DS LAW PLLC, 1629 K St NW Ste 300, Washington, DC 20006,

**United States of America**
**FEDERAL COMMUNICATIONS COMMISSION**
**EXPERIMENTAL**
**SPECIAL TEMPORARY AUTHORIZATION**

| | |
|---|---|
| EXPERIMENTAL | WR9XHW |
| (Nature of Service) | (Call Sign) |
| XT FX MO | 1785-EX-ST-2020 |
| (Class of Station) | (File Number) |

NAME Northrop Grumman Systems Corporation

This Special Temporary Authorization is granted upon the express condition that it may be terminated by the Commission at any time without advance notice or hearing if in its discretion the need for such action arises. Nothing contained herein shall be construed as a finding by the Commission that the authority herein granted is or will be in the public interest beyond the express terms hereof.

This Special Temporary Authorization shall not vest in the grantee any right to operate the station nor any right in the use of the frequencies designated in the authorization beyond the term hereof, nor in any other manner than authorized herein. Neither the authorization nor the right granted hereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934. This authorization is subject to the right of use of control the Government of the United States conferred by Section 706 of the Communications Act of 1934.

Special Temporary Authority is hereby granted to operate the apparatus described below:

Purpose Of Operation:
The purpose of the operation is to test airborne data link capabilities of new equipment.

Station Locations

(1) Mojave (KERN), CA - NL 35-03-32; WL 118-09-05; MOBILE: airborne max altitude 60,000 feet AGL, within 350 km, centered around NL 35-03-32; WL 118-09-05
(2) Grand Forks (GRAND FORKS), ND - NL 47-56-38; WL 97-10-40; MOBILE: airborne max altitude 60,000 feet AGL, within 350 km, centered around NL 47-56-38; WL 97-10-40
(3) Carlsbad (SAN DIEGO), CA - NL 33-05-45; WL 117-18-59; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, centered around NL 33-05-45; WL 117-18-59
(4) Dulles (LOUDOUN), VA - NL 38-56-51; WL 77-27-36; MOBILE: airborne max altitude 25,000 feet AGL, within 242 km, centered around NL 38-56-51; WL 77-27-36
(5) Holloman AFB (OTERO), NM - NL 32-51-57; WL 106-06-27; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, centered around NL 32-51-57; WL 106-06-27
(6) Creech AFB (CLARK), NV - NL 36-35-01; WL 115-40-42; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, centered around NL 36-35-01; WL 115-40-42
(7) Mountain Home AFB (ELMORE), ID - NL 43-02-52; WL 115-52-17; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, centered around NL 43-02-52; WL 115-52-17
(8) Carlsbad (SAN DIEGO), CA - NL 33-05-45; WL 117-18-59; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, centered around NL 33-05-45; WL 117-18-59
(9) Newport (NEWPORT), RI - NL 41-31-57; WL 71-18-26; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, centered around NL 41-31-57; WL 71-18-26

This authorization effective February 25, 2021 and
will expire 3:00 A.M. EST June 08, 2021

**FEDERAL COMMUNICATIONS COMMISSION**

## Frequency Information

Mojave (KERN), CA - NL 35-03-32; WL 118-09-05; MOBILE: airborne max altitude 60,000 feet AGL, within 350 km, centered a

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |

Grand Forks (GRAND FORKS), ND - NL 47-56-38; WL 97-10-40; MOBILE: airborne max altitude 60,000 feet AGL, within 350

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |

## Frequency Information

Carlsbad (SAN DIEGO), CA - NL 33-05-45; WL 117-18-59; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, ce

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |

Dulles (LOUDOUN), VA - NL 38-56-51; WL 77-27-36; MOBILE: airborne max altitude 25,000 feet AGL, within 242 km, centere

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |

## Frequency Information

Holloman AFB (OTERO), NM - NL 32-51-57; WL 106-06-27; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km,

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |

Creech AFB (CLARK), NV - NL 36-35-01; WL 115-40-42; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, cen

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |

## Frequency Information

Mountain Home AFB (ELMORE), ID - NL 43-02-52; WL 115-52-17; MOBILE: airborne max altitude 50,000 feet AGL, within 18

