ~~VGE Note 4~~, with the exception of the coordination under No. S9.15;
- F/54/40B**
SUP | VGE Note 4.
- F/54/38**
(SUP) S9.16
- F/54/41**
ADD S9.17bis | **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 transmissions and where the coordination area of the earth station includes the territory of another country;

F/54/42

MOD S9.1718 kh) for any transmitting station of a terrestrial service in the bands mentioned in No. S9.1517 within the coordination area of an earth station with the exception of the coordination under No. S9.16;

F/54/39

(SUP) S9.18

F/54/43

[(MOD)S9.19* mi) for any transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the broadcasting-satellite service;]

F/54/44

SUP S9.20 To be discussed in 4C.

F/54/45A

MOD S9.21 ej) for any station of a service for which the requirement to coordinate or to obtainseek the agreement of other administrations is included in a footnote of the Table of Frequency Allocations referring to this provision or in any other provision of these Regulations. VGE Note 5

F/54/45B

SUP VGE Note 5.

F/54/46

SUP S9.22

F/54/47

MOD S9.23 Whenever there is a requirement to effect more than one form of coordination in accordance with No. S9.30, the requests shall be appropriately identified by reference to Nos. S9.7 to S9.21, and they shall as far as possible be sent and where appropriate shall be published simultaneously.

F/54/48

SUP S9.24

B/17/32

SUP S9.25

F/54/50

MOD S9.26 Coordination may be effected for satellite network using the information relating to the space station, including its service area, and the parameters of one or more typical earth stations located in all or parts of the service area of the space station. The same provision shall apply Coordination may also be effected for terrestrial networks using the information relating to typical terrestrial stations except for those mentioned in Nos. S11.18 to S11.23.

* Application of these provisions is suspended pending the decision of WRC-97 on revision of Appendices 30 and 30A.

F/54/51
MOD S9.27

Frequency assignments to be taken into account in effecting coordination are specified for each case in Appendix S5. ~~The requesting administration shall, by applying the calculation method and criteria contained in that Appendix to those frequency assignments, identify the administrations with which coordination is to be effected.~~

F/54/52
MOD S9.28

In the case of requests for coordination under No. S9.29, the requesting administration shall, by applying the calculation method and criteria contained in Appendix S5 to those frequency assignments, identify, to the extent possible, the administrations with which coordination is to be effected.

USA/9/35
MOD S9.29

Requests for coordination made under Nos. S9.15 - S9.19 shall be sent by the requesting administration to the identified administrations, with a copy to the Bureau¹, a request for coordination together with the appropriate information listed in Appendix S4 to these Regulations.

F/54/54A
MOD S9.30

The requesting administration may alternatively send the appropriate information to the Bureau for publication in the Weekly Circular² as a request for coordination. Requests for coordination made under Nos. S9.7 - S9.14 [S9.20] and S9.21 shall be sent by the requesting administration to the Bureau together with the appropriate information listed in Appendix S4 to these Regulations.

F/54/55
MOD S9.31

The information sent under No. S9.29 shall also, in the cases covered by Nos. S9.15 ~~or~~, S9.16¹⁷ or S9.17^{bis}, include a copy of diagrams drawn to appropriate scale indicating for both transmission and reception the location of the earth station and its associated coordination area, or the coordination area related to the service area in which it is intended to operate the mobile earth station, and the data on which the diagrams are based. In respect of terrestrial stations, in the cases covered by Nos. S9.16 and S9.18, the information shall include the locations of the stations of a terrestrial network wholly or partly within the coordination area of the relevant earth station.

F/54/56
MOD S9.32

If the responsible administration, following the application of Nos. [S9.22²³ to S9.27], concludes that coordination is not required, it may send the relevant information ~~or pursuant to Appendix S4 to the Bureau for action under S9.34 or under Section I of Article S11.~~

F/54/57

ADD S9.32bis

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**.

F/54/58

MOD S9.33

If for any reason an administration can not act in accordance with **S9.29**, it shall seek the assistance of the Bureau. The latter shall then send the request to the administration concerned and shall provide the necessary assistance, ~~taking~~. The Bureau shall also take any necessary further action under **S9.45** and **S9.46**.

F/54/59

MOD S9.34

On receipt of the complete information sent under No. ~~**S9.29**~~**S9.30** or No. **S9.32** the Bureau shall promptly:

NOC S9.35

a) examine that information with respect to its conformity with No. **S11.31**;

F/54/60

MOD S9.36

b) identify in accordance with No. **S9.27** any ~~other~~ administrations ~~whose services may be affected~~, with which coordination is to be effected⁴;

F/54/61

ADD S9.36.1

⁴ The list of administrations identified by the Bureau under Nos. **S9.12** - **S9.14** and **S9.21** is only for information purposes to help administrations comply with this procedure.

F/54/62

MOD S9.37

c) include their names in the publication under No. **S9.38** ~~information sent under No. **S9.29**~~;

SUP S9.38.1

IND/41/68

MOD S9.38

d) publish, as appropriate,³ the complete information in the Weekly Circular not later than in a four-month period;

F/54/64

SUP S9.39

NOC S9.40

f) inform the administrations concerned of its actions, communicate the results of its calculations, drawing attention to the relevant Weekly Circular.

IND/41/69

ADD S9.40bis

If the information is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification and information not provided.

F/54/66

MOD S9.41

Following receipt of the Weekly Circular, referring to requests for coordination under Nos. S9.7 - S9.9, an administration believing that it should have been included in the request shall, within four months of the date of publication* , inform the initiating administration and the Bureau, giving its technical reasons for doing so, and shall request that its name be included.

F/54/67

MOD S9.42

The Bureau shall study this information on the basis of Appendix S51 ~~and the Rules of Procedure~~ and shall inform both administrations of its conclusions. Should the Bureau agree to include the administration in the request, it shall publish an addendum to the publication under No. S9.38.

F/54/68

SUP S9.42.1

F/54/69

MOD S9.43

~~When these Regulations do not permit the identification of all affected administrations,~~ Following action under No. S9.41, those administrations not responding 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.

USA/9/50

MOD S9.44

The administration ~~seeking agreement~~ requesting coordination and those with which it is sought, or the Bureau when acting pursuant to Article S7, No. S7.6, may request any additional information they consider necessary. ~~The Bureau shall be sent copies of any such requests and the replies.~~

Sub-Section IIB. Acknowledgement of Receipt of a Request for Coordination

F/54/71

MOD S9.45

An administration receiving a request for coordination under No. S9.29 shall, within 30 days from the date of the ~~relevant Weekly Circular~~ request, acknowledge receipt by telegram to the requesting administration, ~~with a copy to the Bureau~~. In the absence of an acknowledgement of receipt of its request within the 30 days the requesting administration shall send a telegram requesting an acknowledgement, ~~with a copy to the Bureau~~.

* Of the relevant Weekly Circular.

NOC S9.46 If there is no acknowledgement of receipt within 15 days of its second request sent under No. **S9.45** the requesting administration may seek the assistance of the Bureau. In this event the Bureau shall forthwith send a telegram to the administration which has failed to reply requesting an immediate acknowledgement.

NOC S9.47 If there is no acknowledgement of receipt within 30 days after the Bureau's action under No. **S9.46** it shall be deemed that the administration which has failed to acknowledge receipt has undertaken:

NOC S9.48 a) that no complaint will be made in respect of any harmful interference affecting its own assignments which may be caused by the assignment for which coordination was requested; and

NOC S9.49 b) that the use of its own assignments will not cause harmful interference to the assignment for which coordination was requested.

Sub-Section IIC. Action Upon a Request for Coordination**

F/54/72A

MOD S9.50

An administration having received a request for coordination, 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^{1,2}. ~~For the assignments to be taken into account, see in accordance with Appendix S5³.~~

SUP S9.50.1

NOC S9.50.2

² In the absence of specific provisions in these Regulations relating to the evaluation of interference, the calculation methods and the criteria should be based on relevant ITU-R recommendations agreed by the administrations concerned. In the event of disagreement on a Recommendation or in the absence of such a Recommendation, the methods and criteria shall be agreed between the administrations concerned. Such agreements shall be concluded without prejudice to other administrations.

NOC S9.50.3

³ Where Appendix S5 specifies a period for which planned assignments may be taken into account, that period may be extended by agreement between the administrations concerned.

F/54/73A

MOD S9.51

Following its action under No. **S9.50** the administration with which coordination was sought under Nos. **S9.7 - 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 ^{VGE Note 6} or act under No. **S9.52**. ~~In the case of a request for coordination which is not required to be published in the Weekly Circular, the (i.e. **S9.15 - S9.19**), four-month period shall commence on the date of the request.~~

SUP

VGE Note 6.

F/54/74

ADD S9.51bis

Following its action under No. **S9.50** the administration with which coordination was sought under Nos. **S9.15 - S9.19** shall within four months of the date of dispatch of the coordination data either inform the requesting administration of its agreement or act under No. **S9.52**.

F/54/75

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-month 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 a satisfactory resolution of the matter. A copy of that information shall be sent to the Bureau. Where that 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**.

F/54/76

ADD S9.52bis

When an agreement on coordination is reached, the administration responsible for the terrestrial stations or the earth station operating in the opposite direction of transmission may send to the Bureau the information concerning those stations covered by the agreement which are intended to be notified under Nos. **S11.2** or **S11.9**. The Bureau shall consider as notifications only that information relating to existing terrestrial or earth stations operating in the opposite direction of transmission or to those to be brought into use within the next three years.

[F/54/77

ADD S9.52ter

For coordination requests under Nos. [12] **S9.11 - S9.14** and **S9.21**, an administration not responding under No. **S9.52** within the specified time limit shall be regarded as unaffected and the provisions of Nos. **S9.48** and **S9.49** shall apply.]

NOC S9.53

Thereafter, the requesting and responding administrations shall make all possible mutual effort, to overcome the difficulties, in a manner acceptable to the parties concerned.

NOC S9.54

Either the administration seeking coordination or one whose assignments may be affected thereby may request additional information which it may require to assess the interference to its own assignments or to assist in resolving the matter.

