

SECTION 4/9B – COORDINATION AND INTERFERENCE CALCULATIONS

RECOMMENDATION ITU-R SF.1193

**CARRIER-TO-INTERFERENCE CALCULATIONS BETWEEN EARTH STATIONS
IN THE FIXED-SATELLITE SERVICE AND RADIO-RELAY SYSTEMS**

(1995)

The ITU Radiocommunication Assembly,

considering

- a) that during the planning stage of a satellite network or a radio-relay system it may be useful to calculate carrier-to-interference (C/I) ratios between carriers of the interfering and interfered-with networks for the purpose of determining levels of interference;
- b) that the C/I ratios can be used in the determination of interference levels contributing to performance degradation;
- c) that the C/I ratios can be used for all modulation methods and signal types;
- d) that the C/I calculation may be an element to complete coordination between satellite networks and radio-relay systems in accordance with the Radio Regulations;
- e) that Recommendation ITU-R S.741 describes C/I calculations between networks in the fixed-satellite service (FSS),

recommends

- 1** that when carrier-to-interference ratios (C/Is) are used to calculate the levels of interference between FSS earth stations and radio-relay systems the methods given in Annex 1 should be used to calculate the interference power in the interfered-with carrier.

ANNEX 1

**Determination of carrier-to-interference ratios and baseband noise power
for coordination of carriers between FSS earth stations
and radio-relay systems****1 Types of interfering carriers**

1.1 The types of interference experienced by FSS carriers from radio-relay systems can be classified as follows:

- noise-like interference;
- interference arising from a TV-FM carrier not employing energy dispersal;
- interference from one TV-FM carrier to another (this category is not addressed in this Annex).

1.2 The types of interference experienced by radio-relay carriers from FSS networks can be classified as follows:

- noise-like interference;
- slowly swept interference arising from a TV-FM carrier modulated only with an energy dispersal (ED) signal;
- interference from one TV-FM carrier to another (this category is not addressed in this Annex).

2 Types of FSS and FS carriers

2.1 For the types of carriers normally used in FSS networks, see § 2.1 of Annex 1 to Recommendation ITU-R S.741.

2.2 The types of carriers normally used in radio-relay systems are:

- Analogue:
 - FDM-FM,
 - TV-FM,
- Digital:
 - large bandwidth carriers,
 - intermediate bandwidth carriers,
 - TDMA carriers.

3 Methodologies used to assess interference into FSS and FS carriers

3.1 Interference into FDM-FM and CFDM-FM carriers

See § 3.1 of Annex 1 to Recommendation ITU-R S.741. However, further study is required for interference into and from radio-relay systems employing FDM-FM of a small modulation index.

3.2 Interference into a non-FDM-FM carrier

See § 3.2 of Annex 1 to Recommendation ITU-R S.741.

Table 1 of Recommendation ITU-R S.741 is also applicable.

3.3 Interference from noise-like digital carriers

See § 3.3 of Annex 1 to Recommendation ITU-R S.741.

3.4 Interference from noise-like analogue carriers

See § 3.4 of Annex 1 to Recommendation ITU-R S.741.

3.5 Interference from slowly-swept TV carrier

See § 3.5 of Annex 1 to Recommendation ITU-R S.741.

3.6 Interference from TV-FM carrier without energy dispersal

Under study.

4 Protection criteria for FSS and FS carriers

Recommendations ITU-R SF.356 and ITU-R SF.558 deal with the interference noise allowance to be made in the noise budget for FSS carriers. Recommendations ITU-R SF.357 and ITU-R SF.615 deal with the interference noise allowance to be made in the noise budget for FS carriers.

Table 2 of Recommendation ITU-R S.741 is not applicable to the case of FSS-FS interference. Further study is required to develop a similar table which is applicable to FSS-FS interference.
