

Patuxent River Infrared Signature Measurements



The Patuxent River Infrared Signature Measurements (PRISM) facility at the Atlantic Test Ranges (ATR) conducts dynamic, surface-to-air and surface-to-surface infrared signature measurements of fixed-wing aircraft, rotary-wing aircraft, missiles, engines, boats and Unmanned Aerial Systems (UAS). The PRISM system is completely mobile and is designed to be operated either locally at the Patuxent River Complex, or at any off-site location. Whether located at Patuxent River or off-site, the integrated ATR facilities can provide real-time telemetry, tracking and range control.

PRISM SYSTEM

The PRISM system provides infrared signature measurements in the short-, mid- and long-wave infrared bands (SWIR, MWIR and LWIR), for both moving and non-moving targets, using infrared spectrometers and imagers.

The two major components of the PRISM system are the data acquisition and processing trailer and the Kineto Tracking Mount (KTM) Optical System. Data acquisition and processing for the PRISM system takes place in an environmentally-controlled, 48-foot trailer. The trailer contains a data acquisition workstation, a customer observation room, a lab/equipment storage room and a galley. The PRISM IR cameras, IR spectrometer and video cameras are mounted on the KTM positioner, which can be remotely operated up to 75 feet from the trailer. Both the PRISM trailer and KTM can be powered by either shore power or the PRISM 120 kW portable generator.

The PRISM team can also provide a smaller acquisition trailer (17 feet) and camera tracking system capable of autonomous data acquisition using up to two imagers and a spectrometer. This system can be used to accommodate tests with fewer requirements or tests which are constrained by physical space.

The PRISM lab facility is designed to provide any routine maintenance, calibrations, spectral responses and filter changes. A team of experts is fully trained in blackbody calibrations, instrument spectral response characterizations and camera filter removals.



PRISM trailer and KTM



Workstations inside the PRISM trailer



An array of PRISM cameras

FOR MORE INFORMATION

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PRISM INSTRUMENTS

The PRISM infrared instrument suite consists of one short-wave, three mid-wave and one long-wave focal plane array infrared imagers, a radiometer, a FLIR microbolometer and two Bomem MR-304 spectroradiometers. In order to provide the customer with maximum flexibility for both target range and resolution, each of the IR imagers has several lenses, ranging from 25mm to 550mm. Target tracking and visual recording is accomplished using digital cameras and image intensifiers (night tracking). Target position is controlled real-time using either eye-safe laser range finders or the Advanced Range Data System (ARDS).

PRISM DATA PRODUCTS

The PRISM data product is provided in electronic format. IR imagery is usually provided as hot parts/plume, airframe and total vehicle signatures and presented as apparent effective intensity. Spectral data is usually provided as total vehicle signatures and presented as apparent contrast intensity. Local weather information (temperature, relative humidity, wind speed, wind direction and barometric pressure) is collected from the PRISM ground weather station as well as the National Oceanic and Atmospheric Administration (NOAA) Flight Operations office and is provided in tabulated format. When operations are performed at the Patuxent River Complex, weather aloft (up to 10,000 feet) can be provided throughout the test by ATR. All data is Inter-Range Instrumentation Group (IRIG) time-stamped.



IR imagery



SWIR IMAGER

320x256 InSb FPA
3 - 5 micrometers
Pixel size: 24 μm
Frame rate: 87 Hz

MWIR #1 IMAGER

640x512 InSb FPA
3 - 5 micrometers
Pixel size: 24 μm
Frame rate: 87 Hz

MWIR #2 IMAGER

640x512 InSb FPA
3 - 5 micrometers
Pixel size: 24 μm
Frame rate: 87 Hz

MWIR #3 IMAGER

640x512 InSb FPA
3 - 5 micrometers
Pixel size: 24 μm
Frame rate: 100 Hz



LWIR IMAGER

640x512 QWIP FPA
8 - 9 micrometers
Pixel size: 24 μm
Frame rate: 87 Hz

ALST LASER RANGE FINDER

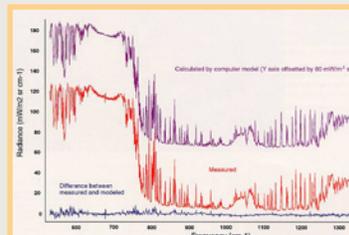
Eye safe
1.54 μm
Detection range: 8 km
Pulse rate: 1 Hz
Resolution: +/- 2 meters

FLIR SYSTEMS SC2000

Microbolometer
320x256 InSb FPA
7.5 - 13 micrometers
Pixel size: 52 μm

BOMEM MR-304

Spectroradiometer
InSb/MCT Detectors
2 - 19.5 micrometers
34 scans/sec @ 4 cm^{-1} resolution



PRISM's spectrometer produces an interferogram data product



PRISM's Rtools® software display

WEATHER/TM DATA

Time/ Wind Dir/Spd /Visibility/ Sky/ Temp/Dew/Alt
0900L 33014KT 7SM SKC 12/M01 A3013
0915L 32013KT 7SM SKC 12/M01 A3013
0930L 33013KT 7SM SKC 13/M01 A3012
0945L 32012KT 7SM SKC 13/M01 A3011
1000L 32012KT 7SM SKC 13/M01 A3011
1015L 33011KT 7SM SKC 13/M01 A3011
1030L 33012KT 7SM SKC 13/M01 A3011
1045L 32012KT 7SM SKC 14/M01 A3011
1100L 33012KT 7SM SKC 14/M01 A3011
1115L 32014KT 7SM SKC 14/M01 A3010
1130L 32011KT 7SM SKC 14/M01 A3010

Tabulated weather data