F/54/78

MOD S9.55

All administrations may use correspondence, any appropriate means of telecommunication, or meetings as necessary to assist in resolving the matter, the results of which shall be communicated to and published in the Weekly Circular, as appropriate, by the Bureau.

SUP S9.56

SUP S9.56.1

SUP S9.57

F/54/80

MOD S9.58

An administration which initiated the coordination, as well as any administration with which coordination is sought, shall communicate to the Bureau any modifications to the published characteristics of their respective networks that were required to reach agreement on the coordination. The Bureau shall publish this information in accordance with No. **S9.38**, indicating that these modifications resulted from the joint effort of the administrations concerned to reach agreement on coordination and for this reason they should be given special consideration. These modifications may involve the application of Sub-Section IIA of Article S9 with respect to other administrations.

NOC S9.59

If there is disagreement between the administration seeking coordination and an administration with which coordination is sought as to the level of acceptable interference, either may seek the assistance of the Bureau; in such a case it shall provide the necessary information to enable the Bureau to endeavour to effect such coordination.

Sub-Section IID. Action in the Event of No Reply, No Decision or Disagreement Upon a Request for Coordination

F/54/81

MOD S9.60

If an administration with which coordination is sought fails to reply or to give a decision under No. S9.51 in the matter or following its action under No. S9.52 fails to reply, to give a decision or to provide information concerning its own assignments upon which its disagreement is based within the four-month period specified in No. **S9.51**, the requesting administration may seek the assistance of the Bureau.

NOC S9.61

The Bureau, acting on a request for assistance under No. **S9.60**, shall forthwith request the administration concerned to give an early decision in the matter.

NOC S9.62

If the administration concerned still does not give a decision in the matter within thirty days of the Bureau's action under No. **S9.61** the provisions of Nos. **S9.48** and **S9.49** shall apply.

NOC S9.63

If there is continuing disagreement, or if any administration involved in the matter has requested the assistance of the Bureau, the latter shall seek any necessary information to enable ~~it~~ the administration to assess the interference. It shall communicate its conclusions to the administrations involved.

F/54/82

MOD S9.64

If after the Bureau has communicated its conclusions to the administrations involved the disagreement remains unresolved, the administration which requested coordination shall, having regard to the other provisions of this Section, defer the submission of its notice of frequency assignments under Article S11 to the Bureau for six months from the date of the request or the Weekly Circular containing the request for coordination, as appropriate.

F/54/83

MOD S9.65

If at the date of receipt of a notice under No. S9.64 above the Bureau has been informed of a continuing disagreement, ~~it~~ the Bureau shall examine the notice under Nos. [S11.32bis] or S11.33¹ and shall act in accordance with No. S11.38.

F/54/84

MOD S9.65.1

¹ A notice of a frequency assignment, for which coordination was requested under No. S9.21 and about which there is a continuing disagreement, shall not be examined under Nos. [S11.32bis] or S11.33; it shall, however, be examined under No. ~~S9.31~~ S11.31 ~~taking into account No. S5.45.~~

**WRC-95**
 WORLD
 RADIOCOMMUNICATION
 CONFERENCE

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GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

AD HOC GROUP 5C1**Draft**

REPORT FROM AD HOC GROUP 5C1 TO WORKING GROUP 5C

1 Feeder links in bands around 5 GHz**Proposed changes to the Table of Frequency Allocations in the band 5 000 - 5 250 MHz**
 MHz
 4 800 - 5 725

Allocation to Services		
Region 1	Region 2	Region 3
5 000 – 5 250 <u>5 150</u>	AERONAUTICAL RADIONAVIGATION 733 [MOD 796] <u>[796A]</u> 797 797A 797B	
5 000 <u>5 150</u> – 5 250	AERONAUTICAL RADIONAVIGATION <u>FIXED-SATELLITE SERVICE</u> <u>(Earth-to-space)</u> 733 796 MOD 797 797A 797B <u>[797C] 797D 797E</u>	

MOD 733 The bands 1 610 - 1 626.5 MHz, 5 000 - ~~5 250~~ 5 150 MHz and 15.4 - 15.7 GHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis. Such use is subject to agreement obtained under the procedure set forth in Article 14.

[MOD 796 See Document DT/65.]

[ADD 796A See Document DT/65.]

MOD 797 The bands ~~5 000 – 5 250 MHz~~ and 15.4 - 15.7 GHz ~~are~~ is also allocated to the fixed-satellite service and the inter-satellite service, for connection between one or more earth stations at specified fixed points on the Earth and space stations, when these services are used in conjunction with the aeronautical radionavigation and/or aeronautical mobile (R) service. Such use shall be subject to agreement obtained under the procedure set forth in Article 14.

NOC 797A

NOC 797B

ADD 797C This allocation is limited to feeder links for non-geostationary-satellite systems of the mobile-satellite service and is subject to the coordination and notification procedures set forth in Resolution 46.

ADD 797D The band 5 150 - 5 216 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. This allocation is limited to feeder links for non-geostationary-satellite systems of the mobile-satellite service and is subject to the coordination and notification procedures set forth in Resolution 46. The power flux-density at the Earth's surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5 150 - 5 216 MHz shall in no case exceed -164 dB(W/m²) in any 4 kHz band for angles of arrival.

ADD 797E Administrations responsible for fixed-satellite service networks in the band 5 150 - 5 250 MHz operated under Nos. 797C and 797D shall coordinate on an equal basis in accordance with Resolution 46 with administrations responsible for non-geostationary satellite networks operated under No. 797A and brought into use prior to 17 November 1995. Satellite networks operated under No. 797A brought into use after 17 November 1995 shall not claim protection and shall not cause harmful interference to stations of the fixed-satellite service operated under Nos. 797C and 797D.

2 Feeder links in bands around 6/7 GHz

Proposed changes to the Table of Frequency Allocations in the band 5 925 - 7 075 MHz

MHz 5 725 - 7 300		
Allocation to Services		
Region 1	Region 2	Region 3
5 925 - 7 075 <u>[XXXX]</u>	FIXED FIXED-SATELLITE (Earth-to-space) MOD 792A MOBILE 791 [MOD 809]	
5 925 <u>[XXXX]</u> - 7 075]	FIXED FIXED-SATELLITE (Earth-to-space) (<u>space-to-Earth</u>) MOD 792A <u>[809A]</u> <u>[809B]</u> MOBILE 791—[MOD 809]	

NOC 791

**MOD 792A
Orb-88**

The use of the bands 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), and 12.75 - 13.25 GHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**.

[MOD 809

In the band 6 425 - 7 075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7 075 - 7 250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the earth exploration-satellite (passive) and space research (passive) services in their future planning of this band.]

[ADD 809A

The space-to-Earth allocation to the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems of the mobile-satellite service and is subject to the coordination and notification procedures set forth in Resolution **46**. [The use of this space-to-Earth allocation by feeder links is not subject to the provisions of No. **2613**]*.]

[ADD 809B

Pending discussions related to the Earth-to-space allocation to the fixed-satellite service in the band 7 025 - 7 075 MHz.]

3 Feeder links in the band 8 GHz to 15 GHz

Pending discussions in Drafting Group 5C1-5.

J. ALBUQUERQUE
Chairman of ad hoc Group 5C1, Box No. 400

* The issue of existing GSO/FSS systems will be discussed in Working Group 5C and this footnote has to be modified accordingly.



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DRAFTING GROUP 5B-a

Chairman, Drafting Group 5B-a

**DRAFT REPORT OF DRAFTING GROUP 5B-A ON
TRANSITIONAL ARRANGEMENTS IN THE 2 GHz BANDS**

The drafting group was established to develop transitional arrangements for MSS access to the 2 GHz bands under the terms of reference defined in Doc DT/49(Rev 1).

The date of entry into force of the bands allocated to MSS in the 2 GHz range has been the subject of repeated discussions in several fora. These MSS allocations are presently constrained by a date of access of 1 January 2005. A group of administrations considers that the advancement of the date to the year 2000 is necessary for the timely development of MSS systems. Others, having terrestrial systems important for their governmental and non-governmental communications, consider that the advancement of the date will cause them serious difficulties.

Following the second meeting of drafting group 5B-a on November 4, 1995, it was agreed that a sub-group be constituted to address the scope and content of possible Article 8 footnotes in respect of 2 GHz transition arrangements.

The sub-group met on November 4, 1995 under the coordination of Mr. Carlos Merchan of Mexico and concluded that it would be appropriate to reflect the scope of the draft RR 746D footnote into the context of the draft Resolution [COM5-X]. This was taken on the basis of simplifying the nature of Article 8 footnotes pursuant to the VGE recommendations and that the transitional elements should be better reflected in the draft Resolution, especially given the sensitivities involved. The proposed text for RR746D would be the following:

"ADD 746D (Rev.) The use of the bands [...] is subject to the provisions of Resolution [COM5/X]."

The sub-group also concluded proposed text for transition measures related to troposcatter systems in the 2 GHz MSS uplink band, but could not conclude whether such text should be included in the Resolution [COM5-X] or as an Article 8 footnote (eg RR 746D bis). The agreed text is as follows:

"Administrations are urged to take all practicable steps to phase out troposcatter systems operating in the band [uplink] MHz by [date XXX]. New troposcatter systems [shall/should] not be brought into operation in the above mentioned band after [date XXX]."

In order to expedite the work of 5B-a and taking into consideration the work of the sub-group, the chairman of 5B-a submits for your consideration a revised draft version of Resolution [COM5-X] taking into account the discussions held during the second 5B-a meeting on November 4, 1995 and the results of the work of the sub-group.

This revised draft Resolution essentially contains the following five major elements and seeks to address in a more exhaustive manner the terms of reference defined in Doc. DT/49(Rev 1):

- application of Resolution 46 and filing of terrestrial systems;
- protection of existing terrestrial systems;
- facilitating MSS introduction and transition arrangements for the FS;
- addressing concerns of developing countries;
- need for further studies in ITU-R.

