

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Allocation and Designation of Spectrum for)	
Fixed-Satellite Services in the 37.5-38.5 GHz,)	IB Docket No. 97-95
40.5-41.5 GHz and 48.2-50.2 GHz Frequency)	
Bands; Allocation of Spectrum to Upgrade Fixed)	RM-8811
and Mobile Allocations in the)	
40.5-42.5 GHz Frequency Band; Allocation of)	
Spectrum in the 46.9-47.0 GHz Frequency Band)	
for Wireless Services; and Allocation of Spectrum)	
in the 37.0-38.0 GHz and 40.0-40.5 GHz)	
Frequency Bands for Government Operations)	

COMMENTS OF ASTROLINK INTERNATIONAL LLC

Astrolink International LLC (“Astrolink”) by its attorneys and pursuant to Section 1.415 of the Commission’s Rules, 47 C.F.R. § 1.415, hereby submits its comments in response to the *Further Notice of Proposed Rulemaking* in the above-captioned proceeding, FCC 01-182 (rel. May 31, 2001) (“*Further Notice*”).

Astrolink is a member of the Satellite Industry Association (“SIA”) and fully supports the SIA comments being filed today in this proceeding. Astrolink is separately filing comments to emphasize its concern with the Commission’s proposals in the *Further Notice* regarding imposing restrictions on fixed-satellite service (“FSS”) operations in order to “fully protect” radio astronomy services. *See Further Notice* at ¶¶ 32-34.

I. BACKGROUND

The *Further Notice* seeks comment on proposed modifications to the Commission’s band plan for services in the 37.0-43.5 GHz frequency range. In addition, the Commission proposes a number of changes to the table of frequency allocations, including

suggested changes in order to provide additional protection to radio astronomy in the 42.5-43.5 GHz band. *Id.* at ¶ 13. Specifically, the Commission requests comment on whether it should adopt domestically a modified version of international footnote S5.551G that would impose strict power flux density (“PFD”) limits on FSS systems. *Id.* at 32, footnote USXXX. As discussed below, this proposal for limitations on FSS operations to protect radio astronomy is premature, unjustified by the record, and would unreasonably constrain the use of the spectrum for FSS.

Astrolink holds a license to construct and operate a global Ka-band satellite system. Astrolink is not currently an applicant for FSS frequencies in the spectrum that would be affected by the proposals in the *Further Notice* regarding protection of radio astronomy. Nevertheless, as an FSS licensee, Astrolink has an interest in the continued availability of expansion bands for FSS operations, including frequencies in the 37.0-43.5 GHz range. Because implementation of the strict limits proposed would impose substantial burdens on FSS systems, Astrolink urges the Commission not to adopt the proposal for domestic PFD limits on FSS operations set forth in paragraphs 32 through 34 of the *Further Notice*.

II. THE COMMISSION SHOULD NOT ADOPT PROPOSED FOOTNOTE USXXX

The Commission’s proposal to adopt restrictions on FSS operations in bands adjacent to those used by radio astronomy cannot be justified given the lack of international consensus on the proposed limits and the absence of any other evidence supporting the limits. Furthermore, the suggested PFD limits reflect only the input of the radio astronomy community, without any consideration of the impact on FSS operations. The limits would seriously impair the ability of FSS to effectively use the 41.5-42.0 GHz band.

A. The Commission Should Not Codify the Provisional PFD Limits Pending Completion of International Studies

As a threshold matter, the Commission's proposal to adopt new rules based on the provisional PFD limits adopted by WRC-2000 is clearly premature. As the Commission acknowledges, these limits are subject to modification by WRC-2003. *See Further Notice at ¶ 32.* The Commission makes no attempt to explain why it is proposing to codify in its domestic rules proposed PFD restrictions that are specifically slated for further international review and are under active study.

Resolution 128 (rev. WRC-2000) and agenda item 1.32 for WRC-03 (*see* WRC-2000 Resolution 800) provide for the ITU-R to review the provisional limits in S5.551G and require the evaluation of a range of possible mitigation techniques. The ITU-R is also requested, as part of its studies, to consider measures to reduce the susceptibility of stations in the radio astronomy service to harmful interference. An international task group (ITU-R TG 1/7) was formed to study these issues and determine what regulatory measures (not necessarily PFD limits) might be appropriate to protect radio astronomy from unwanted emissions. Furthermore, ITU-R Working Party 4A is responsible for reporting on the technical studies conducted under agenda item 1.32 to the Conference Preparatory Meeting for WRC-2003. Both these groups are actively working on these matters, and their studies will not be completed until next spring.

Given this timetable, the Commission's proposal to adopt into its rules the limits provisionally agreed to at WRC-2000 is puzzling at best. Because the limits are likely to be revised, codifying them now in footnote USXXX will only result in the need for modification of the Commission's rules following the outcome of WRC-2003. Instead, the Commission should await the results of the ongoing studies by the international community before taking any action with respect to protection of radio astronomy services. The results of any international studies

would then need to be reviewed by the Commission in a rulemaking proceeding to evaluate whether it is appropriate to apply them in the U.S.

B. The Record in this Proceeding Provides No Support for the Proposed PFD Limits

The record before the Commission in this rulemaking provides no independent support for the Commission's proposals to incorporate the provisional limits from WRC-2000 into the U.S. rules. The *Further Notice* does not cite to any evidence provided by the radio astronomy community that would justify imposition of these restrictions on FSS operations. Perhaps more telling, the *Further Notice* does not even seek comment on whether the proposed strict PFD limits are required to protect radio astronomy sites, or whether they would place unwarranted constraints on FSS systems.

