

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

In the Matter of:

Streamlining Licensing Procedures for)	
Small Satellites)	IB Docket No. 18-86
Assessment and Collection of Regulatory)	MD Docket No. 18-175
Fees for Fiscal Year 2018)	

Reply Comments of University Small-Satellite Researchers

via electronic filing
August 7, 2018

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The above-listed academic researchers in the areas of aerospace engineering, space sciences, and other related fields respectfully reply to comments on the Commission's Notice of Proposed Rulemaking to create a new regulatory category of small satellites under Part 25 of the Commission's rules (*Small Satellite NPRM*)² and related issues from the Commission's Notice of Proposed Rulemaking addressing the assessment and collection of regulatory fees for fiscal year 2018 (*FY 2018 NPRM*),³ which includes a corresponding proposal to address the proposed annual regulatory fees for small satellite applicants.⁴ While the record raises a number of issues, we focus these replies on those that we think are the most critical for the Commission to address to ensure the viability of the streamlined Part 25 process for educational and scientific missions: the continuing viability of Part 5 and Part 97, rejecting the proposed propulsion and tracking requirements, and lowering the proposed application fee for university researchers.

I. The record supports Commission should move forward with a streamlined process for Part 25 while maintaining the viability of Part 5 and Part 97 for university researchers.

First, commenters near universally support the Commission's proposal to adopt a streamlined process for small satellites under Part 25.⁵ The record supports our view that the Commission should proceed with the process while refining the details to ensure that the streamlined process provides a workable path forward for all stakeholders, including those conducting academic and scientific missions.⁶

² Streamlining Licensing Procedures for Small Satellites, Notice of Proposed Rulemaking, IB Docket No. 18-86 (Apr. 17, 2018) ("*Small Satellite NPRM*"), <https://docs.fcc.gov/public/attachments/FCC-18-44A1.pdf>.

³ Assessment and Collection of Regulatory Fees for Fiscal Year 2018, Report and Order and Notice of Proposed Rulemaking, MD Docket No. 18-175 (May 22, 2018) ("*FY 2018 NPRM*"), <https://www.fcc.gov/document/fy-2018-regulatory-fees-nprm>.

⁴ *Id.* at ¶ 32.

⁵ *E.g.*, Commercial Smallsat Spectrum Management Association (CSSMA) Comments at 2-3; Commercial Spaceflight Federation (CSF) Comments at 1; SpaceX Comments at i.

⁶ *See* Comments of Dr. Scott Palo, et al. at 2-6 ("Researcher Comments").

Second, the record supports our position that the Commission should clarify that a streamlined process for Part 25 should be complementary to and not a substitute for existing licensing paths under Part 5 and Part 97.⁷ As the Commercial Spaceflight Federation (CSF) notes, there are some missions that “will be better served to operate under Part 5,”⁸ while Analytical Spaceflight, Inc. (ASI) corroborates our view that it is key to maintain access to Part 5 given the uncertainty about how the Commission will configure the streamlined Part 25 process and whether certain requirements of the process will make it prohibitive for certain types of missions.⁹ While the Commission should endeavor to make the streamlined process viable for educational and scientific mission, it is critical to maintain part 5 as an alternate path.

Finally, we acknowledge and concur with the position of ARRL—The National Association for Amateur Radio and the Radio Amateur Satellite Corporation (AMSAT) that university researchers organizations should be eligible for amateur authorizations under Part 97.¹⁰ While there are many circumstances where the increased protections of Part 25, including standing against interference, will be helpful to university researchers, some educational and scientific missions can be successfully completed with an amateur license, and the Commission should clarify that this path is not foreclosed to university researchers.¹¹

II. The record supports rejecting the Commission’s proposed propulsion requirement.

As we explained in our comments, the Commission’s proposed propulsion requirement for operators deploying small satellites above 400 km would severely limits the potential orbits, lifetime, and uses of small satellites in educational and scientific missions.¹² The record strongly substantiates

⁷ See *id.* at 6-7.

⁸ See CSF Comments at 3.

⁹ See ASI Comments at 5-6; Researchers Comments at 6-7.

¹⁰ See ARRL Comments at 6-7, AMSAT Comments at 3-4; see also Brief Comments of Ray Soifer.

¹¹ See Researchers Comments at 6-7.

¹² See *id.* at 9-11.

these concerns and supports rejecting the propulsion requirement from the final streamlined process.