RESOLUTION [COM5-X] (Rev 1)

USE OF THE FREQUENCY BANDS [UPLINK] AND [DOWNLINK]
BY THE FIXED AND MOBILE-SATELLITE SERVICES & ASSOCIATED TRANSITION ARRANGEMENTS

The World Radiocommunication Conference (Geneva, 1995),

considering

- a) that the use of the frequency bands [uplink] MHz and [downlink] MHz by the mobile-satellite service is subject to a date of entry into force of [Date];
- b) that these bands are shared with the fixed and mobile services on a primary basis and that they are widely used by the fixed service in many countries;
- c) that the studies made have shown that, while sharing of mobile satellite service 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 terrestrial service stations operating in the bands in question to other segments of the spectrum;
- d) 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 feasible to transfer these systems to higher frequency bands because of the economic consequences that would entail;
- e) 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 the Recommendation ITU-R F.1098 (which could be modified to accommodate the Mobile Satellite Service allocation decision of this Conference), which will facilitate the introduction of new Fixed Service systems in band segments that do not overlap with the above mentioned mobile satellite service allocations at 2 GHz;
- f) that sharing between fixed-service systems using tropospheric scatter and Earth-to-space links in the mobile-satellite service in the same frequency band segments is generally not feasible;

recognizing

- a) that WARC-92 identified the bands 1 885 - 2 025 MHz and 2 110 - 2 200 MHz for world-wide use by FPLMTS, the satellite component being limited to the frequencies 1 980 - 2 010 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;

recognizing further

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 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 consider the needs of developing countries and should assist them with the resources needed to implement the required modifications to their radiocommunication networks;

resolves

1. that to facilitate the application of the provisions of Resolution 46 for coordination of mobile satellite service networks with existing or planned terrestrial services:

1.1 administrations shall notify the Radiocommunication Bureau of frequency assignments either requiring protection or typical of those requiring protection to their existing or planned fixed and mobile service stations operating in the frequency bands [uplink] MHz and [downlink] MHz before [XXX]; notifications received by the Radiocommunications Bureau after [XXX] shall carry an asterisk in the register that they are not in conformity with this Resolution [and are registered solely for information purposes].

1.2 those existing fixed and mobile terrestrial stations to which the provisions of Article 48 of the Constitution applies should be the subject of bilateral negotiations between the concerned Administrations;

2 that in respect of stations of the fixed and mobile services taken into account in the application of Resolution 46 administrations responsible for mobile satellite service networks in the band [downlink] MHz shall make all practicable efforts to ensure that unacceptable interference is not caused to fixed and mobile service stations notified before [XXX];

3 that to facilitate the introduction and future use of the 2GHz bands by the mobile satellite service:

3.1 Administrations are urged that frequency assignments to new fixed service systems, to be brought into operation after [XXX], shall be in accordance with channel plans which do not overlap with the [uplink] MHz and [downlink] MHz bands, for example as given in Recommendation ITU-R F.1098;

[3.2 administrations are urged to take all practicable steps to cease the operation of troposcatter systems in the band [uplink] MHz by [XXX]]

(Text agreed in drafting group for possible incorporation in Resolution [COM5-X] or RR 746Dbis)

3.3 administrations are urged to draw up plans for the gradual transfer, of the frequency assignments to their fixed and mobile service stations in the bands [uplink] MHz and [downlink] MHz to non-overlapping bands, giving priority to the transfer of their frequency assignments in the band [uplink] MHz.

4 that when coordination of mobile satellite service networks involves developing countries fixed service networks:

4.1 Administrations responsible for the introduction of mobile satellite systems should recognise the concerns of developing countries to minimize the possible economic impact of transition measures in respect to existing systems;

4.2 that the BDT should be invited, in conjunction with 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;

[5. that the ITU-R should urgently conduct further studies, in conjunction with the Radiocommunication Bureau, to:

5.1 develop the necessary interference assessment tools as soon as possible to assist concerned administrations in the detailed bilateral coordination of mobile satellite systems;

5.2 develop the necessary planning tools as soon as possible to assist those administrations considering a gradual replanning of their terrestrial fixed networks in the 2 GHz range;]

instructs the Director of the Radiocommunication Bureau

to submit a report on the implementation of this Resolution to the 1999 World Radiocommunication Conference.

W. TALLAH

Chairman of Drafting Group 5B-a



WRC-95

WORLD
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CONFERENCE

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6 November 1995
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GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

DRAFTING GROUP 5B-a

Chairman, Drafting Group 5B-a

**DRAFT REPORT OF DRAFTING GROUP 5B-A ON
TRANSITIONAL ARRANGEMENTS IN THE 2 GHZ BANDS**

The drafting group was established to develop transitional arrangements for MSS access to the 2 GHz bands under the terms of reference defined in Doc DT/49(Rev 1).

The date of entry into force of the bands allocated to MSS in the 2 GHz range has been the subject of repeated discussions in several fora. These MSS allocations are presently constrained by a date of access of 1 January 2005. A group of administrations considers that the advancement of the date to the year 2000 is necessary for the timely development of MSS systems. Others, having terrestrial systems important for their governmental and non-governmental communications, consider that the advancement of the date will cause them serious difficulties.

Following the second meeting of drafting group 5B-a on November 4, 1995, it was agreed that a sub-group be constituted to address the scope and content of possible Article 8 footnotes in respect of 2 GHz transition arrangements.

The sub-group met on November 4, 1995 under the coordination of Mr. Carlos Merchan of Mexico and concluded that it would be appropriate to reflect the scope of the draft RR 746D footnote into the context of the draft Resolution [COM5-X]. This was taken on the basis of simplifying the nature of Article 8 footnotes pursuant to the VGE recommendations and that the transitional elements should be better reflected in the draft Resolution, especially given the sensitivities involved. The proposed text for RR746D would be the following:

"ADD 746D (Rev.) The use of the bands [...] is subject to the provisions of Resolution [COM5/X]."

The sub-group also concluded proposed text for transition measures related to troposcatter systems in the 2 GHz MSS uplink band, but could not conclude whether such text should be included in the Resolution [COM5-X] or as an Article 8 footnote (eg RR 746D bis). The agreed text is as follows:

"Administrations are urged to take all practicable steps to phase out troposcatter systems operating in the band [uplink] MHz by [date XXX]. New troposcatter systems [shall/should] not be brought into operation in the above mentioned band after [date XXX]."

In order to expedite the work of 5B-a and taking into consideration the work of the sub-group, the chairman of 5B-a submits for your consideration a revised draft version of Resolution [COM5-X] taking into account the discussions held during the second 5B-a meeting on November 4, 1995 and the results of the work of the sub-group.

This revised draft Resolution essentially contains the following five major elements and seeks to address in a more exhaustive manner the terms of reference defined in Doc. DT/49(Rev 1):

- application of Resolution 46 and filing of terrestrial systems;
- protection of existing terrestrial systems;
- facilitating MSS introduction and transition arrangements for the FS;
- addressing concerns of developing countries;
- need for further studies in ITU-R.

RESOLUTION [COM5-X] (Rev 1)

USE OF THE FREQUENCY BANDS [UPLINK] AND [DOWNLINK]
BY THE FIXED, MOBILE AND MOBILE-SATELLITE SERVICES & ASSOCIATED TRANSITION
ARRANGEMENTS

The World Radiocommunication Conference (Geneva, 1995),

considering

a) ~~that the date for the use of the frequency bands [uplink] MHz and [downlink] MHz by the mobile satellite service has been advanced to 1 January 2000;~~

a) that the use of the frequency bands [uplink] MHz and [downlink] MHz by the mobile-satellite service is subject to a date of entry into force of [Date];

b) that ~~these bands in question~~ are shared with the fixed and mobile services on a primary basis and that they are widely used by the fixed service in many countries;

c) that the studies made have shown that, while sharing of mobile satellite service 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 terrestrial service ~~fixed and mobile service~~ stations operating in the bands in question to other segments of the spectrum;

d) 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 feasible to transfer these systems to higher frequency bands because of the economic consequences that would entail;

e) 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 the Recommendation ITU-R F.1098 (which could be modified to accommodate the Mobile Satellite Service allocation decision of this Conference), which will facilitate the introduction of new Fixed Service systems in band segments that do not overlap with the above mentioned mobile satellite service allocations at 2 GHz;

f) that sharing between fixed-service systems using tropospheric scatter and Earth-to-space links in the mobile-satellite service in the same frequency band segments is generally not feasible;

recognizing

a) that WARC-92 ~~earmarked~~ identified the bands 1 885 - 2 025 MHz and 2 110 - 2 200 MHz for world-wide use by FPLMTS, the satellite component being limited to the frequencies 1 980 - 2 010 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 to bridge the gap between them and the developed countries more effectively;

recognizing further

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 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 consider the needs of developing countries and should assist them with the resources needed to implement the required modifications to their radiocommunication networks;

resolves

~~1. that a procedure should be applied for the gradual transfer of the frequency assignments to fixed and mobile service stations operating the frequency bands [uplink] MHz and downlink MHz, as follows:~~

1. that to facilitate the application of the provisions of Resolution 46 for coordination of mobile satellite service networks with existing or planned terrestrial services:

1.1 administrations shall notify the Radiocommunication Bureau of frequency assignments either requiring protection or typical of those requiring protection to their existing or planned fixed and mobile service stations operating in the frequency bands [uplink] MHz and [downlink] MHz before [Date];

1.2 those existing fixed and mobile terrestrial stations to which the provisions of Article 48 of the Constitution applies should be the subject of bilateral negotiations between the concerned Administrations;

1.3 notifications received by the Radiocommunications Bureau after [Date] shall carry a remark in the register that they are not in conformity with this Resolution and are registered solely for information purpose.

2 that in respect of stations of the fixed and mobile services taken into account in the application of Resolution 46 ~~administrations planning to establish satellite networks for the mobile satellite service~~ responsible for mobile satellite service networks in the band [downlink] MHz shall make all practicable efforts to ensure that unacceptable interference is not caused to fixed and mobile service stations in operation before [Date];

~~4. — that Administrations should be urged to refrain from assigning frequencies to new fixed and mobile service stations in the bands [uplink]MHz and [downlink] MHz and that, as far as possible, frequency assignments to new fixed service systems in the 2 GHz band should be in accordance with channel plans which do not overlap with the above mentioned bands, for example as given in Recommendation ITU-R F.1098;~~

3 that to facilitate the introduction and future use of the 2GHz bands by the mobile satellite service:

3.1 Administrations are urged that frequency assignments to new fixed service systems, to be brought into operation after [Date], shall be in accordance with channel plans which do not overlap with the [uplink] MHz and [downlink] MHz bands, for example as given in Recommendation ITU-R F.1098;

[3.2 administrations are urged to take all practicable steps to cease the operation of troposcatter systems in the band [uplink] MHz by [Date]]

(Text agreed in drafting group for possible incorporation in Resolution [COM5-X] or RR 746Dbis)

3.3 administrations shall draw up plans for the gradual transfer, of the frequency assignments to their fixed and mobile service stations in the bands [uplink] MHz and [downlink] MHz to non-overlapping bands, giving priority to the transfer of their frequency assignments in the band [uplink] MHz.

