

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Amendment of the Amateur Service)
Rules to Provide For Greater Use of) WT Docket No.97-12
Spread Spectrum Communication)
Technologies)

To: The Commission

COMMENTS OF THE RADIO AMATEUR SATELLITE CORPORATION

Introduction

The Radio Amateur Satellite Corporation (AMSAT) is a not-for-profit District of Columbia corporation established in 1969. It is the principal membership organization of the amateur satellite community in North America. Our current membership is approximately 7,000. Together with more than 30 of our affiliated organizations throughout the world, we have constructed, launched and operated over two dozen satellites to date in the Amateur-satellite Service, of which many are presently in operation. AMSAT is currently constructing a new satellite presently designated "Phase 3D". Scheduled for launch later this year by the European Space Agency, it is designed to provide wide area amateur communications transmitting on amateur satellite bands from 2 meters to 1.25 cm. Phase 3D will provide approximately 500 kHz of bandwidth on all of the bands on which it will transmit, except for 2 meters where the bandwidth will be limited to 200 kHz by frequency coordination within the amateur community.

It is envisioned that part of the bandwidth will be used for digital transmission up to speeds of about 56 kb/s. The remainder is expected to be used for multiple access by many stations at a time using narrower band modes such as SSB, CW and other relatively narrowband modes, and could be used for wide bandwidth modes, including SS, that require a linear transponder.

Since its inception, AMSAT has wholeheartedly been in favor of the development of new technologies in and for the Amateur and Amateur-satellite Services.

Summary

1. AMSAT generally supports the intent of the Commission's proposal contained in this NPRM to liberalizing the rules governing the use of Spread Spectrum (SS) in the Amateur Service. We believe that SS may be one of those techniques that offers a potential for improved amateur communication, both terrestrially and via amateur satellites. We respectfully request a modification to the Rules as proposed in the NPRM to minimize the potential for destructive interference to satellite operation. We believe our suggested change to the Rules will enable SS and satellite operation to develop together more rapidly and effectively.

Discussion

2. AMSAT believes that SS is a technique that may very well prove a significant vehicle for facilitating improved communication between licensed amateurs, both terrestrially and through amateur satellites. However, our calculations, (see AMSAT's Reply Comments in RM-8737, paragraphs 3, 4 and 5), show that a single terrestrial SS station transmitting in the 435 MHz amateur satellite band with a power of one watt spread over 10 MHz could increase the "noise" level up to 20 dB at a distance of 20 km, resulting in interference to reception of relatively weak amateur satellite signals. The situation worsens as the number of SS stations increases, and with their transmitting power levels. The interference would also be worse at smaller separation distances.

3. We are also concerned that higher power terrestrial SS signals may find their way into satellite-borne transponders and be inadvertently retransmitted, in whole or in part. These concerns are held despite the good faith efforts incorporated in the NPRM to minimize interference from SS, such as the requirement for automatic power control for SS stations running more than 1 watt. Unfortunately, our calculations show that, even at the 1 watt level, the potential for such destructive interference to weak downlink signals exists for satellite operators located in the vicinity of SS stations, increasing as the number of SS stations becomes large. At the 100 watt level, there is a significant likelihood of SS signals being unintentionally received by amateur satellites.

4. For these reasons, we respectfully request that the Commission adopt the limitation proposed below in an attempt to prevent such interference situations from developing, and still permit the growth and development of SS for both satellite and terrestrial applications.

AMSAT's Proposal

5. AMSAT contends that there is a feasible way to make SS available for both amateur terrestrial use and amateur satellite communication without the potential of destructive interference caused to existing satellite modes. We believe that this can be done by a clear statement in the Rules, that SS transmissions not intended for satellite

access shall take place only outside those ITU designated Amateur-satellite Service allocations below 2410 MHz, unless they are intended for work with or through amateur satellites, or short tests to confirm the proper operation of equipment in preparation for such work.

6. We believe that the Part 18 emissions above 2410 MHz make it irrelevant whether SS interference is present or not. In the higher microwave satellite bands antenna directivity should prevent any significant interference.

7. We respectfully request that the Commission add language to Section 97.305:

97.305 Authorized emission types

SS (spread spectrum) emissions are authorized on the following frequency segments:

420 - 450 MHz*

902 - 928 MHz

1240 - 1300 MHz*

All Amateur frequencies above 2300 MHz*

*In the segments 435 - 438 MHz, 1260 - 1270 MHz and 2400 - 2410 MHz, SS emissions shall be used only for transmissions to or from amateur space stations, except for short tests to confirm proper operation of equipment.

Conclusion and Recommendations

8. AMSAT recommends that the Commission incorporate the above provision in any new Rules arising out of this proceeding, in order to protect amateur satellite users from interference that our calculations show could result from terrestrial (non-satellite) SS communication. Such a provision would still permit the use of SS in conjunction with amateur satellite communication.

9. This suggested course is consistent with the Commission's policy of fostering experimentation among the amateur community and encouraging the growth of SS, including those using it in connection with amateur satellites. At the same time, it will preserve the capability of using current modes in conjunction with satellite operation, even by satellite users located in close proximity to other stations using SS for terrestrial applications.

RESPECTFULLY SUBMITTED,

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May 5, 1997