More specifically, the Commercial Smallsat Spectrum Management Association (CSSMA) supports our assessment that adequate propulsion technology is not yet at the level needed to facilitate easy or affordable implementation in typical missions, noting that the Commission should assess applications on a case-by-case basis in light of evolving propulsion technology.¹³ Only a single propulsion manufacturer argued that propulsion technologies were ripe for inclusion in an eligibility requirement—and even it conceded that a “premature requirement would prevent most smallsat operators from using the [s]treamlined [p]rocess.”¹⁴ The only other commenters supporting propulsion requirements are two large commercial operators with the financial resources to implement sophisticated and complex bespoke systems for satellites costing millions of dollars¹⁵—resources that are unavailable to even the most well-resourced university researchers. And even large commercial operators were split in their support for the propulsion requirement; Boeing urges the Commission to reject the requirement in favor of allowing applicants to more flexibly demonstrate maneuverability using other techniques that would “make unnecessary the incorporation of maneuvering capabilities.”¹⁶

In addition to the concerns raised in our comments, ASI explains that the propulsion requirement would have the effect of thwarting commonly used ridesharing arrangements that place small satellites near the orbits of larger payloads.¹⁷ ASI and CSF also note, correctly, that NASA has routinely supported non-propulsion-capable missions at orbits above 400 km without any significant

¹³ See CSSMA Comments at 16-17.

¹⁴ See Phase 4 Comments at 2-3.

¹⁵ See Iridium Comments at 5-6; SpaceX Comments at 2, 10 (proposing propulsion requirements for deployments at any altitude, presumably out of concern for its operation of a large constellation of LEO satellites).

¹⁶ See Boeing Comments at 11-12.

¹⁷ See ASI Comments at 9-10

consequences.¹⁸ We concur—the record makes clear that the Commission can safely permit missions at altitudes greater than 400 km propulsion without requiring propulsion.

III. The record supports taking a flexible and functional approach toward trackability instead of imposing size restrictions or requiring telemetry markers.

As we explained in our comments, the Commission’s proposals to impose minimum size requirements and require telemetry markers as an eligibility requirement are respectively vague and underinclusive, and the laudable goal of ensuring trackability would be better served by a higher-level functional requirement that allowed smaller than 10 cm per side CubeSats to achieve trackability in other ways.¹⁹ The record again supports this approach; numerous commenters urge the Commission to reject specific size and telemetry regulations in favor of a functional tracking requirement.²⁰ Moreover, no supporter of the proposed trackability requirement rebuts that there are alternative possibilities to minimum size thresholds and telemetry markers to make small satellites trackable.²¹ Accordingly, the Commission should reject the proposed size-and-marker trackability requirements in favor of a functional trackability requirement.

IV. The record supports substantially lowering the Part 25 application fee for educational and scientific applicants.

As we explained our comments in both of the above-referenced proceedings, it is critical that the Commission substantially lower the proposed (and prohibitive) \$30,000.00 application fee for the streamlined Part 25 process to be more in line with the \$70 experimental license fee under Part 5 to ensure that the streamlined process is accessible to academic researcher.²² The record supports

¹⁸ See *id.* at 10; CSF Comments at 6.

¹⁹ Researchers Comments at 11-12.

²⁰ See Boeing Comments at 13 (tracking capability “could be done either by designing satellites that are large enough for tracking *or through other means that the applicant demonstrates will enable tracking*” (emphasis added)); CSF Comments at 5 (noting that “[p]revious satellites have been approved and shown to be trackable at smaller dimensions” and urging the Commission not to “dictat[e] how [applicants] would meet [a trackability] requirement”); ASI Comments at 13-14.

²¹ See SpaceX Comments at 6-7; Iridium Comments at 7 (noting simply that 10 cm per side CubeSats *would* be trackable); EchoStar Comments at 5.

²² See Researchers Comments at 15-16

this proposal; no commenter opposes such a reduction, and the Satellite Industry Association (SIA) supports it, noting that “[m]any of the potential licensees under the [s]treamlined [p]rocess will be university students/faculties . . . attempting to quickly prove technology viability to receive additional funding and move forward with their operations.”²³

Respectfully submitted,

/s/

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²³ SIA Comments at 4-5. While SIA encourages the Commission to adopt a fee reduction for non-commercial application as part of one-year review of the overall fee structure for the streamlined process, it identifies no reason that Commission cannot or should not implement a fee reduction for educational and scientific users as part of its initial implementation.