

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

EXPERIMENTAL

(Nature of Service)

WP9XVW

(Call Sign)

XT MO

(Class of Station)

0053-EX-TC-2020

(File Number)

NAME Northrop Grumman Innovation Systems LLC

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.

Station Locations

- (1) MOBILE: From WFF, VA launch into low earth orbit., centered around NL 37-50-02; WL 75-29-16
- (2) MOBILE: From WFF, VA launch into low earth orbit., centered around NL 37-50-02; WL 75-29-16
- (3) MOBILE: From WFF, VA launch into low earth orbit., centered around NL 37-50-02; WL 75-29-16

Frequency Information

MOBILE: From WFF, VA launch into low earth orbit., centered around NL 37-50-02; WL 75-29-16

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2239.76-2243.24 MHz	MO	3M48F1D	6.3 W (ERP)	0.002 %
2267.55-2271.45 MHz	MO	3M90G1D	5.4 W (ERP)	0.002 %

This authorization effective February 12, 2020 and
will expire 3:00 A.M. EST July 16, 2020

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Frequency Information

MOBILE: From WFF, VA launch into low earth orbit., centered around NL 37-50-02; WL 75-29-16

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2285.55-2289.45 MHz	MO	3M90G1D	4.7 W (ERP)	0.002 %

MOBILE: From WFF, VA launch into low earth orbit., centered around NL 37-50-02; WL 75-29-16

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
5758-5772 MHz	MO	14M0P0N	389.1 W (ERP)	0.05 %

Special Conditions:

- (1) This STA is limited to telemetry and tracking operations for a single Antares launch to support the delivery of Cygnus capsule to Low Earth Orbit, as part of the NASA Commercial Orbital Transportation Services (COTS) program. This STA will expire as soon as the launch has been completed or 15 July 2020, whichever occurs first. Any future launches shall submit applications to the FCC to be re-coordinated with the NTIA.
- (2) All transmissions in the band 2200-2290 MHz shall comply with national and international power flux density limits, unless otherwise coordinated and agreed. PFD analysis and exceedances shall be provided in the FCC application and provided to the NTIA for US Government review.
- (3) Northrop Grumman Innovation Systems, Inc. (NGIS) shall be aware that future non-federal launches will be considered on a case-by-case basis, especially for requests in the band 2200-2290 MHz, and Northrop Grumman Innovation Systems, Inc. (NGIS) shall have no expectations that future launches will be approved.
- (4) 60 days prior to transmitting at Wallops Island, Virginia, Northrop Grumman Innovation Systems, Inc. (NGIS) shall coordinate and schedule their operations with the NASA GSFC Spectrum Management Office (NASA-DL-GSFC-Spectrum-Management@nasa.gov) and Felipe Arroyo (felipe.arroyo-1@nasa.gov, 757.824.1623, NASA WFF SMO). Northrop Grumman Innovation Systems, Inc. (NGIS) is required to provide, as a minimum, launch date/time/window and planned first- and second- stage trajectories, transmission frequencies with associated earth stations and duration/cut- off times.

Special Conditions:

- (5) As soon as possible, but no later than 60 business days prior to the planned launch, Northrop Grumman Innovation Systems, Inc. (NGIS) is required to provide, as a minimum, launch date/time/window and planned first- and second-stage trajectories, transmission frequencies with associated earth stations and duration/cut-off time to Jimmy Nguyen (jimmy.nguyen@us.af.mil, AFSMO), NASA GSFC Spectrum Management Office (NASA-DL-GSFC-Spectrum-Management@nasa.gov), Johnnie Best, (johnnie.w.best1@navy.mil, NMSC), NOAA Satellite Operations Control Center, Wallops Island at (757) 824-7360, philip.l.whaley@noaa.gov, and Cathy Sham (catherine.c.sham@nasa.gov, NASA JSC SMO). In the event of last-minute changes, 48-hour notice is required.
- (6) The STOP BUZZER POC information for launch operations shall be provided to NTIA (bmitchell@ntia.gov). This phone shall be manned 24/7.
- (7) Northrop Grumman Innovation Systems, Inc. (NGIS) shall keep a log of all transmissions in the band 2200-2290 MHz that shall be provided to the NTIA after the mission. This log shall include, at a minimum, the date, time, frequency, e.i.r.p density, pointing direction of the antennae. The log shall be provided to the following NTIA personnel no later than three (3) weeks after completion of the mission: Brandon Mitchell at bmitchell@ntia.gov, Ed Drocella at edrocella@ntia.gov.
- (8) Due to potential harmful interference to naval activities, Northrop Grumman Innovation Systems, Inc. (NGIS) RF operations plan shall be submitted, at least 60 days prior to planned launch date, to the Naval Surface Warfare Center, Dahlgren Division (NSWCDD), Mr. James Moneyhon 540.653.3477, or james.moneyhon@navy.mil, Monique Winslow (540) 653-1211, monique.winslow.ctr@navy.mil or Phillip Scyphers, (540) 653-6071, phillip.scyphers@navy.mil, for assessment. A blackout zone of 1500 nautical mile radius, centered at 22N160W, shall be assumed, unless otherwise coordinated with, and agreed to, by the NSWCDD. Northrop Grumman Innovation Systems, Inc. (NGIS) must also comply with any and all restrictions that may be levied by the Naval Surface Warfare Center, Dahlgren Division (NSWCDD).
- (9) In order to mitigate the potential for interference with these naval activities, four blackout zones (BOZs) shall be assumed as follows: (1) 1500 nautical mile radius centered at 22N160W; (2) 1500 nautical mile radius centered at 33.25N119.57W; (3) 1500 nautical mile radius centered at 4.11N175.2W; and (4) 1500 nautical mile radius centered at 57.46N152.38W. These BOZs shall be implemented, unless otherwise coordinated and agreed to by the Naval Surface Warfare Center, Dahlgren Division (NSWCDD). In addition, Northrop Grumman Innovation Systems, Inc. (NGIS) must also comply with any and all restrictions that may be levied by NSWCDD. Coordination of the Northrop Grumman Innovation Systems, Inc. (NGIS) operations schedule and timeline, and all restrictions levied by the NSWCDD, including imposition and implementation of any BOZs, shall be coordinated through NASA JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov).

Special Conditions:

- (10) Northrop Grumman Innovation Systems, Inc and Wallops Flight Facility coordinate with Mid-Atlantic Area Frequency Coordinator (MIDLANTAFC) at least 7-business days in advance of proposed operations. USN-Mid-Atlantic Area Frequency Coordinator, Naval Air Warfare Center Aircraft Division, Mr. Mikel R. Ryan, NIPR: mikel.ryan@navy.mil, SIPR: mikel.ryan@navy.smil.mil, DSN: 342-1532, COM: 301-342-1532 and Mr. Robert Goddard, NIPR: robert.n.goddard@navy.mil, SIPR: robert.goddard@navy.smil.mil, COM: 301-342-1194, DSN: 342-1194.