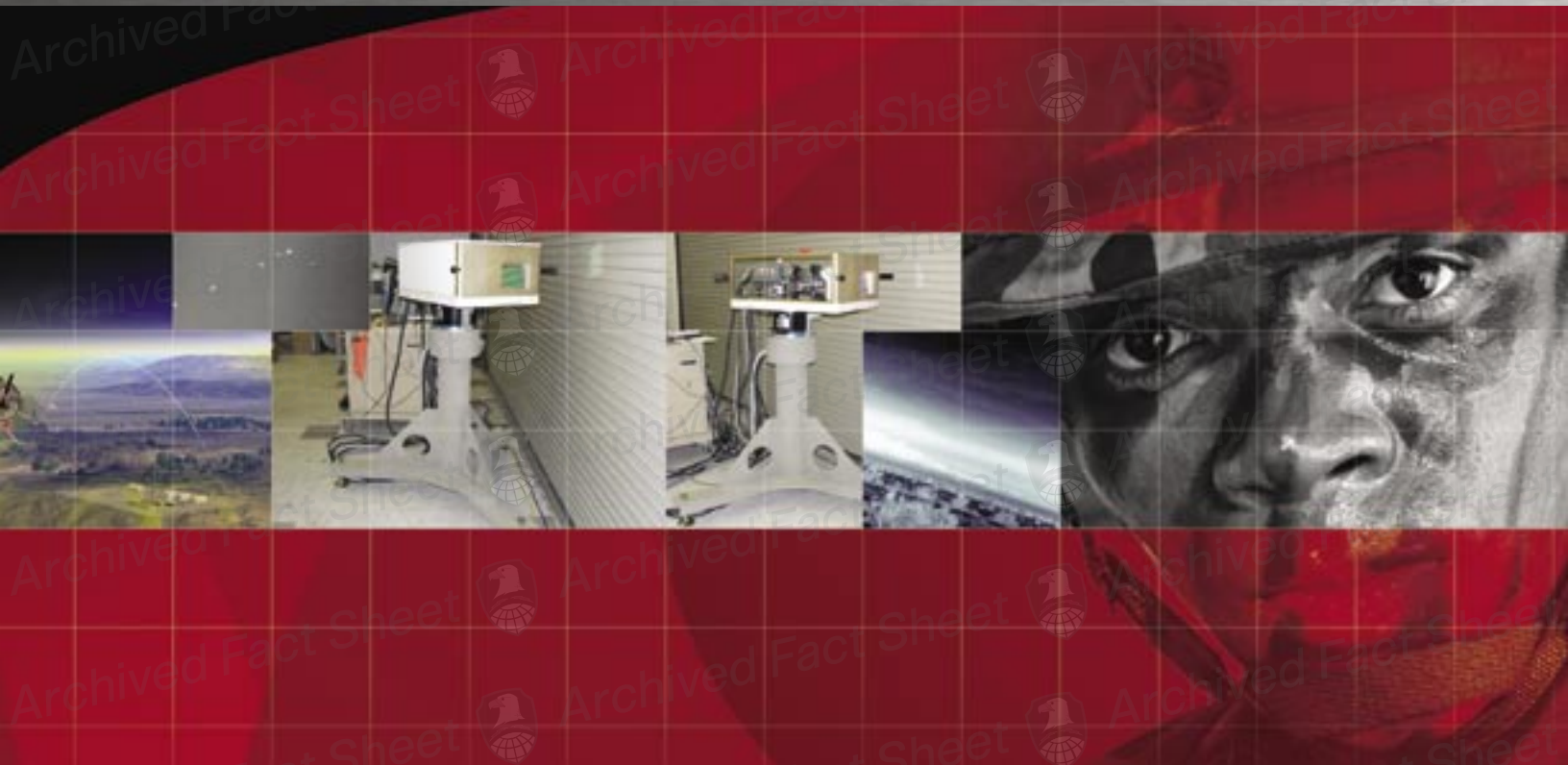




# RTATS

Rapid Target Acquisition and Tracking System



## Summary

- 3-D precision RAM track
- Determination point of origin / point of impact in real time
- Autonomous acquisition of RAM targets
- MWIR imagery; Wide field of regard acquisition and track
- Clutter suppression at low elevations

**RTATS is a stand alone precision optical acquisition and 3-D tracking system designed to support fixed site protection against rockets, artillery shells and mortar grenades (RAM), sniper, and other indirect fire threats.**

RTATS is a scanning mid-wave infrared (MWIR) optical acquisition sensor equipped with a laser ranging system. RTATS can detect, acquire, and track multiple RAM targets either autonomously or from cues supplied by forward area air defense (command, control, and intelligence) (FAAD(C2I)). Targets are tracked in 2-D with the MWIR system. Range information is obtained from a 1.06 micron laser range system. Track data is transmitted to FAAD along with point of origin and point of impact information. RTATS is a calibrated sensor which also is used to characterize and collect data on the radiometric signatures of RAM targets. Wide field coverage is provided via an azimuth stage giving +/- 180° coverage.

### Overview

RTATS is a precision, 3-D optical tracking system based on a rapidly scanning mid-wave infrared (MWIR) acquisition and laser ranging system. The performance of RTATS technology has been demonstrated at the Yuma Proving Ground in Arizona. This, coupled with its relatively accurate image track at low elevation for surveillance and tracking, will complement skin track radars. Its small size makes this technology an attractive candidate for a fixed site protection sensor when combat radar is not available. The ability to perform surveillance and tracking of RAM and sniper threats enables effective response measures. Additional capabilities of the RTATS system include early determination of the point of origin and point of impact in sufficient time and with high accuracy, making a prompt response possible.

### Benefits for Tomorrow's Defense

RTATS has demonstrated the capability to optically track rockets and mortars with great accuracy. The system has also demonstrated the capability to acquire and track rockets autonomously (i.e., without a radar cue). A "delta-beta" Kalman filter algorithm is utilized to provide point of impact and point of origin data. RTATS has also demonstrated the ability to track multiple RAM targets in flight at the same time. Imagery of targets and engagements is archived for later analysis and review. For troop protection, point of impact information provides the capability for early warning, and point of impact information provides the capability for early counter-fire.

### Technical Concept

The RTATS system is designed to operate autonomously (i.e. without operator intervention). It can be integrated with C2I systems such as FAAD(C2I), where it acts as a complementary Radar Element Subsystem sensor. In one operating mode, RTATS accepts cues from any available sensors (e.g., radars, acoustics) which transmit to FAAD(C2I), rapidly slews to cue, and performs a closed loop precision track. Real time track data is transmitted to the C2I system at rates up to 100 Hz if required. RTATS is designed to track multiple targets and has demonstrated the ability to perform cued tracking of multiple mortars in flight at the same time. If required, RTATS can be operated as an autonomous aerial target surveillance, acquisition and tracking sensor. In this mode, the system scans a predetermined sky sector using a step and stare approach. When targets are detected the system automatically switches to track mode.

The RTATS system can be remotely monitored and controlled via a fiber optic link. The optics module houses an MWIR focal plane array used for angle/angle search and a laser system used for 3-D tracking. The high speed scanner is mounted on a slower field of regard platform to extend coverage.



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