



Special Temporary Authority to Test Radar Instrumentation An NRL/CReSIS Project

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**Jawad Obaid
Center for Remote Sensing of Ice Sheets (CReSIS)
University of Kansas, Lawrence, Kansas
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A. Purpose of Operation and Need for License

The purpose of this application is to request authorization from the FCC for CReSIS (Center for Remote Sensing of Ice Sheets) at the University of Kansas to operate an aircraft-mounted radar system during two flight tests (2-4 hours each flight) from February 13-20, 2016, near Grand Junction, Colorado, to test and calibrate the radar system prior to deploying it later on a field mission to collect Arctic sea ice data. The objective of the overall project is to collect radar survey data over Arctic sea ice from a manned airborne platform (Naval Research Laboratory (NRL) contract number NNX13AQ30A). The radar data will be used to map the snow-air and snow-ice interfaces for estimating the thickness of the snow cover over sea ice.

Pre-deployment flight tests are needed near Grand Junction, Colorado, the location where the radar systems will be installed by CReSIS on the NRL's Twin Otter aircraft. Operation of the radar during flight tests requires authorization from the FCC. We are including nominal operating parameters (frequency and power), but we can adjust these to accommodate FCC requirements.

B. Locations of Proposed Operation

A two-week STA is requested to allow the operation of the aircraft-mounted radars during flight tests to test the radars and calibrate the systems prior to deployment. The locations of operation are outlined in Table 1.

Table 1 – Summary of Proposed Operation Locations

Proposed Location	
Area near Grand Junction, CO	Blue Mesa Reservoir and its surrounding area near Grand Junction, Colorado, as shown in Figure 1. Coordinates are provided in section E.1

The area of operation is located over the Blue Mesa Reservoir and its surrounding area, near Grand Junction, Colorado, as shown in Figure 1. The operation will be limited to two flights, each flight lasting two to four hours, between February 13th and February 20th, 2016. The height of the transmitter will be between 500 and 1500 feet AGL.

