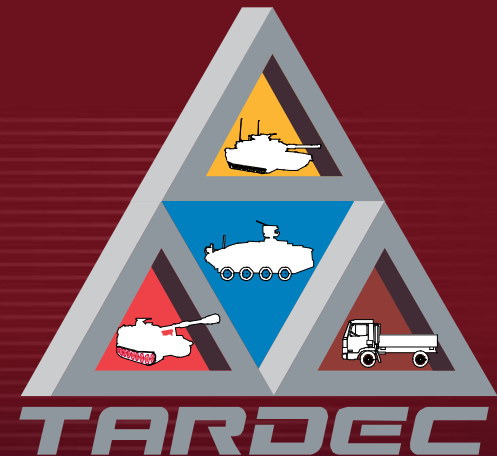




RDECOM

Vision Protection Army Technology Objective (ATO) Overview for GVSET VIP Day

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POC: Rob Goedert, TARDEC ATO manager

Date: 17 Jul 09

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Report Documentation Page

Form Approved
OMB No. 0704-0188

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1. REPORT DATE 17 JUL 2009		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE Vision Protection Army Technology Objective (ATO)Overview for GVSET VIP Day				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Rob Goedert				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000				8. PERFORMING ORGANIZATION REPORT NUMBER 20142 RC	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S) TACOM/TARDEC	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) 20142 RC	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at NDIAs Ground Vehicle Systems Engineering and Technology Symposium (GVSETS), 17 22 August 2009, Troy, Michigan, USA, The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 7	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Problem: Lasers can disable vision systems

Mission:

- Provide solutions protecting eyes and day-vision cameras from laser weapons.

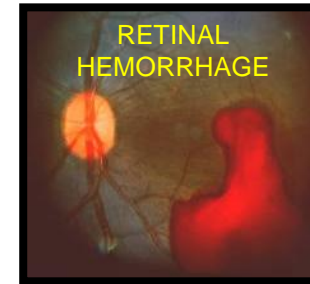
Objective:

- Develop materials that limit the amount of light energy allowed to the sensor
- Develop new optical system designs allowing the integration of advanced laser protection materials

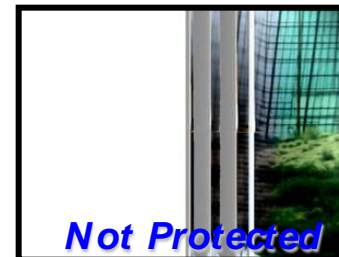
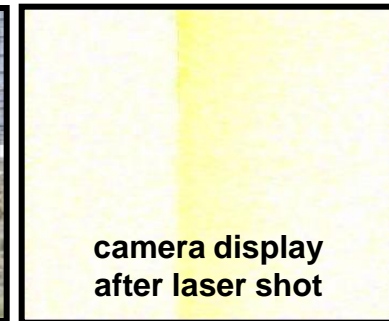
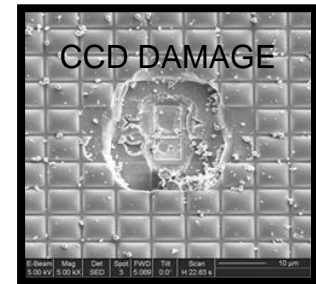
Method:

- Integrate protection materials into optical systems and test in lab & field.
- Demonstrate relevant designs to customers (GCV & HBCT).

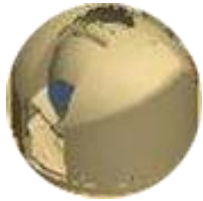
Eye Damage



Camera Damage



Fire Control Camera



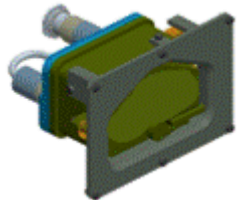
CCD Protection
(Narrow Field of View)

Optical Fire Control



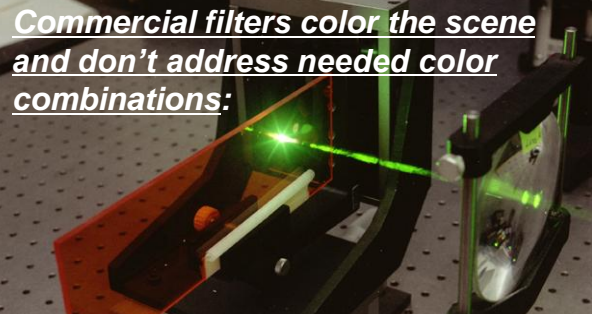
EYE Protection

Driver's Vision

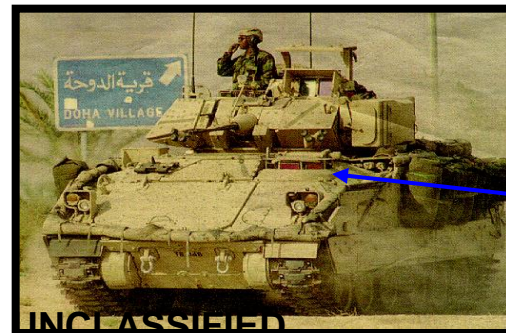


CCD Protection
(Wide Field of View)

