



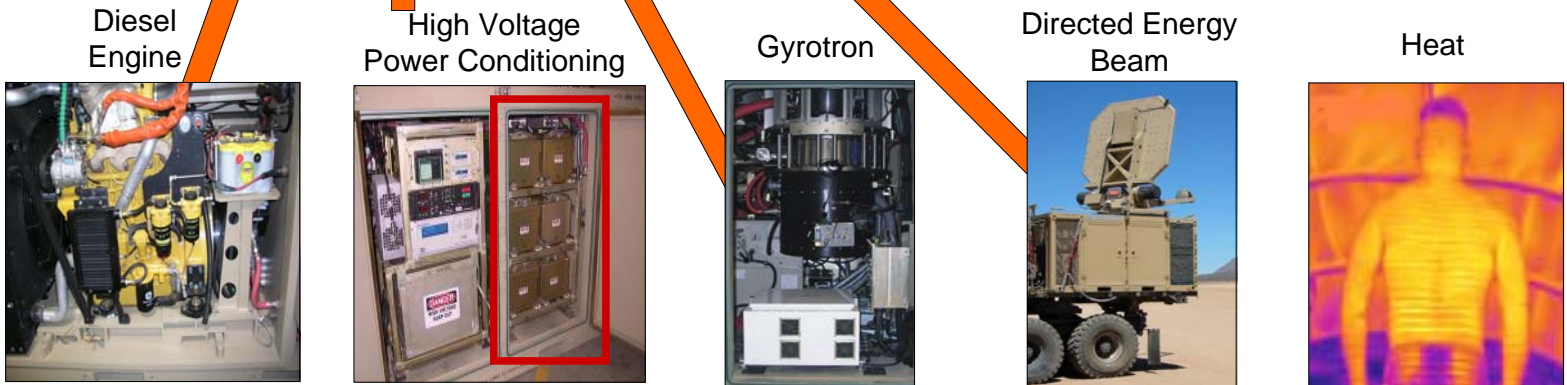
Active Denial System Enabling Technologies



- First counter-personnel, non-lethal Directed Energy Weapon (DEW)
- First extended range DEW
- Highest energy shot for DEW
- Safest counter-personnel, non-lethal weapon with rapid, robust capability

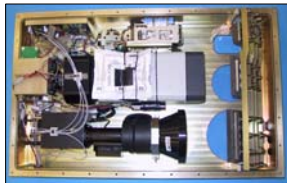


System Power Flow



Active Denial System Incorporates Many Levels of Control to Ensure Safe, Effective Repel

- Hardware: Boresighted sensor suite – operator sees entire beam path and target area – no ballistics or windage
- Computer: Limits shot duration and beam power to achieve a safe, effective, non-lethal repel effect
- Operator: Trigger is fail-safe: operator releases trigger to end shot
- Target: Repel effect forces target to move before getting injured



Sensors
FLIR
Low Light Camera
Laser Rangefinder



Operator Display
(Cameras Off)

ADS builds on groundbreaking technology to give our warfighters a major non-lethal capability



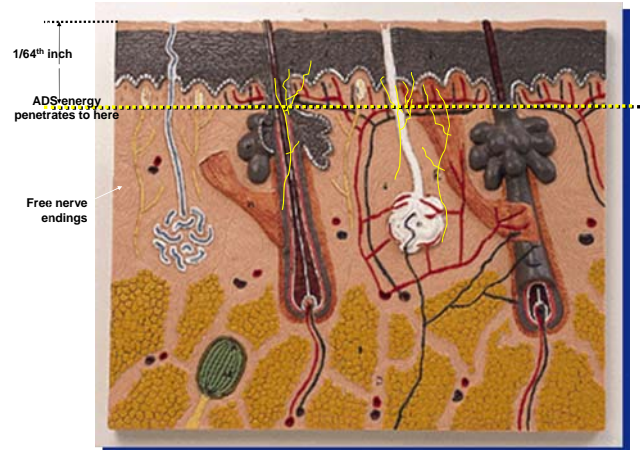


Active Denial System Research and Health Effects Studies Began in 1993



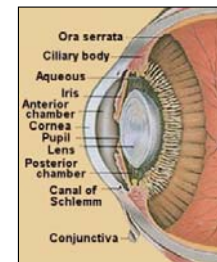
Skin Research

- Energy penetrates ~ 1/64th inch or equal to three sheets of paper
- Energy beam heats surface of skin
- This produces a *TEMPORARY* heating sensation
- Subjects instinctively move to avoid the beam
- Aversion response = Self-limiting exposure