~~2 — that when coordination of mobile satellite service network involves developing countries terrestrial fixed service networks, measures should be considered that minimise economic implications for them;~~

4 that when coordination of mobile satellite service networks involves developing countries fixed service networks:

4.1 Administrations responsible for the introduction of mobile satellite systems should recognise the concerns of developing countries to minimize the possible economic impact of transition measures in respect to existing systems;

4.2 that the BDT should be invited, in conjunction with 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;

[5. — that the ITU-R should urgently conduct further studies, in conjunction with the Radiocommunication Bureau, to:

5.1 develop the necessary interference assessment tools as soon as possible to assist concerned administrations in the detailed bilateral coordination of mobile satellite systems;

5.2 develop the necessary planning tools as soon as possible to assist those administrations considering a gradual replanning of their terrestrial fixed networks in the 2 GHz range;]

instructs the Director of the Radiocommunication Bureau

to submit a report on the implementation of this Resolution to the 1999 World Radiocommunication Conference.

W. TALLAH
Chairman of Drafting Group 5B-a



WRC-95

WORLD
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CONFERENCE

Document DL/11-E
6 November 1995
English only

GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

COMMITTEE 5

Note by the Chairman of Committee 5

**INFORMATION RECEIVED BY THE RADIOCOMMUNICATION BUREAU CONCERNING
SPACE STATIONS WITH FREQUENCY ASSIGNMENTS IN THE
BANDS 18.8 - 19.7 AND 28.5 - 29.5 GHZ**

Attached is a list of geostationary and non-geostationary satellite networks with frequency assignments in the bands 18.8 - 19.7 and 28.5 - 29.5 GHz for which information has been received by the Radiocommunication Bureau up until 1 November 1995.

This list provides the indication of the date of receipt of information with respect to the different stages of the coordination and notification process. Information is given for cases received for Advance publication (Section I of Article 11) and not yet published, those which have been advance published, those received for the publication of a coordination request (Section II of Article 11) and not yet published, those which have had the coordination request published, those received for examination under Article 13 and not yet recorded in the MIFR or returned, and those already recorded in the MIFR.

G. F. JENKINSON
Chairman of Committee 5

LIST OF SPACE STATIONS WITH FREQUENCY ASSIGNMENTS IN THE 18.8-19.7 GHz AND 28.5-29.5 GHz BANDS
 CASES RECEIVED UP TO 1.11.95 - DATES IN COLUMNS WITH AN "*" ARE PROVISIONAL PENDING CONFIRMATION OF NOTICE COMPLETENESS

Nr	ADM	NAME OF SPACE STATION	ORB POS	Date of receipt of AP4 - RR1042 (for AR11/A)*	AR11/A Date of receipt of AP4	Date of receipt of AP3 - RR1064 (for AR11/C)*	AR11/C Date of receipt of AP3 - RR1064	Date of receipt - RR1488 (for Art. 13)*	IN the MIFR	18.8 19.7 GHz	28.5 29.5 GHz
5	CAN	CANSAT KA-1	107.3W		01.11.94	20.10.95				X	X
	CAN	CANSAT KA-2	111.1W		01.11.94	20.10.95				X	X
	CAN	CANSAT KA-3	118.7W		01.11.94	20.10.95				X	X
	CAN	CANSAT-KA-4	111.1W	20.10.95						X	X
	CAN	CANSAT-KA-5	118.7W	20.10.95						X	X
7	D	DFS-1	023.5E				09.01.84		X	X	
	D	DFS-2	028.5E				09.01.84		X	X	
	D	DFS-5	033.5E				15.04.91			X	
	D	DFS-6	026.0E				11.11.91			X	
	D	QUASIGEO-L1	9999.9E		19.01.93					X	X
	D	QUASIGEO-L2	9999.9E		19.01.93					X	X
	D	QUASIGEO-L3	9999.9E		19.01.93					X	X
2	F	F-SAT ICO	9999.9E		19.11.93					X	X
	F	F-SAT LEO	9999.9E		19.11.93					X	X
8	F/ESA	ARTEMIS-16.4E DR	016.4E		07.05.93	25.07.94				X	X
	F/ESA	ARTEMIS-21.5E DR	021.5E		07.05.93	25.07.94				X	X
	F/ESA	EDRSS-E	059.0E		02.04.90	08.05.95				X	X
	F/ESA	EDRSS-EC	047.0E		02.04.90	08.05.95				X	X
	F/ESA	EDRSS-W	044.0W		02.04.90	08.05.95				X	X
	F/ESA	EDRSS-WC	032.0W		02.04.90	08.05.95				X	X
	F/ESA	EURECA	9999.9E		03.02.86					X	X
	F/ESA	L-SAT	019.0W				31.10.83		X	X	X
20	F/EUT	EUTELSAT-KA-4E	004.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-7E	007.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-10E	010.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-13E	013.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-16E	016.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-21.5E	021.5E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-25.5E	025.5E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-33E	033.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-36E	036.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-44E	044.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-48E	048.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-70.5E	070.5E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-76E	076.0E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-80.5E	080.5E	04.09.95						X	X
F/EUT	EUTELSAT-KA-83.5E	083.5E	04.09.95						X	X	

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	F/EUT	EUTELSAT-KA-88.5E	088.5E	04.09.95						X	X
	F/EUT	EUTELSAT-KA-12.5W	012.5W	04.09.95						X	X
	F/EUT	EUTELSAT-KA-14.8W	014.8W	04.09.95						X	X
	F/EUT	EUTELSAT-KA-37.2W	037.2W	04.09.95						X	X
	F/EUT	EUTELSAT-KA-64W	064.0W	04.09.95						X	X
19	G	AFRISAT-1	019.0E		27.02.95	27.08.95				X	X
	G	AFRISAT-2	032.0E		27.02.95	27.08.95				X	X
	G	AFRISAT-3	038.0E		27.02.95	27.08.95				X	X
	G	AFRISAT-4	064.5E		27.02.95	27.08.95				X	X
	G	SAMSAT-1	075.0W		27.02.95	27.08.95				X	X
	G	SAMSAT-2	082.0W		27.02.95	27.08.95				X	X
	G	SAMSAT-3	089.0W		27.02.95	27.08.95				X	X
	G	SKYSAT-A1	118.3E		05.08.94	05.02.95				X	X
	G	SKYSAT-A2	121.5E		05.08.94	05.02.95				X	X
	G	SKYSAT-A3	124.7E		05.08.94	05.02.95				X	X
	G	SKYSAT-B1	133.2E		05.08.94	05.02.95				X	X
	G	SKYSAT-B2	136.4E		05.08.94	05.02.95				X	X
	G	SKYSAT-B3	139.6E		05.08.94	05.02.95				X	X
	G	SKYSAT-B4	142.8E		05.08.94	05.02.95				X	X
	G	SKYSAT-C1	080.0E		28.09.94	28.03.95				X	X
G	SKYSAT-C2	090.0E		28.09.94	28.03.95				X	X	
G	SKYSAT-C3	101.5E		28.09.94	28.03.95				X	X	
G	SKYSAT-C4	104.8E		28.09.94	28.03.95				X	X	
G	SKYSAT-C5	169.2E		28.09.94	28.03.95				X	X	
1	HOL	PETALRING 30C-K	9999.99		22.11.93					X	X
12	I	EUROSKYWAY-10.2E	010.2E	28.09.95						X	X
	I	EUROSKYWAY-13.2E	013.2E	28.09.95						X	X
	I	EUROSKYWAY-16.4E	016.4E	28.09.95						X	X
	I	EUROSKYWAY-22E	022.0E	28.09.95						X	X
	I	EUROSKYWAY-30E	030.0E	28.09.95						X	X
	I	EUROSKYWAY-39E	039.0E	28.09.95						X	X
	I	EUROSKYWAY-5E	005.0E	28.09.95						X	X
	I	ITALSAT	013.2E				25.05.85		X	X	X
	I	ITALSAT-10.2E	010.2E				24.09.93			X	X
	I	ITALSAT-13.2E	013.2E				24.09.93			X	X
	I	ITALSAT-16.4E	016.4E				24.09.93			X	X
I	SARIT-19W	019.0W		27.03.95					X		
15	IND	INSAT-108W	108.0W	16.10.95						X	X
	IND	INSAT-13W	013.0W	16.10.95						X	X
	IND	INSAT-75.2W	075.2W	16.10.95						X	X

