

**United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
RADIO STATION CONSTRUCTION PERMIT
AND LICENSE**

EXPERIMENTAL

(Nature of Service)

XC MO

(Class of Station)

WJ2XAY

(Call Sign)

0461-EX-CR-2021

(File Number)

NAME Leidos, Inc.

Subject to the provisions of the Communications Act of 1934, subsequent acts, and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this license, the licensee hereof is hereby authorized to use and operate the radio transmitting facilities hereinafter described for radio communications in accordance with the program of experimentation described by the licensee in its application for license.

Operation: In accordance with Sec. 5.3(c) of the Commission's Rules

Station Locations

- (1) MOBILE: Bridgewater VA, within 1 km, centered around NL 38-22-00; WL 78-57-37
- (2) MOBILE: Bridgewater VA, within 370 km, centered around NL 38-22-00; WL 78-57-37
- (3) MOBILE: Manassas VA, within 1 km, centered around NL 38-43-15; WL 77-30-54
- (4) MOBILE: Airborne Operations Around Manassas VA, within 370 km, centered around NL 38-43-15; WL 77-30-54

Frequency Information

MOBILE: Bridgewater VA, within 1 km, centered around NL 38-22-00; WL 78-57-37

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14.246-14.274 GHz	MO	10M0G1W	150 W (ERP)	
14.402-14.429 GHz	MO	10M0G1W	150 W (ERP)	
29.5-31 GHz	MO	10M0G1W	50 W (ERP)	

This authorization effective November 01, 2021 and
will expire 3:00 A.M. EST August 17, 2023

**FEDERAL
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Frequency Information

MOBILE: Airborne Operations Around Manassas VA, within 370 km, centered around NL 38-43-15; WL 77-30-54

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14.402-14.429 GHz	MO	10M0G1W	150 W (ERP)	
29.5-31 GHz	MO	10M0G1W	50 W (ERP)	

Special Conditions:

- (1) Licensee should be aware that other stations may be licensed on these frequencies and if any interference occurs, the licensee of this authorization will be subject to immediate shut down.
- (2) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (3) The station identification requirements of Section 5.115 of the Commission's Rules are waived.
- (4) Leidos, Inc., must take all necessary measures to ensure that the operation authorized does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.13.10. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for workers. The licensee shall ensure installation of terminals on aircraft by qualified installers who have an understanding of the antenna's radiation environment and the measures best suited to maximize protection of the general public and persons operating the aircraft and equipment. A terminal exhibiting radiation exposure levels exceeding 1.0 mW/cm² in accessible areas, such as at the exterior surface of the radome, shall have a label attached to the surface of the terminal warning about the radiation hazard and shall include thereon a diagram showing the regions around the terminal where the radiation levels could exceed 1.0 mW/cm².
- (5) Operation pursuant to this authorization must be in compliance with the terms of Leidos, Inc.'s coordination agreement with the National Science Foundation pertaining to operation of earth stations aboard aircraft (ESAA) in the Ku-Band.
- (6) Airborne uplink operations must comply with the requirements in 47 C.F.R. 25.227.
- (7) Stop buzzer contacts:
Chris Henry (814) 229 2863
Joshua Mayfield (484) 793 5232

Special Conditions:

- (8) Operation is subject to coordination prior to activation and, as appropriate, possible scheduling with Paulette Woody, pwoody@nrao.edu, (304) 456-2107, when used within 20 nautical miles of the National Radio Quiet Zone.
- (9) Operation must be in accordance with the NRQZ coordination letter ID 13154.
- (10) This authorization is issued for the express purpose of conducting experimental operations described in the related application and required by the U.S. Government; contract number W56KGY-16-D-0001. The use of this radio station in any other manner or for any other purpose will constitute a violation of the privileges herein authorized. Except as subsequently authorized by the Commission, this radio station shall not be operated after the expiration date of the contract designated in the related application and enumerated above.
- (11) Operations of the Leidos Military Aircraft Earth Stations are limited to operations aboard military aircraft only, without the monitor/control requirements of Section 25.227(a)(10)-(11), as long as the Leidos' operation will not impact the deployment of broadband service, or commercial competition, or Part 25 authorized satellite and earth station operations in view of the facts that the Leidos system authorized under Station WJ2XAY has remote control and monitoring ability to: (1) send disable commands from the ground NCMC; (2) employs human ground monitoring – which gives the ground operator full access to the system's graphic interface and the ability to issue disable commands; (3) has is a dedicated operator on board the aircraft who is responsible for enabling and disabling the transmission and setting system parameters. Such on board operator is responsible for monitoring the system for fault conditions; (4) can auto detect an off-pointed condition and will auto-mute upon an off-point of 0.5 degrees or more. (5) Leidos will also have radio contact via VHF and UHF radio voice channels when the aircraft is in range. In case of any interference issues, Leidos will have the ability to reach the aircraft via a secure UHF satellite communications channel over the tactical onboard radio system. (6) will allow any remote "disable" command to will remain in effect until the on board aircraft operator proactively initiates an "enable" command after clearing any faults.
- (12) Antenna elevation for all operations must be at least 5 degrees above the geographic horizon while the aircraft is on the ground.
- (13) Stations authorized herein must not be used to provide air traffic control communications.

