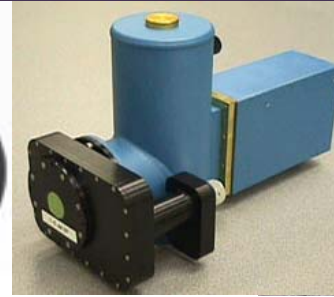




# High Energy Laser Airborne Target Irradiance and Imagery Measurement



## HEL ATIM Capability Summary

- Provides radiometrically calibrated imagery of airborne targets in the visible, near infrared, mid-wave infrared, and long-wave infrared wavelengths
- Capable of remote operations
- Provides a testbed for integrating, testing, and evaluation DET S&T projects
- Includes time-stamped imagery and data acquisition and recording
- Transportable between test sites
- Developed by White Sands Missile Range's Survivability, Vulnerability Assessment Directorate
- Available for use at White Sands Missile Range, NM

## Testbed Approach

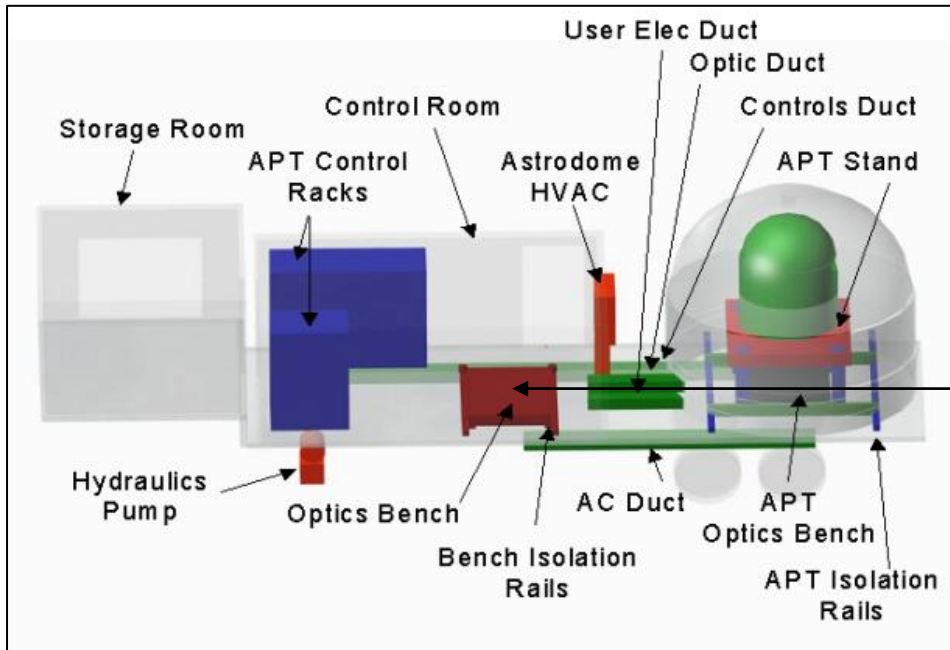
- A cost-effective solution to the HEL ATIM problem does not exist
- DETEC performed a risk reduction effort by creating a commercial-off-the-shelf imaging capability and testbed to examine innovative approaches to solving the HEL ATIM problem
- The White Sands Test Center-owned Advanced Pointer Tracker was enhanced to serve as the HEL ATIM Testbed
- The enhanced HEL ATIM testbed will serve as an interim HEL ATIM Capability

The High Energy Laser (HEL) Airborne Target Irradiance and Imagery Measurement (ATIM) Testbed was developed by the Directed Energy Test and Evaluation Capability (DETEC) project. The HEL ATIM Testbed, which serves as an interim HEL ATIM Capability, provides time-spaced, high-resolution imagery in several spectral bands, including near-infrared (NIR) laser in-band, visible, out-of-band NIR, mid-wave infrared (MWIR), and long-wave infrared (LWIR). This capability is being developed in response to a high-priority shortfall identified by the 2004 DETEC Tri-Service Study (T-SS), which developed, scoped, and prioritized shortfalls in the infrastructure needed for testing directed energy (DE) weapons. The shortfall addressed by the HEL ATIM Capability is the need for time-dependent, high-resolution imagery of the target surface in several spectral bands.

## HEL ATIM Overview

A cost-effective solution that meets all the requirements of the HEL ATIM Capability does not exist; therefore, DETEC performed a significant risk reduction effort before procuring the full HEL ATIM Capability. The purpose of the risk reduction effort was two-fold. The first purpose was to characterize how closely commercial off-the-shelf (COTS) technology comes to meeting the HEL ATIM requirements. The second was to create a testbed where innovative approaches to solving specific HEL ATIM technical challenges such as imagery, radiometric accuracy, and spatial resolution can be investigated.

DETEC identified the Advanced Pointer Tracker (APT) as a suitable existing capability for enhancing into a HEL ATIM Testbed. The White Sands Test Center (WSTC) owns the APT, which is operated by its Survivability, Vulnerability Assessment Directorate (SVAD). This ground-based platform can acquire, track, and image airborne targets. It is also transportable. It contains a 60 cm aperture tracking telescope and several sensors with the ability to produce imagery in the visible, NIR, MWIR, and LWIR. The platform also contains two FLIR Systems Phoenix NIR cameras suitable for imaging laser spots on targets.



Install DET S&T hardware on second optical bench in the control room.

DETEC enhanced the APT into an HEL ATIM Testbed by adding modern MWIR and LWIR cameras, installing a new, high-bandwidth track error processor, installing a second optical bench in the APT control room, and adding a secure remote capability.

A full HEL ATIM Capability is not within the current effort; however, the testbed created by this risk reduction effort will serve as the interim HEL ATIM Capability.

### Program Status

The DETEC Systems Integration Contractor (SIC) oversaw the HEL ATIM Testbed risk reduction effort, which started in July 2007 and completed in August 2009. SVAD managed the project with several support contractors providing specific subsystems. The HEL ATIM Testbed now resides at its host site, White Sands Missile Range, and is available for the T&E community to use.

### HEL ATIM Capability Integrated Product Team

To guide the testbed development process, DETEC formed the HEL ATIM Capability Integrated Product Team (IPT) with representatives from the Major Range and Test Facility Base (MRTFB), the military Services, and the HEL community. The IPT participated regularly throughout the development effort providing guidance and expert advice. The IPT also participated in key reviews at significant points during design, fabrication, integration, and characterization.

### About DETEC

DETEC is funded by the DOD Test Resource Management Center's Central Test and Evaluation Investment Program (CTEIP) to address joint service DE weapon system test and evaluation infrastructure needs and implement solutions to these needs. DETEC develops and fields capabilities to address the high-priority shortfalls identified in the 2004 CTEIP-funded T-SS.

The DETEC SIC, Science Applications International Corporation (SAIC), implements the DETEC project by working with Government and industry teammates to develop functional specifications for certain DE T&E infrastructure capabilities. The SIC acquires these capabilities in competitive procurements and integrates the capabilities into the MRTFB to help meet the testing requirements for current and future HEL and high power microwave weapon systems. ■

*For more information about the HEL ATIM Testbed, please contact the DETEC team at [detec@saic.com](mailto:detec@saic.com)*

*To schedule time with the HEL ATIM Testbed, please contact Mr. Chris Beirsto, Survivability, Vulnerability Assessment Directorate, 575-679-5551, [Chris.Beirsto@smdchl.smdc.army.mil](mailto:Chris.Beirsto@smdchl.smdc.army.mil)*