

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”) for sixty (60) days beginning December 1, 2023 to launch and test its non-geostationary orbit (“NGSO”) second generation (“Gen2”) satellites¹ with direct-to-cellular communications payloads to connect unmodified cellular phones directly to SpaceX Gen2 satellites, subject to the conditions set forth in the *Gen2 Order* granting SpaceX authority to launch and operate 7,500 satellites. This STA is necessary as the Commission continues to process SpaceX’s application to enable supplemental coverage from space (“SCS”) for consumers on a permanent basis² and would permit SpaceX to timely launch its first tranche of direct-to-cellular-enabled satellites in December 2023. In the alternative, SpaceX urges the Commission to grant its direct-to-cell application.

Specifically, SpaceX seeks special temporary authority to operate its direct-to-cellular payload during the launch and early orbit phase (“LEOP”)—including orbit-raising—and when on station. The payload will communicate with specific terrestrial test locations identified in Exhibit B with a radius of 50 km around each site. This STA will permit SpaceX to connect to cellular phones over the 1910-1915 MHz and 1990-1995 MHz bands (the “PCS G Block”) with the technical specifications set forth in Exhibit A and in cooperation with T-Mobile USA, Inc. and its subsidiaries (collectively, “T-Mobile”) who are the sole licensee of the PCS G Block in the United States. The two parties executed a spectrum manager lease pursuant to which T-Mobile granted SpaceX the right to use the PCS G Block as described in SpaceX’s underlying application and the instant request for an STA. In granting the requested STA, SpaceX asks that the Commission confirm that it is authorized to use the PCS G Block spectrum licensed to T-Mobile consistent with that spectrum manager lease.

In addition to the locations SpaceX identified for testing with T-Mobile, SpaceX also requests special temporary authority to conduct tests in coordination with the National Science Foundation (“NSF”), including NSF’s National Radio Astronomy Observatory (“NRAO”) and NSF’s Green Bank Observatory (“GBO”). Planned testing will include within the National Radio Quiet Zone (“NRQZ”) in West Virginia, where the Green Bank Telescope (“GBT”) is located, at the Very Large Array (“VLA”) in New Mexico or Very Long Baseline Array (“VLBA”) sites, as listed in footnote US131 of the U.S. Table of Frequency Allocations.³ These tests will be fully coordinated with the NSF prior to any transmissions to ensure that radio astronomy observations are protected from the possibility of harmful interference. SpaceX will work through NSF with any other radio astronomy facilities within the United States which may be impacted.

SpaceX will operate in the PCS G Block on a non-protected, non-interference basis pursuant to the commercial agreement between SpaceX and T-Mobile. The SpaceX direct-to-cellular system will operate in the United States pursuant to a cooperative agreement with T-Mobile’s primary terrestrial mobile operations and will protect adjacent band and cross-border operations from harmful interference. SpaceX will observe the applicable Part 24 and Part 25

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

² See ICFS File No. SAT-MOD-20230207-00021, Callsign: S3069.

³ See 47 C.F.R. § 2.106 at footnote US131.

limits, including the in-band field strength limit in Section 24.236 and the out-of-band field strength limits in Section 24.238 along with the cessation of emissions rule in Section 25.207 and frequency tolerance in Section 25.202(e). All uplink operations from certified mobile handsets will conform to Part 24 standards and limits. SpaceX certifies that its direct-to-cellular system will operate without causing harmful interference to or requiring protection from any other service duly licensed in these bands. 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.

The Commission has good cause to approve this request because it is in the public interest. Granting this STA will enable SpaceX to begin testing its transformative direct-to-cell technology, which will bring connectivity in areas where terrestrial mobile networks are absent or have been impacted by natural disasters. The STA would also allow SpaceX to confirm the operational status of its direct-to-cell satellites and their ability to communicate with cell phones immediately upon insertion, rather than waiting weeks while the satellites complete orbit raising to ensure proper functioning. And because SpaceX will take the steps described earlier to protect systems in adjacent bands and across national borders, SpaceX will realize the consumer benefits of its direct-to-cell technology without causing harmful interference to other licensed operators. Accordingly, SpaceX requests that the Commission expeditiously grant the STA for direct-to-cellular satellites for 60 days to support those operations beginning in December 2023 while the Commission continues to consider its direct-to-cell application. SpaceX understands that Commission grant of the STA does not prejudice the Commission's further consideration of its direct-to-cell application.

EXHIBIT A

DIRECT-TO-CELLULAR RADIOFREQUENCY CHARACTERISTICS

Schedule S Parameters

	Receiving Beams Envelope	Transmitting Beams Envelope
Beam Type	Both Steerable and Shapeable	
Peak Gain	{ 29.0, 32.0, 35.0, 38.0 } dBi	
Antenna Pointing Error	0.1 degrees	
Antenna Rotational Error	0.1 degrees	
Polarization	Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees	
Co- or Cross Polar Mode	C	
Service Area Description	Global	
Polarization	{ V, H }	{ RHCP, LHCP }
G/T at Max. Gain Point:	{ 3.5, 6.5, 9.5, 12.5 } dB/K	
Min. Saturation Flux Density	-0.1 dBW/m ²	
Max. Saturation Flux Density	0.0 dBW/m ²	
Max. Transmit EIRP Density		{ -11.33, -8.33, -5.33, -2.33 } dBW/Hz
Max. Transmit EIRP		{ 49.0, 52.0, 55.0, 58.0 } dBW

Transmitting Beams Max. Power Flux Density (dBW/m²/MHz):

Peak Gain	0°-5°	5°-10°	10°-15°	15°-20°	20°-25°	25°-90°
29.0 dBi	-88.9	-87.2	-85.6	-84.2	-83.0	-80.0
32.0 dBi	-85.9	-84.2	-82.6	-81.2	-80.0	-80.0
35.0 dBi	-82.9	-81.2	-80.0	-80.0	-80.0	-80.0
38.0 dBi	-80.0	-80.0	-80.0	-80.0	-80.0	-80.0

EXHIBIT B
TEST LOCATIONS

T-Mobile Test Locations (latitude, longitude)

Mountain View, CA

- 37.41539, -122.07180
- 37.39100, -121.48750

Kansas City, KS

- 38.91540, -94.65727
- 39.92200, -96.35200

Dallas, TX

- 33.10832, -96.82122

Bethel, OK

- 34.35930, -94.81236

Redmond, WA

- 47.67530, -122.12833
- 47.35394, -121.45111
- 48.49112, -120.82483

Reston, VA

- 38.95030, -77.37785
- 38.49230, -79.68790

Miami, FL

- 25.76000, -80.73600
- 25.38000, -80.81500
- 25.97282, -80.232120

Austin, TX

- 30.2650201, -97.7439398
- 30.6038986, -98.7042145

Columbus, OH

- 39.9589194, -82.9999745
- 39.652337, -82.029359

Virginia Beach, VA

- 36.844009, -75.9816943
- 36.6207425, -76.5489834

Los Angeles, CA

- 34.0446236, -118.2589345
- 34.3150226, -118.1053642

Houston, TX

- 29.7532886, -95.3623303
- 28.7118434, -98.7885817

San Diego, CA

- 32.8857142, -117.2114311
- 33.3037286, -116.2556856