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |

Carlsbad (SAN DIEGO), CA - NL 33-05-45; WL 117-18-59; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, ce

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 W (ERP) | |

Frequency Information

Newport (NEWPORT), RI - NL 41-31-57; WL 71-18-26; MOBILE: airborne max altitude 50,000 feet AGL, within 185 km, cente

| Frequency | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|---|---|---|---|---|
| 2410-2470 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 2410-2470 MHz | MO | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | FX | 20M0G1D | 125 W (ERP) | |
| 5725-5850 MHz | MO | 20M0G1D | 125 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) Licensee must coordinate with local Society of Broadcast Engineers frequency coordinator in each proposed area prior to operation in the frequency range from 2450 MHz to 2470 MHz.

(3) Licensee must coordinate with Fixed Microwave Service licensees in accordance with 47 C.F.R, Part 101.103(d) in each proposed venue prior to operation in frequency range from 2450 MHz to 2470 MHz.

(4) Grand Forks AFB, NV: Must provide stop buzzer POC information and coordinate with TSgt Christopher Kowalke, 701-747-4933, installation spectrum manager prior to operations.

(5) Mountain Home AFB, ID: Must provide stop buzzer POC information and coordinate with TSgt Michael Detoma, 208-828-6357, installation spectrum manager prior to operations. User must also contact the DoD AFC Nevada at Nellis AFB, comm (702)-679-0607, e-mail: DoDAFC@us.af.mil, prior to operations to establish process for scheduling frequency usage within the DoD AFC Nevada area of responsibility.

Special Conditions:

(6) Creech, AFB, NV: Must provide stop buzzer POC information and coordinate with TSgt Charles Rountree, 702-652-3393, installation spectrum manager prior to operations. User must also contact the DoD AFC Nevada at Nellis AFB, comm (702)-679-0607, e-mail: DoDAFC@us.af.mil, prior to operations to establish process for scheduling frequency usage within the DoD AFC Nevada area of responsibility.

(7) Avoid operating or testing within the geographic area of the National Radio Quiet Zone. Coordinate with the point of contact for both VLBA and VLA prior to operation: Dan "Mert" Mertely, nrao-rfi@nrao.edu, phone: (575) 835-7128

(8) Avoid testing under this STA within 50km (azimuthal) of the Hancock, NH VLBA station located at NL 42-56-01; WL 71-59-12, and avoid direct illumination of the site, in order to prevent damage to the system's receivers. Coordinate with the point of contact for both VLBA and VLA prior to operation: Dan "Mert" Mertely, nrao-rfi@nrao.edu, phone: (575) 835-7128

(9) The FAA has no objection as long as (1) the use of ISM is limited to payload and not command/control (C2) purposes.

(10) If the ISM radios are for UAS C2 testing and the airborne platform is a manned aircraft, the FAA concurs with the understanding that further development of a UAS C2 platform will require either migration to a more suitable frequency band, and/or rule changes for its allowance for commercial applications.

(11) If the ISM radios are for UAS C2 testing using a unmanned platform, the FAA will conditionally concur provided that:
a. Operations are limited to Restricted/Warning airspace and/or a FAA-approved COA.
b. Loss of link procedures are documented with FAA via the COA process.
c. Further development of a UAS C2 platform will require either migration to a more suitable frequency band, and/or rule changes for its allowance for commercial applications.

(12) Therefore, for UAS C2 usage regardless of manned or unmanned aircraft testing, the applicant should be aware that commercial operation of this system will require the transition away from experimental licenses and that in in the 2.4 and 5.8 GHz ISM bands, the 125 Watt ERP used by this system will not be available without a waiver from the FCC or a change to the FCC rules.

(13) Avoid testing under this STA within 50km (azimuthal) of the Hancock, NH VLBA station located at NL 42-56-01; WL 71-59-12, and avoid direct illumination of the site, in order to prevent damage to the system's receivers. Coordinate with the point of contact for both VLBA and VLA prior to operation: Dan "Mert" Mertely, nrao-rfi@nrao.edu, phone: (575) 835-7128