Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of:

Streamlining Licensing Procedures for Small Satellites	**)** **)** **)**	**IB Docket No. 18-86**

To: The Commission

REPLY COMMENTS OF RADIO AMATEUR SATELLITE CORPORATION

The Radio Amateur Satellite Corporation (AMSAT®), respectfully submits reply comments in response to the *Notice of Proposed Rule Making and Order*, FCC 18-44, 83 Fed. Reg. 24064, released May 24, 2018 (the Notice). These reply comments are timely filed.

We concur in full with the comments filed by ARRL, the national association for Amateur Radio.[1] In particular, we agree that the Commission has utilized an overly restrictive interpretation of what constitutes an amateur radio satellite and that the Commission should authorize amateur radio satellites that have a licensed radio amateur as a control operator at all times, are operated in compliance with all portions of Part 97 of the Commission's regulations, and are coordinated by the International Amateur Radio Union (IARU) in advance of launch. Other factors not found in Part 97, such as the ownership or funding sources for the mission, should not be used to evaluate the suitability of a mission for authorization in the amateur satellite service. We also agree that satellites authorized under Part 5 should not operate in amateur spectrum, consistent with ITU Resolution 659.

I. Pecuniary interest

Commission regulations prohibit communications in which an amateur control operator has a pecuniary interest, or communications on behalf of an employer. This regulation is ultimately intended

[1] Comment of ARRL, the national association for Amateur Radio in proceeding IB-86. ID 10709274556851.

to prevent the commercial exploitation of the amateur service. The Comment of Open Research Institute[2] discusses the pecuniary interests involved in university research and comes to the conclusion that most university projects are not appropriate for the amateur satellite service due to the potential of research results to lead to publications in journals, patents, or even a Nobel Prize. We disagree with this broad interpretation of pecuniary interest. First, the prohibition on pecuniary interest only applies to the control operator, not to any other parties involved in the amateur satellite project. Second, were the Commission to construe pecuniary interest so broadly, it would likely prohibit many currently common amateur practices. For example, services exist where licensed amateur operators can rent time on amateur stations and operate those stations remotely. In this case, the owner of the station has pecuniary interest since they are receiving income for the operation of that station, but Commission regulations do not (and should not) prohibit this activity since the control operator has no pecuniary interest. In the case of the amateur satellite service, a university or non-profit organization may build and own a satellite and may have a pecuniary interest in its operation, but the regulations only apply to the licensed amateur control operator that is ultimately responsible for operating the satellite. In a reply comment[3], the Open Research Institute proposes to expand the prohibition on pecuniary interest to prohibit all communications in which a pecuniary interest exists, regardless of the party which has the pecuniary interest. We believe such an expansion of the regulation is unnecessary and counter-productive. The commenter provides two potential amateur satellite operations in which the licensed control operator would have no pecuniary interest, but which would clearly be exploitations of the amateur service. We believe the regulations already prohibit the potential operations discussed since they do not fit within the basis and purposes of the amateur service, as discussed in the next section.

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2 Comment of Open Research Institute in proceeding IB 18-86. ID 10709776226029.

3 Reply Comment 2 of Open Research Institute in proceeding IB 18-86. ID 107300939610718.

The Open Research Institute also proposes a new exception to the regulation prohibiting pecuniary interest which would allow amateur satellite control operators to be paid for their services, in order for control operators to be available instantly to command a satellite based upon a Commission request. We believe such an exception to be unnecessary. Volunteer amateur operators have been commanding amateur satellites for nearly 50 years. These efforts have included managing some very complicated and advanced satellite systems. For example, a worldwide amateur control operator network in the mid-1970s kept AMSAT-OSCAR 6 in operation by feeding it thousands of commands a day due to a problem that caused the satellite to keep switching off in the absence of command station intervention. Another example is the crisis management with AMSAT-OSCAR 10. Launched in 1983, AMSAT-OSCAR 10 was nearly lost shortly after reaching orbit when the upper stage of the Ariane launch vehicle bumped the satellite, causing it to tumble and spin. The worldwide amateur control network sprung into action, issuing commands to stabilize the satellite, which continued functioning until 2002. Further, the availability of internet access and remote amateur station technology means that a control operator does not necessarily need to be present at their station to issue a command. If set up to do so, they can simply use technology to remotely connect to their station and issue the command.

