DESCRIPTION OF EXPERIMENTATION

Lockheed Martin Corporation hereby seeks experimental authority to test and demonstrate a development technology for IRAD purposes. The program proposes to develop a radar product to prepare for potential U.S. military 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; it will also be reoriented mechanically on a motorized or manual positioner. When fielded, this radar will receive a cue and search in a small angular volume using standard radar techniques. It will also illuminate threats with a pulsed waveform and reflections from the threat will be received by a radar on an interceptor missile.

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

To accomplish these objectives, we will perform a series of steps requiring RF emissions, in locations all located at our Moorestown, NJ campus:

- 8-channel transmitting modules will be measured in a laboratory for evaluation, debug and acceptance tests
- A small array of approximately 64 channels will be measured in a near field antenna pattern test facility for evaluation and debug
- The full phased array will be measured in the near field test facility
- The radar 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.

Lockheed Martin has successfully developed phased array radars at lower frequencies, has developed a transmit-only phased array at this frequency band, and has developed components for this particular program. We have high confidence that we will produce a functional prototype. The program will contribute to the use of radar for military defense by enabling guidance of interceptor missiles to threats. The high frequency of operation is a key development item.