

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Amendment of Parts 2 and 97 of the)	
Commission's Rules Concerning the Use)	ET Docket No. 02-98
of the 2400-2402 MHz Band by the)	RM-9949
Amateur and Amateur-Satellite Services)	

To: The Commission

COMMENTS OF THE RADIO AMATEUR SATELLITE CORPORATION

BACKGROUND

1. The Radio Amateur Satellite Corporation (AMSAT[®]) is a scientific and educational corporation chartered in the District of Columbia in 1969 and certified by the Internal Revenue Service as a charitable corporation under §501(c)(3) of its Rules. FCC licensed amateur radio operators make up the vast majority of our membership.
2. We design, construct, test, and operate amateur radio satellites, often in cooperation with radio amateurs in many other countries. We also make available a variety of publications, computer programs, and INTERNET services promoting space science education among radio amateurs and students worldwide. (See: <http://www.amsat.org>.)
3. AMSAT-OSCAR-40, the latest of our free flying spacecraft, was lifted to orbit by an Ariane-5 launcher in November 2000. Radio amateurs from more than a dozen countries cooperated in its design and construction. Similarly, together with ARRL, NASA, and cooperating radio

amateurs from other nations, we are maintaining and expanding an amateur space station aboard the International Space Station (ISS) for use by astronauts and cosmonauts who are licensed amateur radio operators and for a variety of experiments. (See the new 3-D IMAX film *Space Station* and watch part of our station in operation.)

**PAST AND PRESENT AMATEUR-SATELLITE SERVICE OPERATIONS
IN THE 2400 to 2402 MHz BAND**

4. Amateur space stations have used this band over the course of many years. See Table I.

**Table I. Amateur-satellite service space stations
designed for the band 2400 – 2402 MHz.**

Spacecraft	Start year	Frequency (MHz)	Application(s)
UoSAT-OSCAR-9	1981	2401.000	telemetry
UoSAT-OSCAR-11	1984	2401.500	telemetry
AMSAT-OSCAR-13	1988	2400.711 - 2400.747 2400.664	transponder downlink telemetry
AMSAT-OSCAR-16	1990	2401.143	telemetry
DOVE-OSCAR-17	1990	2401.221	telemetry
UoSAT-OSCAR-36	1998	2401.000	high speed data
AMSAT-OSCAR-40	2000	2401.100 - 2401.350 2400.350 - 2400.600 2400.650 - 2400.950 2401.225 – 2401.475 2401.173 2401.323 2400.573	digital transponder uplink analog transponder uplink digital transponder downlink analog transponder downlink telemetry telemetry telemetry

5. Because this frequency allocation was available to the amateur-satellite service, amateur radio operators increased their knowledge and the state-of-the-art of transmitters, receivers, antennas, propagation, plus modulation and coding techniques through the development of the spacecraft themselves and, especially, many, many individual Earth stations.

FUTURE AMATEUR-SATELLITE SERVICE OPERATIONS IN THE 2400 to 2402 MHz BAND

6. Plans for a new spacecraft now being constructed by AMSAT include a transmitter in the 2400 to 2402 MHz band for an advanced digital communication experiment. The leading candidate experiment relies upon coding techniques to improve effective link power budget and apply novel, cost-saving radio design techniques using digital signal processing available in off-the-shelf personal computers. Future applications well beyond amateur radio likely will benefit significantly if this experiment works as intended. Adequate flexibility designed into the spacecraft should allow a variety of other interesting communication experiments during the lifetime of this project.

CONSIDERATIONS FOR A PRIMARY ALLOCATION

7. As can be seen from Table I, amateur-satellite service uses of the 2400 – 2402 MHz band increase in scope and complexity with each new project. Early amateur satellites used the band for telemetry¹, propagation experiments, and as an incentive for individual amateur operators to design and construct their own equipment for this frequency band. Now, the band supports linear transponders and digital experiments. More interesting experiments are on the way.

¹ On amateur-satellite service missions, while consistent with the definition in 47 CFR §97.203, our beacons function more along the lines of “other related activities” by conveying telemetry providing a rich source of data for our own and students’ educational projects.

8. ARRL is right that a primary allocation to the amateur-satellite service will help to protect the 2400 – 2402 MHz band from incompatible sharing partners. As it is, amateurs still must tolerate interference from ISM devices. By allocating frequencies to our licensed service at the edge of the ISM band, the Commission creates a reasonable sharing opportunity for amateurs. We expect a technical challenge dealing with interference from co-located ISM devices. Geographical separation will be a problem because the amateur-satellite service includes both space and Earth stations. Fortunately, residential ISM operation is intermittent.

CONCLUSIONS

9. A primary allocation to the amateur service and amateur-satellite service in the band 2400 – 2402 MHz serves the public interest well by encouraging experimentation and education.

10. AMSAT acknowledges and thanks the American Radio Relay League for its foresight and efforts in proposing this Rule Making and recommends favorable action by the Commission.

RESPECTFULLY SUBMITTED,

The Radio Amateur Satellite Corporation
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By _____ Date July 15, 2002
Dr. Perry I. Klein, W3PK
Vice President, Government Liaison