New and Improved AMOR Complex for Advanced Sensing Capabilities

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AMOR Outline

- AMRDEC Mission
- AMOR Capabilities
- Unique Features
- Facility Upgrades
- Laser Transceiver Upgrades
- Threat Motion Table Upgrades
- Advanced Photonics Testbed Lab Expertise
- Remote Calibration Sensor
AMRDEC Mission

#1: Readiness
Provide aviation and missile systems solutions to ensure victory on the battlefield today.

#2: Future Force
Develop and mature Science and Technology to provide technical capability to our Army’s (and nation’s) aviation and missile systems.

#3: Soldiers and People
Develop the engineering talent to support both Science and Technology and the aviation and missile materiel enterprise.

Deliver collaborative and innovative aviation and missile capabilities for responsive and cost-effective research, development and life cycle engineering solutions.
Who is AMRDEC?

Core Competencies

- Life Cycle Engineering
- Research, Technology Development and Demonstration
- Design and Modification
- Software Engineering
- Systems Integration
- Test and Evaluation
- Qualification
- Aerodynamics/Aeromechanics
- Structures
- Propulsion
- Guidance/Navigation
- Autonomy and Teaming
- Radio Frequency (RF) Technology
- Fire Control Radar Technology
- Image Processing
- Models and Simulation
- Cyber Security
AMOR- Advanced Measurement Optical Range is the Army’s National Asset for laser indoor range testing

- Ladar/Lidar Sensor/Seeker Characterization
- Laser-based Calibrated Threat Measurements
- All-digital M&S Laser Signal Injection
- HWIL Laser-based Sensor/Seeker Simulations
- Outdoor testing capabilities
Unique Features

- Threat Motion Table
  - Realistic spin and wobble motion for targets

- 2 meter diameter primary mirror
  - Allows measurements of up to full-scale targets
Unique Features

• Optical Telescope System
  – High quality collimated beam two meters in diameter
  – Optical zoom system allows for variable range and fly-in-simulations using active or passive sensors

• Laser Transceiver
  – Coherent measurements (heterodyne detection)
  – Non-coherent measurements (direct detection)
  – Wide-bandwidth arbitrary waveforms
Laser Upgrade

- New Nd:YAG 1064 nm laser transmitter
- Modular Laser Configuration
- Coherent measurement system
  - Micro-Doppler capable
- Agile waveform capable
- Fiber optics
  - Less free space lasing mitigates alignment and safety concerns

- Significant improvements in
  - Frequency stability
  - Power fluctuations
  - Phase Locking
  - Beam Quality across aperture
Digital Receiver Upgrade

- Increased bandwidth (multi-GHz sample rates)
- GPU-based processing for greater speed
- Increased quantity of range gates
  - Measure longer targets
  - Reduced data acquisition time
  - Greater quantity of measurements
- 172 TB network attached storage system
- Live and recorded data for
  - Playback
  - Onsite data processing
  - External processing over classified links
- Integration of motion table controls
• New servo motors
  – Smoother motion
  – Higher rotational rates
• Full integration into the Data Acquisition System
• Aspect angle and secondary target control upgrades
• Motion table capabilities
  – Spin rates: 0-12 RPS
  – Precession rates: 0-20 RPS
  – Precession angles: 0-20 deg
  – Translation speed: 0-0.5 m/s
  – Maximum weight: 500 lbs
Facility and Security Upgrade

- Control Room Remodeling
  - New furniture and modern layout
  - Large screens for viewing live data collection
- Upgraded to open storage
- Classified and Unclassified processing and networks
- Clean Room
- New optical tables
- Safety upgrades
APTL Simulation and Test functions transitioning to AMOR Complex. Capability for comprehensive Lidar module and system testing and evaluation.
- Multi-function Calibration Sensor
  - Data collection for Scene Generation V&V
  - Calibration Sensor for projector development
- Multispectral Sensor / Optics Configurations
  - UV, Visible, SWIR, MWIR, LWIR, LIDAR
  - Common adjustable mounts for sensor boresighting
- Modular Interfaces
  - GigE, Camera Link, CoaXPress, SDI, Analog, USB
  - Up to 2240 MB/s
  - Up to 22.5 TB hot-swappable, solid state drive capacity
- Alignment
- Integrated GPS & IRIG-A/B receivers
- High precision Pan & Tilt positioner
- Graphical User Interface
  - Sensor setup & control
  - Target tracking & Geolocation
Summary

- AMOR is a unique National Asset that provides customers the ability to...
  - Bring Ladar/Lidar Systems to test
    - At simulated ranges
    - Against realistic targets
  - Bring targets to characterize
  - Test Ladar/Lidar waveforms and algorithms

- AMOR is undergoing improvements and modernization and will be operational for customer use within 9-12 months
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