Special Conditions:

- (14) Licensee is authorized to conduct tests on a L3-75in antenna on board aircrafts (ESAA) and operations are subject to the following conditions:
- a. POINT OF COMMUNICATION: Geostationary-satellite orbit (GSO) Satellites: SES-1 (S2807), AMC-21(S2676), Intelsat 29e (S2913), Intelsat 37e (S2972) Satellites.
 - b. The ESAA station is authorized to conduct tests via SES-1 at 101° WL satellite in the 14.246-14.274 GHz and 14.402-14.429 GHz bands.
 - c. The ESAA station is authorized to conduct tests via AMC-21 at 124.9° WL satellite in the 14.246-14.274 GHz and 14.402-14.429 GHz bands.
 - d. The ESAA station is authorized to conduct tests via Intelsat 29e at 50° WL satellite in the 14.246-14.274 GHz, 14.402-14.429 GHz, and 29.5-30 GHz bands.
 - e. The ESAA station is authorized to conduct tests via Intelsat 37e at 18° WL satellite in the 14.246-14.274 GHz, 14.402-14.429 GHz and 29.5-30 GHz bands.
 - f. Prior to operation, licensee must coordinate with stations authorized to operate in these frequency bands that are located within a 60 mile radius of the transmitter.
 - g. The authorized stations operating in the 14.246-14.274 GHz, 14.402-14.429 GHz bands must be in compliance with the off-axis EIRP power spectral density ("PSD") standards (the "off-axis mask") set forth in 25.218(f) for conventional Ku-band earth stations.
 - h. Operations in the 14.246-14.274 GHz, 14.402-14.429 GHz bands must be in compliance with the requirements set forth in Section 25.212(c)(2) of the Commission's Rules: the input power spectral density into the antenna must not exceed -14 dBW/4 kHz.
 - i. The authorized station's antenna performance specifications do not comply with Sections 25.138(a) and 25.209 of the FCC Rules. The operation of these antennas will not be protected from harmful interference caused by other geostationary satellite networks to the extent that harmful interference would not be expected to be caused to an antenna that is compliant with the antenna performance standards of Section 25.209.
 - j. Operations in the 14.246-14.274 GHz, 14.402-14.429 GHz and 29.5-30 GHz bands must be in compliance with the applicable ESAAs requirements set forth in Section 25.227 of the Commission's Rules.
 - k. ESAAs in aircraft on the ground must not transmit at elevation angles less than three degrees. There is no minimum angle of antenna elevation for ESAAs while airborne.
 - l. In accordance with Article 4.4 of the ITU Radio Regulations, the operations authorized herein shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the ITU Constitution, the ITU Convention, and the ITU Radio Regulations.

Speciæ

m. Prior to commencement of operations with each satellite pursuant to this experimental license, Leidos, Inc. shall obtain a certification regarding the notification of all satellite operators with co-frequency operations within 6 degrees longitude of each satellite, generally describing the experimental operations authorized herein, including the term thereof, and providing a point of contact for the purpose of resolving any complaints of interference. Leidos, Inc. shall obtain a similar certification if, during the term of this experimental license, any of the satellites move orbit locations, or if a satellite operator commences co-frequency operations within 6 degrees longitude of each of the satellites. If the point of contact receives a complaint of harmful interference, the party receiving the complaint (if not Leidos, Inc.) will notify Leidos, Inc., and Leidos, Inc. shall immediately cease such operations or adjust such operations to avoid harmful interference. Leidos, Inc. will submit a copy of these certification(s) to the Commission for incorporation into the record of this file.

n. The stations are authorized, on a non-protected and non-harmful interference basis, to transmit to the geostationary-orbit space stations using the 14.246-14.274 GHz, 14.402-14.429 GHz and 29.5-30 GHz bands that are authorized by the Commissions. The stations authorized herein must immediately terminate operations upon notification that such operation is causing harmful interference to any other radio system lawfully operating in the 14.246-14.274 GHz, 14.402-14.429 GHz and 29.5-30 GHz bands. The stations authorized herein cannot claim protection from harmful interference from any radio system lawfully operating in the 14.246-14.274 GHz, 14.402-14.429 GHz and 29.5-30 GHz bands.

o. Operation pursuant to this authorization must be in compliance with the terms of coordination agreements between the authorized GSO Ku-band and Ka-band satellite operators operating in the 14.246-14.274 GHz, 14.402-14.429 GHz and 29.5-30 GHz bands and operators of other Ku-band and Ka-band geostationary space stations within six angular degrees of those space stations. In the event that another GSO FSS space station commences operation in the Ku-band and Ka-band at a location within six degrees of any of these space stations, earth stations operating pursuant to this temporary authority shall cease transmitting to that space station unless and until such operation has been coordinated with the new space station's operator or Licensee demonstrates that such operation will not cause harmful interference to the new co-frequency space station.

p. Communications between authorized station(s) and the Ku-band and Ka-band geostationary space stations must be in compliance with all existing and future space station coordination agreements reached between the Ku-band and Ka-band GSO operators and other administrations; and between the Ku-band and Ka-band GSO operators and, if any, the Ku-band and Ka-band NGSO (non- geostationary space stations) operators.

q. Licensee's ESAAs must employ a tracking algorithm that is resistant to capturing and tracking adjacent satellite signals, and each station must be capable of inhibiting its own transmission in the event it detects unintended satellite tracking.