FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SPECIAL TEMPORARY AUTHORITY

Applicant Name

Name of Applicant: United Launch Alliance

Address

Attention:
Street Address:
P.O. Box:
City:
State:
Zip Code:
Country:
E-Mail Address:

Best Contact

Give the following information of person who can best handle inquiries pertaining to this application:
Last Name:
First Name:
Title:
Phone Number:

Explanation

Please explain in the area below why an STA is necessary:

PTT2 and FRF (Full Stack Booster and Centaur Pathfinder Tanking Test with a Flight Readiness Firing)
This STA is being sought for the Vulcan Centaur Pathfinder Cryogenic Fuel Tanking Test at Cape Canaveral Space Force Station Launch Complex 41. This test is part of certifying that the new Vulcan rocket can execute prelaunch countdown operations including fueling the vehicle, but will not result in an actual launch of the vehicle. As part of this test the Booster and Centaur RF Transmitter systems will be activated and verified compatible with the local Eastern Test Range ground station TEL-4. This test is manifested for an earliest Initial Test Capability of January 2023. Open RF transmissions would begin as early as January 1, 2023 and would be executed intermittently during the duration of the testing which has current test windows through the 2nd quarter of 2023. These test windows are highly volatile and dependent on multiple launch schedules at the site but testing will occur within 6 months of the requested test start.

Cert-1 Launch (Astrobotic Peregrine with Kuiper Rideshare)
This STA is being sought for the Vulcan Centaur Certification-1 launch at Cape Canaveral Space Force Station Launch Complex 41. This launch is part of

certifying that the new Vulcan rocket can execute a successful mission while also delivering the Astrobotic Peregrine lunar lander as well as a pair of Kuiper test satellites. During this launch, the vehicle will be using our standard S-Band telemetry transmitter and our standard S-Band GPS transmitter. There will also be two additional S-Band links on the Booster. The launch is currently planned for February 25, 2023. Start of launch vehicle testing, which includes open loop RF transmissions, is scheduled to begin 1/31/2023. The nominal mission profile has the Centaur ending in a hyperbolic disposal orbit, after placing the Peregrine lander in a Translunar Injection Orbit.

Purpose of Operation

Please explain the purpose of operation:	Launch vehicle communications for certifying Vulcan Centaur for future commercial space launch missions from Space Launch Complex 41 (LC-41) at Cape Canaveral Space Force Station, Florida.

Information

Callsign:	To be assigned
Class of Station:	
Nature of Service:	

Requested Period of Operation

PTT-2 and FRF
Operation Start Date: 1/1/2023
Operation End Date: 7/1/2023

Cert-1 Launch
Operation Start Date: 2/24/2023
Operation End Date: 8/24/2023

Manufacturer

List below transmitting equipment to be installed (if experimental, so state) if additional rows are required, please submit equipment list as an exhibit:

Manufacturer	Model Number	No. Of Units	Experimental
Microwave Innovations	TTS-1225	1	No
L3 Communications (Cincinnati Electronics)	T-740U	1	No
L3 Communications (Cincinnati Electronics)	GTX	1	No
Microwave Innovations	TTS-1225	1	No

Certification

Neither the applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. The applicant hereby waives any claim to the use of any particular frequency or electromagnetic spectrum as against the regulatory power of the United States because of the prvious use of the same, whether by license or otherwise, and requests authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended.) The applicant acknowledges that all statements made in this application and attached exhibits are considered material representations, and that all the exhibits part hereof and are incorporated herein as if set out in full in this application; undersigned certifies that all statements in this application are true, complete and correct to the best of his/her knowledge and belief and are made in good faith. Applicant certifies that construction of the station would NOT be an action which is likely to have a significant environmental effect. See the Commission's Rules, 47 CFR1.1301-1.1319.

Signature of Applicant (Authorized person filing form):

Title of Applicant (if any):

Date: -----

Station Location

City	State	Latitude	Longitude	Mobile	Radius of Operation
Cape Canaveral SFS	Florida	279.4 deg East	28.6 deg North	Launch Vehicle – Stationary Test Only	0 km

Datum: NAD 83

Is a directional antenna (other than radar) used? No

Exhibit submitted: No

(a) Width of beam in degrees at the half-power point:

(b) Orientation in horizontal plane:

(c) Orientation in vertical plane:

Will the antenna extend more than 6 meters above the ground, or if mounted on an existing building, will it extend more than 6 meters above the building, or will the proposed antenna be mounted on an existing structure other than a building? Yes

(a) Overall height above ground to tip of antenna in meters:

TTS-1225: 33.6
T740: 40.9
GTX: 41

(b) Elevation of ground at antenna site above mean sea level in meters: 7

(c) Distance to nearest aircraft landing area in kilometers: 10

(d) List any natural formations of existing man-made structures (hills, trees, water tanks, towers, etc.) which, in the opinion of the applicant, would tend to shield the antenna from aircraft:

Nearest air field is CCSFS Skid Strip, all test activity coordinated with Air Force.