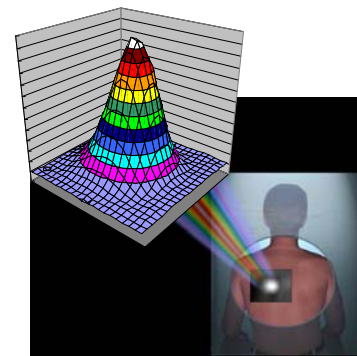
Eye Research

- Blink reflex occurs in 1/4 second
- ADS beam does not penetrate through the eyelid
- Extensive research has been conducted
- Eye blink, head turn, and aversion response all protect eyes



Additional Research

- ADS exposure does not affect reproductive organs
- ADS does not initiate, promote, or co-promote skin cancer



***A significant margin of safety exists between
repel response and potential injury from ADS exposure***



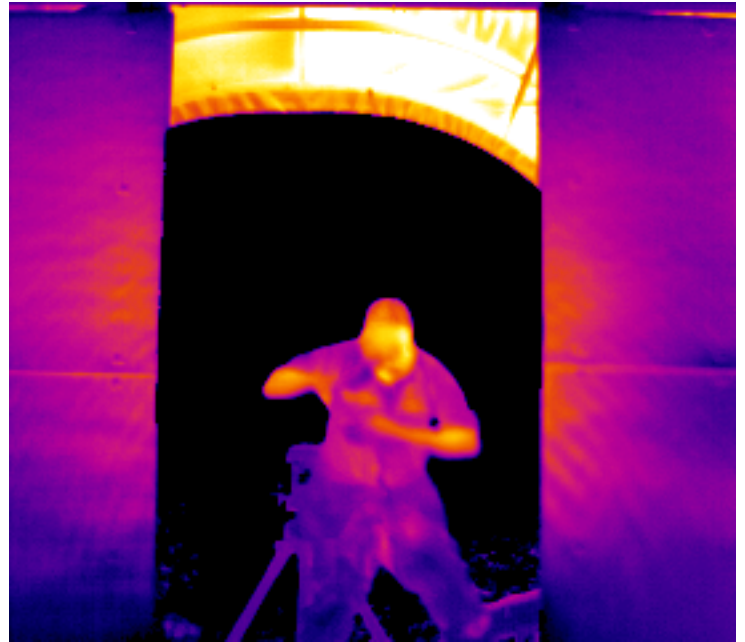


Active Denial System Advanced Concept Technology Demonstration Human Effects



Testing

- Human laboratory testing began in 2001.
- All exposures were done under formal human use protocols and the oversight of the USAF Surgeon General's Office.
- The test program was conducted in strict compliance with the procedures, laws, and federal regulations governing animal and human research.
- All testing, protocols, and results were reviewed by independent panels comprised of recognized academic and medical experts.
- Bio-effects research has undergone six independent reviews.



Infrared camera image.

11,000+ human exposures conducted.
No adverse health effects.



There are no known long-term effects from ADS exposure.



Infrared camera image.

The safety and effectiveness of ADS is supported by more than a decade of scientific research





Legal and Treaty Review

The Active Denial System is Legal and Treaty Compliant

Legal Review

- ADS is a legal weapon
- Office of the Secretary of Defense, Joint Staff, and services legal counsel concur in analysis
- Signed by the Air Force Judge Advocate General (JAG) (System 1 -April 04, System 2 – Mar 08)



**Active Denial System
complies with
International Laws of
Armed Conflict.**



Treaty Compliance Review

- Signed by the Under Secretary of Defense for Acquisition, Technology, and Logistics (System 1 - May 04, System 2 – May 08)

- **ADS meets all treaty requirements**
- **U.S. Central Command JAG concurred that ADS is employable under current Rules Of Engagement**

ADS will provide our warfighters additional options on today's complex battlefields





Active Denial System Assessment Events



ADS has undergone rigorous assessments to determine operational deployment suitability

Extended User Evaluation Oct 06 – Sep 07

The EUE was conducted by the 820th Security Forces Squadron at Moody AFB, Georgia, using the System 1 technology demonstrator. Multiple scenarios and situations were evaluated.

The ADS was exercised twice weekly; almost 1600 shots were fired.

The capability of ADS to move, suppress, or deny personnel access to an area was well documented.

Capabilities and Limitations Assessment Jan 08 – Apr 08

The purpose of the CLA was to determine the suitability and supportability for fielding System 2 in an operational theater.

The ADS was extensively exercised in multiple scenarios and environments, including 91 hours with approximately 1400 shots fired.

