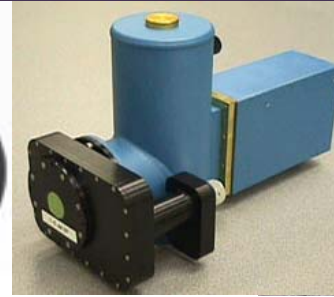




High Energy Laser Airborne Target Irradiance and Imagery Measurement



HEL ATIM Capability Summary

- A cost effective solution to the HEL ATIM problem does not exist
- DETEC is performing a risk reduction by creating a COTS imaging capability and test-bed to examine innovative approaches to solving the HEL ATIM problem
- The White Sands Test Center-owned Advanced Pointer Tracker will be enhanced to serve as the HEL ATIM test-bed
- DET S&T projects that address specific HEL ATIM challenges will be evaluated to determine their benefit
- The enhanced HEL ATIM test-bed will serve as an interim HEL ATIM capability

APT Upgrade Summary

- Improve tracking performance while imaging dynamic airborne targets
- Rearrange the existing APT optics bench to feed light to a second optics bench
- Install a second optics bench for testing candidate DET S&T program solutions to various HEL ATIM technical challenges
- Provide an encrypted link for remote control of the APT

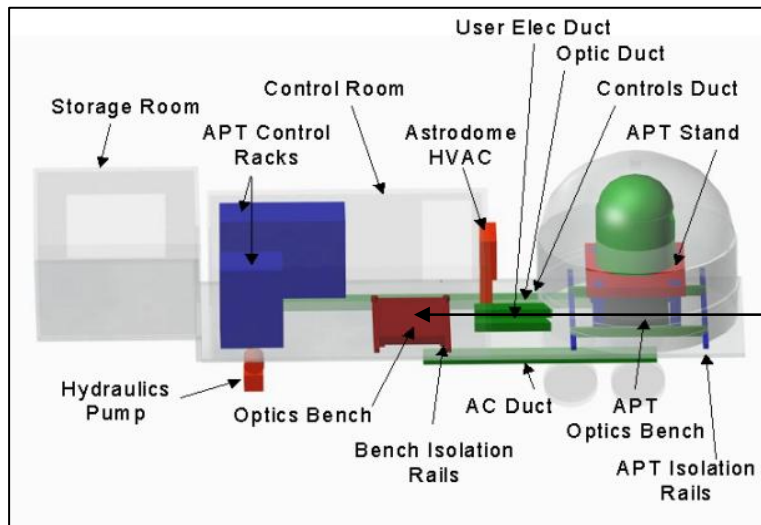
The High Energy Laser (HEL) Airborne Target Irradiance and Imagery Measurement (ATIM) Test-bed is being developed by the Directed Energy Test and Evaluation Capability (DETEC) project. The interim HEL ATIM capability provides time-spaced, high-resolution imagery in several spectral bands, including near-infrared (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 is performing a significant risk reduction effort before procuring the full HEL ATIM Capability. The purpose of the risk reduction effort is two-fold. The first is to characterize how closely commercial off-the-shelf (COTS) technology comes to meeting the HEL ATIM requirements. The second is to create a test-bed 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 test-bed. 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 six sensors with the ability to produce imagery in the visible, near infrared (NIR), mid-wave infrared (MWIR), and long-wave infrared (LWIR). The platform also contains two FLIR Systems Phoenix NIR cameras suitable for imaging laser spots on targets.

To create the HEL ATIM test-bed, DETEC is enhancing the APT with COTS equipment. Track error processor upgrades improve tracking of highly



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

dynamic targets. New MWIR and LWIR cameras enhance the APT's spectral imaging capability. The upgrade adds the ability to control the test-bed remotely. Tests involving high-energy materials may have large keep-out zones that would prevent a favorable viewing geometry were the APT occupied during a test. With the remote capability, the test-bed may be placed in the keep-out zone, while the operators remain at a safe distance. The encrypted remote link supports up to SECRET data transmission. Upon upgrade completion, a characterized APT performance is planned for its new baseline capability.

The results will show how closely COTS technology comes to meeting the full HEL ATIM capability requirements. Characterization is performed in several stages using both fixed and moving targets.

DETEC is integrating the Directed Energy Test Science and Technology (DET S&T) projects that address HEL ATIM technical challenges into the test-bed. Follow-on test series are to determine if, and by how much, each S&T project improves the performance of the test-bed. Projects that prove successful may be permanently integrated into the test-bed.

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

Program Status

The DETEC Systems Integration Contractor (SIC) is overseeing the HEL ATIM Test-bed risk reduction effort, which started in July 2007. SVAD is managing the project with several support contractors providing specific pieces. Project completion is planned for the summer of 2009. Upon completion, the APT will reside at WSTC.

HEL ATIM Capability Integrated Product Team

To guide the test-bed 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 participates regularly throughout the development effort providing guidance and expert advice. The IPT participates 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. ■

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