

RECOMMENDATION 744

ORBIT/SPECTRUM IMPROVEMENT MEASURES FOR SATELLITE NETWORKS
HAVING MORE THAN ONE SERVICE IN ONE OR MORE FREQUENCY BANDS

(Question [Doc. 4/2])*

(1992)

The CCIR,

considering

- a) that for economic and practical reasons there are increasing numbers of GSO satellites having multiple networks in multiple services and/or using one or more frequency bands;
- b) that each of the networks may require different types of coordination procedures;
- c) that the GSO orbital spacing of the multi-network and/or multi-band spacecraft will be determined by the largest required orbital separation;
- d) that Annex 1 describes the difficulties associated with coordinating such satellite networks;
- e) Recommendation No. 715 of WARC ORB-88 invited the CCIR to continue its technical studies pertaining to multi-band and multi-service satellite systems,

recommends

- 1. that when multiple coordination procedures are necessary with respect to a single spacecraft, individual methods should be applied to utilize all the flexibility available with full recognition of the implementation process inherent in each procedure;
- 2. that the technical and operational constraints of existing coordinated networks and of those being coordinated should be fully taken into account;
- 3. that administrations should in a cooperative spirit, take account of the preferred orbit positions, allocated frequency bands, and technical parameters of proposed satellite networks, which could assist in accommodating a new multi-network and/or multi-band satellite system, taking into account the factors outlined in Annex 1.

ANNEX 1

1. Introduction

In this Annex, § 2 describes the coordination methods, the applicable allocations, and parts of the Radio Regulations. In addition, it describes the type of networks associated with the different methods.

Section 3 is an analysis of the potential problems which may be presented when combinations of different networks are used on the same satellite.

Section 4 derives observations based on one example of a multiple network satellite.

Section 5 summarizes the findings about multi-service and multi-band satellites.

* Resulting from the rearrangement of existing Questions.

2. Description of the situation for networks with more than one service in one or more frequency bands

The procedural approaches for coordination and notification of frequency assignments to geostationary-satellite networks are indicated in Table 1 along with their distinguishing characteristics.

As indicated below, there are multiple combinations of frequency bands that can be put on a single satellite platform. When this occurs, multiple coordination procedures are necessary.

A single band of a satellite may also be subject to multiple coordination procedures. An example of this is the 12 GHz FSS band in which a network may be simultaneously subject to the procedures of RR Articles 11, 14, 15 and even Resolution No. 33. The coordination network possibilities are described below.

TABLE 1

Method	Allocation (GHz)	Regulations
BSS Plan (SAT-77) Feeder links (ORB-88)	BSS 11.7-12.5 (Region 1) BSS 11.7-12.2 (Region 3) FSS 14.5-14.8 (Regions 1 & 3) FSS 17.3-18.1 (Regions 1 & 3)	Appendix 30, Article 15 Appendix 30, Article 15 Appendix 30A, Article 15A Appendix 30A, Article 15A
BSS Plan (SAT-83) Feeder links (ORB-85)	BSS 12.2-12.7 (Region 2) FSS 17.3-17.8 (Region 2)	Appendix 30, Article 15 Appendix 30A, Article 15A
FSS Allotment Plan	FSS 4.5-4.8/6.725-7.025 FSS 10.7-10.95 FSS 11.2-11.45 FSS 12.75-13.25	Appendix 30 B Resolution No. 107
Improved procedures (Multilateral planning meeting)	Certain FSS bands	Resolution No. 110
Simplified procedures (unplanned bands and services)	Remaining FSS bands and all other space services allocations	Articles 11 & 13
Unplanned BSS	Remaining BSS bands	Resolution No. 33
Article 14	Footnote	Article 14

2.1 Registered networks

These are networks for which coordinating/registration procedures have been completed and which have had their frequency assignments and orbit locations recorded in the IFRB Master Register. Due to already agreed coordination constraints some of these networks may have few, if any, degrees of freedom remaining to accommodate additional satellites. The flexibility available to such networks to successfully conclude subsequent coordinations will greatly depend on the level of congestion present in the orbital arc at the time coordination is undertaken.

2.2 Assignment plans

The networks use orbit and spectrum which are part of the assignment plans for BSS and associated feeder links (Appendices 30 and 30A of RR); orbit positions and operating parameters are defined by the Plans and in practice there is little flexibility in modification of orbital position short of seeking a formal plan change; there is only limited flexibility in equipment parameters choice.