

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

EXPERIMENTAL

(Nature of Service)

WM9XYG

(Call Sign)

XT MO

(Class of Station)

1124-EX-ST-2018

(File Number)

NAME Virgin Orbit

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:**

Testing RF link.

**Station Locations**

- (1) MOBILE: Airspace R2508, R2515, W289S & W291, Alt. 40,000ft, within 2 km, centered around NL 34-35-03; WL 117-22-44
- (2) MOBILE: Airspace R2508, R2515, W289S & W291, Alt. 40,000ft, within 2 km, centered around NL 35-03-24; WL 118-09-28

**Frequency Information**

MOBILE: Airspace R2508, R2515, W289S & W291, Alt. 40,000ft, within 2 km, centered around NL 34-35-03; WL 117-22-44

| Frequency  | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|------------|---------------|---------------------|------------------|---------------------------|
| 2287.5 MHz | MO            | 4M21G1W<br>2M11G1W  | 79.43 W (ERP)    | 0.002 %                   |

This authorization effective August 16, 2018 and  
will expire 3:00 A.M. EST January 24, 2019

**FEDERAL  
COMMUNICATIONS  
COMMISSION**



## Frequency Information

MOBILE: Airspace R2508, R2515, W289S & W291, Alt. 40,000ft, within 2 km, centered around NL 35-03-24; WL 118-09-28

| Frequency  | Station Class | Emission Designator | Authorized Power | Frequency Tolerance (+/-) |
|------------|---------------|---------------------|------------------|---------------------------|
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## Special Conditions:

- (1) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (2) 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.
- (3) As soon as possible, but no later than 60 business days prior to each planned flight, Virgin Orbit is required to provide, as a minimum, launch date/time/window and planned flight path, and transmission frequencies with associated duration/cut-off time to Jimmy Nguyen (jimmy.nguyen@us.af.mil, AFSMO), Felipe Arroyo (felipe.arroyo-1@nasa.gov, NASA/WFF), Scott Galbraith (vincent.s.galbraith@nasa.gov, NASA/GSFC), Stephen Horan (stephen.j.horan@nasa.gov, NASA/LaRC), NOAA Satellite Operations Control Center (philip.l.whaley@noaa.gov), Richard Ontiveros, (richard.ontiveros1@navy.mil, NMSC), and Cathy Sham (catherine.c.sham@nasa.gov). In the event of last-minute changes, 48-hour notice is required.
- (4) All transmissions in the band 2200-2290 MHz shall comply with national and international power flux density limits (PFD), except in cases where expected exceedance is pre-coordinated and agreed. PFD analysis and exceedances shall be included in the FCC STA application and provided in the request to the NTIA for US Government review and assessment.
- (5) Virgin Orbit telemetry transmission using a frequency of 2287.5 MHz is not permitted when in view of the Goldstone Deep Space Communications Complex (GDSCC), from horizon to horizon, until clearance to transmit is provided by the Joint Propulsion Laboratory (JPL) Spectrum Manager, Farzin Manshadi at (818) 354-0068 or Farzin.Manshadi@jpl.nasa.gov. Requests for coordination shall occur a minimum of 30 business days prior to operation, and shall include, at a minimum, planned communication timelines with start/end time, receiving station location, transmit/receive parameters/power/bandwidth, and aircraft flight paths. Alternatively, changing the operating frequency to 2215.0 MHz would facilitate successful coordination.
- (6) The STOP BUZZER POC information for all operations shall be provided to NTIA (bmitchell@ntia.doc.gov). This phone shall be manned 24/7.

**Special Conditions:**

- (7) Virgin Orbit must coordinate with the Naval Surface Warfare Center, Dahlgren Division (NSWCDD), Mr. James Moneyhon, (540)653-3477, or james.moneyhon@navy.mil, a minimum of 60-days prior to any operations, to mitigate harmful interference to Navy and Marine Corps operations. Virgin Orbit, LLC, must also comply with any and all restrictions that may be levied by the Naval Surface Warfare Center, Dahlgren Division (NSWCDD).