



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND

MANUFACTURING TECHNOLOGY SUCCESS STORY

Macrocell Receiver Conversion for Millimeter Wave

PROBLEM / OBJECTIVE

Radar warning receivers require digital processing to provide timely and accurate situational awareness and countermeasures against advanced radar technology. Current digital processing rates must be increased to sample at the Nyquist Rate of the highest millimeter wave (mmW) frequency of interest. Improved manufacturing for low loss mmW frequency block conversion is a cost effective solution that maximizes the utility of existing digital receivers without the need for complete system redesign or replacement.

The objective of this project was to develop production processes for millimeter wave macrocell technologies that can receive and perform frequency conversion to a baseband. The MaRCm end products will provide enhanced performance achieved with a lower Size, Weight, and Power + Cost (SWaP+C) that addresses requirements for the Army's Modernized Radar Warning Receiver.

ACCOMPLISHMENTS / PAYOFF

Demonstrated the ability to manufacture Monolithic Microwave Integrated Circuits (MMIC) with an integrated front end down-converter suitable for the next higher assembly. Accomplishments include:

- Reduced size, weight, and power of mmW detection module, which will enable integration into aircraft and all other equipment requiring mmW detection
- Reduced module complexity and increased reliability
- Reduced manufacturing and test cycle time
- Reduced millimeter wave module cost
- Successfully transitioned to the Modernized Radar Warning Receiver Program of Record.



(Photo credit: U.S. Army)

This ManTech project supports the Army Futures Command Future Vertical Lift modernization priority by significantly reducing vulnerabilities from future threat systems.

PARTICIPANTS

This project was executed by the Combat Capabilities Development Command (CCDC) - Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center in collaboration with industry partners.

CCDC C5ISR Center, Intelligence and Information Warfare Directorate, APG, MD

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