

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

EXPERIMENTAL

(Nature of Service)

XR FX MO

(Class of Station)

WR9XTX

(Call Sign)

1196-EX-ST-2020

(File Number)

NAME Dartmouth College

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:

Conduct scientific research associated with understanding Earth's Van Allen radiation belts using the REAL cubesat.

Station Locations

- (1) MOBILE: LEO, 550 km altitude, 90 degree inclination
- (2) MOBILE: LEO, 550 km altitude, 90 degree inclination
- (3) Bozeman, MT - NL 45-39-59; WL 111-02-44

Frequency Information

MOBILE: LEO, 550 km altitude, 90 degree inclination

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
450.06 MHz	MO	50K0F1D	922 mW (ERP)	0.001 %

This authorization effective November 01, 2021 and
will expire 3:00 A.M. EST May 01, 2022

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

MOBILE: LEO, 550 km altitude, 90 degree inclination

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2202 MHz	MO	4M00F1D	2.2 W (ERP)	0.001 %

Bozeman, MT - NL 45-39-59; WL 111-02-44

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
450.06 MHz	FX	50K0F1D	912 W (ERP)	0.001 %

Special Conditions:

- (1) The licensee shall provide the Commission with all information required for the Advance Publication, Coordination and Notification of frequency assignments pursuant to the International Radio Regulations. This includes the preparation of draft materials, to be provided to the Commission prior to submission to the International Telecommunication Union. The authorized operations require notification of frequency assignments pursuant to Article 11 of the ITU Radio Regulations. Licensee shall provide the FCC, not later than 30 days after a frequency assignment is brought into use, the documents required for notification (including SpaceCap Notification MDB file) of such frequency assignments. The licensee shall also prepare materials for informing the ITU that a frequency assignments has been brought into use, or that its use has been suspended or permanently discontinued.
- (2) Upon receipt of a conjunction warning from the JSpOC or other source, the licensee must review the warning and take all possible steps to assess and, if necessary, to mitigate collision risk, including, but not limited to: contacting the operator of any active spacecraft involved in such warning; sharing ephemeris data and other appropriate operational information with any such operator; modifying spacecraft attitude and/or operations.
- (3) Following launch of the satellite, the licensee must notify the FCC through electronic submission to the license file, of the status of the satellite (transmissions commenced, etc.), not later than 7 days after commencement or expected commencement of transmissions, and of termination of transmissions, not later than three months after such termination.

Special Conditions:

- (4) All Dartmouth College operations granted on an experimental basis shall be on an unprotected, non-interference basis to authorized federal stations, and Dartmouth College should be aware that any interference to these users will subject the licensee to immediate shut down. Dartmouth College shall also be aware that long term or operational use of the 2200-2290 MHz frequency band by Non-Federal stations is not possible, and Dartmouth College shall have no expectation that future requests for operation or renewal of experimental licenses in this band will be approved.
- (5) All operations shall be limited to an on-orbit operational period of six months as specified in the documentation provide by Dartmouth College. This authorization will expire once the on-orbit operation is completed, or 30 April 2022, whichever occurs first.
- (6) Dartmouth College use of 450 MHz by the REAL CubeSat and Bozeman, Montana earth station will result in harmful interference to federal operations. To mitigate these concerns, this frequency must be replaced by either 450.2 MHz or 450.06 MHz.
- (7) Dartmouth College shall notify the NASA GSFC Spectrum Management Office at NASA-DL-GSFC-Spectrum-Management@mail.nasa.gov and the NASA JSC Spectrum Management Office at JSC-DL-Spectrum-Management@mail.nasa.gov of the proposed ground station contact dates and times, at least 2 weeks in advance of operations.
- (8) 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 are 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.
- (9) Prior to operations, the STOP BUZZER POC information for all operations shall be provided to NTIA (ravery@ntia.gov), Air Force (Jimmy.Nguyen@us.af.mil), and NASA GSFC Spectrum Management Office (NASA-DL-GSFC-Spectrum-Management@mail.nasa.gov). This phone shall be manned during all operational periods.
- (10) In the event that any changes occur to the mission's parameters, NSWCDD/E3 requires that Dartmouth provide updated documentation and parameters to be submitted NLT 60 days prior to launch to the Naval Surface Warfare Center, Dahlgren Division (NSWCDD). In the event that these changes result in any potential harmful interference to Navy and DoD operations, Dartmouth College must comply with any and all restrictions that may be levied by the Naval Surface Warfare Center, Dahlgren Division. The primary contacts for frequency coordination: Mr. James Moneyhon, (540) 653-3477- james.moneyhon@navy.mil, Mr. A. Jason Verdugo, (540) 653-9590 – Anthony.J.Verdugo@navy.mil, and/or Mr. Phillip B. Scyphers, (540) 653-6071 – Phillip.scyphers@navy.mil. Group email box. - W_DLGR_NSWC_FTMA_FM@navy.mil.