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July 6, 2013

DEPARTMENT OF COMMERCE
Bureau of Industry and Security
Docket No. 13011003-3030-01
RIN 0694-AF87
"Export Administration Regulations (EAR) Control of Spacecraft Systems and Related Items the President Determines No Longer Warrant Control Under the United State Munitions List (USML)"

The Radio Amateur Satellite Corporation (AMSAT), a not-for-profit scientific and educational 501-(c)-(3) organization charted in the District of Columbia in 1969, wishes to make comments and suggestions relative to the Referenced Docket.

We ask that the Department of Commerce recognize the relative impacts of regulatory oversight on small, not-for-profit scientific and education organizations such as AMSAT and to find ways to mitigate these impacts on both AMSAT and our volunteers.

Based upon the distinctions between the commercial satellite industry and amateur radio satellites, AMSAT suggests the following steps:

1. Create a separate category for "Amateur Satellite Service" under ECCN 9A515 for amateur radio satellite and components and ground station equipment, and a comparable category in 9E515 for associated technical data.

2. Allow a license exception for "deemed exports" for amateur radio satellite design and construction so as to allow free exchange of ideas, software, etc. pertaining to amateur radio satellite design and construction when interacting with foreign nationals who are citizens of nations listed in the License Exemption STA Country List.

3. Export licensing requirements should only focus on the export of hardware, such as amateur radio satellite subsystems or complete amateur radio satellites.

Background

We wish to make clear that our comments and suggestions reflect our members experience and are not created by legal counsel. AMSAT is composed of a dues paying membership of about 3,000 mostly American citizens with a smaller cadre of volunteers who manage the organization and a team of engineering volunteers who design/build amateur radio spacecraft. We have a single paid employee, our Office Manager. Legal advice and assistance, normally employed by for profit organizations, is normally beyond our financial means.

AMSAT is a unique organization, as reflected in our Mission Statement:

"AMSAT is a non-profit volunteer organization which designs, builds and operates experimental satellites and promotes space education. We work in partnership with government, industry, educational institutions and fellow amateur radio societies. We encourage technical and scientific innovation, and promote the training and development of skilled satellite and ground system designers and operators."

We employ technology that once developed, is made freely available in the public domain, to design and build small satellites to promote space education and provide two-way communications for licensed amateur radio operators. All of the software associated with amateur radio "ground control systems" as well as most of the flight software is open source and freely available. All of AMSAT's spacecraft development programs have been paid for by donations from AMSAT members, other individuals, other amateur radio organizations, and foundations.

Since its inception, AMSAT has designed, constructed, tested, and launched 15 communications satellites for use by licensed radio amateurs, either on its own or in cooperation with individuals associated with AMSAT-type organizations from other countries, such as Germany, the UK and Japan. Such international cooperation mostly took place prior to 1999, when commercial satellites were returned to ITAR. However, AMSAT did self-disclose in 2009 to DDTC when we recognized that we may have been in violation of the ITAR deemed export rules.

All AMSAT satellites, past, present, and future, are licensed by the Federal Communications Commission (FCC) in the amateur-satellite service, which is established by Treaty. See International Telecommunication Convention and annexed radio regulations, ART1, RR 1.56 and 1.57.[1] The same language is repeated domestically in 47 USC 153(3) and 47 CFR 2.1(c).

Essentially, all AMSAT projects must be for self-training by licensed *persons* who are interested in radio technique for personal purposes and *without compensation* of any kind. (Emphasis supplied.)

AMSAT is currently building four "CubeSat" spacecraft that will host educational and scientific payloads as well as equipment for two-way amateur radio communications plus telemetry to downlink science data and provide satellite status information. As a result of AMSAT's non-profit status plus the technical merits of our proposals, two of the CubeSats have been accepted by NASA for launch in its Educational Launch of NanoSatellites (ELaNa) program. These CubeSats, because they commenced under the post-1999 ITAR restrictions, are designed and built entirely by US citizens, without any consultation with foreign nationals. This limits us in our efforts as many of those non-U.S. person amateur radio enthusiasts who we have consulted with prior to ITAR were very helpful to us in adding to our design ideas.

