Recommendation 6-2R1

TRANSPONDER TURNAROUND FREQUENCY RATIOS

FOR SPACE RESEARCH, CATEGORY A[(1)(2)]

The SFCG,

CONSIDERING

a) that many space missions require coherency between the Earth-to-space and space-to-Earth links in order to provide accurate doppler frequency shift and range delay measurements;

b) that a turnaround frequency ratio must be defined for those missions which require coherency;

c) that standardized transponder turnaround frequency ratios are necessary for one agency's spacecraft to be supported by another agency's earth stations;

d) that care should be exercised in the selection of the numbers comprising the turnaround frequency ratios;

e) that transponder turnaround frequency ratios have previously been defined and used extensively and successfully in the 2,7, and 8 GHz Category A frequency bands,

RECOMMENDS

1. that, for Category A missions, SFCG member agencies utilize the transponder turnaround frequency ratios listed in Table 1.

[1] Category A missions are those having an altitude above the Earth of less than $2 \exists 10^6$ km.

[2] CCSDS has adopted a similar Recommendation.

TABLE I - Turnaround frequency ratios for Category A[1] missions

Frequency ratio	Allocated band (MHz)	Nominal[2] available band (MHz)	Allocated band (MHz)	Nominal[2] available band (MHz)
E-S/S-E	*E - S*	*E - S*	*S - E*w200 - 2290	*S - E*
221/240	2025 - 2110	2025 - 2110	8450 - 8500	2200 - 2290
749/880	7190 - 7235	7190 - 7235	8450 - 8500	8450 - 8500
221/900	2025 - 2110	**2075 - 2087**	2200 - 2290	8450 - 8500
765/240	7190 - 7235	7190 - 7235		**2256 - 2270**
E-S/E-S	*E - S*	*E - S*	*E - S*	*E - S*
221/765	2025 - 2110	**2077 - 2090**	7190 - 7235	7190 - 7235
S-E/S-E	*S - E*	*S - E*	*S - E*	*S - E*
240/900	2200 - 2290	**2253 - 2267**	8450 - 8500	8450 - 8500

(1) Category A missions are those whose distance from the Earth is less than $2 \exists 10^6$ km.

(2) The nominal available band for a particular direction is determined by the frequency ratio and the width of the allocated band for the other direction. The figures listed are approximate. For some frequency ratios, for example 221/900, the width of the nominal available band in one of the directions will be less than the allocation width in that direction. These cases are shown in bold face type.