T-740U Transmitter

Action	Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
Liftoff mode							
New	2211 MHz	MO	**44.0 W Xmtr Output Pwr 60.9 W ERP** (based on 4.3 dB cable loss & 7.8 dBiC ant gain)	P	0.0017%	11M5G7D	QPSK
Orbital Mode during R&D Playbacks							
New	2211 MHz	MO	**53.5 W Xmtr Output Pwr 152.5 W ERP** (based on 1.3 dB cable loss & 8.0 dBiC ant gain)	P	0.0017%	3M00G7D	QPSK
Orbital Mode							
New	2211 MHz	MO	**53.5 W Xmtr Output Pwr 152.5 W ERP** (based on 1.3 dB cable loss & 8.0 dBiC ant gain)	P	0.0017%	3M60G1D	BPSK

GPS Transmitter

Action	Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New	2287.5 MHz	MO	**10.0 W Xmtr Output Pwr 5.2 W ERP** (based on 5.35 dB cable loss & 4.7 dBiC ant gain)	P	0.002%	323G1D	BPSK

TTS-1225 Transmitters

Action	Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New	2255.5 MHz	MO	**16.0 W Xmtr Output Pwr 14.8 W ERP** (based on 4.82 dB cable loss & 6.63 dBiC ant gain)	P	0.002%	5M00G7D	SOQPSK
New	2272.5 MHz	MO	**16.0 W Xmtr Output Pwr 14.8 W ERP** (based on 4.82 dB cable loss & 6.63 dBiC ant gain)	P	0.002%	5M00G7D	SOQPSK

Required Supplemental Information

The following additional information is provided pursuant to the Office of Engineering and Technology's Public Notice, "Guidance on Obtaining Experimental Authorizations for Commercial Space Launch Activities," DA: 13-446 (OET, released March 15, 2013):

a. Technical information including frequency, power, emission, latitude and longitude coordinates of the launch site or test operations.

See foregoing STA Form for technical parameters. For telemetry transmission, two S-band antennas are used, mounted 180° apart, to achieve nearly spherical coverage. Coordinates for SLC-41 launch site are: Latitude 28° 35' 00.4414" North; longitude 80° 34' 58.3806" West. The launch pad altitude is 22.2 feet above mean sea level.

b. An overview of the proposed launch or testing including, if appropriate, identifying the launch facility and the overall mission.

See "Purpose of Operation" on Main STA Form.

c. The anticipated orbital parameters or range of orbital parameters (altitude, inclination) in which the launch vehicle or related spacecraft will operate.

PTT-2 and FRF

This is a Launch Pad Ground System Test and the transmitters will not be moved from their location on the stationary launch vehicle located on the SLC-41 launch pad during this test. This test is utilized as part of the launch vehicle certification process for future launches from this launch pad.

Cert-1 Launch

The Peregrine mission will be launched from the Eastern Range and utilize a trajectory design consisting of a two Centaur burn ascent to spacecraft separation. One Earth-relative trajectory will be used through the first Centaur engine burn (MES1) for all launch opportunities. At MECO1, the Centaur is in a circular 500 km park orbit at an inclination of 30 degrees. This orbit is sustained through Kuiper separation. After MECO1, polynomial RAAN steering is activated, and the Centaur flies a varying mission profile for each launch opportunity to reach TLI. These consist of different coast lengths along the MECO1 orbit. At MECO2, the orbit parameters differ between the three different coast length profiles. The short coast will have a perigee/apogee altitude of 494.20/370,872.31 km and an inclination of 30.08 degrees, the medium coast will have a perigee/apogee altitude of 487.93/395,521.85 km and an inclination of 30.09 degrees, and the long coast will have a perigee/apogee altitude of 493.43/364,004.18 km and an inclination of 30.07 degrees. The variation in orbital parameters continues to Peregrine separation. At Peregrine separation, the short coast will have a perigee/apogee altitude of 494.41/382,527.97

km and an inclination of 30.08 degrees, the medium coast will have a perigee/apogee altitude of 487.61/402,774.56 km and an inclination of 30.09 degrees, and the long coast will have a perigee/apogee altitude of 493.98/363,946.57 km and an inclination of 30.07 degrees. Spacecraft separation is followed by a third main engine burn (MEB3) to place Centaur in a hyperbolic disposal orbit, a demonstration of the reaction control system (RCS), and blowdown of the remaining propellants and hydrazine depletion. Following the completion of these events, End-of-Mission (EOM) occurs.

d. A 24-hour contact for interference issues.

TBD – Launch and Range Operations
Office @ CCAFS: xxx-xxx-xxxx
Mobile: xxx-xxx-xxxx

e. If the applicant is also requesting authorization to operate an earth station to communicate with the launch vehicle or spacecraft, it should provide the frequency, power, emission, latitude and longitude coordinates for the earth station. If the applicant is planning to communicate with an earth station operated by another company, the United States government, or one located outside the United States, its territories and possessions, the applicant should include technical parameters of the earth station in an exhibit to the application for reference purposes only.

Station	Geodetic Latitude (deg N)	Geodetic Longitude (deg W)	Geodetic Altitude (ft)	Antenna Gain (dB)	Noise Temperature (K)	G/T (dB/K)	Systems
TEL-4	28.46	80.65	-35.17	41.6	257		TLM_I, TLM_Q, TLM_I_95PCT, GPS_TLM, GPS_TLM_95PCT
JDMTA	26.98	80.11	-36.48	48.9	202		TLM_I, TLM_Q, TLM_I_95PCT, GPS_TLM, GPS_TLM_95PCT
HULA A	21.56	158.24	1409.66			26.0	TLM_I, TLM_Q, GPS_TLM
GUAM A	13.615	215.144	709.07			26.0	TLM_I, TLM_Q, GPS_TLM
REEF A	-7.27	287.63	-191.97			21.5	TLM_I, TLM_Q, GPS_TLM
BOSS A	42.95	71.63	652.68			25.5	TLM_I, TLM_Q, GPS_TLM
COOK A	34.82	120.50	881.66			25.5	TLM_I, TLM_Q, GPS_TLM