

AN/ALE-55 Fiber-Optic Towed Decoy



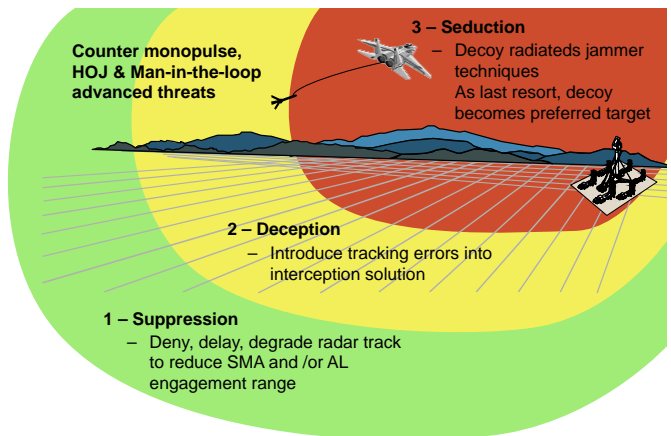
BAE SYSTEMS

Robust RF self-protection

Today's RF threat is growing, not only in numbers, but also in capability. For mission success across a range of hostile environments, self-protection is essential for all aircraft, from fighters to bombers to transports. Robust RF self-protection is available from BAE Systems' AN/ALE-55 fiber-optic towed decoy (FOTD).

Unlike traditional decoys, such as straight-through repeaters, the fiber-optic towed decoy is coherent and works synergistically with an aircraft's onboard electronic warfare (EW) equipment to defeat RF threats. It protects aircraft throughout the threat envelope, delivering three layers of defense.

- 1. Suppression.** During the tracking radar's acquisition phase, the aircraft's EW system uses the FOTD to emit jamming techniques that suppress the radar's ability to acquire and track the target.
- 2. Deception.** If the target tracking radar achieves successful target track in spite of suppression techniques, deception is the next layer of response. Once the radar emissions are analyzed, the system determines optimum jamming techniques to break aircraft track. If more than one radar threat is detected, the system can respond with simultaneous transmission of multiple jamming techniques.
- 3. Seduction** is the third layer of protection. If an RF missile is launched, the FOTD can break the missile's track of the aircraft or lure the missile away from the target aircraft by itself becoming the target.



Benefits

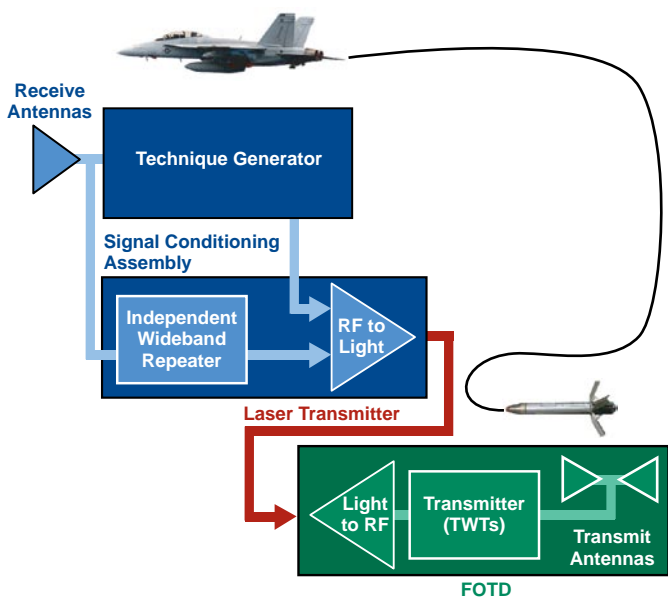
- Reliable protection against advanced RF threats
- High-power coherent jamming
- Rapid launch
- Stable flight across wide speed and altitude variations
- Suitable for fighter, bomber and transport aircraft
- Proven performance
- Interfaces with multiple configurations
- Upgradeable for new threats
- Affordable
- In production



Reel out / Reel in option. *In addition to the standard “fast deploy expendable” decoy, BAE Systems is working to develop a “Reel out / Reel in” deployment system for fighter aircraft. Based on a flight-test-proven design for C-130 aircraft, this option replaces expendable decoys with decoys that can be used again and again. This not only means the decoy will be there when it’s needed, but it also lowers the system’s life-cycle costs.*

AN/ALE-55 components

The AN/ALE-55 subsystem consists of an on-board signal conditioning assembly and the FOTD. The signal conditioning assembly converts RF frequencies to light for transfer through the fiber-optic line. The system has two modes. In the primary mode, the onboard EW system detects and analyzes a threat, determines the appropriate response, and then sends that response down the line to the FOTD for transmission. An alternative, back-up mode is an independent repeater, where the threat signal is detected, modulated, and then sent down the line to the FOTD. The system can interface with any on board techniques generator, and can convert any technique. This broad capability enables the system to be installed on a variety of aircraft and to handle both today's range of techniques and any developed to defeat future threats.



System features

- Jamming across a broad frequency range to defeat advanced RF threats.
- Dual high powered Traveling Wave Tubes generate enough power to protect a variety of platforms from fighters to large airlift aircraft.
- Its efficient broad-beam antennas optimize the jamming signal. The antennas employ integral linearization, using detectors built into the antennas, to assure the FOTD operates at optimum power level.
- FOTD was designed with variable drag fins for aerodynamic stability. The fins open and close in response to air pressure and speed. This ensures stable flight under wide altitude and speed variations, resulting in highly reliable jamming performance over a wide flight envelope while minimizing tension on the fiber-optic line.
- Fighter versions of the AN/ALE-55 include a highly robust signal and towline that has been tested on the F/A-18E/F to meet the required deployment and tow envelope.
- Uses a state-of-the-art active braking system to maximize system response time and meet the demanding requirements for defeating advanced RF threats. Unlike centrifugal braking, this active braking system enables extremely fast and precise decoy deployment. This means faster deployment speeds, as well as braking options at different lengths. Faster deployment means a second FOTD can be quickly deployed if necessary.

Ready now

The AN/ALE-55 has been extensively flight-tested on a variety of aircraft, demonstrating robust aerodynamic performance and its ability to jam threats. The AN/ALE-55 is currently in low rate production and scheduled to enter full-rate production in 2007.



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