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	IND	INSAT-KA-100	100.0E	16.10.95						X	X
	IND	INSAT-KA-50	050.0E	16.10.95						X	X
	IND	INSAT-KA-54	054.0E	16.10.95						X	X
	IND	INSAT-KA-63	063.0E	16.10.95						X	X
	IND	INSAT-KA-67	067.0E	16.10.95						X	X
	IND	INSAT-KA-74	074.0E	16.10.95						X	X
	IND	INSAT-KA-76	076.0E	16.10.95						X	X
	IND	INSAT-KA-78	078.0E	16.10.95						X	X
	IND	INSAT-KA-83	083.0E	16.10.95						X	X
	IND	INSAT-KA-87	087.0E	16.10.95						X	X
	IND	INSAT-KA-93.5	093.5E	16.10.95						X	X
	IND	INSAT-KA-98	098.0E	16.10.95						X	X
12	J	COMETS	121.0E		30.09.94	08.06.95				X	X
	J	CS-3A	132.0E				30.04.87		X	X	X
	J	CS-3B	136.0E				30.04.87		X	X	X
	J	ETS-6-FS	154.0E				21.10.91			X	X
	J	KIKU-6	9999.99		22.12.94					X	X
	J	MTSAT-135E	135.0E	01.09.95						X	X
	J	MTSAT-140E	140.0E	01.09.95						X	X
	J	MTSAT-145E	145.0E	01.09.95						X	X
	J	N-STAR-A	132.0E				16.11.91	06.04.95		X	X
	J	N-STAR-B	136.0E				16.11.91	04.10.95		X	X
	J	SUPERBIRD-A	158.0E				18.03.88		X	X	X
	J	SUPERBIRD-B	162.0E				18.03.88		X	X	X
6	KOR	DACOMSAT-4	140.0E	03.10.95						X	X
	KOR	EASTSAT	164.0E	01.08.95						X	X
	KOR	GLOBALSAT	177.5E	01.08.95						X	X
	KOR	INFOSAT-A	103.0E	01.08.95						X	X
	KOR	INFOSAT-B	113.0E	01.08.95						X	X
	KOR	INFOSAT-C	116.0E	01.08.95						X	X
21	LUX	LUX-KA-19.0E	019.0E	24.04.95		24.10.95				X	X
	LUX	LUX-KA-24.2E	024.2E	25.09.95						X	X
	LUX	LUX-KA-26.2E	026.2E	25.09.95						X	X
	LUX	LUX-KA-28.2E	028.2E	25.09.95						X	X
	LUX	LUX-KA-31.5E	031.5E	25.09.95						X	X
	LUX	LUX-KA-35.5E	035.5E	25.09.95						X	X
	LUX	LUX-KA-37.5E	037.5E	25.09.95						X	X
	LUX	LUX-KA-41.2E	041.2E	25.09.95						X	X
	LUX	LUX-KA-43.2E	043.2E	25.09.95						X	X
	LUX	LUX-KA-60.2E	060.2E	20.10.95						X	X

Nr	ADM	NAME OF SPACE STATION	ORB POS	Date of receipt of AP4 - RR1042 (for AR11/A)*	AR11/A Date of receipt of AP4	Date of receipt of AP3 - RR1064 (for AR11/C)*	AR11/C Date of receipt of AP3 - RR1064	Date of receipt - RR1488 (for Art. 13)*	IN the MIFR	18.8 19.7 GHz	28.5 29.5 GHz
	LUX	LUX-KA-78.2E	078.2E	20.10.95						X	X
	LUX	LUX-KA-107.2E	107.2E	20.10.95						X	X
	LUX	LUX-KA-123.2E	123.2E	20.10.95						X	X
	LUX	LUX-KA-145.2E	145.2E	20.10.95						X	X
	LUX	LUX-KA-33.2W	033.2W	20.10.95						X	X
	LUX	LUX-KA-42.2W	042.2W	20.10.95						X	X
	LUX	LUX-KA-56.2W	056.2W	20.10.95						X	X
	LUX	LUX-KA-79.2W	079.2W	20.10.95						X	X
	LUX	LUX-KA-93.2W	093.2W	20.10.95						X	X
	LUX	LUX-KA-123.2W	123.2W	20.10.95						X	X
	LUX	LUX-KA-177.2W	177.2W	20.10.95						X	X
5	PAK	PAKSAT-A	038.0E	27.10.95						X	X
	PAK	PAKSAT-B	041.0E	27.10.95						X	X
	PAK	PAKSAT-C	030.0E	27.10.95						X	X
	PAK	PAKSAT-D	088.0E	27.10.95						X	X
	PAK	PAKSAT-E	101.0E	27.10.95						X	X
4	RUS	GOMS-1M	014.5W				26.09.89	16.12.94			X
	RUS	GOMS-2M	166.0E				08.11.89	09.06.95			X
	RUS	GOMS-M	076.0E				23.11.89	09.06.95			X
	RUS	LOUTCH-1	014.0W		22.04.88					R	R
1	S	SIRIUS-4	005.0E	29.06.95						X	X
5	TON	TONGASAT-ELL-1	9999.99		31.03.92					X	X
	TON	TONGASAT-LEO-10000	9999.99		27.03.92					X	X
	TON	TONGASAT-LEO-1200	9999.99		27.03.92					X	X
	TON	TONGASAT-LEO-1300	9999.99		27.03.92					X	X
	TON	TONGASAT-RADIO/TV-8	9999.99		06.04.92						X
22	URS	TOR-1	026.5W				09.03.88			X	
	URS	TOR-11	003.0W				06.07.88			X	
	URS	TOR-12	015.0E				30.08.88			X	
	URS	TOR-13	058.0E				14.07.88			X	
	URS	TOR-14	069.0E				06.10.88			X	
	URS	TOR-15	001.0E				14.07.88			X	
	URS	TOR-16	049.0E				06.10.88			X	
	URS	TOR-17	070.0E				06.12.88			X	
	URS	TOR-18	012.0E				06.12.88			X	
	URS	TOR-19	005.0E				03.01.89			X	
	URS	TOR-2	035.0E				09.03.88			X	
	URS	TOR-20	027.0E				06.12.88			X	

R - only frequencies 19.237GHz and 28.856 Ghz as propagation beacons in the space to Earth direction.

Nr	ADM	NAME OF SPACE STATION	ORB POS	Date of receipt of AP4 - RR1042 (for AR11/A)*	AR11/A Date of receipt of AP4	Date of receipt of AP3 - RR1064 (for AR11/C)*	AR11/C Date of receipt of AP3 - RR1064	Date of receipt - RR1488 (for Art. 13)*	IN the MIFR	18.8 19.7 GHz	28.5 29.5 GHz
	URS	TOR-21	032.0E				23.02.89			X	
	URS	TOR-22	040.0E				21.02.89			X	
	URS	TOR-23	053.0E				23.02.89			X	
	URS	TOR-24	062.0E				28.02.89			X	
	URS	TOR-25	065.0E				28.02.89			X	
	URS	TOR-26	019.0E		19.04.88					X	
	URS	TOR-3	045.0E				18.05.88		X	X	
	URS	TOR-4	085.0E				18.05.88		X	X	
	URS	TOR-5	170.0W				02.06.88		X	X	
	URS	TOR-6	128.0E				19.04.88			X	
25	USA	ACTS	100.0W				12.08.91		X	X	X
	USA	HIBLEO-2	9999.99		05.02.92					X	X
	USA	LEOSAT-1	9999.99		15.02.95			20.10.95		X	X
	USA	MSSLEO-1	9999.99		19.11.93					X	X
	USA	MSSLEO-2	9999.99		19.11.93					X	X
	USA	USASAT-27A	090.0W		28.10.92					X	X
	USA	USASAT-29A	101.0W		07.03.95					X	X
	USA	USASAT-29B	099.0W		07.03.95					X	X
	USA	USASAT-29C	050.0W		07.03.95					X	
	USA	USASAT-29D	025.0E		07.03.95					X	X
	USA	USASAT-29E	110.0E		07.03.95					X	X
	USA	USASAT-29F	175.0E		07.03.95					X	X
	USA	USCSID-A1	0.00	07.08.95						X	
	USA	USCSID-A2	044.0E	07.08.95						X	
	USA	USCSID-A3	075.0E	07.08.95						X	
	USA	USCSID-A4	082.0E	07.08.95						X	
	USA	USCSID-A5	092.0E	07.08.95						X	
	USA	USCSID-A6	110.0E	07.08.95						X	
	USA	USCSID-E1	010.0W	07.08.95						X	
	USA	USCSID-E2	013.0W	07.08.95						X	
	USA	USCSID-E3	024.0W	07.08.95						X	
	USA	USCSID-E4	030.0W	07.08.95						X	
	USA	USCSID-P	9999.99	07.08.95						X	
	USA	USCSID-W1	141.0W	07.08.95						X	
	USA	USCSID-W2	144.0W	07.08.95						X	

Nr	ADM	NAME OF SPACE STATION	ORB POS	Date of receipt of AP4 - RR1042 (for AR11/A)*	AR11/A Date of receipt of AP4	Date of receipt of AP3 - RR1064 (for AR11/C)*	AR11/C Date of receipt of AP3 - RR1064	Date of receipt - RR1488 (for Art. 13)*	IN the MIFR	18.8 19.7 GHz	28.5 29.5 GHz
7	USA/IT	INTELSAT-KA-33E	033.0E	14.06.95						X	X
	USA/IT	INTELSAT-KA-66E	066.0E	14.06.95						X	X
	USA/IT	INTELSAT-KA-95E	095.0E	14.06.95						X	X
	USA/IT	INTELSAT-KA-157E	157.0E	14.06.95						X	X
	USA/IT	INTELSAT-KA-307E	053.0W	14.06.95						X	X
	USA/IT	INTELSAT-KA-319.5E	040.5W	14.06.95						X	X
	USA/IT	INTELSAT-KA-359E	001.0W	14.06.95						X	X
S	19	197		100	56	30	41	6	12	193	156



DRAFTING GROUP 5B-a

Note by the Chairman of Drafting Group 5B-a

NON-GSO FSS

Basic Considerations

- 1 The Conference should recognize that the rights and obligations of Administrations acquired in accordance with the Radio Regulations in force at the time they were required cannot be taken away from Administrations retroactively.

(No decision should be taken retroactively which affects the rights and obligations of Members).

