Austin Weber, 13412 Galleria Circle Suite H-100, Austin, TX 78738,

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

EXPERIMENTAL	WL2XOX
(Nature of Service)	(Call Sign)
XT FX MO	0184-EX-CM-2021
(Class of Station)	(File Number)

NAME CesiumAstro, Inc.

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: CS1, LEO 550 km, inclination 97.6 deg
(2) MOBILE: CS2, LEO 550 km, inclination 97.6 deg
(3) MOBILE: CS1, LEO 550 km, inclination 97.6 deg
(4) MOBILE: CS2, LEO 550 km, inclination 97.6 deg
(5) MOBILE: CS1, LEO 550 km, inclination 97.6 deg
(6) MOBILE: CS2, LEO 550 km, inclination 97.6 deg
(7) MOBILE: CS1, LEO 550 km, inclination 97.6 deg
(8) MOBILE: CS2, LEO 550 km, inclination 97.6 deg
(9) MOBILE: CS1, LEO 550 km, inclination 97.6 deg
(10) MOBILE: CS2, LEO 550 km, inclination 97.6 deg
(11) Broomfield (JEFFERSON), CO - NL 39-54-58; WL 105-07-05
(12) Broomfield (JEFFERSON), CO - NL 39-54-58; WL 105-07-05
(13) Austin (TRAVIS), TX - NL 30-18-35; WL 97-56-23
(14) Austin (TRAVIS), TX - NL 30-18-35; WL 97-56-23
(15) Austin (TRAVIS), TX - NL 30-18-54; WL 97-56-48
(16) Austin (TRAVIS), TX - NL 30-18-54; WL 97-56-48

Frequency Information

MOBILE: CS1, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27-27.4 GHz	MO	200MG1W	1995.3 W (ERP)	0.0005 %

This authorization effective September 30, 2021 and will expire 3:00 A.M. EST June 01, 2026

FEDERAL COMMUNICATIONS COMMISSION

Frequency Information

MOBILE: CS1, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27-27.4 GHz	MO	200MG1W	1995.3 W (ERP)	0.0005 %
27.1-27.3 GHz	MO	100MG1W 100MG1W	1995.3 W (ERP)	0.0005 %
27.2 GHz	MO	100MG1W 100MG1W	1995.3 W (ERP)	0.0005 %
27.3 GHz	MO	100MG1W 100MG1W	1995.3 W (ERP)	0.0005 %

MOBILE: CS2, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27-27.4 GHz	MO	200MG1W 200MG1W	1995.3 W (ERP)	0.0005 %
27.1-27.3 GHz	MO	100MG1W 100MG1W	1995.3 W (ERP)	0.0005 %
27.2 GHz	MO	100MG1W 100MG1W	1995.3 W (ERP)	0.0005 %
27.3 GHz	MO	100MG1W	1995.3 W (ERP)	0.0005 %

Frequency Information

MOBILE: CS2, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27.3 GHz	MO	100MG1W	1995.3 W (ERP)	0.0005 %

MOBILE: CS1, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1615.65 MHz	MO	1M23G1W	1.11 W (ERP)	0.0005 %
1616.88 MHz	MO	1M23G1W	1.11 W (ERP)	0.0005 %

MOBILE: CS2, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1615.65 MHz	MO	1M23G1W	1.11 W (ERP)	0.0005 %
1616.88 MHz	MO	1M23G1W	1.11 W (ERP)	0.0005 %

MOBILE: CS1, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1616.25 MHz	MO	2M50G1D	198 mW (ERP)	0.001 %

Frequency Information

MOBILE: CS2, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1616.25 MHz	MO	2M50G1D	198 mW (ERP)	0.001 %

MOBILE: CS1, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2211 MHz	MO	640KF1D	2.43 W (ERP)	0.0008 %
2215 MHz	MO	640KF1D	2.43 W (ERP)	0.0008 %

MOBILE: CS2, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2211 MHz	MO	640KF1D	2.43 W (ERP)	0.0008 %
2215 MHz	MO	640KF1D	2.43 W (ERP)	0.0008 %

MOBILE: CS1, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2455 MHz	MO	2M40G1W 2M40G1W 1M20G1W	10.5 W (ERP)	0.0005 %

Frequency Information

MOBILE: CS1, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2455 MHz	MO		10.5 W (ERP)	0.0005 %
		1M20G1W		
		600KG1W		
		600KG1W		

MOBILE: CS2, LEO 550 km, inclination 97.6 deg

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2455 MHz	MO		10.5 W (ERP)	0.0005 %
		2M40G1W		
		2M40G1W		
		1M20G1W		
		1M20G1W		
		600KG1W		
		600KG1W		

Broomfield (JEFFERSON), CO - NL 39-54-58; WL 105-07-05

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27-27.4 GHz	FX		4073.8 kW (ERP)	0.0005 %
		200MG1W		
		200MG1W		
27.1-27.3 GHz	FX		4073.8 kW (ERP)	0.0005 %
		100MG1W		
		100MG1W		
27.2 GHz	FX		4073.8 kW (ERP)	0.0005 %
		100MG1W		

