

Additional Information for Application

Background

Artis, LLC is funded by the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) to develop self-protection systems that disable rocket-propelled grenades (RPGs) and other projectiles that may be used to attack U.S. Army vehicles. Artis, LLC's Iron Curtain self-protection system (http://artisllc.com/iron_curtain_active_protection_system/) requires a radar to provide initial detection of the projectile being fired and tracking of the object to cue the rest of the system. Artis, LLC identified the Compact Hemispheric Radar (CHR) radar made by RADA Electronic Industries (<https://www.rada.com/capabilities/land-radars/aps-app-menu.html>) as suitable for the purpose and has obtained two such units.

To test the integration of the CHR radars with the rest of the self-protection system Artis, LLC needs to test the systems in a controlled environment. Artis, LLC has already performed similar testing of the Iron Curtain self-protection system without the radar.

Description of Integration Testing

Figure 1 described the test setup. Metalized tennis balls (used as a surrogate for an RPG) are launched towards the integrated Iron Curtain system. The radars detect and track the projectiles, and cue the optical sensors. Once the time is right the optical sensors initiate the rest of the Iron Curtain self-protection system to intercept the projectile and disable it.

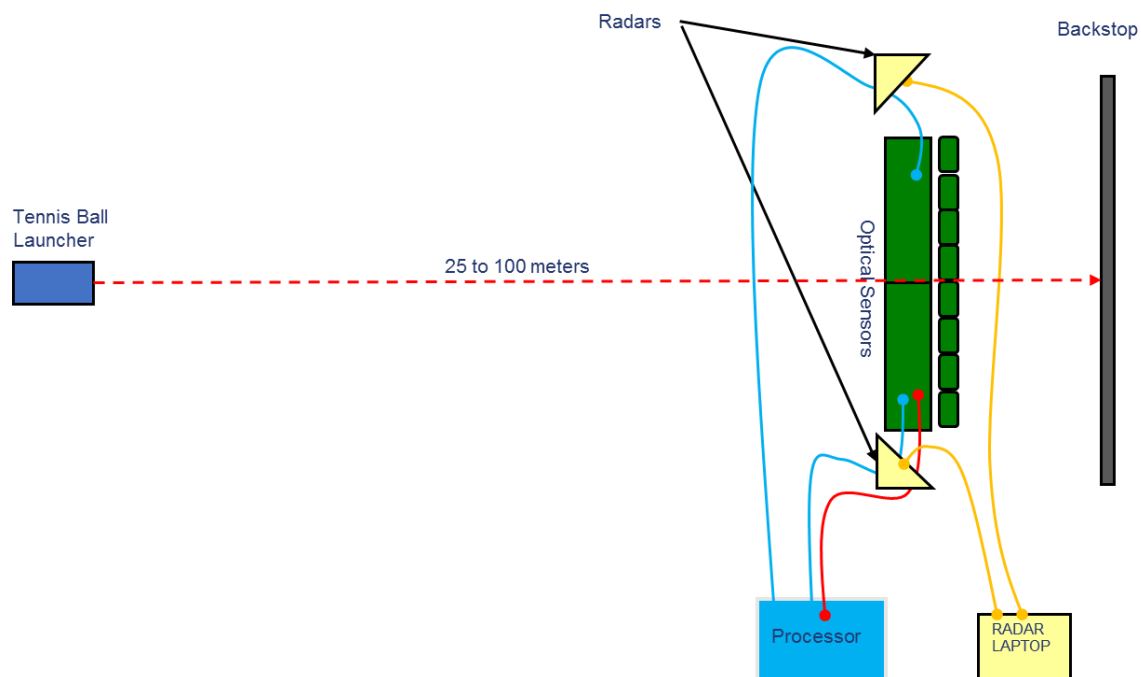


Figure 1: Example testing scenario

In the license application multiple mobile antenna locations have been specified. Two of these locations are field sites near the Artis, LLC offices in Herndon, VA and Salt Lake City, UT. The other locations are field sites near the sponsoring U.S. Army offices. The radar system will only be used at one site at a time.

Description of CHR Radar

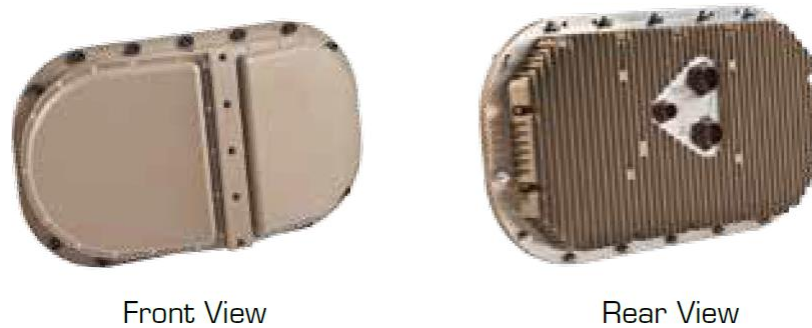


Figure 2: CHR Radars.

The CHR is a software-defined radar platform that can host various operational missions. It is electrically similar to the larger RADA MHR radar systems that others have obtained FCC licenses for in the past. The following are the key characteristics of the CHR:

- Pulse-Doppler radar
- Active Electronically Scanned Array (AESA) antenna
- 120 degrees by 90 degrees coverage for each CHR unit
- Solid State, digital (software-defined), no moving parts
- Compact and mobile, for tactical applications

The MHR radar's operating parameters are as follows

- Transmitter
 - Peak power: 40 watts
 - Maximum duty factor: 20%
 - Maximum average power: 8 watts
 - Operating frequencies: 3.5 GHz to 3.65 GHz
 - Bandwidth: 20 MHz
 - Waveform: Binary phase code using Barker sequences
 - Pulse compression gain: 2 to 26 (3 dB to 14 dB)
 - Pulse length: 0.05 μ s to 26 μ s
- Antenna
 - Gain: 12 dBi
 - Beamwidth: approx. 70° at broadside
 - Highest sidelobe: -13 dB relative to the peak at broadside