- 2 The provision for the identification of appropriate spectrum for the feeder links of non-GSO MSS systems in the Ka-band needs to be taken into account.
- 3 No further debate should be undertaken on the need for the service; reference should be made, in general, to non-GSO FSS and not to a single system.
- 4 Pursuant to Document DT/38 (Rev.2), the proposed solution consists of the inclusion of a footnote against the two sub-bands in the 20/30 GHz spectrum range for use by non-GSO FSS systems, and the adoption of a Resolution specifying the conditions of the use of these sub-bands. In addition, the following points are included in the *resolves* and *further resolves* provisions of the Draft Resolution contained in Doc. DT/38 (Rev.2):
 - * Resolution [46 (WRC-95)] shall be applied in the bands [] to frequency assignments of GSO and non-GSO satellite systems of the FSS communicated to the BR [after ...], according to the date of receipt of coordination information complete as required on the date that the information is communicated to the Bureau and to those of the terrestrial services to which these bands are allocated (see DT/42 -- note from the BR Director);
 - * when applying Resolution [46 (WRC-95)], [No.2613] shall not be taken into account;
 - * administrations should be urged to communicate to the BR their satellite systems in the bands [] prior to the date of WRC-95, to make every effort to reach agreement on the coordination of their respective systems;
 - * the ITU-R be requested, as a matter of urgency, to study the criteria to be applied for the sharing of the Ka-band between GSO and non-GSO satellite systems, on the one hand, and among those systems and the terrestrial services, on the other hand, taking account of existing and planned systems and to recommend the required revisions to the RRs;

- * the BR Director be instructed to ensure, in consultation with the chairmen of the SGs, Committees and meetings, that the results of these studies be available in due time for their consideration by WRC-97;
 - * it be recommended that WRC-97 review the results of the sharing studies and take appropriate action for the harmonious development of GSO and non-GSO systems and the terrestrial services in the Ka-band;
 - * administrations concerned be urged to cooperate to the maximum extent practicable in initiating the required coordination and to conduct them with the view to reaching results acceptable to all the parties concerned.
- 5 Committee 5 is to: identify an appropriate bandwidth of spectrum; identify specific bands where the non-GSO FSS system(s) can be located, taking into account existing services, and the fact that sharing studies have not been completed.¹
-

¹ If improvements can be identified with respect to sharing possibilities, recommendations can be provided to Committee 5 from the Ad Hoc Group.



COMMITTEE 5 AD HOC 2

NOTE BY THE CHAIRMAN OF 5 AD HOC 2

NON-GSO FSS: Points for Discussion

- 1** The focus of the discussions is on non-GSO FSS as a service to be implemented in Ka-band, and not on any one system or systems.
- 2** As such, debates with respect to exclusivity, and/or the application of 2613, and/or the technical justification of any one system are beyond the purview and mandate of the Ad Hoc Group.
- 3** The determination of an appropriate amount of spectrum (bandwidth) to permit the operation of non-GSO FSS is dependent on the following factors:
 - 3.1** the number of requirements based on the number of subscribers to be served, taking into account regional and demographic differences; and
 - 3.2** the nature of the service to be provided.
- 4** The range of bandwidth considered to be appropriate for the implementation of non-GSO FSS in Ka-band (at the moment) is 50 to 500 MHz.
- 5** In order to provide more specific guidance to the ITU-R on sharing studies to be undertaken by the relevant Study Groups, the Ad Hoc Group considered that, in addition to sharing between GSO and non-GSO systems, between non-GSO and terrestrial services, and GSO and terrestrial services, studies should also be focused on sharing between non-GSO FSS and non-GSO FSS.



WRC-95

WORLD
RADIOCOMMUNICATION
CONFERENCE

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GENEVA, 23 OCTOBER – 17 NOVEMBER 1995

COMMITTEE 5

**TERMS OF REFERENCE OF 5 AD HOC 3 TO CONSIDER TECHNICAL
ASPECTS IN RELATION WITH RESOLUTION 46**

A Taking into account the CPM Report and the technical results achieved concerning Resolution 46 in Committee 5, the 5 Adhoc Group 3 will be entrusted, in liaison with Committee 4 :

- to prepare draft texts concerning the achieved technical results of Committee 5 with adequate format to be introduced or referred to in Resolution 46,
- to prepare texts with relevant formats for the following technical subjects which need further consideration :
 - coordination distances applicable between the different services
 - coordination thresholds (Annex 1 of Rec. ITU-R IS 1143)
 - affected region (doc ITU-R [8/1034])
- to prepare texts for future work concerning the three above items, as necessary

B The Adhoc Group will be chaired by

C The Adhoc Group is required to finalize its report by



C5 AD HOC 3

Note by the Chairman of C5 ad hoc 3

DRAFT APPENDIX XYZ

**Determination methods for the need of coordination between space stations of the
MSS (space-to-Earth) and terrestrial services in the 1 - 3 GHz frequency
bands shared between MSS (space-to-Earth) and terrestrial services**

1 Objectives

Generally, the necessity for coordination between terrestrial services and space stations of the MSS (space-to-Earth) was performed using power flux-density limits. However, to facilitate the sharing between digital FS stations and NGSO MSS space stations, the concept of fractional degradation in performance (FDP) was adopted. This concept involves new methodologies described in this Appendix.

As a consequence of this new concept, in this Appendix, the need for coordination between space stations of the MSS and terrestrial services is determined using two methods:

- the need for coordination is determined using FDP trigger value (typical characteristics of FS stations are used with the simplest definition of the MSS system) or power flux-density;
- the need for coordination is determined using a system specific methodology (SSM), typical characteristics of FS stations are used with specific characteristics of the MSS system.

There is a need for coordination in the situation where both methodologies give a negative result. If one of the two methods gives a positive result there is no need for coordination.

2 General considerations

2.1 Method for calculating the value of fractional degradation in performance (FDP)

FDP is used in case of sharing between digital FS stations with non-GSO MSS stations (space-to-Earth).

For calculating the value of the FDP, the following parameters are needed:

- technical characteristics of digital FS station; and

- technical characteristics of non-GSO MSS constellation.

The FDP is calculated:

- by simulating the proposed MSS constellation;
- by positioning the FS station at a certain latitude (each station is assumed to operate at an elevation angle of 0°);
- by calculating for each pointing azimuth (Azi) varying between 0° and 360°;
- at each time instance of the simulation, the aggregate interference from all visible space stations received at the FS station.
- the FDP_{Azi} for the azimuth Azi using the following formula:

$$FDP_{Azi} = \max_{I_i = \min N_T} \sum \frac{I_i f_i}{N_T}$$

- by the following formula:

$$FDP = \max(FDP_{Azi})$$

(the formula for FDP applies to the 1 - 3 GHz frequency range only. A different formula may apply at frequencies above 3 GHz),

where:

- I_i = interference noise power level
- f_i = the fractional period of time that the interference power equals I_i
- N_T = station receiving system noise power level = kTB
- k = boltzmann's constant = $1.38 \cdot 10^{-23}$
- T = station receiving system effective noise temperature (T should be calculated by the following formula: $10 \log T = NF + 10 \log T_0$ where NF (dB) is the receiver noise figure given in Annex 1 and T_0 should be assumed as 290 K)
- B = reference bandwidth = 1 MHz.

NOTE – For the purpose of FDP calculation according to this Appendix, it should be assumed that all space stations in the same MSS constellation operate on the same frequencies.

2.2 Characteristics of reference systems in the fixed service

The following parameters represent the set of reference parameters of the fixed service.

2.2.1 Characteristics of reference digital point-to-point systems

Three different digital systems are described in this 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))	-174	-173	-170

Antenna pattern:

$$\begin{aligned}
 G(\varphi) &= G_{\max} - 2.5 \times 10^{-3} (D\varphi/\lambda)^2 && \text{for } 0 < \varphi < \varphi_m \\
 G(\varphi) &= G_1 && \text{for } \varphi_m \leq \varphi < 75.86(\lambda/D) \\
 G(\varphi) &= 49 - 10 \log (D/\lambda) - 25 \log \varphi && \text{for } 75.86(\lambda/D) \leq \varphi < 48^\circ \\
 G(\varphi) &= 7 - 10 \log (D/\lambda) && \text{for } 48^\circ \leq \varphi
 \end{aligned}$$

$G(\varphi)$ = gain relative to an isotropic antenna

φ = off-axis angle

D = antenna diameter

λ = wavelength expressed in the same unit as D

G_1 = gain of the first side lobe = $2 + 15 \log (D/\lambda)$

(D/λ may be estimated from $20 \log D/\lambda \approx G_{\max} - 7.7$)

G_{\max} = main-lobe antenna gain (dBi);

$$\varphi_m = 20 (\lambda/D) \times \sqrt{(G_{\max} - G_1)} \text{ (degrees)}$$

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 the reduced side-lobe radiation pattern by up to 3 dB.

2.2.2 Characteristics of reference analogue point-to-point systems

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 long-term interference per link (20% of time) (dB(W/4kHz))	-170

Antenna pattern:

$$G(\varphi) = G_{\max} - 2.5 \times 10^{-3} (D\varphi/\lambda)^2 \quad \text{for } 0 < \varphi < \varphi_m$$

$$G(\varphi) = G_1 \quad \text{for } \varphi_m \leq \varphi < 75.86(\lambda/D)$$

$$G(\varphi) = 49 - 10 \log (D/\lambda) - 25 \log \varphi \quad \text{for } 75.86(\lambda/D) \leq \varphi < 48^\circ$$

$$G(\varphi) = 7 - 10 \log (D/\lambda) \quad \text{for } 48^\circ \leq \varphi$$

$G(\varphi)$ = gain relative to an isotropic antenna

φ = off-axis angle

D = antenna diameter

λ = wavelength expressed in the same unit as D

G_1 = gain of the first side lobe = $2 + 15 \log (D/\lambda)$

(D/λ may be estimated from $20 \log D/\lambda \approx G_{\max} - 7.7$)

G_{\max} = main-lobe antenna gain (dBi);

$$\varphi_m = 20 (\lambda/D) \times \sqrt{(G_{\max} - G_1)} \text{ (degrees)}$$

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 the reduced side-lobe radiation pattern by up to 3 dB.

2.2.3 Characteristics of reference point-to-multipoint systems

PARAMETER	CENTRAL STATION	OUTSTATION
Antenna type	Omni/sector	Dish/horn
Antenna gain (dBi)	10/17	20 analogue 27 digital
e.i.r.p. (max) (dBW)		
analogue	12	21
digital	24	34
noise figure (dB)	3.5	3.5
feeder loss (dB)	2	2

IF bandwidth (MHz)	3.5	3.5
Maximum permissible long-term interference power (20% time)		
Total (dBW)	- 142	- 142
dB(W/4 kHz)	- 170	- 170
dB(W/MHz)	- 147	- 147

Antenna pattern:

For the outstation antenna pattern, the reference pattern described in Sections 2.2.1 or 2.2.2 has to be used.

