JOHNS HOPKINS
APPLIED PHYSICS LABORATORY

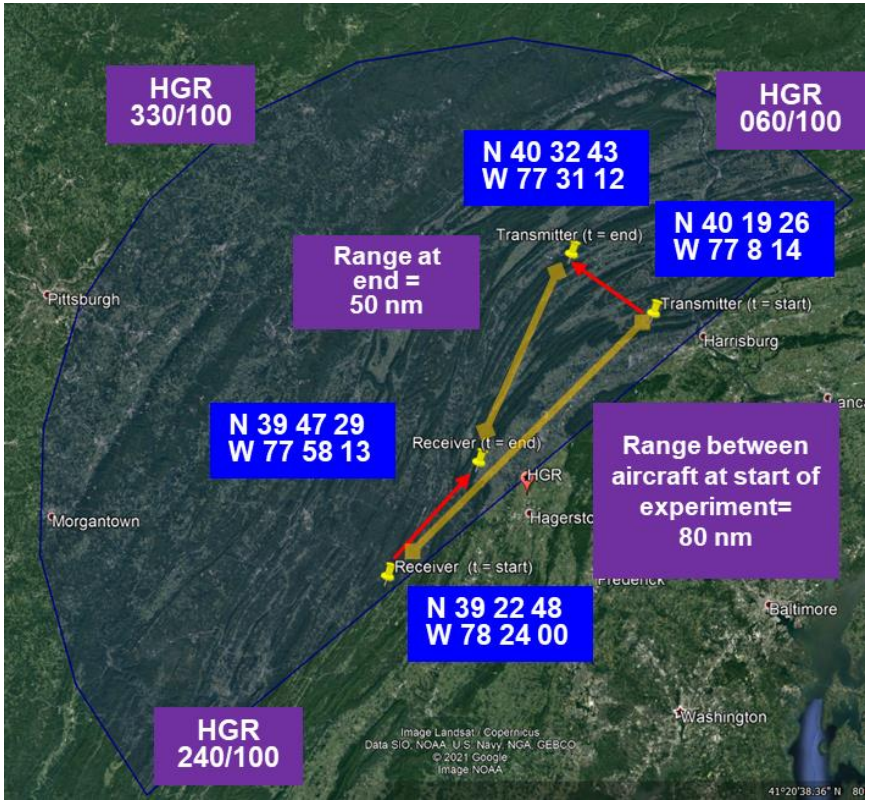
JHU APL RSSI Experiment: Air-to-Air Measurement [1/2]

- Background: This Special Temporary Authority (STA) License Application covers research initiated under the contract HQ003419D0006.

- Experiment Description: The Johns Hopkins University Applied Physics Laboratory (JHU APL) is a University Affiliated Research Center (UARC) that conducts basic research for the United States Government (USG). JHU APL is under contract to conduct a RF over the air (OTA) experiment for the Department of Defense (DoD). During the experiment, JHU APL will transmit from airborne RF equipment to an airborne instrumented Over The Air (OTA) aircraft. A principal scientific objective of the experiment is to measure air-to-air RSSI voltage levels at the experiment's Intermediate Frequency (IF) conversion state as a function of aircraft system dynamics, environmental conditions and equipment configuration settings; primarily at ranges between 50 to 80 nautical miles (nm) from the airborne based RF equipment (ABE) to the instrumented OTA aircraft. The experiment's general area of flight operations will be in the Hagerstown VOR (HGR/240/100) clockwise through HGR 330/100, HGR 060/100 back to HGR. The ABE will be at flight levels between 15000 – 20000 feet mean sea level (MSL). The ABE consists of commercial off the shelf (COTS) antenna, COTS amplifier (Ophir 500S1) and CFE electronics; the antenna will point and radiate in the horizontal plane from 0° T to 360° T. The instrumented OTA aircraft will be at flight levels between 4500 – 11500 feet MSL and consists of an L-band blade antenna (UB Corp AO120) and Contractor Furnished Equipment (CFE) electronics. The air-to-air experiment will occur over a two week duration during the license period and between the hours of 0800 – 1700 with RF radiation occurring for no more than 30 minutes per hour. JHU APL will operate on a not to interfere basis and can deconflict with any operations as required. Cease buzzer procedures and operations are regularly employed by JHU APL personnel for FCC OTA experiments and the JHU APL POC is Dr Robert Schmid (240-228-6653).

