

August 17, 2021

FILED ELECTRONICALLY VIA IBFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street, N.E.
Washington, DC 20554

Re: Spaceflight, Inc.;
Errata to Application for Special Temporary
Authority ("STA") to deploy and operate
Sherpa-FX3, File No. SAT-STA-20210810-00097

Dear Ms. Dortch:

Spaceflight, Inc. ("Spaceflight"), hereby respectfully requests that Attachment 1 of the above-reference STA request, be replaced with the attached revised Attachment 1.

Attachment 1 to the original STA that was filed included the paragraph quoted below that was mistakenly included but is inapplicable to the above-referenced STA request.

"With regard to these frequencies, Spaceflight understands that it will need waivers to use the 402.9 MHz band as a non-conforming use. Such waivers are respectfully requested. With regard to use of 400.5 MHz, Spaceflight understands that its use would be permitted only on a secondary, non-interference basis."

Spaceflight regrets this error and apologizes for any confusion that it may have caused.

Questions with respect to this matter should be referred to the undersigned.

Sincerely,

/s/ Will Lewis

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REQUEST FOR SPECIAL TEMPORARY AUTHORITY

Spaceflight Inc. (“Spaceflight”), pursuant to Section 25.120 of the Commission’s Rules,¹ hereby requests Special Temporary Authority (“STA”) to permit it to deploy and operate the Sherpa-FX3, launching on a SpaceX Falcon 9 for a period not to exceed 36 hours, with such period to commence from their launch and deployment that is scheduled to occur between December 1, 2021, and January 31, 2021. Sherpa-FX3 will operate for up to 36 hours from launch and deployment.

Overview

The Sherpa-FX3 will be placed in sun synchronous orbit (SSO) at an altitude of 525 km \pm 25km at an inclination of 97.59 degrees. At that point and after subsequent delays in accordance with SpaceX requirements, the Rapidly Reconfigurable Avionics (R2A)-Core (discussed below) will initiate a timed sequence of procedures to begin the deployment of spacecraft on Sherpa-FX3.

Sherpa-FX3

Sherpa-FX3 will be functionally the same as Sherpa-FX1, approved by the Commission under license number SAT-STA-20200728-00089. Sherpa-FX3 is a non-propulsive, free-flying spacecraft that will deploy auxiliary spacecraft after Sherpa-FX3 itself separates from the Falcon 9 launch vehicle. Sherpa-FX3 will deploy up to eight (8) spacecraft.² Of these spacecraft, three have propulsion. None of the Sherpa-FX3 deployed spacecraft will deploy further payloads or spacecraft. The total launch mass of the Sherpa-FX3 will be approximately 280 kg, of which approximately 150 kg will be made up of customer spacecraft to be deployed. Sherpa-FX3 will also carry one approximately 5 kg, hosted payload, subject to the provider of that payload, NearSpace Launch, securing its own separate authority for this mission from the Commission.

¹ Spaceflight also respectfully requests a waiver of Section 25.113(g) of the Commission’s rules, requiring orbital deployment approval and operating authority to be applied for and granted prior to orbital deployment and operation of a space station. In this case, given: (1) the short operational life of Sherpa-FX3; (2) the similarity of its function to that of an upper stage launch vehicle; (3) the descriptions contained herein and in the associated attachments of the spacecraft operations and debris mitigation plans that might otherwise be presented for approval as part of an application for approval for the orbital deployment and operation of a space station; and (4) the overall public interest of the mission that is presented, Spaceflight urges that the underlying purpose of the rule sought to be waived is met and that the grant of the requested waiver will serve the public interest.

² Currently, eight (8) spacecraft are expected to be onboard the Sherpa-FX3. However, the Sherpa-FX3 manifest may change before launch. In any event, Sherpa-FX3 will carry no more than eight (8) spacecraft on this launch and all risk assessments and analyses of the Sherpa-FX3 spacecraft factor in the maximum number of spacecraft and highest possible launch mass.

Further detail on Sherpa-FX3 and the hosted payloads is included in Exhibit A.

Like Sherpa FX1 and Sherpa FX2, Sherpa-FX3 will utilize Spaceflight's R2A-Core sequencer that communicates over L-band with the Globalstar network. R2A-Core will utilize the EyeStar S3 Black Box Radio (provided by NearSpace Launch) and L-Band transmitter to send deployment confirmation telemetry to the Globalstar constellation for relay by commercial Globalstar and NearSpace Launch data services to Spaceflight.

The Sherpa-FX3 mission is anticipated to last less than six (6) hours and all communications from R2A-Core will stop at or less than 36 hours after launch.³ Sherpa-FX3 is equipped with an S-band receiver, also contained within the EyeStar S3 Black Box Radio, to allow a kill-command to be sent from a ground station operated by NearSpace Launch to deactivate the transmitter in the event of radio frequency interference. The R2A-Core will also have an on-board timer to cut off its transmissions several hours after the end of the planned deployment cycle. If all else fails, battery life is expected to be exhausted by 36 hours into the mission. Sherpa-FX3 will naturally deorbit over time.

