



Special Temporary Authority to Radiate off the Northern Coast of Alaska Over Sea Ice

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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 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. Operation of the radar during the mission 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 four-week STA is requested for the field mission to collect Arctic sea ice data. The locations of operation are outlined in Table 1.

Table 1 – Summary of Proposed Operation Locations

Proposed Location	
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

The area of operation is within two hundred nautical miles off the Northern Coast of Alaska as shown in Figure 1. The operation will be limited to few flights, between March 9th and March 27th, 2015. The height of the transmitter will be between 500 and 1500 feet AGL.



Figure 1 - Proposed Site (Arctic Management Area)

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:

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E. Appendix

1. Arctic Management Area Coordinates

Below is all the coordinates that make up the Management Area. Please see above picture for a more general idea.

72.949 N 137.581 W
73.194 N 139.093 W
73.367 N 140.822 W
73.442 N 142.004 W
73.461 N 143.222 W
73.652 N 144.593 W
73.746 N 145.907 W
73.800 N 147.229 W
73.813 N 147.313 W
73.944 N 148.281 W

74.058 N 149.321 W
74.112 N 149.939 W
74.280 N 150.872 W
74.464 N 152.097 W
74.566 N 153.164 W
74.668 N 154.441 W
74.682 N 155.029 W
74.713 N 156.505 W
74.672 N 158.111 W
74.562 N 159.817 W
74.390 N 161.295 W
74.193 N 162.462 W
73.977 N 163.474 W
73.885 N 163.775 W
73.765 N 164.505 W
73.632 N 165.338 W
73.397 N 166.349 W
73.297 N 166.769 W
73.239 N 166.925 W
73.176 N 167.358 W
73.027 N 168.012 W
72.939 N 168.402 W
72.782 N 168.934 W
72.740 N 168.966 W
69.977 N 168.959 W
66.061 N 168.968 W
65.503 N 168.952 W
65.663 N 168.110 W
65.701 N 168.080 W
65.826 N 167.464 W
66.007 N 166.925 W
66.196 N 166.288 W
66.214 N 166.145 W
66.241 N 166.121 W
66.377 N 165.613 W
66.475 N 165.058 W
66.553 N 164.574 W
66.582 N 164.313 W
66.576 N 163.914 W
66.530 N 163.741 W
66.384 N 163.826 W
66.189 N 163.881 W
66.057 N 163.727 W
66.056 N 163.110 W

66.078 N 162.792 W
66.029 N 162.576 W
66.018 N 162.289 W
66.015 N 161.811 W
66.233 N 161.507 W
66.217 N 161.278 W
66.180 N 160.986 W
66.245 N 160.952 W
66.561 N 161.144 W
67.032 N 161.738 W
67.040 N 161.913 W
67.034 N 162.854 W
67.121 N 163.714 W
67.405 N 163.804 W
67.611 N 164.051 W
67.894 N 164.316 W
68.142 N 164.955 W
68.326 N 165.773 W
68.645 N 165.531 W
68.701 N 164.415 W
68.826 N 163.544 W
69.243 N 162.567 W
69.582 N 162.479 W
69.910 N 162.032 W
70.076 N 161.513 W
70.123 N 160.752 W
70.471 N 159.483 W
70.595 N 158.714 W
70.698 N 157.515 W
70.668 N 156.478 W
69.880 N 149.737 W
69.695 N 144.907 W
69.431 N 141.002 W
69.657 N 141.023 W
70.186 N 140.271 W
70.478 N 140.175 W
70.818 N 139.838 W
70.961 N 139.815 W
70.961 N 139.798 W
72.210 N 138.428 W
72.771 N 137.486 W
72.949 N 137.581 W