Rocket, Artillery and Mortar Warning (RAM Warn)

Real time early warning detection capability for all RAM threats.

As the threat for Rocket, Artillery, and Mortar (RAM) increases around the world, the need for a system to detect and alert Soldiers of incoming rounds for military locations becomes vital to mission success and force survivability. The RAM Warn system is the next generation system for the Sense & Warn Mission. Its primary focus is to warn military forces of Incoming Indirect Fire (IDF) by providing early warning of attacks using localized audio/visual warning devices. The core of the RAM Warn System is the Forward Area Air Defense / Counter Rocket Artillery and Mortar Command and Control (FAAD/C-RAM C2) system. As a component of the Sense & Warn Mission, FAAD/C-RAM C2 utilizes the RAM track data to calculate a predicted point of impact and issue a command for a localized warning in the area affected by the incoming threat. In addition to supporting the Sense & Warn Mission, the FAAD/C-RAM C2 system was developed by Northrop Grumman to provide command and control (C2) for the U.S. Army Short Range Air Defense (SHORAD) Systems. FAAD/C-RAM C2 receives air track data from multiple local sensors as well as multiple external track and C2 sources. All track data is correlated, and a single integrated air picture (SIAP) is distributed to all SHORAD weapons, along with engagement orders and weapon control status to provide complete situational awareness (SA).

A Proven Fielded System
In 2004, an Urgent Operational Needs Statement (UONS) for Operation Iraqi Freedom (OIF) was issued. Sense & Warn was rapidly deployed and installed throughout Iraq. Since 2004, C-RAM has delivered warnings for more than 6000 rocket or mortar attacks against forward operating bases (FOBs) with a minimum number of false warnings. The RAM Warn system alerts soldiers in hazard areas to lie prone or seek protection prior to the impact of the rounds. Additionally, the information provided allows for a response to the attacks resulting in the destruction of IDF crews. The RAM Warn system is in the U.S., Army inventory and fielded to soldiers in Brigade Combat Teams (BCTs).

Transportable
RAM Warn is transit-case based which allows the capability of rapid deployment and additional protection for hardware against environmental elements. The capability to readily adapt components that are modularized, standardized and reconfigurable facilitates the timely dissemination of alerts/warnings of a rocket, artillery or mortar threat.

Communication
The Wireless Network Node is a ruggedized, multi-band radio that can operate on multiple frequencies simultaneously. The wireless network forms a uniquely modular and dynamic system that supports self-forming, self-healing, and jam-resistant communication.
Sensor Interfaces
- Comprehensive family of warfighter SA and C2 software
- Sentinel (AN/MPQ-64)
- Lightweight Surveillance Tracking and Acquisition Radar (LSTAR)
- Giraffe Agile Multi-beam (GAMB)
- Ku-Band Radio Frequency Sensor (KRFs)
- Highly Adaptable Multi-mission Radar (HAMMR)/Ground Based Fighter Radar (GBFR)
- Expandable to new or legacy sensors

Weapon Interfaces
- Avenger (AN/TWQ-1)
- Chaparral
- Expandable to new or legacy weapon systems

External Track/C2 Interfaces
- MIL-STD-6016 (Link-16)
- MIL-STD-6011 (Link-11B)
- MIL-STD-3011 A/B/C
- Link-16 Multicast
- Cursor on Target (CoT)
- Counter Unmanned Aerial System (UAS)
- Low Level Air Picture Interface (LLAPI)
- Air and Missile Defense Workstation (AMDWS)
- Automatic Dependent Surveillance-Broadcast (ADS-B)/ Universal Access Transceiver (UAT)/Mode 5 Squitter
- Air Traffic Navigation, Integration and Coordination System (ATNAVICS)
- Blue Force Tracking
- Expandable to new or legacy Track/C2 sources

Products currently integrated into FAAD/C-RAM C2.

COMM/Device Interfaces
- Enhanced Position Location Reporting Systems (EPLRS)
- Single Channel Ground and Airborne Radio System (SINCGARS)
- Joint Tactical Information Distribution System (JTIDS)/ Multifunctional Information Distribution System (MIDS)
- PRC-117F/G
- Local area network (LAN)(Fiber, Wireless)
- Rajant
- Internet protocol version 6 (IPv6)
- Secure Terminal Equipment (STE) (asynchronous)
- Serial (synchronous)
- Serial (asynchronous)
- Global Position System (GPS)/ Precision Lightweight GPS Receiver (PLGR)/ Defense Advanced GPS Receiver Polaris
- Network Time Protocol (NTP) Server

Sensor Management Capabilities
- Sensor registration
- Align sensor to truth aircraft source
- Provide bias correction to sensor
- Sensor cueing
- Sensor merging
- High precision J2.0 PPLI
- Sensor exclusion zones
- High precision track message
- Time synchronization

Exportability
All interfaces and capabilities are subject to export compliance regulations and may not be available to all customers.

For more information, please contact:
Northrop Grumman Mission Systems
Robert Walker
256-830-3910
robert.walker@ngc.com