



Active Denial Technology Fact Sheet

<http://jnlwp.defense.gov>



Non-lethal weapons provide our operating forces with escalation-of-force options that minimize casualties and collateral damage.

What Is It?

Active Denial Technology produces a focused beam of directed energy to provide our troops a non-lethal option to stop, deter and turn back suspicious individuals with minimal risk of injury. Active Denial Technology is designed to protect the innocent, minimize fatalities and limit collateral damage across the range of military operations.

How Does It Work?

Active Denial Technology uses radio frequency millimeter waves at a frequency of 95 gigahertz. Traveling at the speed of light, the millimeter-wave directed energy engages the subject, penetrating the skin to a depth of only about 1/64th of an inch, or the equivalent of three sheets of paper. The beam produces an intolerable heating sensation, compelling the targeted individual to instinctively move. The sensation immediately ceases when the individual moves out of the beam or when the operator turns off the beam. There is minimal risk of injury due to the shallow energy penetration into the skin at this short wavelength and normal human instinctive reactions.

Military Applications

Active Denial Technology can be used for both force application and force protection missions. Applications include crowd control, patrol and convoy protection, perimeter security and other defensive and offensive operations from both fixed-site or mobile platforms.

Non-lethal directed energy weapons using Active Denial Technology have the potential to provide a non-lethal effects at distances up to and beyond small arms range, providing U.S. military forces with additional time and space to assess the intent of potential adversaries.



Active Denial System 2
Official Department of Defense Image

Current Configurations

From 2002 to 2007, the Active Denial System Advanced Concept Technology Demonstration integrated and packaged Active Denial Technology into two system configurations. System 1, the technology prototype, integrated the technology into a High Mobility Multi-Purpose Wheeled Vehicle. System 2 was built as an armored, containerized system transportable by tactical vehicles. Both systems successfully completed a series of land and maritime-based military utility assessments. During 2014–2015, System 1 was refurbished into a more robust and mobile system transported by a Marine Corps Medium Tactical Vehicle Replacement truck.

Both prototypes are long-range, large spot sizes systems, available for Service or Combatant Command exercises and suitable for operational employment.

Active Denial Technology

Human Effects

Human effects testing on the large-scale version of Active Denial Technology has included more than 13,000 exposures on volunteer subjects both in static demonstrations and in realistic operational assessments. Both laboratory research and full-scale test results demonstrated that there is only a 1/10th of 1% chance of injury from a System 1 or System 2 exposure. Research on the safety and effectiveness of 95 gigahertz millimeter-wave directed energy has been peer reviewed in numerous professional journals and independently reviewed by the Human Effects Advisory Panel. A copy of the panel's report is available at:

http://jnlwp.defense.gov/Portals/50/Documents/Future_No_n-Lethal_Weapons/HEAP.pdf.

Technology Demonstrations

Due to the novel nature of the Active Denial Technology non-lethal effect, the Joint Non-Lethal Weapons Program has had a proactive strategy in raising the awareness of the benefits, safety and effectiveness of this new technology. Several major broadcast and print media reporters have attended technology demonstrations, allowing for first-hand accounts on experiencing the effect of System 1 or 2. Active Denial Technology has been featured on CBS's *60 Minutes*, the Discovery Channel's *Future Weapons* program and the History Channel's *Modern Marvels* program. A U.S. Marines-produced Active Denial Technology video can be viewed here:

<https://www.dvidshub.net/video/302022/with-gear-bringing-heat-with-active-denial-system#.VTbCSCFVhBe>.

Emerging Technology Configurations

While the Active Denial System Advanced Concept Technology Demonstration succeeded in demonstrating a large-scale version of Active Denial Technology, a smaller-scale, more mobile version is also of military interest. Several efforts are underway to identify new millimeter-wave sources that will allow for reduced size, weight and system cost with instant "turn-on" and "shoot-on-the-move" capabilities. A video about one of these new technologies can be seen here:

<https://www.dvidshub.net/video/304622/solid-state-active-denial-technology#.VTbCqSFVhBe>.



Lt. Gen. Ronald L. Bailey, USMC, Deputy Commandant, Plans, Policies, and Operations, HQMC, reacts to experiencing the Active Denial Technology effect.

Official Department of Defense Image

Conceptual next-generation ADT system



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