

Active Denial System (ADS) Environmental Assessment

The Active Denial System will be demonstrated in Tucson, AZ during the time period 13 June through 28 June 2006. The system will be installed at the Open Air Radio Frequency (RF) Test Range operated by Raytheon Missile Systems. The following measures have been instituted to prevent exposure of controlled or uncontrolled personnel working or transiting around the RF exclusion zone for the system.

1. The RF signal transmitted from the ADS antenna is a focused beam of approximately 36-inches in beam width or beam height.
2. Boundaries will be established at each side, behind and down-range of the active system.
3. RF Measurements will be made to ensure RF levels outside of established boundaries are below applicable Permissible Exposure Levels as established by the Federal Communications Commission (FCC) policies associated with RF exposures.
4. A backstop will be installed behind the ADS target to absorb the RF energy and prevent the energy from traveling beyond the boundaries of the RF Test Range.
5. The ADS antenna will be locked on the pointing angle for the target and will not be allowed to traverse in any direction while transmitting.
6. RF Safety Monitors will be stationed outside the boundaries to prevent any personnel from entering the RF exclusion zone during transmission by the system.
7. The RF Test Range Safety Warning Systems (i.e. Red Flashing Lights) will be utilized to warn personnel of operations of the system.
8. Communications with Department of Defense (DoD) Area Frequency Coordinator (AFC) Fort Huachuca and the FCC Regional Coordinator prior to operation of the demonstration to ensure a “*Stop Buzzer*” control mechanism is in place to prevent any interference with other licensed users within the surrounding areas.

Receivers operating within the frequency range of the ADS system will not be affected by the transmission of the ADS by the following environmental controls.

1. When the antenna is being traversed the system operator is aligning the transmit antenna to the intended target by using a video and infrared camera system integrated with the transmit antenna.
2. Once the target has been visually selected the antenna movement is inhibited by placing the “Run/Safe” switch in “Safe”, which prevents any further antenna travel.
3. The RF Safety Monitors verify the antenna is directed to the intended target.
4. After this step the operator is allowed to activate the transmit switch.

Since the ADS is not intended to operate against external receivers and will only transmit against the intended target, no transmitted signal would reach any known authorized receiver operating within this frequency band within the surrounding areas.

System Parameters

Transmitter Data

Output Power	30 kW
Frequency	94.1 GHz
Pulse Width	CW
Rise Time	10 ms

Antenna Transmit Only

Type	Flat Aperture Parabolic Surface (FLAPS) Reflect Array
Manufacturer	Malibu Research Associates
Mfg Nomenclature	95 GHz FLAPS
Polarization	Linear
Design Frequency	95 GHz
Design Bandwidth	+/- 0.5
Width (in)	45
Height (in)	45

Calculated Antenna Parameters

Calculated Gain	62.2
Lambda (in)	0.12
Beam Width Horizontal (deg)	0.14
Beam Width Vertical (deg)	0.14
ERP	49.4 GW

Antenna Scan Characteristics

Type	Mechanical
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Vertical Scan

Max. Elevation	40 deg
Min. Elevation	-45 deg
Scan Rate	25 deg/sec
Scan Acceleration	50 deg/sec ²

Horizontal Scan

Sector Scanned	+/- 180 deg
Scan Rate	100 deg/sec
Scan Acceleration	150 deg/sec ²

Sector Blanking