As a participant in the international task group studying these issues in preparation for WRC-2003, Astrolink is familiar with the background of the PFD proposals. The limits, which were originally contained in Recommendation ITU-R RA-769-1, were derived using generic radio astronomy receiver characteristics, and, as is the case with many ITU-R recommendations on interference, provide a conservative starting point for discussion of protection. In the U.S., the radio astronomy receivers that are actually in use are likely much less susceptible to harmful interference.¹ Furthermore, the proposed limits fail to take into consideration the variation in the types of receivers in use and the corresponding variation in the actual protection level needed. For example, very long baseline interferometers or arrays require significantly less stringent protection than do single telescope receivers. Another important

¹ Recommendation ITU-R RA-769-1 assumed an antenna pattern with a 0 dBi side lobe at 19 degrees off axis. Typical U.S. radio astronomy receivers have much better antenna characteristics.

consideration is that every radio astronomy site does not make measurements in each frequency band allocated to the radio astronomy service. For instance, it is our understanding that only a very few radio astronomy sites in the U.S. (on the order of two) actually conduct measurements in the 42.5-43.5 GHz band. The proposed text of USXXX does not take this into account.

Instead, it simply would require the PFD limit to be met at every radio astronomy site, regardless of whether or not that site actually monitors the subject frequency band.

These facts suggest that the level of interference protection that is appropriate for U.S. radio astronomy operations will generally be less stringent because of improved receive antenna parameters and will vary given the specific technical characteristics of a given site. As a result, the Commission's proposed "one size fits all" rule, and the specific proposed limit itself, simply do not reflect the actual requirements of the U.S. radio astronomy community.

Nor does the proposal take into account the impact of the proposed limits on the viability of FSS operations in the affected bands. Compliance with the stringent PFD limits set forth in the proposed footnotes would be extremely constraining for FSS systems. For example, any FSS system planned for operation in these bands would almost certainly employ multiple spot beams. Should the FSS be required to include the type of filtering that would be needed to suppress out-of-band emissions to the levels proposed, the impact of this filtering would be considerable. The weight and cost of filtering each beam would be multiplied by the number of beams on the spacecraft. In addition, the added insertion loss associated with such filtering would either reduce the capacity of the spacecraft or could increase its size to unreasonable proportions. For example, a filter insertion loss of 1-2 dBs (a reasonable value) would carry with it a 26-37% capacity reduction. Counteracting this reduction by increasing the power would require a significant increase in the size and weight of the satellite. Under these circumstances,

the usefulness of the 41.5-42.0 GHz band for FSS services would be significantly impaired if the PFD limits proposed in the *Further Notice* were to go into effect.

In sum, the PFD limitations proposed represent only one side of the sharing equation. They reflect the outcome of a number of conservative assumptions regarding the needs of the radio astronomy service for protection and fail to consider at all the effect of the limits on the primary designation for FSS in the 41.5-42.0 GHz band. The Commission clearly cannot move forward with domestic rules on this subject until it has examined the requirements of the radio astronomy service and the consequences for FSS operations to arrive at balanced compatibility criteria that reflect the needs of both services.

C. The Commission Should Not Delete the Current BSS Allocation in the 42.0-42.5 GHz Band

In the *Further Notice*, the Commission asks for comment on whether the provisional PFD limits adopted at WRC-2000 for BSS “fully protect [radio astronomy], and if not, whether we should delete the current BSS allocation from the 42.0-42.5 GHz band.”

Further Notice at ¶ 34. Astrolink opposes any revision to the BSS allocation based on a purported need to provide additional protection for radio astronomy services.

First, there is no reason to believe that such a step is necessary. The provisional PFD limits adopted at WRC-2000 were taken from ITU-R Recommendation RA-769-1, which was developed by the radio astronomy community. There is simply no evidence to suggest that these conservative limits are not adequate to fully protect the radio astronomy service.² As

² NTIA originally suggested the elimination of the BSS allocation at 42.0-42.5 GHz, but presented no technical justification for this extreme proposal. See Letter of William T. Hatch, Office of Spectrum Management, NTIA, to Bruce Franca, Office of Engineering and Technology, FCC (March 2, 2001) at 2.

described in greater detail above, the relevant question is whether or not these strict limits are truly required to protect U.S. radio astronomy sites.

Second, the Commission's proposal makes no attempt to accommodate BSS. The BSS allocation in the 40.5-42.5 GHz band pre-dates WRC-92. Astrolink objects to the suggestion that a long-standing active service allocation must be deleted in order to "fully protect" the radio astronomy service. Instead, the Commission should strive to achieve compatibility criteria that would allow the two adjacent services to co-exist. The Commission should abandon the idea of deleting the BSS allocation and instead focus on reaching a solution that meets the needs of both BSS and radio astronomy operations.

III. CONCLUSION

For the foregoing reasons, Astrolink opposes the Commission's proposal to codify the provisional PFD limits by adopting footnote USXXX. Instead, the Commission should await the outcome of the pending international studies and then seek a solution that is tailored to the needs of both radio astronomy and FSS operations in the U.S. Finally, the Commission should retain the long-standing BSS allocation in the 42.0-42.5 GHz band.

Respectfully submitted,

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