Radio Frequencies to Be Employed

Spaceflight seeks authority to employ the same frequencies for the FX3 spacecraft as Spaceflight was authorized for its FX2 spacecraft. Thus, Spaceflight seeks authority to permit it to establish one-way telemetry link from both Sherpa-FX3 to the Globalstar constellation for an up to 36-hour period during spacecraft deployment. Globalstar will use its own licensed network to downlink the telemetry and is responsible for securing FCC authority to receive signals from R2A-Core.⁴ The L-band link will permit the Spaceflight technical crew to monitor the deployment of the small spacecraft onboard both Sherpa vehicles. This data will be disseminated both to Spaceflight's customers and to the Combined Space Operations Center (CSpOC).

Spaceflight also seeks authority for the operation of an S-band receive antenna to be connected to both Sherpa-FX3 to enable it to receive signals from a NearSpace Launch owned and operated S-band transmit station.⁵ The purpose of this S-band link is to enable the L-band antenna to be shut down from the ground if required to avoid any unanticipated harmful interference and/or as a final failsafe if the L-band antenna is not shut off within 36 hours by operation of its on board timer or loss of battery life. The Sherpa-FX3 is equipped with a GPS receive unit to enable it to be more easily tracked.

³ Due to improvements in technology, the battery life on the Sherpa-FX3 is now 36 hours instead of the 24 hour battery life of Sherpa-FX2.

⁴ R2A-Core does not transmit signals to the ground, except through the Globalstar constellation network.

⁵ This is the same facility for which NearSpace Launch was authorized to use to support Spaceflight's FX1 and FX2 missions.

Authority for that unit is also hereby requested.⁶

After the 36-hour period, R2A-Core and communication to or from the EyeStarS3 Black Box Radio will shut down completely and Sherpa-FX3 will no longer receive or send communication.

A summary of frequencies to be used is detailed in the table below:

Sherpa-FX3 OTV Comms	
Parameter	S-Band Uplink to Sherpa
Data Rate	38.4 Kbps
Modulation	2-GFSK
Center Frequency	2075 MHz
Bandwidth	300 KHz
Transmit Power	
Transmit Antenna/Gain	
EIRP	
Polarization	
Receive Antennas	Active Patch/5.5 dBi
Receive Noise Temp.	
Receive System Figure of Merit (G/T)	
Encryption	AES-256
Duty Cycle (max)	50%

⁶ There may also be a passively modulated radar reflector to help identify Sherpa sooner among the cluster of objects separated by the launch vehicle. This radar reflector does not transmit or receive any radio frequencies and is simply a component to assist identification and tracking.

With regard to all frequencies to be employed that were and/or are also being employed for Spaceflight's Sherpa-FX3, Spaceflight will observe all operating restrictions and coordination conditions for its new SherpaFX3 missions as were specified in the grant to Spaceflight of Special Temporary Authority for its Sherpa-FX1 mission.⁷

Customer Manifest:

Current customer manifest for Sherpa-FX3 is attached as Exhibit D. Because the availability of customer spacecraft can change closer to the time of launch, Spaceflight requests that the authority it be granted include authority: (i) to substitute non-separating mass module(s) for customer spacecraft that are not available.

Responsibilities of Owners/Operators of Spacecraft to be Deployed and Hosted Payloads; Customer Manifests

The spacecraft to be deployed and the hosted payload on Sherpa-FX3 are owned and to be operated by Spaceflight's customers or, in some cases, their customer operator. Each customer is expressly required under its agreement with Spaceflight to obtain and/or require its customer operator to obtain all licenses, authorization, clearances, and permits from their applicable administrations that may be necessary to operate its individual spacecraft or hosted payload. Further detail on the hosted payload to be flown on Sherpa-FX3 is included in Exhibit A, the Technical Annex, attached hereto. The above referenced customer manifests include the identity of customers or, if different, operators, and their authorizing administrations.

Exhibits

A more detailed technical showing is attached as Exhibit A.

An Orbital Debris Assessment Report ("ODAR") for the Sherpa-FX3 is attached hereto as Exhibit B

A Recontact Probability Analysis relative to the customer spacecraft to be deployed by Sherpa-FX3 is attached hereto as Exhibit C .

Lists of customers/operators for the spacecraft to be deployed and the hosted payload are attached hereto as Exhibit D.

Exhibit E, together with Attachment 1 and 2 detailing Spaceflight's ownership information is attached hereto.

An ITU Cost Recovery Letter is provided as Exhibit F hereto. Spaceflight notes that the attached letter does not have the Commission file number for this Request

⁷ SAT-STA-20200728-00089.

which will only be available after the Request is filed. Once available, Spaceflight will resubmit the ITU Cost Recovery Letter with that file number.

Spaceflight also has under preparation and will submit as soon as possible a SpaceCap filing covering the frequencies requested for use herein.

Conclusion

Spaceflight urges that grant of the instant request for Special Temporary Authority will be in the public interest. Such grant will permit Spaceflight to continue to provide its new and innovative deployment technology for small spacecraft, thereby providing a cost-efficient means for placing them into their designed orbits.