Special Temporary Authority to Test Radar Instrumentation

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A. Purpose of Operation and Need for License

The primary objectives of the project are to perform radar measurements as a part of NASA's OIB (Operation ICE Bridge) program over the Greenland and Antarctic ice sheets, Antarctica and Arctic sea ice. NASA contract number NNX10AT68G. The radar data are to be used to determine ice thickness and map both near-surface and deep internal layers of ice sheets, as well as map the snow-air and snow-ice interfaces for estimating the thickness of snow over sea ice.

Predeployment flight tests and some Arctic sea data collection requires that the radar operates within 200nm of the of the US coastline, requiring authorization from the FCC.

B. Locations of Proposed Operation

A 6-Month STA is requested to allow the collection of sea ice data using aircraft mounted ultra-wideband radar and for the calibration and testing of the radar. The height of the transmitter will be at 1500 feet AGL. The locations of operation are outlined in Table 1.

Table 1 – Summary of Proposed Operation Locations

Proposed Location	
1. Arctic Management Area	Within two hundred nautical miles off the Northern Coast of Alaska as shown in Figure 1. Coordinates are provided in section E.1
2. Nonregulatory Warning Area W-386 Virginia Capes, VA	Within two-hundred nautical miles off the coast of Virginia.

The first area of operation is located along the northern coast of Alaska as shown in Figure 1. The operation will be limited to two flights (8 hours each) between March 12 and April 12, 2012.

Figure 24 to Part 679– Arctic Management Area

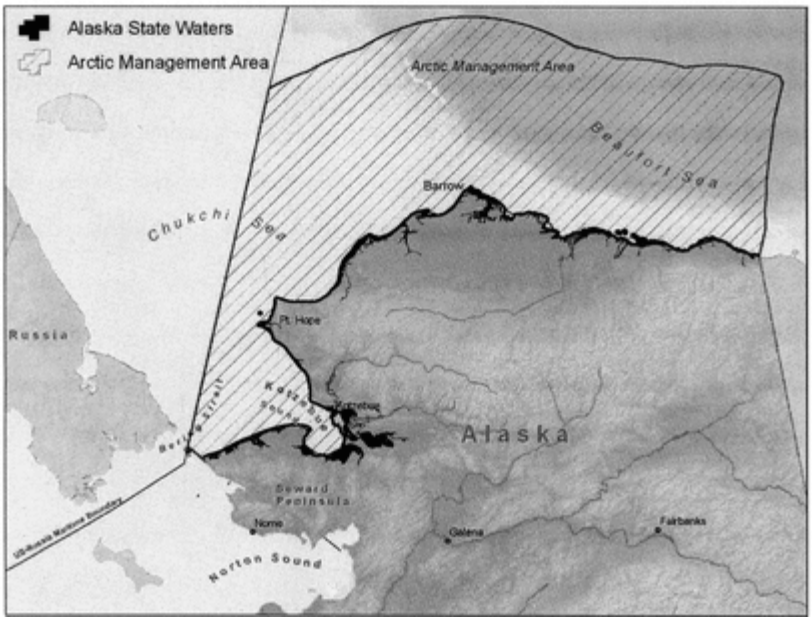

Figure 1 - Proposed Site 1 (Arctic Management Area)

The second proposed site is located just outside of Wallops Flight Facility. This is warning area W-386 shown below in black. The area is defined in section E.2. The period of operation will be for two flights (8 hours each) that will occur between March 2nd and March 6th, 2012.

