



9 Channel Center, Floor 7
Boston, MA 02210

Purpose of Request

The Tomorrow Companies Inc. ("Tomorrow.io") requests Special Temporary Authority (STA) to conduct limited-duration testing of a prototype Ka-band precipitation radar in support of engineering validation. The requested authorization will permit evaluation of system performance under controlled conditions prior to production deployment.

Description of Radar Instrument and Experimental Operation

The experimental system is a beamformed Ka-band precipitation radar operating within the 35.5–36.0 GHz frequency band. The radar employs a high-gain antenna producing an approximately 0.5° pencil beam. During operation, the antenna elevation angle remains fixed while the beam is electronically scanned over an azimuth sector of up to $\pm 20^\circ$ about boresight.

The radar transmits pulsed linear frequency modulated (LFM) waveforms with a nominal pulse duration up to 10 μ s and an instantaneous chirp bandwidth of approximately 1.2 MHz. Pulse amplitudes are shaped using a Von Hann window to reduce spectral sidelobes. The transmitted center frequency is varied on a pulse-to-pulse basis through frequency hopping within the authorized 35.5–36.0 GHz operating band. The maximum transmitter peak output power is 24 W, and the maximum transmitter duty cycle will not exceed 35%.

The purpose of the experimental operation is to characterize the radar's beamforming performance, antenna pointing accuracy, calibration, and overall system performance. Testing will be conducted using calibrated reference targets, including metallic spheres, positioned at known locations at ranges between approximately 800 m and 2,000 m from the radar. Measurements will be used to verify beam steering accuracy, antenna patterns, calibration constants, and radar system performance under controlled conditions.

The radar system will be transported to test sites on a truck but will only be operated while stationary. No transmissions will occur while the vehicle is in motion.

Experimental operation is requested at the two locations identified in this application:

- **Radar Research Facility:** The radar will be operated from a fixed position with the antenna nominally oriented toward the west.
- **Research Airfield:** The radar will be operated from a fixed position with the antenna nominally oriented toward the north.

Both test locations are restricted-access facilities that are closed to the public. Radar operation will be conducted only within the controlled boundaries of these facilities, where access can be



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managed during testing. The selected locations provide sufficient separation from public areas to minimize the potential for uncontrolled RF exposure.

The radar will be operated only within the authorized frequency band of 35.5–36.0 GHz and within the antenna pointing directions identified in this application. Operation is limited to engineering testing and system characterization. Appropriate operational controls, including restricted site access, controlled antenna pointing, and established exclusion zones as necessary, will be implemented to ensure compliance with the applicable FCC requirements for RF exposure.

Directional Antenna Information:

The following directional antenna information is provided as the tolerances were not included in the STA form:

Width of beam in degrees at the half power point:	0.5 deg
Orientation in the horizontal plane:	270+/-20 deg
Orientation in the horizontal plane:	0+/-20 deg
Orientation in vertical plane:	2 - 10 deg

Frequency Information:

Frequency:	35.5-36.0 GHz
Station Class:	FX
Output Power / ERP	24.00W / 0.92MW
Mean Peak:	P
Frequency Tolerance (+/-):	0.00100000%
Emission Designator:	1M23QXN
Modulating Signal	LFM chirped radar pulses (up to 10 μ s, 1.2 MHz sweep) with Von Hann amplitude windowing and pulse-to-pulse frequency hopping over 35.5–36.0 GHz

Testing Locations:

Location 1: CSU-CHILL Radar Facility

Latitude: 40.446062 deg N

Longitude: -104.638208 deg W

Radius of Operations: Within the location boundaries

Address: 30750 Weld County Road 45, Greeley, CO 80631.



Location 2: CSU Drone Center - Christman Airfield

Latitude: 40.591364 deg N

Longitude: -105.143946 deg

Radius of Operations: Within the location boundaries

Address: 3985 Laporte Ave, Fort Collins, CO 80521



Testing will be conducted under the control of qualified personnel. Operations will cease immediately upon notification of harmful interference. The equipment will operate only within the authorized parameters, and all reasonable precautions will be taken to avoid interference to authorized spectrum users.

Stop Buzzer POC:

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