

Background

Georgia Tech Research Institute (GTRI) is a not for profit applied research group within the Georgia Institute of Technology. Information on GTRI can be found at www.gtri.gatech.edu. GTRI is currently building a low power X-Band phased array radar. The radar will be carried on a Griffin Aerospace Outlaw ER unmanned air vehicle (UAV). The Outlaw ER is a small UAV with a maximum takeoff weight of 150 pounds and a wing span of 16 feet.

Objective

The objective of the project is to demonstrate a level of radar performance that is not currently available in a small form factor. Currently available small form factor systems that can be deployed on a 150 pound UAV are very limited in performance. This system will provide performance on a small UAV that is comparable to much larger radar systems deployed on large aircraft.

Technical Description

The prototype radar system will have 34 Watts of peak RF power and a maximum duty cycle of 20 percent. The antenna system has a peak gain of 23 dBi, a half power azimuth beamwidth of 4 degrees, and a half power elevation beamwidth of 13 degrees.

The band of operation is 9.2-9.8 GHz. The radar has two primary modes of operation, Synthetic Aperture Radar (SAR), and Ground Moving Target Indicator (GMTI). In SAR mode the transmit waveform bandwidth will range from 100 MHz to 600 MHz. The maximum bandwidth supported by the radar system is 600 MHz. In GMTI mode the transmit waveform bandwidth will range from 10 MHz to 200 MHz.

Areas of Operation

GTRI is currently approved to fly the Outlaw ER at Early County Airfield in Blakely Georgia and at the ISR Group test facility in Savannah Tennessee. The aircraft will be operated within the boundaries shown in the supporting documents Early_County_AO.pdf and ISR_Group_Range.pdf. Maximum flight altitude for the aircraft will be 8000 feet above ground level. The aircraft cruise speed will range from 65 knots to 85 knots true air speed.

Relevant Experience

RF design, fabrication, and testing are core capabilities at GTRI. GTRI has extensive experiencing in developing and testing RF systems of all types. GTRI currently has an FCC experimental license for an outdoor RF test range. The call sign for the GTRI outdoor test range is KA2XAJ. The radar system discussed here is being developed by the same group that holds the KA2XAJ license.

Contact Information

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