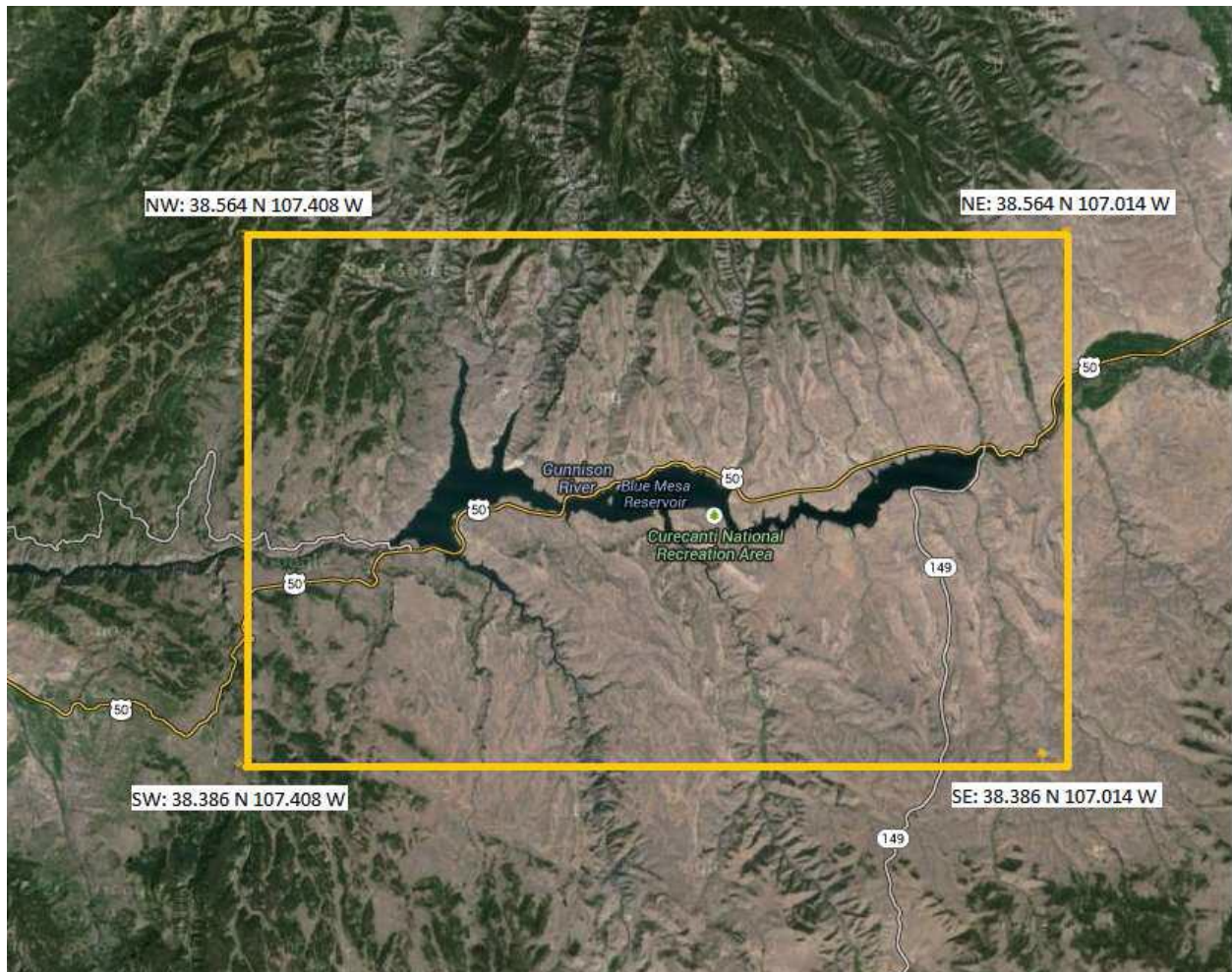


Figure 1 - Proposed Site (Blue Mesa Reservoir and Surrounding Area, near Grand Junction, CO)

C. Technical Specifications

1. Frequency of Operation

CRISIS requests authorization to operate from 2 – 18 GHz bands.

2. Effective Radiated Power (ERP)

The effective radiated power (ERP) will not exceed 1 W average for 2 – 18 GHz.

3. Modulation Signal Description and Emissions

The 2 – 18 GHz signal is an FMCW (frequency modulated continuous wave) radar signal with a pulse width of 250 μ s, duty cycle of 100%, and a pulse repetition frequency of 4 kHz. These parameters can be adjusted.

4. Antenna Information

The transmit antenna that will be used is a Q-Par Angus Ltd. WBHDP0.9-18S dual polarized horn antenna. The antenna exhibits 4.5 to 13.4 dBi of gain across the 2-18 GHz band, with a half-power beamwidth ranging from 110°-40° (azimuth and elevation) in the 2-6 GHz range and 30° across the 6-18 GHz range. The antenna will be radiating nadir, toward the surface of the earth.

The receive antenna that will be used is an A-Info LB-SJ-20180 broadband dual polarization horn antenna. The antenna exhibits 15 dB of gain across the band, with a half power beamwidth between 80°-10°. The antenna will be pointing at nadir, toward the surface of the earth.

5. Equipment Utilized

Equipment used for this system is custom built at CReSIS. One unit will be used for each frequency band under this STA application.

6. Station Class

This station will be Aeronautical Mobile in the areas described in section B, with a nominal altitude of 1500 feet AGL.

D. Contact Information

For questions about this application or in the unlikely event interference concerns should arise, please contact:

Jawad Obaid
Center for Remote Sensing of Ice Sheets (CReSIS)
The University of Kansas
2335 Irving Hill Rd
Lawrence, KS 66045
Telephone: (785) 864-4655
jobaid@ku.edu

E. Appendix

1. Flight Test Area Coordinates

38.564 N, -107.408 W

38.564 N, -107.014 W

38.386 N, -107.014 W

38.386 N, -107.408 W