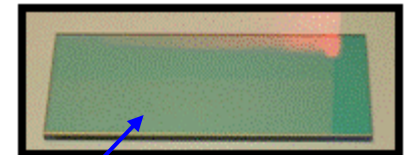
Fielded Hazard Protection:



Commercial filters color the scene and don't address needed color combinations:



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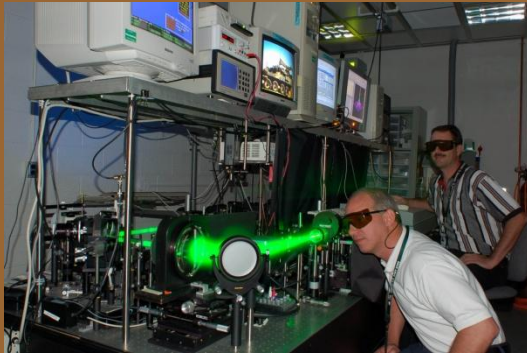
Fielded Filter protects from laser rangefinders & designators





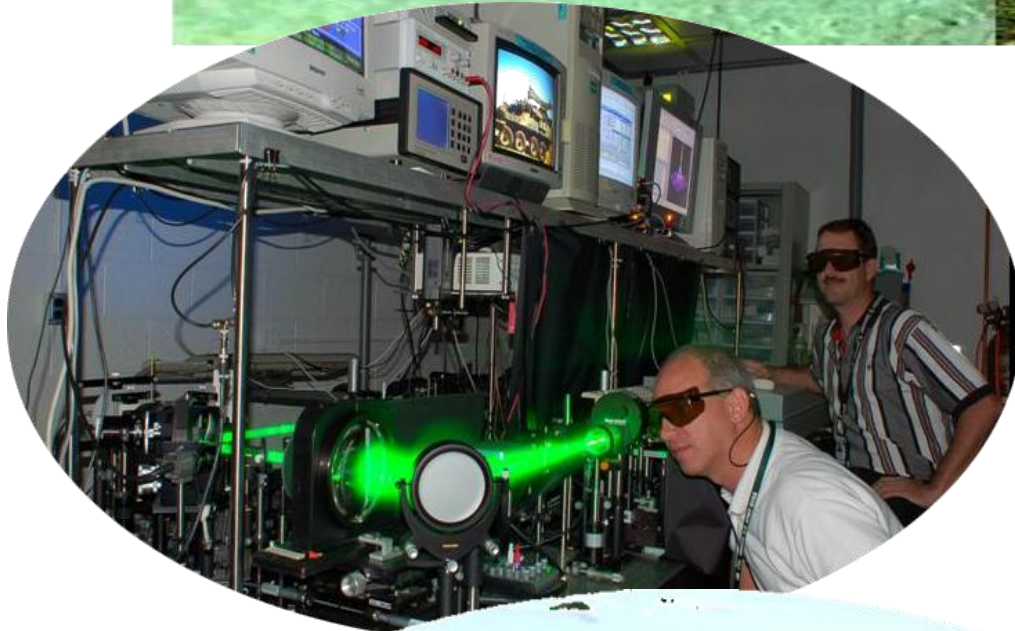
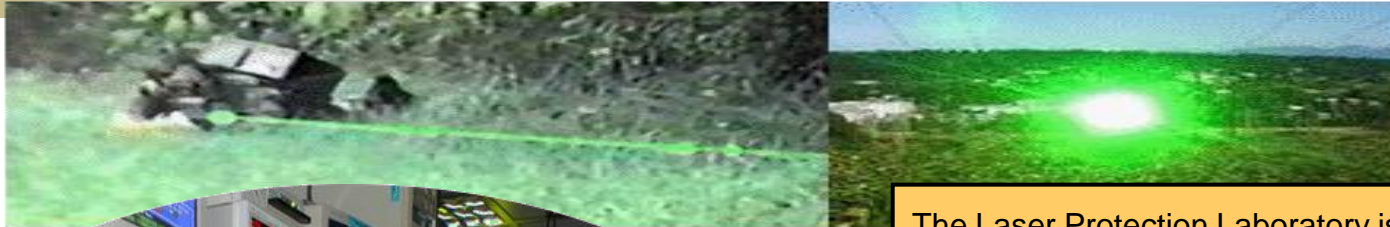
Current test capabilities:

- Laser-induced damage threshold testing of camera image sensors
- Non-linear optical material characterization
- Photopic and NVG-weighted transmission measurements of transparent armor
- Haze measurements



Additional capabilities:

- Optical design & analysis
- Mechanical design
- Laser hazard assessment
- Image analysis & processing
- Laser beam diagnostics
- Measurement automation
- Technical computing
- Photometric measurement
- NLO material integration on cameras
- Digital and film photography
- Microscopic examination



The Laser Protection Laboratory is used to develop and evaluate techniques to harden combat vehicle day vision optics against multiple battlefield laser hazards and threats. In this laboratory, engineers and scientists conduct various optical performance tests on vision devices and laser protection filters, as well as conduct advanced research in nonlinear optical materials and novel optical design development. The laboratory is located in a Class 100,000 clean room and the available equipment includes several laser sources, detection devices, spectrometric instrumentation, optical test benches, laser beam profiling systems, optical microscopes, and computer support facilities.

- *Lab & field experience*
- *Strong collaboration with OGA's and Industry*



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