Exhibit 1

Shown below is the configuration of the AUT facility. Figure 1 shows the side view of the

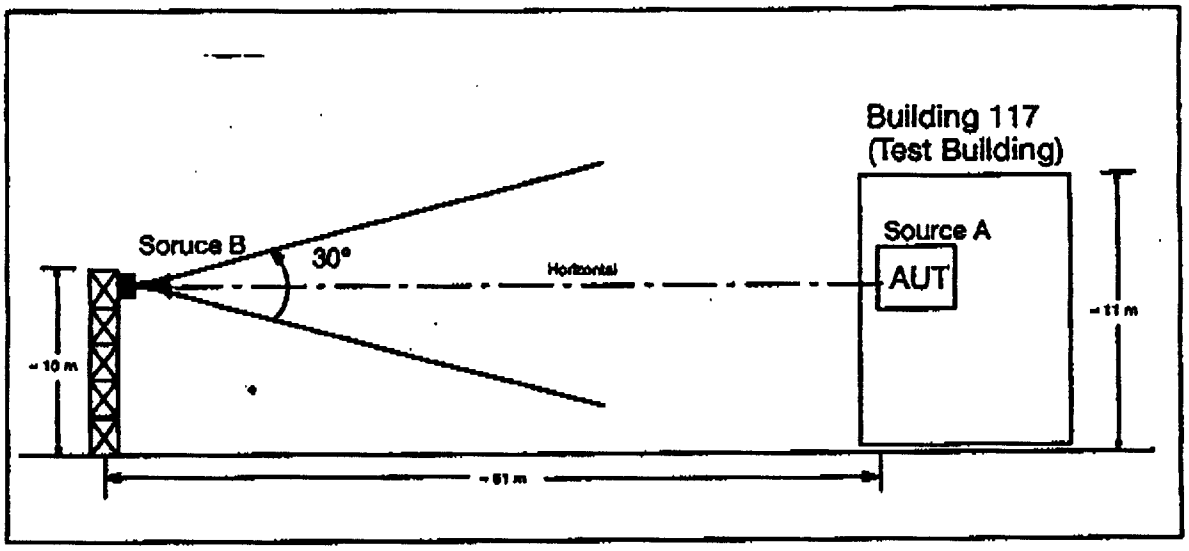

Figure 1: Side View of the Antenna Test Facility

site with vertical beam width of the test source horn, and Figure 2 shows the top veiw of

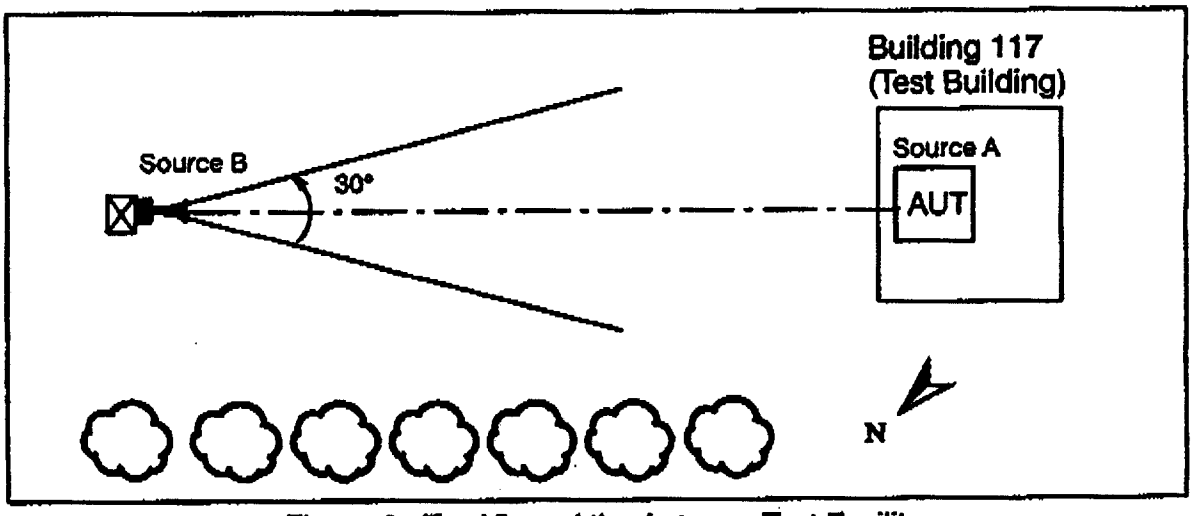

Figure 2: Top View of the Antenna Test Facility

the site with the horizontal beam width of the test source horn.

Exhibit 2

Proposed Program of Research and Experimentation

The proposed research involves the operation of a solid state array antenna, in both transmit and receive mode, in order to evaluate the performance of the antenna. This antenna is made up of 64 radiating elements controlled by 64 transmit/receive (T/R) modules. These modules are, in turn, made up of an amplification stage and a phase shifter. As a result, the amplitude and relative phase of signal being emitted from each of the array elements is independent and controllable, and the antenna beam can be steered through a wide range of directions as controlled by the control computer. During this research, the antenna under test (AUT) will be electronically steered to 50 different beam positions by introducing a linear phase taper across the face of the array. The control computer will steer the antenna while antenna pattern recording equipment records the antenna pattern.

The array T/R modules are constructed of microwave monolithic integrated circuits (MMIC's) that have very favorable noise characteristics. This will yield an antenna with a remarkably low system noise temperature and will allow the reception and detection of much smaller signals than would be possible with a more traditional antenna.

Another advantage of this T/R module design is that the components that lie in the microwave path operate over a wide range of frequencies. More specifically, this module is designed to operate within both the S and C radar bands. The AUT will be operated at the 10 different frequencies, 5 of which will reside within the S band and 5 will reside within the C band.

One of the unique features of this antenna is that the received signal is amplified and split into two channels within the T/R module (this feature is available only in receive mode). These channels can then be processed independently by the radar receiver. In this way, the antenna can be made to form two distinct antenna beams simultaneously while in the receive mode. This will allow a wide range of tracking and signal processing algorithms that will greatly improve the performance of the radar.

The thermal characteristics of the antenna will also be evaluated during the far-field test of the antenna. Temperature measurement apparatus will be used to monitor temperatures at various locations within the antenna in order to evaluate the antenna's temperature control system.

Objectives

The objectives of this program of experimentation are to collect antenna patterns, and to evaluate the array cooling performance. The antenna patterns will be collected while the antenna is operating in both transmit and receive modes. The resulting antenna patterns will dictate the performance of the antenna with respect to beam pointing accuracy, pattern uniformity, and difference pattern null depth.

One of the disadvantages of this type of antenna is that it would typically generate a great deal of heat. Consequently, the array cooling performance is of great concern, and will be closely scrutinized during this test.

Contribution

This program of experimentation will provide critical information about the configuration and performance of this experimental antenna. All test data will be used to form conclusions about the viability of this antenna configuration. It will dictate changes to the next generation of this T/R module. This research will help to progress the development of solid state array technology.