

DESCRIPTION OF EXPERIMENTATION

Lockheed Martin Corporation hereby seeks experimental authority to test and demonstrate a developmental technology for IRAD purposes. The program proposes to develop a radar product to prepare for potential defense contract opportunities in the future. The system has a single solid state phased array antenna with amplifiers and phase shifters at each element. Beamforming is analog on both transmit and receive. Beam steering is primarily electronic. When fielded, this radar will be used to identify varying obstacles in the flight path of the platform using standard radar techniques.

The objectives are to demonstrate that the system meets its performance requirements and functionality through measurement. Requirements and functionality include beamsteering capability, ERP, sidelobe levels, field of regard, noise figure, target range-rate measurement, target angle measurement.

To accomplish these objectives, we will perform a series of steps requiring RF emissions, in various locations at Lockheed Martin campuses in Moorestown, NJ, Grand Prairie, TX, Fort Worth, TX, Bithlo, FL, and Stratford, CT.

- 8-channel transmitting modules will be measured in a laboratory for evaluation, debug and acceptance tests
- An array of approximately 200 channels will be measured in a near field antenna pattern test facility for evaluation and debug
- A radar using the ~200 channel array will be measured on an outdoor range with a companion low-power emitter on a tower that is approximately 0.5 miles away. The low power emitter will receive the signal from the antenna under test (AUT), amplify, modulate and retransmit it back to the AUT to support angle and range-rate accuracy verification.
- The radar will be flown on a rotary wing aircraft near Stratford, CT. The area is defined in the license application. The aircraft will not exceed an altitude of 5000 ft AGL.

Lockheed Martin has successfully developed phased array radars at lower frequencies, has developed a transmit-only phased array at this frequency band, and has tested this product in a nearfield chamber under call sign WJ2XBM. We have high confidence that follow-on work will be successful. The program will contribute to the use of radar for military defense by enabling detection of obstacles.