

RECOMMENDATION ITU-R M.1232

**SHARING CRITERIA FOR SPACE-TO-EARTH LINKS OPERATING IN THE
MOBILE-SATELLITE SERVICE WITH NON-GEOSTATIONARY
SATELLITES IN THE 137-138 MHz BAND**

(Question ITU-R 83/8)

(1997)

Summary

In this Recommendation, the sharing criteria for downlinks of FDMA non-GSO/MSS networks and SSMA non-GSO/MSS networks are recommended in terms of the maximum single-entry interference levels.

The ITU Radiocommunication Assembly,

considering

- a) that frequency bands allocated to the mobile-satellite service (MSS) in the band 137-138 MHz may be shared by several systems, including those operating in other services;
- b) that Recommendation ITU-R M.1231 specifies the interference criteria needed to determine the sharing criteria;
- c) that sharing criteria may be determined using the methodology described in Recommendation ITU-R SA.1023;
- d) that Annex 1 presents the parameters used in the implementation of Recommendation ITU-R SA.1023 using the interference criteria arrived at in Recommendation ITU-R M.1231;
- e) that the typical deployment of interfering stations may change over a period of years as a result of growth in the number of systems and revisions to frequency band allocations that are adopted by world radio conferences;
- f) that the sharing criteria derived using the methodology of Recommendation ITU-R SA.1023 is based on an estimated number of systems that generate interference at significant levels;
- g) that two general types of modulation are to be considered for non-geostationary (non-GSO) MSS operating in the 137-138 MHz band, which are: narrow-band modulation with frequency division multiple access (FDMA) and wideband modulation and direct sequence spread spectrum multiple access (DS-SSMA),

recommends

- 1 that the single-entry interference levels presented in Table 1 be used as sharing criteria, or as the basis for alternative forms of sharing criteria (e.g., power flux-density limits), for the protection of stations operating in the MSS in the band 137-138 MHz;
- 2 that the criteria specified in *recommends* 1 be used as the basis for coordination thresholds for receiving stations operating in the MSS in the band 137-138 MHz;
- 3 that the deployment of interferers specified in Annex 1 be reviewed periodically in order to determine whether the typical interference environment and consequential sharing criteria should be revised.

NOTE 1 – The sharing criteria of Table 1 (including the Notes below) are intended to be applied in frequency sharing analyses and the coordination of frequency assignments (i.e., as the minimum levels of accepted interference for applicable ground stations). In coordination applications, the actual interference environment seen by the receiving ground station should be compared with that assumed in Annex 1 in order to help determine whether interfering signal power greater than the permissible single-entry level can be accepted. Generally, this consideration may enable acceptance of single-entry interference levels that may be as high as those specified in the applicable interference criteria (Recommendation ITU-R M.1231).

TABLE 1

Sharing criteria for stations in the MSS operating in the band 137-138 MHz

Frequency band (MHz) modulation type	Function and type of receiving antenna	Interfering signal power (dBW) in the channel to be exceeded for no more than 20% of the time ⁽¹⁾		Interfering signal power (dBW) in the channel to be exceeded for no more than $p\%$ of the time ⁽²⁾	
		Space-Earth	Terrestrial	Space-Earth	Terrestrial
137-138 (narrow-band modulation with FDMA)	Data downlink to gateway (15 dBi horn antenna) Reference bandwidth is 44 kHz	-146.2 ⁽³⁾	-147.3	-133.8 ⁽³⁾ $p = 0.0625\%$	-133.8 $p = 0.125\%$
137-138 (narrow-band modulation with FDMA)	Data downlink to subscriber terminal 0 dBi monopole antenna with a $\cos^2$ pattern Reference bandwidth is 19.2 kHz	-159.9 ⁽³⁾	-160.6	-144.7 ⁽³⁾ $p = 0.0625\%$	-144.8 $p = 0.125\%$
137-138 (wideband modulation with DS-SSMA)	Data downlink to gateway (16 dBi antenna) Reference bandwidth is 885 kHz	-138.5 ⁽³⁾	-141.5	-129 ⁽³⁾ $p = 0.0625\%$	-129.5 $p = 0.125\%$

(1) The interfering signal level is determined during reception at elevation angles equal to or greater than 20°.

(2) The interfering signal level is determined during reception at elevation angles equal to or greater than 5°.

(3) As explained in Table 2, this interference power is to be applied to a single constellation of interfering satellites. Usually this number reflects the anticipated number of single interfering transmitters. However, for this Recommendation, this number reflects the number of anticipated interfering constellations. Any limits or thresholds that would apply to a single spacecraft of one of these constellations would be handled during detailed and formal coordination.

NOTE 2 – The single-entry interfering signal power thresholds in Table 1 are the permissible levels of interfering signal power that fall within the specified reference bandwidth. Accordingly, the total power in interfering signals should be considered in frequency sharing analyses. In cases where the interfering signal bandwidth exceeds the reference bandwidth or does not fully overlap the passband of a specific receiver under study, the available frequency dependent rejection should be applied in conjunction with the specified permissible interference levels. Other pertinent ITU-R Recommendations should be consulted for guidance on this matter.

NOTE 3 – The sharing criteria presented in Table 1 are based on representative stations having the specified antenna gain values. Recommendation ITU-R SA.1022 presents a method for scaling the permissible level of total interfering signal power for other antenna gain values. The single-entry criteria also must be scaled in accordance with earth station antenna gain by the same amount of adjustment that would occur for interference criteria using the method in Recommendation ITU-R SA.1022.

NOTE 4 – In deriving the above sharing criteria from permissible total levels of interfering signal power, no allowance has been made for interference from spurious emissions.