

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

Space Exploration Holdings, LLC (“SpaceX”), pursuant to Section 25.120 of the Commission’s rules, hereby requests Special Temporary Authority (“STA”) to operate very-high frequency (“VHF”) telemetry, tracking and command (“TT&C”) beacons on SpaceX’s recently-licensed second generation (“Gen2”) satellites.¹ The Commission deferred licensing these beacons in the *Gen2 Authorization* pending further consideration and recently issued a 30-day STA while the underlying amendment application for these beacons remains on public notice.² Here, SpaceX requests a 60-day STA for additional VHF beacon operations while its underlying application is being processed.³ Detailed technical information is provided in Exhibit A hereto.

SpaceX plans to operate these beacons during two phases of a satellite’s lifetime: (1) during the launch and early operations phase (“LEOP”), which occurs between the injection of a Gen2 satellite at a lower-than-operational altitude through its orbit raising to its intended orbit; and, (2) in emergency situations once the satellite has reached its nominal altitude and begins operations, for example, in the case of solar weather events, anomalies impacting primary TT&C communications, and emergencies where the beacons capabilities would enhance space sustainability. The number of beacons in operation at any given time will depend on the launch cadence of Gen2 satellites, but in this STA specifically, SpaceX requests authority to operate a maximum of 300 beacons (and typically many fewer) across the entire Gen2 constellation at any one time (covering both LEOP and on-station operations), with a maximum of 56 beacons per launch. Each beacon will operate for approximately four weeks during orbit-raising, and as needed during on-orbit emergency operations.

SpaceX will operate the tracking beacons with the technical parameters set forth in Exhibit A. SpaceX will continue to operate any beacons under an STA on a non-interference basis. In the extremely unlikely event that harmful interference should occur due to transmissions to or from its spacecraft, SpaceX will take all reasonable steps to eliminate the interference. Should an issue arise, SpaceX can be reached at satellite-operators-pager@spacex.com, which links to the pagers of appropriate technical personnel 24/7/365.

Public Interest

SpaceX is fundamentally committed to leading the industry in innovative space sustainability practices. The modular architecture of the VHF beacon embodies this commitment, as it will permit SpaceX to introduce important new capabilities on its Gen2 satellites without launching a single additional satellite.

The Commission has good cause to grant the STA. Granting this additional payload for backup TT&C transmissions would enhance space sustainability by providing redundant capabilities for the TT&C functions that are essential to tracking and locating the spacecraft and ensuring the health and safety of SpaceX’s Gen2 constellation, while also allowing SpaceX to confirm and monitor the location of its satellites immediately upon orbital insertion. This will support better

¹ See *Space Exploration Holdings, LLC*, FCC 22-91 (rel. Dec. 1, 2022) (“*Gen2 Authorization*”).

² See *id.* ¶ 69.

³ See IBFS File No. SAT-AMD-20221216-00175 (Dec. 16, 2022); Public Notice, Rep. No. SAT-01692 (Jan. 13, 2023) (accepting application for filing).

tracking of all SpaceX satellites from insertion through orbit raising and in any emergency situation where operation of the beacons would enhance space sustainability. These details will benefit all operators in the instance of a conjunction or an anomaly.

Accordingly, SpaceX requests that the Commission expeditiously grant the STA for tracking beacons on its Gen2 satellites for 60 days while the Commission considers SpaceX's pending application to ensure that SpaceX's initial launches of Gen2 satellites continuing throughout the first half of 2023 can include VHF tracking beacons and the space safety enhancements they provide.

EXHIBIT A

GEN2 RADIOFREQUENCY BEACON CHARACTERISTICS

Operating Frequency Bands:

137.00-138.00 MHz Transmit (space-to-Earth)

148.00-150.05 MHz Receive (Earth-to-space)

Receiving Channel Characteristics			
Channel ID	Channel Bandwidth (MHz)	Center Frequency (MHz)	Type of Link
R001	0.03 ⁴	148.2825	Service
R002	0.03	148.3125	Service
R003	0.03	148.3425	Service
R004	0.03	148.3725	Service
R005	0.03	148.4025	Service
R006	0.03	148.4325	Service
R007	0.03	148.4625	Service
R008	0.03	148.4925	Service
R009	0.03	148.5225	Service
R010	0.03	148.5525	Service
R011	0.03	148.6625	Service
R012	0.03	148.6925	Service
R013	0.03	148.7225	Service
R014	0.03	149.9250	Service

Receiving Beam Parameters	
Polarization	RHCP
Peak Gain	0.0 dBi
Antenna Pointing Error	2.0 degrees
Antenna Rotational Error	2.0 degrees
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-24.8 dB/K
Min. Saturation Flux Density	-154.2 dBW/m ²
Max. Saturation Flux Density	-125.2 dBW/m ²
Co- or Cross-Polar Mode	Co-Polar
Service Area	Global

⁴ Because the Schedule S software automatically rounds up from 0.025 MHz to 0.03 MHz, the Schedule S associated with the Amendment lists bandwidths of 0.03 MHz. In fact, during operations, the bandwidth of the VHF beacon transmission is 25 kHz (single-sided) and 50 kHz (double-sided). This is consistent with the Schedule S presentation in the application granted for Swarm's authorization. See Swarm Technologies, Inc., 34 FCC Rcd. 9469 (IB 2019).

Transmitting Channel Characteristics			
Channel ID	Channel Bandwidth (MHz)	Center Frequency (MHz)	Type of Link
T001	0.03	137.055	Service
T002	0.03	137.085	Service
T003	0.03	137.115	Service
T004	0.03	137.145	Service
T005	0.03	137.3513	Service
T006	0.03	137.5038	Service
T007	0.03	137.6175	Service
T008	0.03	137.8463	Service
T009	0.03	137.8763	Service
T010	0.03	137.9063	Service
T011	0.03	137.9363	Service
T012	0.03	137.9663	Service

Transmitting Beam Parameters	
Polarization	RHCP
Peak Gain	0.0 dBi
Antenna Pointing Error	2.0 degrees
Antenna Rotational Error	2.0 degrees
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-41.4 dBW/Hz
Max. Transmit EIRP	1.76 dBW
Co- or Cross-Polar Mode	Co-Polar
Service Area	Global

Maximum Power Flux Density (dBW/m ² /BW)						
BW:	0°-5°	5°-10°	10°-15°	15°-20°	20°-25°	25°-90°
4.0 kHz	-129.4	-129.3	-129.2	-129.0	-128.8	-125.9