

Pseudo-Monostatic Research Radar, PMRR
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The pseudo-monostatic research radar shown in figure 1 below is being designed to support basic radar hardware configuration and tracking algorithm development. The main enclosure provides a 3X4 element phased array with RHCP for both transmit and receive along with separate TX and receive antennas with linear polarization and LHCP. Two separate receive antennas are spaced from 50 to 100 ft from the main enclosure on 10 to 40 ft telescopic stands with RHCP.

The radar system operates in the 2.4 to 2.5 GHz GSM band from 1 to 10 watts with both frequency and power level selectable. CW doppler and pulsed doppler modes are available with and without FM chirp. Up to four acquisition channels at 50 Msps and 12-bit resolution each support collection of IF from the receive antennas and transmitter. IF data and IQ data is stored directly on SSDs and channeled to four Xilinx Kintex Ultrascale KCU116 development boards for real-time processing and algorithm development. USB 3.0, HDMI, RS422/485 and gigabit Ethernet provide connection to an external PC for additional processing and display.

This basic radar system provides a platform for both hardware configuration and algorithm research and development to support much larger enhanced configurations for specific applications. Research applications include hostile fire indicator, HFI, and tracking, drone and projectile tracking. The 3X4 element phased array supports both single and multiple beamformed tracking and active jamming in the 2.4 GHz GSM band.

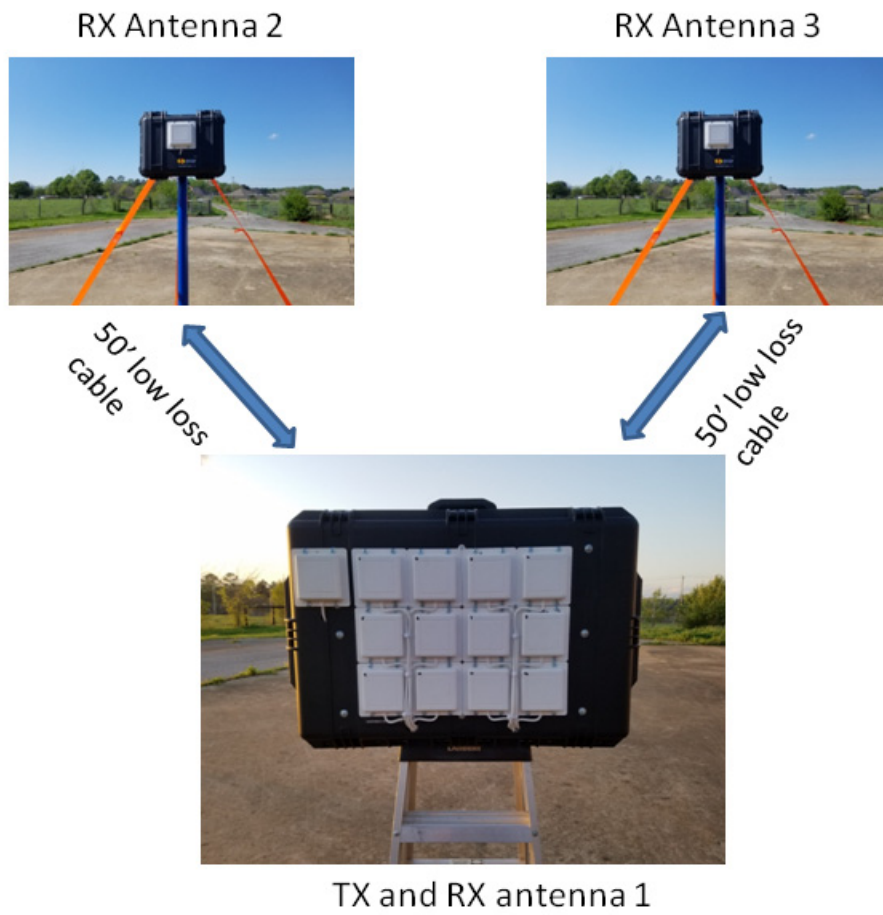


Figure 1. Pseudo-Monostatic Research Radar, PMRR