March 10, 2008

Federal Communications Commission
Office of Engineering and Technology
Experimental Licensing Branch
445 12th St., S.W.
Room 7-A322
Washington, DC 20554

To Whom it May Concern,

On behalf of ImSAR LLC I would like to apply for a Special Temporary Authority to further the development of a lower power radar system. The system transmits less than 1W peak power and will be operated on an occasional basis of a few times per month for roughly an hour each time it is used.

This request is comparable to similar systems that have been granted an STA[1] and an Experimental Radio Service License[2].

I hope the attached document has sufficient information to enable a favorable approval of an STA.

Sincerely,
Adam Robertson
NanoSAR Program Manager
510 W 90 S
Salem UT 84653
801-762-7263
adamr@imsar.com

[1] Refer to STA file number S-2353-EX-96

[2]Refer to Experimental Radio Service file number 0302-EX-PL-2004

Purpose of radio operation:

ImSARs LLC has technology that is able to track moving targets, image the surface of the earth, create digital elevation maps, assist in search and rescue operations, and detect small changes in a scene, such as the movement of a vehicle. The US Navy, Army and Air Force have expressed interest in this technology. The size, weight, power, and cost of this Nano sized Synthetic Aperture Radar system (NanoSAR) is an order of magnitude less than similar systems. The radical change is weight and power consumptions enables tactical use of the radar, which in turn gives surveillance capabilities to small sets of soldiers that were previously unavailable. With the new surveillance capabilities, dangerous and life threatening situations can be further reduced.

Similar radar systems, such as Linx SAR weighs 85 lbs and transmit 300W of power. ImSAR's radar system weighs 2 lbs and transmits less than 1W of power. ImSAR requests a temporary authority in order to compete product testing and begin customer demonstrations.

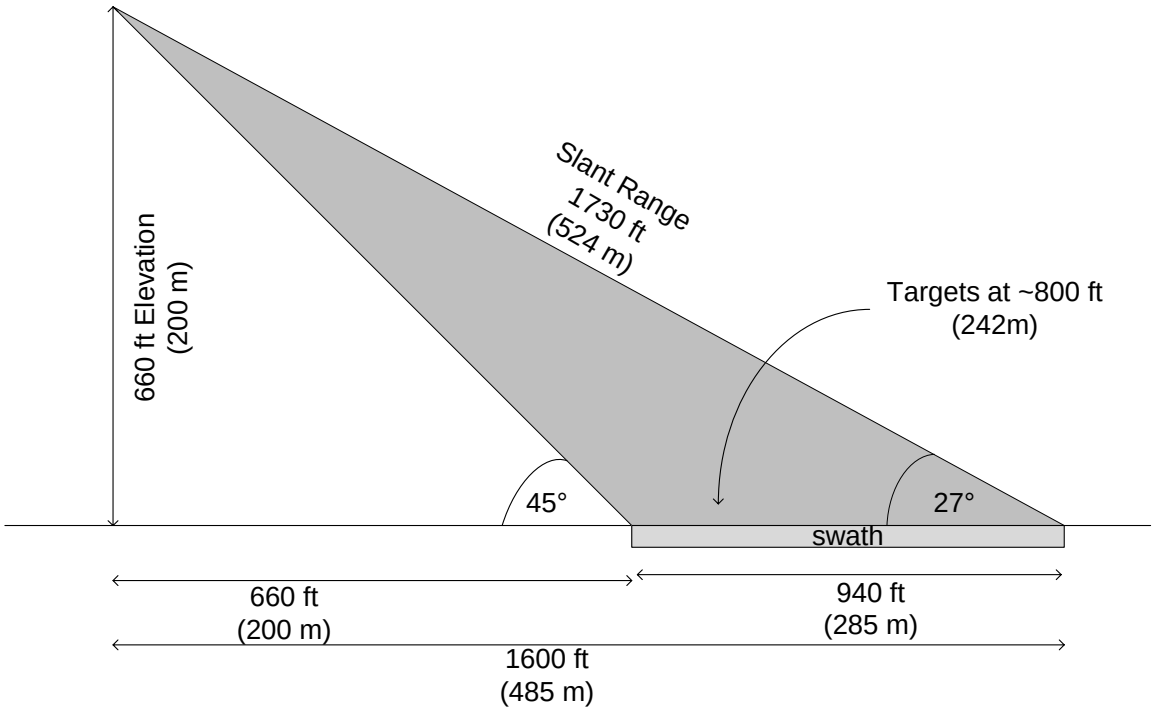
ImSAR will use this STA to performed tests from a small aircraft flying under 2km in elevation. The transmit and receive antennas are nominally pointed toward the earth. Reflected signals are collected and processed to create images of the ground. The resolution of the imagery is directly proportional to the bandwidth of the signal transmitted. In order to obtain resolutions as small as 0.3 m, a transmit bandwidth of 500 MHz is desired. Transmission is linear frequency modulated continuous wave with the frequency being swept from the minimum to the maximum frequency 1000 times per second. Because the transmission power is under 1W and the frequency sweeps very rapid, the average power at a given frequency is extremely low.

Transmissions will be generally performed in remote areas over very limited time intervals of roughly an hour at a time, a few times per month.

Operation Location and Height:

NanoSAR will be operated from a small aircraft at a height between 0m and 5000m. The transmit signal is directed perpendicular to the line of site and towards the ground using a simple patch antenna array with a beam width approximately 45°in elevation and 10° along the track of the aircraft. The peak of the antenna pattern has a 45° incident angle to the ground. The return signal is received by an identical receive antenna co-located with the transmit antenna.

Data collections will occur primarily over rural areas of northern Utah to test the functionality and demonstrate the utility of the NanoSAR as a tool for both commercial and military applications. Sites of interest to be imaged will be terrains of interest to potential customers, including urban and rural scenes.



Description of the Transmit Signal:

The transmit signal is from 10 to 10.5 GHz. Most transmissions will be further constrained to a small bandwidth of 150 MHz from 10.325 to 10.475 GHz. The signal is continuous and modulated only by frequency. The frequency is ramped from the bottom of the bandwidth to the top of the bandwidth at a 1kHz rate. The received signal is mixed with the transmitted signal in a homodyne fashion. Frequency is controlled with a highly stable PLL and 25 MHz crystal with 25 ppm stability. The frequency ramp is controlled with a direct digital synthesizer capable of over 60 dB ACPR. The final power amplifier is a linear MMIC based amplifier with excellent linearity. The highest power spectral density we anticipate is -49 dBW/Hz (75 MHz bandwidth.

We have equipment in house to measure out of band spurious signals and we regularly measure our transmission signals to minimize harmonics and spurious signals.

Time Period of Operation

We are preparing form 1494 for NanoSAR. We anticipate the 1494 to take at least 6 months for approval. Until that is complete, we would like to continue development. We anticipate doing tests a few times per month, with each test typically lasting under 1 hour.