Airborne Tx Antenna

- Number of units: 1
- Manufacturer: Rozendal Model Number: RA-4510-5R2H
- Polarization: RHCP
- 3-dB Beamwidth: 60 deg Az/El
- Gain: 10 dBiC



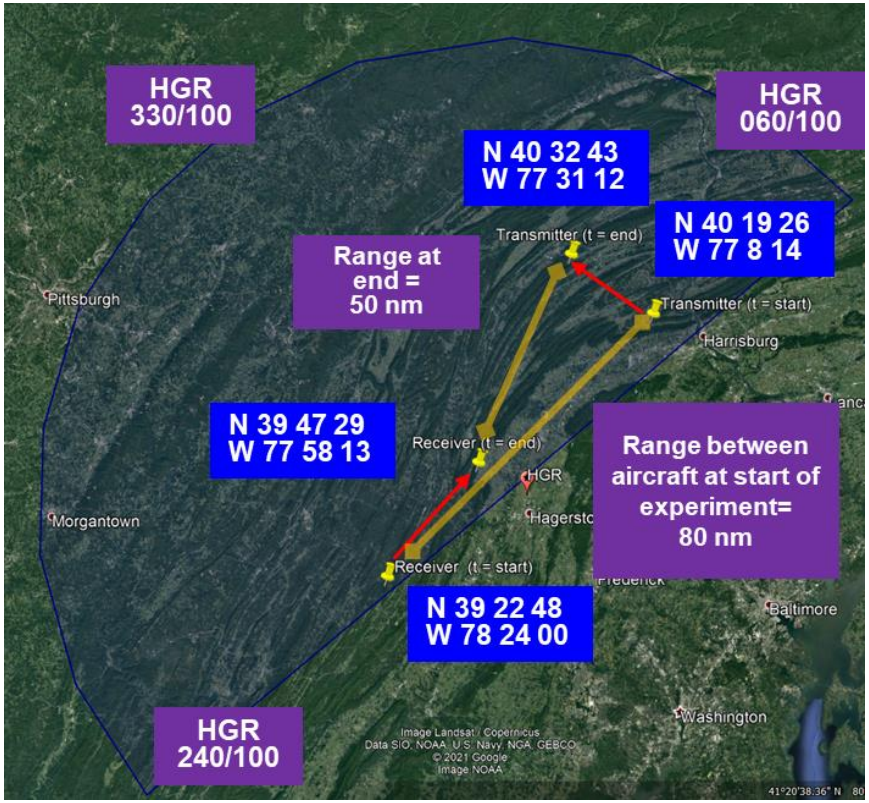
Example of air-to-air RSSI flight experiment depicting RSSI measurement ranges between the aircraft at time = start and time = end as operating in the HGR VOR

JHU APL RSSI Experiment: Air-to-Air Measurement [2/2]

- Emission Information
  - 1475.5MHz +/- 9.9 MHz (Unmodulated carrier, no information transmitted)
    - 0.9 W Max Tx Power (0.9 W average), 90 W Max ERP (90 W average)
  - 1497.5MHz +/- 9.9 MHz (Unmodulated carrier, no information transmitted)
    - 0.9 W Max Tx Power (0.9 W average), 90 W Max ERP (90 W average)
  - 1524 MHz (Unmodulated carrier, no information transmitted)
    - 0.9 W Max Tx Power (0.9 W average), 90 W Max ERP (90 W average)
  - 1525 MHz (Unmodulated carrier, no information transmitted)
    - 0.9 W Max Tx Power (0.9 W average), 90 W Max ERP (90 W average)

Airborne Tx Antenna

- Number of units: 1
- Manufacturer: Rozendal Model Number: RA-4510-5R2H
- Polarization: RHCP
- 3-dB Beamwidth: 60 deg Az/El
- Gain: 10 dBiC



Example of air-to-air RSSI flight experiment depicting RSSI measurement ranges between the aircraft at time = start and time = end as operating in the HGR VOR