Frequency Information

Broomfield (JEFFERSON), CO - NL 39-54-58; WL 105-07-05

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27.2 GHz	FX	100MG1W	4073.8 kW (ERP)	0.0005 %
27.3 GHz	FX	100MG1W 100MG1W	4073.8 kW (ERP)	0.0005 %

Broomfield (JEFFERSON), CO - NL 39-54-58; WL 105-07-05

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2061.2 MHz	FX	250KF1D	4732 W (ERP)	0.0005 %

Austin (TRAVIS), TX - NL 30-18-35; WL 97-56-23

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27-27.4 GHz	FX	200MG1W 200MG1W	4073.8 kW (ERP)	0.0005 %
27.1-27.3 GHz	FX	100MG1W 100MG1W	4073.8 kW (ERP)	0.0005 %
27.2 GHz	FX	100MG1W 100MG1W	4073.8 kW (ERP)	0.0005 %
27.3 GHz	FX	100MG1W	4073.8 kW (ERP)	0.0005 %

Frequency Information

Austin (TRAVIS), TX - NL 30-18-35; WL 97-56-23

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27.3 GHz	FX	100MG1W	4073.8 kW (ERP)	0.0005 %

Austin (TRAVIS), TX - NL 30-18-35; WL 97-56-23

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2061.2 MHz	FX	250KF1D	4732 W (ERP)	0.0005 %

Austin (TRAVIS), TX - NL 30-18-54; WL 97-56-48

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27-27.4 GHz	FX	200MG1W 200MG1W	4073.8 kW (ERP)	0.0005 %
27.1-27.3 GHz	FX	100MG1W 100MG1W	4073.8 kW (ERP)	0.0005 %
27.2 GHz	FX	100MG1W 100MG1W	4073.8 kW (ERP)	0.0005 %
27.3 GHz	FX	100MG1W 100MG1W	4073.8 kW (ERP)	0.0005 %

Frequency Information

Austin (TRAVIS), TX - NL 30-18-54; WL 97-56-48

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2061.2 MHz	FX	250KF1D	4732 W (ERP)	0.0005 %

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) Operation is subject to prior coordination with the local Society of Broadcast Engineers, Inc. (SBE) frequency coordinator. Consult the list at http://sbe.org/wp-content/uploads/freqcoor.pdf to find the appropriate coordinator.

(3) 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.

(4) 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.

(5) The station identification requirements of Section 5.115 of the Commission's Rules are waived.

(6) 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.

(7) This is for experimental purpose only and doesn’t permit commercial service or market access.

(8) Licensee must successfully coordinate with the local Society of Broadcast Engineers frequency coordinator in each proposed area prior to accessing to 2061 MHz.

(9) Point of Communication: Cesium Satellite 1 (CS1) and Cesium Satellite 2 (CS2)

Special Conditions:

(10) The CS-1/CS-2 2215 MHz downlinks, the downlink transmission must cease when the CS-1/CS-2 satellites come within a certain angle of the DSCOVR satellite (as indicated in the table below), as it's being tracked by the Wallops ground stations. This angle should be measured from the boresight of the Wallops ground station antenna as it's tracking the DSCOVR satellite.

CS-1/CS-2 Ground Station Antenna: Austin, TX
Avoidance Angle for GOES-17 DL to Wallops: 6 degrees
Avoidance Angle for GOES-16 DL to Fairmont: 10 degrees
Avoidance Angle for GOES-17 DL to Fairmont: 6 degrees
Avoidance Angle for DSCOVR DL to Wallops: 10 degrees

CS-1/CS-2 Ground Station Antenna: Broomfield, CO
Avoidance Angle for GOES-17 DL to Wallops: 6 degrees
Avoidance Angle for GOES-16 DL to Fairmont: N/A
Avoidance Angle for GOES-17 DL to Fairmont: 6 degrees
Avoidance Angle for DSCOVR DL to Wallops: N/A

(11) The CS-1/CS-2 2211 MHz downlinks, the downlink transmission must cease when the CS-1/CS-2 satellites come within a certain angle of either the GOES-16 or GOES-17 satellites (as indicated in the table below), as they're being tracked by the Wallops and Fairmont ground stations. This angle should be measured from the boresight of the Wallops or Fairmont ground station antenna as it's tracking the GOES-16 or GOES-17 satellite.

CS-1/CS-2 Ground Station Antenna: Austin, TX
Avoidance Angle for GOES-17 DL to Wallops: 6 degrees
Avoidance Angle for GOES-16 DL to Fairmont: 10 degrees
Avoidance Angle for GOES-17 DL to Fairmont: 6 degrees
Avoidance Angle for DSCOVR DL to Wallops: 10 degrees

CS-1/CS-2 Ground Station Antenna: Broomfield, CO
Avoidance Angle for GOES-17 DL to Wallops: 6 degrees
Avoidance Angle for GOES-16 DL to Fairmont: N/A
Avoidance Angle for GOES-17 DL to Fairmont: 6 degrees
Avoidance Angle for DSCOVR DL to Wallops: N/A

(12) Stop Buzzer Designation
Name: Scott Carnahan
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