

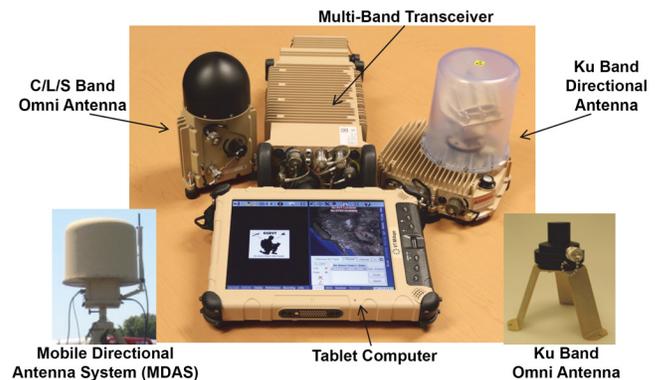
One System Remote Video Terminal (OSRVT) Increment II

Executive Summary

- The Army conducted the One System Remote Video Terminal (OSRVT) Increment II IOT&E in conjunction with the Gray Eagle Unmanned Aircraft System (UAS) FOT&E at Edwards AFB, California, and the National Training Center (NTC) in Fort Irwin, California, from May 14 through June 2, 2015. The Army conducted the test in accordance with the DOT&E-approved test plan and the Test and Evaluation Master Plan.
- During IOT&E, the OSRVT demonstrated the capability to interface with the Gray Eagle UAS and support combat operations.
- Compared to the OSRVT Increment I performance during the 2012 Gray Eagle IOT&E, OSRVT Increment II facilitated an increased level of situational awareness of the supported unit by providing more effective full motion video.
- The Army has simplified procedures for OSRVT operators to connect to and receive Gray Eagle video, but they remain arduous and at times not successful. In addition to receiving full motion video, OSRVT operators exercised control of the Gray Eagle electro optical/infrared (EO/IR) sensor. Operators achieved this capability, known as Level of Interoperability 3 (LOI 3), on six missions during the test, but had to frequently re-establish the LOI 3 datalink during each of those missions.

System

- The OSRVT system is a portable transceiver unit configured to receive imagery and metadata from selected manned and unmanned aircraft. It is modular in design and configured for mounted or dismounted operations or placement in a Tactical Operations Center.
- The OSRVT Increment II builds upon the capabilities of the currently fielded OSRVT Increment I. Increment I is a remote video, radio frequency-based, line-of-sight multi-band, receive-only system. In addition to the Increment I capabilities, the OSRVT Increment II provides a bi-directional communications capability that allows LOI 2 and 3 of unmanned aircraft platforms. LOI 2 allows direct receipt of



imagery and/or data from a UAS. LOI 3 allows the OSRVT operator to control the UAS EO/IR payload. Increment II also provides a National Security Agency-approved Type-1 datalink encryption capability.

- The OSRVT has three major subsystems:
 - A Multi-Band Transceiver, capable of receiving and transmitting digital data
 - Display/Computing subsystem (Tablet Computer), to receive, view, and transmit video and run the software to provide the capability to overlay telemetry data or text onto moving maps for enhanced geo-spatial situational awareness
 - Antennas, including the Mobile Directional Antenna System for extended range beyond 50 kilometers

Mission

Commanders and Soldiers at all echelons employ the OSRVT system to gain and maintain situational awareness during an operation, thus enabling the user to visualize the battlefield by receiving full motion video at standoff ranges.

Major Contractor

Textron, Unmanned Systems – Hunt Valley, Maryland

Activity

- The Army conducted the OSRVT Increment II IOT&E in conjunction with the Gray Eagle UAS FOT&E at Edwards AFB, California, and the NTC in Fort Irwin, California, from May 14 through June 12, 2015, in accordance with the DOT&E-approved test plan and the Test and Evaluation Master Plan.
 - During tactical operations in the IOT&E, a Stryker Brigade Combat Team used OSRVT Increment II while conducting a training rotation at the NTC. The Brigade Combat Team employed the OSRVT Increment II from brigade down to company level.

FY15 ARMY PROGRAMS

- The Army collected data during the OSRVT IOT&E to assess the OSRVT-equipped units' increased situational awareness and mission accomplishment as a result of the full motion video and LOI 3 capabilities that the OSRVT Increment II provides.
- DOT&E submitted a combined Gray Eagle FOT&E and OSRVT IOT&E report in January 2016.

Assessment

- Compared to the OSRVT Increment I performance during the 2012 Gray Eagle IOT&E, OSRVT Increment II facilitated an increased level of situational awareness of the supported unit by providing more effective full motion video.
- The Army has simplified procedures for OSRVT operators to connect to and receive Gray Eagle video, but they remain arduous and at times not successful. In addition to receiving full motion video, OSRVT operators exercised control of the Gray Eagle EO/IR sensor. Operators achieved this capability, known as LOI 3, on six missions during the test, but had to frequently re-establish the LOI 3 datalink during each of those missions.
- In a detailed analysis of missions supporting units at NTC, units receiving OSRVT video from Gray Eagle located threat targets in a shorter timeframe than other units that received Gray Eagle support, but without OSRVT video.
- Testing demonstrated that LOI 3 is capable in two of the three Gray Eagle modes of control, satellite communication and line-of-sight. Testing also demonstrated that during the Air Data Relay mode of control, the LOI 3 capability is not possible. This technical limitation cannot currently be resolved.
- The OSRVT Increment II has multiple cables, which connect the transceiver to the other system components. These cable connections on the transceiver are spaced too close together and connecting them is difficult, even under ideal conditions.

- During test, when under limited-visibility conditions and while adhering to noise and light discipline, Soldiers were not able to use lights and therefore, the operators could not easily connect the cables to the transceiver. This caused the OSRVT operators to wait for daylight to complete emplacement resulting in loss of time that the system could have been operational. Operators stated that the multiple cables should be color coded to facilitate ease of system set up.
- The OSRVT is vulnerable to cybersecurity threats.
- The OSRVT Increment II Capability Production Document states there is no reliability requirement for the system. The OSRVT reliability characterization during test resulted in zero system aborts and two essential function failures during the total 892 LOI 2 (882.3 hours) and LOI 3 (9.7 hours) operating time, indicating the system is suitable to support combat operations.

Recommendations

- Status of Previous Recommendations. The Army addressed all previous recommendations in the FY12 Gray Eagle Annual Report concerning OSRVT operations. However, this is the first annual report for the OSRVT program.
- FY15 Recommendations. The Army should:
 1. Simplify procedures to establish and improve the reliability of LOI 3 connectivity.
 2. Investigate and if possible rectify the inability of LOI 3 functionality when the Gray Eagle aircraft is flown via the Air Data Relay mode of control.
 3. Increase the space between the cable connections on the transceiver to provide the operators more room to connect the required system cables and color code the cables to facilitate ease of system set up.
 4. Eliminate cybersecurity vulnerabilities and confirm corrections in follow-on testing.