

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

EXPERIMENTAL
(Nature of Service)

XD MO
(Class of Station)

WK2XEQ
(Call Sign)

0201-EX-CN-2019
(File Number)

NAME Carnegie Mellon University

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(j) of the Commission's Rules

Station Locations
(1) MOBILE: Statewide, CA
Frequency Information

MOBILE: Statewide, CA

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
617-652 MHz	MO	20M0G7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W 270KG7W	24.27 W (ERP)	0.0001 %
617-652 MHz	MO	20M0G7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W	2 W (ERP)	0.0001 %

This authorization effective June 12, 2019 and
will expire 3:00 A.M. EST June 12, 2024

FEDERAL
COMMUNICATIONS
COMMISSION



Frequency Information

MOBILE: Statewide, CA

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
617-652 MHz	MO	1M40W7W 270KG7W	2 W (ERP)	0.0001 %
663-698 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W 270KG7W	2 W (ERP)	0.0001 %
663-698 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W 270KG7W	24.27 W (ERP)	0.0001 %
880-915 MHz	MO	5M00W7W 20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W 270KG7W	2 W (ERP)	0.0001 %
880-915 MHz	MO	5M00W7W 20M0W7W	24.27 W (ERP)	0.0001 %

Frequency Information

MOBILE: Statewide, CA

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
880-915 MHz	MO	15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W 270KG7W	24.27 W (ERP)	0.0001 %
925-960 MHz	MO	270KG7W 5M00W7W 20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W	2 W (ERP)	0.0001 %
925-960 MHz	MO	1M40G7W 10M0W7W 15M0W7W 20M0W7W 5M00W7W 3M00W7W 5M00W7W	24.27 W (ERP)	0.0001 %
1880-1920 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7N 1M40W7W	24.27 W (ERP)	0.0001 %

Frequency Information

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Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1880-1920 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W	2 W (ERP)	0.0001 %
1910-1930 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W	2 W (ERP)	0.0001 %
1910-1930 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7N 3M00W7W 1M40V7N	24.27 W (ERP)	0.0001 %
2300-2310 MHz	MO	10M0W7W 15M0W7W 1M40W7W 20M0W7W 3M00W7W 5M00W7W	2 W (ERP)	0.0001 %
2300-2310 MHz	MO	20M0W7W 15M0W7W	24.27 W (ERP)	0.0001 %

Frequency Information

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Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2300-2310 MHz	MO	10M0W7W 5M00W7W 3M00W7W 1M40W7W	24.27 W (ERP)	0.0001 %
2501-2690 MHz	MO	10M0W7W 15M0W7W 1M40W7W 20M0W7W 3M00W7W 5M00W7W	2 W (ERP)	0.0001 %
2501-2690 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W	24.27 W (ERP)	0.0001 %
2570-2620 MHz	MO	1M40W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 20M0W7W	2 W (ERP)	0.0001 %
2570-2690 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W	24.27 W (ERP)	0.0001 %

Frequency Information

MOBILE: Statewide, CA

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2570-2690 MHz	MO	3M00W7W 1M40W7W	24.27 W (ERP)	0.0001 %
3550-3700 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W	2 W (ERP)	0.0001 %
3550-3700 MHz	MO	20M0W7W 15M0W7W 10M0W7W 5M00W7W 3M00W7W 1M40W7W	24.27 W (ERP)	0.0001 %

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) This authorization SUPERSEDES the previously issued authorization with the same call sign and file number:
- (4) Operations in the WCS bands (2305-2310 MHz) must comply with the emission limits applicable to those bands. See 47 C.F.R. § 27.53(a).
- (5) Ensure that the transmitting base station antenna(s) tip down when possible and avoid point towards the horizon in order to protect satellite earth stations nearby.
- (6) Licensee must maintain separation from the grandfathered earth stations as defined in Part 90 subpart Z, or notify and obtain an agreement with the grandfathered earth station licensees prior to accessing to 3650-3700 MHz band. Consult MyIBFS database to identify all existing registered earth stations in the 3650-3700 MHz band for each proposed experimental area of operation. The coordinates of these stations are available at <http://www.fcc.gov/ib/sd/3650/grandftr.pdf>.

Special Conditions:

- (7) Licensee shall ensure that the operations will not cause harmful interference to any existing registered stations in 3550-3700 MHz, and notify the registered users in the proposed areas prior to operation in those frequency bands.
- (8) Licensee be aware that FSS earth stations are licensed above 3700 MHz and if any interference occurs, the experimental licensee of this authorization will be subject to immediate shut down.
- (9) All of the experimental devices will be under the control of Carnegie Mellon University.
- (10) The stop buzzer contact for this project is Primary:
Daniel Munsch, Esq. E-Mail Address: dmunsch@andrew.cmu.edu

- (11) The authorized station must be in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules.
- (12) The authorized station must be in compliance with environmental requirement set forth in Section 1.1307 of the Commission's Rules.
- (13) Experimental station shall use the minimum power level necessary to establish communications links to minimize potential interference to licensed users.
- (14) This authorization is without prejudice to any determination that the Commission may make regarding pending or future experimental satellite earth station applications.
- (15) Operations are on a non-interference basis (NIB) and shall not cause harmful interference to, and shall not claim protection from, interference caused to it by any other lawfully operating station and it shall cease transmission(s) immediately upon notice of such interference and notify the FCC in writing.
- (16) The applicant shall secure consents from the Advance Wireless Service licensees prior to operation in 1915-1920 MHz band
- (17) The applicant shall obtain consents from the Educational Broadband Service and the Broadband Radio Service licensees prior to operation in 2500-2690 MHz range.
- (18) The applicant shall maintain operation separation from the grandfathered earth stations as defined in Part 90, Subpart Z, or coordinate an agreement with the grandfathered earth station licensees prior to operation in 3650-3700 MHz band.
- (19) The applicant shall consult the ULS database to ensure that the operation will not cause harmful interference to any existing registered stations in the 3650-3700 MHz band, and notify the registered users in the proposed geographic areas prior to operation in this band.
- (20) The applicant shall coordinate with the local Society of Broadcast Engineers frequency coordinator prior to operation in 617-652 MHz, 663-698 MHz, and 925-960 MHz bands.
- (21) The applicant shall coordinate with affected Fixed Microwave Service licensees prior to operation in 925-960 MHz band.

Special Conditions:

- (22) Prior to commencing any operations in the frequencies below, the applicant must obtain consent from the following within 50 miles of the contours of the testing area:
- Cellular licensees (824-849 MHz/869-894 MHz)
 - Commercial Air-Ground licensee (849-851 MHz/894-896 MHz)
 - SMR licensees (896-901 MHz/935-940 MHz)
 - B/ILT licensees (896-901 MHz/935-940 MHz)
 - Narrowband PCS licensees (901-902/930-931/940-941 MHz)
 - Location & Monitoring Service licensees (902-928 MHz)
 - Paging Service licensees in 929 MHz and 931 MHz
 - Broadband PCS licensees (1850-1910 MHz/1930-1990 MHz)
 - WCS (2305-2320 MHz/2345-2360 MHz) licensee (AT&T)