Obtained meaningful suitability data (maintainability, deployability, training)



System 1

Results

ADS permits early and long-range engagements to disrupt or disperse as needed. The ADS also provided a means to disrupt “suspicious” persons long enough to permit a quick reaction force to intercept



System 2

Results

ADS provides a non-lethal alternative to the warfighter that is suitable and supportable for deployment in a wide range of operating temperatures

ADS “System 2” is assessed to be fully supportable in theater





ADS Transition to Warfighter



Assure Warfighter needs addressed and fulfilled

- Assist approval process for joint requirements documents
- Capture lessons learned from MUAs, EUE, and ops concepts

Expedite transition of ADS capability to Warfighter

- Advance technologies -- smaller, lighter, more capable, ease of use
- Ensure systems are effective, producible, sustainable
- Coordinate Service developments, collaborate w/ other Gov't agencies
- Facilitate potential joint/Service ADS acquisitions
- Assure joint and Service-specific employment options maintained
- Maritime, Ground, Airborne



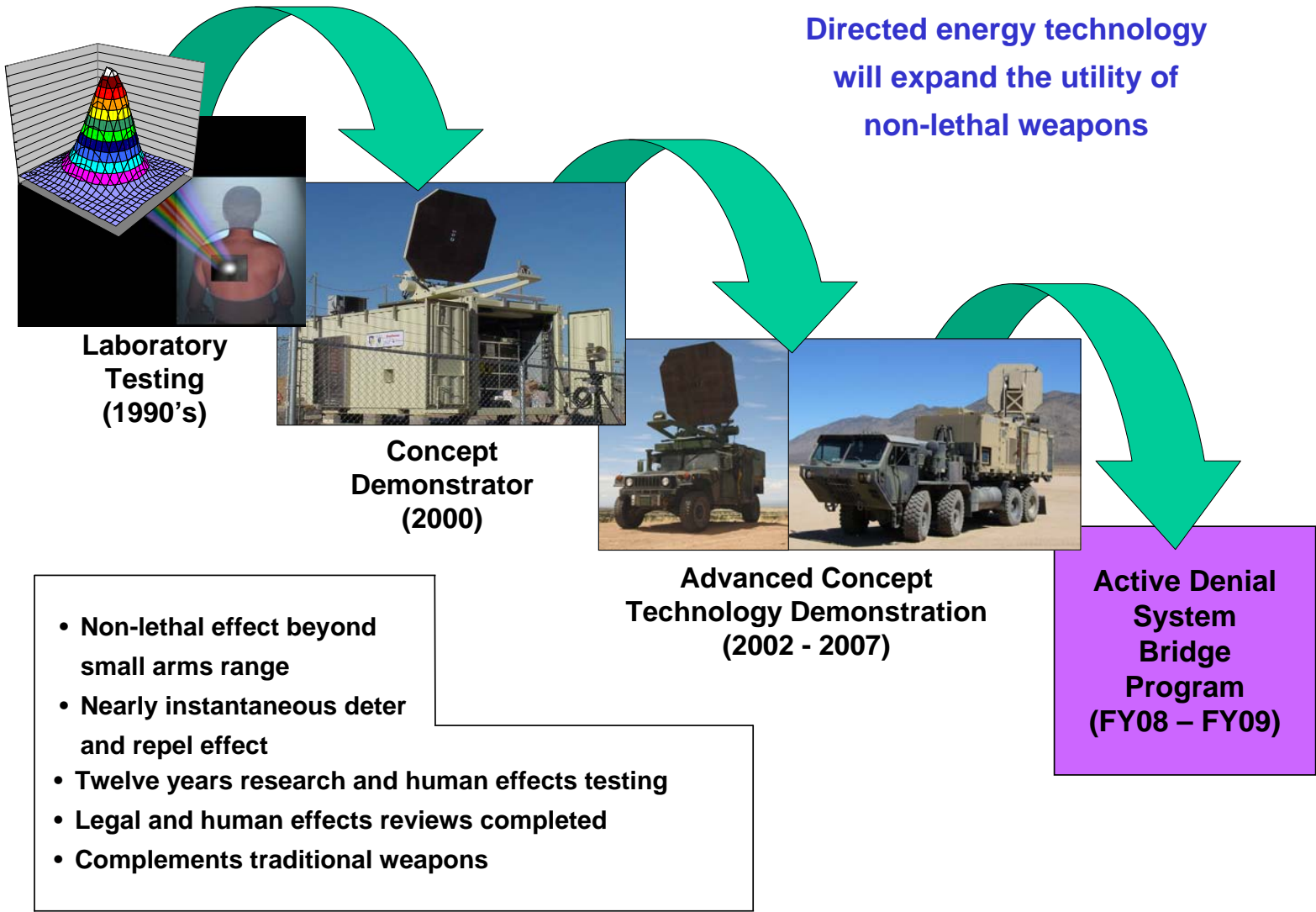
Non-lethal weapons continue to evolve in response to the needs of our warfighters





Meeting the Challenge

Long Range, Rapid, Measured Repel Capability



ADS helps fill a gap in the force continuum



ADS represents a breakthrough non-lethal capability for the warfighter