The reference radiation pattern for omnidirectional antennas is the following:

$$G(\theta) = G_0 - 12 (\theta/\phi_3)^2, \text{ dBi} \quad 0 \leq \theta < \phi_3$$

$$G(\theta) = G_0 - 12 - 10 \log (\theta/\phi_3), \text{ dBi} \quad \phi_3 \leq \theta \leq 90^\circ$$

where

$$G_0 = \text{maximum gain in the horizontal plane (dBi)}$$

$$\theta = \text{the radiation angle above the horizontal plane (degrees).}$$

ϕ_3 (degrees) is given by:

$$\phi_3 = \frac{1}{\alpha^2 - 0.818}, \text{ degrees}$$

$$\alpha = \frac{10^{0.1G_0} + 172.4}{191.0}$$

It should be noted that the above antenna pattern is provisional and that further study is under way in the ITU-R.

3 Determination of the need for coordination between MSS space stations and stations of the FS

The two following methods show the possibility of sharing between the two services involved and thus that it is not necessary to coordinate.

3.1 First method for the determination of the need for non-coordination between MSS space stations (space-to-Earth) and other terrestrial services sharing the same frequency band

The following table gives the coordination thresholds (in case of sharing with MSS downlink in the 1 - 3 GHz band):

Frequency Band (MHz)	Service to be protected	Coordination threshold factors				
		Geostationary space stations		Non-geostationary space stations		
		power flux-density (per space station) calculation factors (NOTE 2)		power flux-density (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz)
		P dB(W/m ²) in 4 kHz	r dB/deg.	P dB(W/m ²) in 4 kHz	r dB/deg.	
1 492 - 1 525	analogue FS	-152	0.5	-152	0.5	
	digital FS	-152	0.5			25
	other terrestrial services	-152	0.5	-152	0.5	
1 525 - 1 530	analogue FS	-152	0.5	-152	0.5	
	digital FS	-152	0.5			25
	other terrestrial services	-152	0.5	-152	0.5	
2 160 - 2 200	analogue FS	-152	0.5	-147	0.5	
	digital FS	-152	0.5			25
	other terrestrial services	-152	0.5	-147	0.5	
2 483.5 - 2 500	fixed	-152	0.5	-150	0.65	
	other terrestrial services	-152	0.5	-150	0.65	
2 500 - 2 520	analogue FS	-152	0.5	-152	0.5	
	digital FS	-152	0.5			25
	other terrestrial services	-152	0.5	-152	0.5	
2 520 - 2 535	analogue FS	-160	0.75	-152	0.5	
	digital FS	-160	0.75			25
	other terrestrial services	-160	0.75	-152	0.5	

NOTE 1 – The calculation of FDP (Fractional Degradation in Performance) is contained in Section 2.1, using reference FS parameters contained in Sections 2.2.1 and 2.2.3

NOTE 2 – The following formula are used for power flux-density:

$$\begin{aligned}
 &P \text{ dB(W/m}^2\text{/4 kHz)} && \text{for } 0^\circ \leq \delta \leq 5^\circ \\
 &P + r(\delta-5) \text{ dB(W/m}^2\text{/4 kHz)} && \text{for } 5^\circ < \delta < 25^\circ \\
 &P + 20r \text{ dB(W/m}^2\text{/4 kHz)} && \text{for } 25^\circ \leq \delta \leq 90^\circ
 \end{aligned}$$

where δ is the angle of arrival (degrees).

The limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

NOTE 3 – The coordination threshold in the band 2 160 - 2 200 MHz to protect other terrestrial services do not apply to the terrestrial component of the FPLMTS as the satellite and the terrestrial components are not intended to operate on common frequencies within this band.

[NOTE 4 – The coordination threshold factors applicable to other terrestrial services may be reviewed at a future conference as necessary.]

3.2 A system specific methodology (SSM) to be used in determining the need for coordination of NGSO MSS systems in the space-to-Earth MSS allocations with the fixed service

3.2.1 Introduction

The purpose of the system specific methodology (SSM) is to allow a detailed assessment of the need to coordinate frequency assignments to transmitting non-GSO MSS space stations with frequency assignments to receiving FS stations in an FS network of a potentially affected administration. The SSM takes into account most specific characteristics of the non-GSO MSS system and reference FS characteristics.

The SSM requires as input a characterization of the reference FS system as well as that of the non-GSO MSS satellite system as described in Section 2.2.

The computation methodology is based on the data relevant statistics of interference caused by the non-GSO MSS constellation to the given reference FS system. For a given administration the SSM is exercised at a suitable sample of latitudes (e.g. every 5 degrees) covering the latitude range covered by the territory of that administration.

If the applicable maximum interference criteria are not exceeded coordination is not considered to be necessary.

3.2.2 FS and MSS data requirements

3.2.2.1 Analogue FS system data

It is assumed that there are $M = 51$ analogue stations on a route centred at a given latitude with a given trendline for the given non-GSO MSS constellation. The routes span a distance of $D = 2\,500$ km with stations spaced exactly $d = 50$ km apart. The azimuth angle for each station is specified by the given trendline angle and a variable angle that is uniformly distributed between $V = \pm 12.5$ degrees. Each FS station is assumed to use a high gain antenna pointed at the next station at an elevation angle of 0 degrees. The point-to-point FS station antenna gain conforms to the antenna pattern having averaged side-lobe levels as defined in Section 2.2.2.

The characteristics of the reference analogue FS system are taken to be as given in Section 2.2.2.

3.2.2.2 Digital FS system data

Only one digital FS receiver is required for the analysis as opposed to a complete route. The FS station is positioned at a given latitude pointing in a given azimuth direction. The FS station is assumed to use an antenna at an elevation angle of 0 degrees. The FS station antenna gain conforms to the antenna pattern having averaged side-lobe levels as defined in Section 2.2.1.

The characteristics of the reference digital FS system are taken to be as given in Section 2.2.1.

Point-to-multipoint systems, which use antennas that are omnidirectional in azimuth, may also need to be considered in some bands. The characteristics of the reference digital point-to-multipoint system are given in Section 2.2.3.

3.2.2.3 Non-GSO MSS data to be used

The following data (in addition to Appendix 3 to Annex 2 data) is to be supplied by the administration responsible for the non-GSO MSS system:

- a) Full information to characterize the orbital elements of each satellite in the non-GSO constellation (i.e. orbital altitude, orbital inclination, right ascension of ascending node, argument of perigee, mean anomaly, mean motion and epoch) in accordance with an appropriate reference inertial coordinate system.
- b) Full information to characterize the antenna pattern (maximum gain, antenna roll-off pattern and polarization) of each spot beam of each satellite in the non-GSO MSS constellation. The MSS spot beam antenna pattern may for example be characterized by a parabolic roll-off with a floor, any of the applicable WARC-88 or WARC-77 satellite antenna patterns or as given in Recommendation ITU-R S.672.
- c) Full information on the maximum e.i.r.p. density /4 kHz or 1 MHz in any active beam with potential carrier frequency overlap with the assumed FS receiver of any satellite visible to the FS system at all sample points in time. This information should implicitly reflect the intra-satellite and inter-satellite frequency reuse plans as well as satellite spot beam traffic loading taking into account the expected geographical distribution of traffic for the MSS system.

In general if a CDMA/FDMA access scheme is employed on the non-GSO MSS constellation, then potentially all beams of all visible satellites may operate co-frequency. However if a TDMA/FDMA or FDMA access scheme is employed on the non-GSO MSS constellation, then only a subset of beams on visible satellites will operate co-frequency.

- d) In the absence of such information c) above, each spot beam of each satellite is to be assumed to have frequency overlap with the FS receiver and to be loaded to a level given by:
 - i) either the absolute worst case maximum MSS traffic loading (MAX) for any spot beam (which would result in a considerable overestimation of interference power into the FS system);
 - ii) or the mean MSS loading (MEAN) for any spot beam obtained by dividing the total instantaneous maximum satellite traffic capacity by the number of spot beams on the satellite (which would underestimate the effect of interference power into the FS system);
 - iii) or by a random variation between the above MAX and MEAN levels (which would mediate between i) and ii) to more accurately reflect the effect of interference power into the FS system);
- e) For non-GSO MSS systems which employ CDMA/FDMA, all visible satellites could be considered in the computation of aggregate interference to the victim FS station. For non-GSO MSS systems which employ TDMA/FDMA or FDMA, one satellite randomly selected among visible satellites or the highest elevation angle satellite could be considered in the computation of aggregate interference to the victim FS station.

3.2.3 Methodology for calculating interference

The SSM simulates the interference into the FS network from the non-GSO satellite constellation(s) as follows.

The SSM calculates the position and velocity vectors of the satellites of the NGSO satellite system and stations of FS system at each time instance.

At each time sample the SSM calculates the total interfering power at each victim FS station from all active spots with active carrier frequency overlap to the given FS station receiver bandwidth from all visible and appropriately selected MSS satellites. The aggregate interference power from all active spot beams of all visible satellites visible to the FS station(s) is determined using the following equation:

$$I = \sum_{k=1}^M \sum_{i=1}^N \sum_{j=1}^S \frac{E_{ijk}}{L_{ik}} G^3(\alpha_{ijk}) G^4(\theta_{ik}) \frac{B_w}{B_{ij}} \frac{1}{F_k} \frac{1}{P_{ik} A} \quad (1)$$

where:

- I = interference power (W)
- i = 1 of N visible satellites to the current kth FS station;
- j = 1 of S of active spot beams on the visible selected MSS satellite with frequency overlap to the current FS station receiver;
- k = 1 of M FS stations on an FS route;
- E_{ijk} = the maximum e.i.r.p. density per reference bandwidth input to the antenna for the jth active spot beam in its boresight direction of the ith visible selected satellite (W/reference bandwidth);
- B_{ij} = the reference bandwidth for the interfering signal from the jth active spot beam of the ith visible selected satellite (kHz);
- G³(α_{ijk}) = the antenna discrimination of the jth active spot beam of the ith visible selected satellite towards the kth FS station;
- α_{ijk} = the angle between the boresight pointing vector of the jth active spot beam of the ith visible selected satellite and the range vector from the kth FS station to this satellite (degrees);
- L_{ik} = free space loss at the given reference frequency from the ith visible selected satellite to the kth FS station;
- G⁴(θ_{ik}) = kth FS station antenna gain in the direction of the ith visible selected satellite;
- θ_{ik} = angle between the kth station antenna pointing vector and the range vector from the kth station to the ith visible selected satellite (degrees);
- B_w = receiver bandwidth of the victim FS station;
- A = averaging factor to take into account MSS carrier frequency, power or time variability;
- F_k = feed loss for the kth FS station;
- P_{ik} = polarization advantage factor between ith MSS satellite and kth FS station.