Amateur radio spacecraft provide not only communications facilities for amateur radio operators, but also unique opportunities for supporting Science, Technology, Engineering and Mathematics (STEM) in the classroom. AMSAT is currently collaborating with several organizations to develop classroom-based education opportunities utilizing amateur radio spacecraft as the basis for focusing on communications, earth sciences and physics. Analysis of spacecraft telemetry, for example, allows students to understand how spacecraft function and how telemetry can be used to determine spacecraft status. Determination of spacecraft spin rates, power generation and system status provides students with a better understanding of how spacecraft behave in orbit. The sharing of non-proprietary amateur radio spacecraft telemetry data allows students to evaluate the data obtained from a payload onboard the spacecraft. Clearly, this is an exciting approach towards bringing STEM into the classroom based upon "real" satellites.

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[1] **RR 1.56** *amateur service:* A *radio communication service* for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.
RR 1.57 *amateur-satellite service:* A *radio communication service* using *space stations* on earth *satellites* for the same purposes as those of the *amateur service*.

Another difference between AMSAT, which uses volunteers to design/construct amateur radio spacecraft, and commercial for-profit firms with paid employees, is that we follow an "open source" approach to software development. All of AMSAT's satellite development efforts have been and will be placed in the public domain through publication in AMSAT's bi-monthly magazine (AMSAT Journal), our annual Proceedings of the AMSAT Space Symposium, and various amateur radio publications. We also publish materials on our website (www.amsat.org).

Summary

Over the past 43+ years AMSAT has been integral to the development of amateur radio communications spacecraft based upon the model of an all-volunteer organization that follows "open source" practices and creates spacecraft that are very low cost which also reflects relatively low levels of sophistication compared to commercial satellites.

Because of the significant constraints inherent in the proposed regulations, we ask that the Department of Commerce consider the relative level of sophistication of AMSAT projects when determining whether the regulatory processes, such as how "deemed exports" should be applied to the AMSAT. If AMSAT is to have an opportunity to collaborate with other AMSAT-like organizations for future amateur radio satellite programs under EAR, we are dependent upon the ability to openly exchange ideas, software development, and technical exchanges in the development of amateur radio satellites. Such exchanges increase the prospects of building spacecraft that will "keep amateur radio in space."

In addition, the low probability of impermissible uses of technology used by AMSAT coupled with the desire to collaborate with AMSAT organizations of countries that are friendly to the United States (and included in the License Exemption STA Country List) further suggests that little is to be gained by the continuance of the same kind of very strict prohibitions we experienced under ITAR through continuation of restrictive treatment of commodities transferred to EAR from Category XV of the USML.

Given the significant benefits of amateur radio satellites not only to the amateur radio community, but to public service (such as emergency communications) and education (encouraging STEM), plus the relatively unsophisticated nature of our technology compared to commercial and other satellites, we ask that the Department of Commerce recognize the relative impacts of regulatory oversight on small, not-for-profit scientific and education organizations such as AMSAT and to find ways to mitigate these impacts on both AMSAT and our volunteers.

Based upon the distinctions between the commercial satellite industry and amateur radio satellites, AMSAT suggests the following steps:

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Such an approach essentially places AMSAT back to the regulatory requirements prior to ITAR and eliminates concerns about how to setup a proper compliance program that we have neither the funds nor expertise to implement. A simplified system that both the AMSAT leadership and our cadre of engineering

team volunteers can understand and easily follow is essential if we are to 100% comply with EAR while also working with other AMSAT organizations to develop amateur radio satellites that benefit us all. The alternative is that despite the transition from ITAR, AMSAT will be compelled to forsake international collaboration that in turn significantly reduces prospects for “keeping amateur radio in space.”

We want to express appreciation to the Bureau of Industry and Security personnel for their efforts to develop a more hospitable export control regime for satellites without compromising U.S. security and foreign policy interests.

Barry A. Baines, WD4ASW
President