



Offensive Sensors Laboratory

AIR COMBAT ENVIRONMENT TEST & EVALUATION FACILITY

Overview

The Offensive Sensors Laboratory (OSL) provides developmental test and evaluation of aircraft offensive sensors using simulated complex combat scenarios in which aircraft sensors are realistically stimulated with actual electro-optical and radar signals. The OSL provides open-loop radio frequency (RF) and infrared (IR) target generation to aircraft sensor systems such as aircraft radar systems, targeting and navigational forward looking infrared (FLIR), search and track systems, missile launch detector systems, missile warning systems, missile approach warning systems and IR missile seekers.

OSL capabilities are linked to the ACETEF architecture by the Shared Memory Network. The Radar Target Stimulator is fully integrated with the Simulated Warfare Environment Generator (SWEG) for real-time dynamic scenario control and interaction.

Radar Target Stimulator

The Radar Target Stimulator (RTS) is a radar environment simulator used to provide stimulation to the F/A-18 AN/APG-73 radar upgrade and the F-14D AN/APG-71 radar sets. The RTS is used to verify the functionality of air-to-air modes of the radar sets. The RTS is capable of simulating up to four targets in the main beam of the radar antenna. A total of 32 targets can be simulated in test. The RTS provides various electronic countermeasure effects: noise, deceptive, amplitude, coherent noise, cover pulse, noncoherent noise, repeater range, Doppler and alternating. The RTS provides various clutter effects: main lobe, side

lobe altitude line return and scintillation. The RTS has four internal jammer targets and can be integrated with an AN/ULQ-24 jammer, lab impersonator, or two external DLQ-3B jammers. The RTS has a 40 signature jet engine modulation library and variable radar cross-section. The RTS can be operated in a standalone mode or integrated with SWEG. RTS signals can be provided to the system under test directly via RF cables to the radar receiver or radiated from the horn antenna to the radar antenna assembly.

Generic Radar Target Generator

The Generic Radar Target Generator (GRTG) is a radar environment stimulator used to provide stimulation of the F/A-18 APG-73, V-22 APQ-174 and the Joint Strike Fighter radar sets. The GRTG is used to verify the functionality of air-to-air and air-to-surface (A/S) modes of the radar sets. The GRTG is capable of simulating up to four targets in the main beam of the radar antenna. A total of 32 targets can be simulated in the radar field of regard. The GRTG can provide radar returns from predefined terrain shapes with statistically distributed clutter and imbedded point targets for functional testing of A/S modes. The GRTG also provides various programmable electronic countermeasures effects. The GRTG can be operated in a stand-alone mode or integrated with the ACETEF infrastructure. GRTG signals can be provided directly via RF cables to the radar receiver or radiated from horn antennas to the radar antenna assembly.

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Universal Radar Moving Target Transponder

The Universal Radar Moving Target Transponder (URMTT) is a radar simulator used to provide simulation to complex and simple radar systems. The URMTT is a portable, open-loop, free-space simulator capable of providing a radar threat to any radar system operating from 6 to 18 GHz. The URMTT is unobtrusive to the system under test.

Dual Infrared Point Source Projector

The Dual Infrared Point Source (DIRPS) projector is an IR projection device used to test IR sensor systems in an installed test environment. The DIRPS simulates real-time, dynamic, radiometrically accurate in-band infrared energy of point source targets and projects into the entrance aperture of FLIR, such as AAS-3813 and other IR sensors on aircraft platforms. The DIRPS is used to test the detection and tracking capability of the IR sensors under a wide range of target characteristics and atmospheric conditions by stimulating these sensors with real-world situational scenarios. The DIRPS projector system consists of custom software, commercially available processors and custom hardware interfacing to the SWEG and a two-source collimator (TSC) projection system. The TSC system stimulates an AAS-38B targeting FLIR, as installed on the F/A-18, by providing a collimated output of two point sources. The point sources are independently controlled in azimuth and elevation within the field of view of the collimator to stimulate the motion and closure of airborne targets.

Infrared Sensor Stimulator System

The Infrared Sensor Stimulator System (IRSS) provides free-space optical stimulation of IR/ultraviolet (UV) sensors and project temporally-, spectrally- (thermally) and spatially-correct IR/UV images to sensors for testing fielded, upgraded and new development airborne weapons systems on F-22, F/A-18, JSF, V-22, B-1, B-2, F-14, F-15 and F-16 aircraft. The IRSS is capable of stimulating and testing up to three sensors simultaneously to evaluate the sensor under test field-of-view and operational performance. The IRSS consists of a multispectral (IR/UV/visible) scene generation subsystem that uses IR/UV phenomenology models (targets, backgrounds, atmosphere, sensors, etc.) to render dynamic multichannel real-time images for projection and/or injection to sensors under test. The IRSS consists of a direct injection subsystem that tests the sensor's image process electronics through direct insertion of an analog/digital IR scene/image signal; a point source projector subsystem capable of projecting two dynamic IR point sources controlled in intensity, XY position and speed of motion; and a growth function providing the capability to project IR/UV images directly into the sensor optics. IRSS operates in a stand-alone mode or integrated with other laboratories.