The averaging factor A may be applicable to reflect dynamic frequency, time or power variations in MSS traffic levels in a given reference bandwidth (due to for example use of voice activation, duty cycle, power control etc. as appropriate for the concerned non-GSO MSS system).

The polarization advantage P_{ik} of 3 dB is to be used only if the range vector from the k^{th} FS station to the i^{th} MSS satellite is within the 3 dB beamwidth of the FS antenna pointing vector.

3.2.4 Applicable interference criteria

3.2.4.1 Analogue FS

The SSM calculates the interference statistics based on the aggregate interference noise power accumulated over all stations as calculated at each sample point. The interference statistics indicate the probability that the aggregate received interference noise power exceeds a given interference level.

It was assumed that there are 51 analogue stations on a route centred at a given latitude. The routes span a distance of 2 500 km with stations spaced exactly 50 km apart. The azimuth angle for each station is specified by a given trendline angle and a variable angle that is uniformly distributed between ± 12.5 degrees. The analysis considers trendline angles that vary between 10 degrees and 170 degrees in 20 degree steps. Each station is assumed to use a high gain antenna pointed at the next station at an elevation angle of 0 degrees.

The SSM calculates the interference statistics based on the aggregate interference noise power calculated at each sample point. The interference statistics show the probability that the aggregate received interference noise power exceeds a given interference level. The interference interval is then mapped to the interference noise power in a 4 kHz telephony channel by:

$$N_{ch} = \frac{N_T}{kTB} I \quad (3)$$

where:

- N_T = thermal noise power introduced in a 4 kHz telephony channel at a station
= 25 picowatts psophometrically weighted at a point of zero relative level (pW0p)
- k = Boltzmann's constant
- T = station receiving system noise temperature
- B = reference BW = 4 kHz
- I = aggregate received interference noise power in the reference BW.

In order to assess if coordination is triggered or not with respect to analogue FS systems, the computed N_{ch} is compared with respect to the following criteria:

- 50 000 pW0p for 0.01% of time;
- 1 000 pW0p for 20% of time.

3.2.4.2 Digital FS system

For the digital FS case the SSM calculates the fractional degradation in performance FDP (as described in Section 2.1).

In order to assess if coordination is triggered or not with respect to digital FS systems, the computed FDP is compared with respect to the applicable criterion of 25%.

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C5 AD HOC 3**Note by the Chairman of C5 ad hoc 3****DRAFT ANNEX AAA****Coordination Areas for Mobile Earth Stations Operating Below 3 GHz and Earth Stations Providing Feeder Links for Non-Geostationary Satellites Operating in the Mobile-Satellite Service****1. Objectives**

[In regard to Section III and IV, Paragraphs 3.1 and 4.1, of the Annex to Resolution 46 (WRC-95),] this [Annex] specifies the coordination area (see No. [165]) for mobile earth stations as well as earth stations providing feeder links for non-geostationary satellite networks operating in the mobile-satellite service. In both cases, the coordination contour (see No. [166]) associated with the coordination area is drawn to scale on an appropriate map in order to depict the coordination area and the extent to which it overlaps the territory of administrations that may be affected. Tables 1-3 specify coordination distances (see No. [167]) for certain of the frequency sharing situations and frequency bands in which the provisions of Resolution 46 (WRC-95) are applied.

The coordination area of a mobile earth station is determined as the service area in which it is intended to operate the typical earth stations, extended in all directions by the coordination distance. Tables 1 and 2 specify coordination distances for mobile earth stations operating below 1 GHz and in the 1 - 3 GHz frequency range, respectively. In the case of feeder link earth stations, the coordination contour is determined as the end points of coordination distances measured from the earth station location. Coordination distances for feeder link earth stations operating below 1 GHz are specified in Table 1. Coordination distances for feeder link earth stations operating above 5 GHz are specified in Table 3 with respect to stations in terrestrial services and, where applicable, earth stations of other satellite networks operating in the opposite direction of transmission.

2. General considerations

Two types of coordination distances are specified in Tables 1 - 3: (1) predetermined distances, and (2) distances that are to be calculated on a case-by-case basis taking into account specific parameters of the earth station for which the coordination area is being determined. Neither of these distances indicate required separation distances.

It must be emphasized that the presence or installation of another station within the coordination area of an earth station would not necessarily preclude the satisfactory operation of either the earth station or the other station, since coordination distances are based on the most unfavourable case assumptions as regards interference.

TABLES 1 - 3 (General Description)

Tables 1-3 of Document 189 will be edited as follows to create Tables 1-3 of this Annex. These tables will be available on Monday, 13 November.

- Combine Tables 1a and 1b of Doc. 189 to form Table 1 having the heading “**Table 1 - Earth Stations Operating Below 1 GHz**” and delete the third column (“Applicable ITU-R Recommendation”).
- Combine Tables 2a and 2b of Doc. 189 to form Table 2 having the heading “**Table 2 - Mobile Earth Stations Operating in the 1 - 3 GHz Frequency Range**” and delete the third column (“Applicable ITU-R Recommendation”).
- Re-label the heading of Table 3 of Doc. 189 to read “**Table 3 - Feeder Link Earth Stations Operating with Non-Geostationary Satellite Networks**” and delete the third column (“Applicable ITU-R Recommendation”). Also delete Note 1 to Table 3.
- In all Tables, edit all entries in the 1st column to obtain language more suitable for inclusion in the RR, and make any references to existing ITU-R Recommendations comply with the guidance given in Doc. 124 (Rev. 1).
- In all tables update the last column in accordance with the latest decisions of COM 5 and make the following changes to Table 3 (as agreed at the first meeting of COM 5 ad hoc 3):
 - in the 1st row (i.e., the row with a 1st-column entry “Bands in which the FSS is already allocated; earth station operating co-directionally”), modify the existing entry:

A) [19.2-19.7 GHz and 29-29.5 GHz]: predetermined distance - value not given (in DT/26);

B) [19.2-19.7 GHz and 29-29.5 GHz]: case-by-case calculation using Recommendations ITU-R IS.847 and 849.

- in the last row (i.e., the row with a 2nd column entry “Bands in which the FSS is already allocated; earth station operating in reverse direction”), modify the existing entries to read as follows:

A) [19.2-19.7 GHz]: [170 km]

B) [13/11 GHz]: 225 km

C) [7 GHz]: 300 km

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COMMITTEE 4

DRAFT

CONSEQUENTIAL MODIFICATIONS TO RESOLUTION 21

As a consequence of the deletion of provision S11.16 the following modifications are proposed to the attached text of Resolution 21.

MOD

RESOLUTION NO. 21 (~~WARC-92~~)(REV. WRC-95)
IMPLEMENTATION OF CHANGES IN FREQUENCY ALLOCATIONS
BETWEEN 5 900 KHZ AND 19 020 KHZ

The World Administrative Radiocommunication Conference, for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992) Geneva, 1995.

considering

- a) that parts of the frequency bands between 5 900 kHz and 19 020 kHz which were previously allocated on an exclusive or shared basis to the fixed and mobile services have been reallocated to the broadcasting service;
- b) that some existing fixed and mobile assignments may need to be removed progressively from those reallocated bands to make way for the broadcasting service;
- c) that the assignments to be removed, termed "displaced assignments", must be reaccommodated in other appropriate frequency bands;
- d) that developing countries may require special assistance from the IFRB Bureau, as well as in application of Resolution 22 (~~WARC-92~~), in replacing their displaced assignments with appropriate protection;
- e) that procedures already exist in Article ~~12~~ S.11 of the Radio Regulations that may be used to this effect;

recognizing

the difficulties that administrations and the IFRB Bureau might encounter during the period of transition from the previous allocations to those made by this Conference;

resolves

1. that the duration of the transition period shall be from 1 April 1992 to 1 April 2007;
2. that, as of 1 April 1992, administrations should no longer notify any frequency assignments to stations of the fixed and mobile services in the reallocated bands. Assignments notified in these bands after 1 April 1992 shall bear a symbol to indicate that the finding will be examined by the IFRB Bureau as of 1 April 2007 in accordance with the provisions of No. ~~1240~~ S.11.31 of the Radio Regulations;
3. that, as of 1 April 1992, the IFRB Bureau shall undertake a continuing action to review the Master International Frequency Register with the help of administrations. In this respect the IFRB Bureau shall periodically consult the administrations concerning the frequency assignments to links for which another satisfactory means of telecommunication exists, with a view to either downgrading assignments of class of operation A or deleting such assignments;

4. that administrations shall, for assignments of class of operation A in the reallocated bands, either notify the replacement frequencies to the IFRB Bureau or request the IFRB Bureau's assistance in selecting the replacement frequencies in application of ~~No. 1218~~ Articles S.7 and S.13 of the Radio Regulations; ~~and Resolution 103 (WARC-79)~~;
5. that the IFRB Bureau shall develop in due time a draft procedure to be used for the replacement of remaining frequency assignments and shall consult administrations in accordance with ~~No. 1001.1~~ Article S.14 of the Radio Regulations;
6. that the IFRB Bureau should modify the draft procedures taking into account, to the extent practicable, comments received from administrations and propose replacement assignments at the latest three years before 1 April 2007. In so doing, the IFRB Bureau shall request administrations to take appropriate action to bring their assignments in conformity with the Table of Frequency Allocations by the due date;
7. that a replacement frequency assignment whose basic characteristics, with the exception of the assigned frequency, have not been modified in the above process, shall keep its original date. However, if these basic characteristics of a replacement frequency assignment are different from those of the displaced assignment, the replacement assignment shall be treated in accordance with ~~Nos. 1376 to 1380~~ the relevant provisions of Section II of Article S.11 of the Radio Regulations;

invites administrations

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