II. Funding and ownership of amateur satellites

As discussed in our submitted comments, we believe the funding sources and ownership of amateur satellites to be irrelevant to whether or not a mission is suitable for authorization in the amateur service and find no basis in the Commission's regulations for evaluating an amateur satellite project on the basis of its funding sources or ownership. We concur with the Reply Comments of Faculty/Amateur Radio Mentors of a Federal "University"[4]. The missions referenced in the comments, such as PCSAT and PSAT, are very popular among amateur operators and the Commission should continue to authorize these missions as amateur under Part 97.

[4] Reply Comments of Faculty/Amateur Mentors of a Federal "University" in proceeding IB 18-86. ID 10801107363428.

III. Purposes of an amateur satellite

While we believe the amateur service to allow for a broad range of missions, there are missions not suitable for the amateur satellite service. Importantly, amateur satellite operations must comply with all provisions of Part 97. As such, any requirements for an encrypted or otherwise obscured data downlink would not be appropriate for the amateur service. Additionally, satellite communications are necessarily international in scope, and the international communications regulation at 47 CFR § 97.117 must apply to amateur satellites. This regulation limits transmissions to a different country to "communications incidental to the purposes of the amateur service and to remarks of a personal character." This limits the types of missions suitable for the amateur service to those which, for example, contribute to advancing skills in both the communication and technical phases of the radio art, enhance international goodwill, and expand the existing reservoir of trained operators, technicians, and electronics experts. We believe that a majority of university small satellite missions that are conducting educational, experimental, or technology demonstration missions can fall within these categories as explained in our initial comments. However, missions which are designed to be purely operational to conduct, for example, missions such as astronomical studies or planetary science may not be appropriate for the amateur service. We encourage the Commission to work with AMSAT, ARRL, and other interested parties to better define the types of missions appropriate for the amateur service for the benefit of mission planners.

IV. Orbital debris mitigation

AMSAT understands the risks associated with excessive orbital debris and we are committed to being good stewards of orbital resources. However, we also caution against overregulation which would harm the amateur satellite service by imposing excessive costs on amateur satellite operations. We concur with the comments filed by the Open Research Institute regarding orbital debris.

As mentioned in the comments of the Open Research Institute, AMSAT-OSCAR 7 is functioning nearly 44 years after its launch. Additionally, several other satellites launched by amateur groups have had long lifetimes. One of the most popular amateur communications satellites, the Japan Amateur Radio League's Fuji-OSCAR 29, has been in service for nearly 22 years. Contrary to other small satellite missions which may plan for service lifetimes of a few months to a year, AMSAT, and other amateur groups, design and build satellites to function the longest possible lifetime. AMSAT's Fox-1 satellites are designed to function as amateur repeaters even if the Internal Housekeeping Unit fails.[5] The FUNcube Project's AMSAT-OSCAR 73 is designed to function in sunlight even after its batteries fail. We note that current orbital debris mitigation rules require deorbiting or transfer to a disposal orbit within 25 years after the end of the mission. However, due to the high failure rate, CubeSat missions are often assumed to have missions lasting "zero years." Due to AMSAT's long track record of successful missions, we would ask for flexibility for a longer orbital lifetime before deorbit or transfer to a parking orbit on the basis of perhaps a planned five or ten-year lifetime. We also concur with the comments of the Open Research Institute that a transfer (or direct launch) to a parking orbit should satisfy the orbital debris mitigation requirements.

V. Alternatives to the amateur service

As discussed above, not all university or non-profit small satellites can be authorized under the amateur satellite service. We concur with the Comments of University Small Satellite Researchers[6] in suggesting that educational institutions be accommodated outside the amateur bands through the Part 5 process, or with a substantially lower Part 25 application fee if their satellites cannot be authorized under Part 97.

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[5] As required by Commission regulations, AMSAT retains the capability to terminate the satellites' transmissions in the event of an IHU failure.

[6] Comments of University Small Satellite Researchers in proceeding IB 18-86. ID 107091398724499.

VI. Conclusion

AMSAT appreciates the opportunity to submit comments regarding licensing of small satellites in the amateur satellite service, and we look forward to working with Commission staff moving forward on clarifying the current regulations and processes regarding authorization of satellites in the amateur satellite service.

RESPECTFULLY SUBMITTED,

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