Exhibition to questions 7 where the answers to items 4, 5, and 6 are "NO".

a. The complete program of research and experimentation proposed including description of equipment and theory of operation.

Description of our equipment: Our equipment is an IFF AESA radar system consisting of a transmit/receive module and an array antenna with 8 dipole patch elements. The IFF test system consists of AESA Antennas manufactured by us (Antenna Research Associates) and an IFF Interrogator (Model Number SFF-44B) manufactured by Telephonic Corporation.

The AESA antenna design allows for precise control of the transmitted and received signals, enabling the system to accurately detect and identify targets. The test system employees 2 AESA antenna, each antenna supporting a range of +/- 45 degrees Combined system can scan in Azimuth 0-180. The orientation of the overall antenna can be repositioned on the tower mount to restrict radiation to a specific sector. In addition, Interrogator can also further blank transmission in certain sectors within the 0-180 degs scan azimuth during testing if needed. The maximum EIRP of the system of TX is 73 dBm anticipated range of the system is 200 Km in LoS.

ARA is seeking an experimental testing license for our two sites in Laurel, MD and Middleborough, MA. The details of these sites with the antenna information can be found in Exhibit 3.

With this configuration, the system can provide comprehensive surveillance and tracking capabilities.

Theory of operation for IFF: The theory of operation of an IFF system is based on the concept of identifying a friendly aircraft by exchanging unique identification codes between the aircraft and ground-based or airborne systems. An IFF system typically consists of two components: a transponder installed on the aircraft, and an interrogator or radar system installed on the ground or in another aircraft. The transponder is a radio transmitter/receiver that responds to interrogation signals sent by the ground-based or airborne interrogator and sends back a reply signal with the aircraft's identification code. The interrogator sends out a radio signal in a specific frequency band (1030 MHz), which is received by the transponder on the aircraft. The transponder then generates a reply signal, which is transmitted back to the interrogator on a different frequency (1090 MHz). The reply signal contains information that identifies the aircraft as friendly and provides other data such as altitude, speed, and position. For current testing only SIF IFF Modes will be employed Modes 1,2,3,A,C.

Overall, an IFF system is a critical technology that allows military and civilian aircraft to be identified and tracked accurately, thereby helping to prevent friendly fire incidents and improve situational awareness.

b. The specific objectives sought to be accomplished.

The specific objectives of testing an IFF radar system would be to verify and validate the accuracy, reliability, and performance of the system's identification capabilities. This would involve testing the system's ability to distinguish between friendly and hostile aircraft under different scenarios and conditions.

By conducting controlled experiments in a laboratory or test environment, it would be possible to assess the system's ability to accurately identify friendly aircraft and reject hostile ones, as well as evaluate its performance in different scenarios. The results of such testing would help to identify any potential issues or limitations with the system and inform further development and refinement of the technology.

c. How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion, or utilization of the radio art, or is along line not already investigated.

The program of experimentation for an IFF radar system has a reasonable promise of contributing to the development and utilization of the radio art. IFF radar is a critical technology used in military and civilian aviation, and the testing of new and improved systems is essential for ensuring the safety and effectiveness of these systems. By conducting controlled experiments, it is possible to identify potential issues and limitations with the system and inform further development and refinement of the technology. This has the potential to improve the accuracy, reliability, and performance of IFF radar systems, and ultimately contribute to the continued development and advancement of radio technology in aviation and other industries. While IFF radar is a well-established technology, ongoing experimentation and innovation are necessary to keep pace with evolving threats and operational requirements.