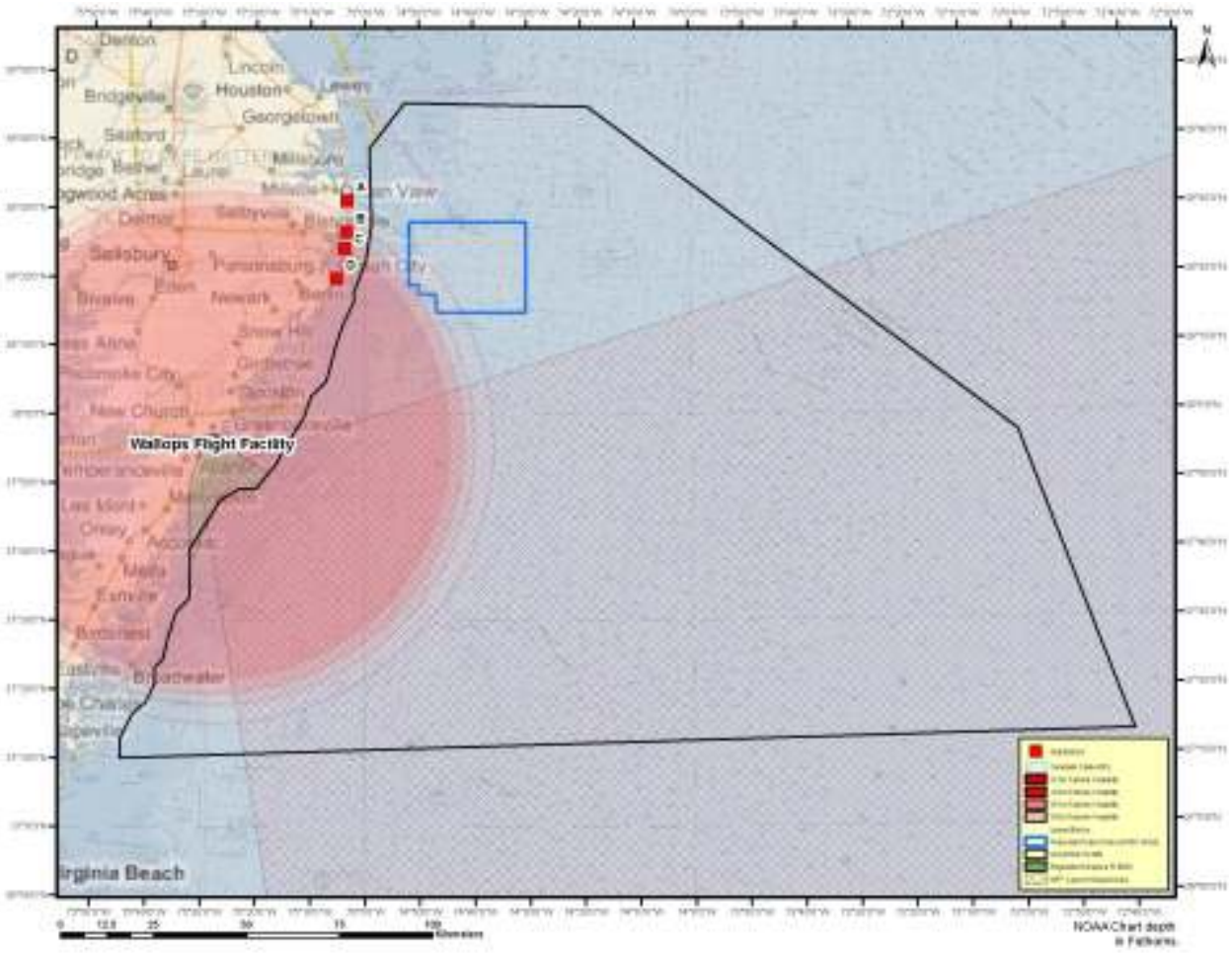

Figure 2 – W-386 Outlined in black

C. Technical Specifications

1. Frequency of Operation

CReSIS requests authorization to operate from 12 – 18 GHz, 2 -8 GHz and 600 – 900 MHz bands.

2. Effective Radiated Power (ERP)

The effective radiated power (ERP) will not exceed 2.51 W peak for 12 – 18 GHz.

The effective radiated power (ERP) will not exceed 1 W peak for 2 – 8 GHz.

The effective radiated power (ERP) will not exceed 398 W peak, 39.8 W average for 600 – 900 MHz

3. Modulation Signal Description and Emissions

The primary emission designator is 6G00F3X for 12 – 18GHz and 2 – 8 GHz. For 600 – 900 MHz the emission designator is 300MM3X.

12 – 18 GHz and 2 – 8 GHz the signal is a FMCW radar signal with a pulse width of 250 µs, duty cycle of 100% and a pulse repetition frequency of 4 kHz.

600 – 900 MHz is a pulsed chirp with a pulse width of 2µs, duty cycle of 10% and a pulse repetition frequency of 50 kHz.

4. Antenna Information

12-18 GHz: The antenna used is a Pasternak PE9854/SF-20 horn antenna. The antenna exhibits 20 dBi of gain with a 18.8° azimuth beamwidth and 18.9° elevation beamwidth. The antenna will be radiating nadir, toward the surface of the earth.

2 – 8 GHz: The antenna used is an ETS Lindgren 3115 Horn antenna. The antenna exhibits 10 dBi of gain with a 45° Az-El beamwidth. The antenna will be radiating nadir, toward the surface of the earth.

600 – 900 MHz: The antenna used is an eight element elliptical dipole array with approximately 16dB of gain. This antenna is custom built by CReSIS. The antenna is pointed 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 an altitude of 1500 feet AGL.

D. Contact Information

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

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E. Appendix

1. Arctic Management Area Coordinates

-137.5808672734118,72.9492636931742
-139.0926016477092,73.19418693952268
-140.822225985256,73.36703196251334
-142.0036084364698,73.44172926345183
-143.2222477521815,73.46131022782181
-144.5932100852399,73.6520514841568
-145.9065073004052,73.74574798893471
-147.2288038101016,73.80005168453411
-147.3128096022309,73.81323665268127
-148.2812668449654,73.94422352416504
-149.3214686404397,74.05810522414001
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-138.4280347332044,72.20988599501361
-137.4863254362799,72.77068073908809

-137.5808672734118,72.9492636931742

2. Warning Area W-386

Beginning at lat. 38°36'50"N., long. 74°59'49"W.; to lat. 38°45'00"N., long. 74°52'59"W.; to lat. 38°45'00"N., long. 74°20'00"W.; to lat. 37°57'00"N., long. 73°00'30"W.; to lat. 37°13'39"N., long. 72°40'00"W.; to lat. 37°00'00"N., long. 75°30'00"W.; to lat. 37°08'01"N., long. 75°30'00"W.; to lat. 37°08'01"N., long. 75°46'59"W.; thence 3 NM from and parallel to the shoreline to the point of beginning.