

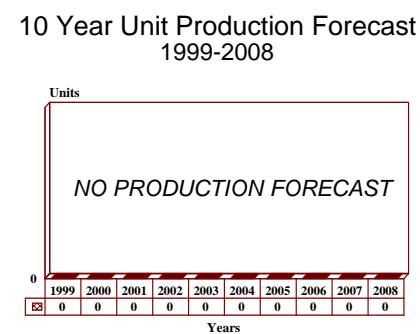
ARCHIVED REPORT

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ALQ-157(V) - Archived 5/2000

Outlook

- Ongoing logistics support continues
- DIRCM systems may replace many units in the future



Orientation

Description. Infrared countermeasures system.

Sponsor

US Navy

Naval Air Systems Command

NAVAIR HQ

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Contractors

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Status. In production with ongoing logistics support.

Total Produced. Through 1998, an estimated 550 units had been produced.

Application. CH-53, CH-46E, CH-47, SH-3, P-3, E-2C, C-130, Lynx. Fielded mostly on US DoD large helicopters and some fixed-wing aircraft.

Price Range. Approximately US\$150,000.

Technical Data

	<u>Metric</u>	<u>US</u>
Dimensions		
Transmitter:	39.37 x 48.26 cm	15.5 x 19 in
Power Supply:	26.67 x 21.59 x 45.72 cm	10.5 x 8.5 x 18 in
Weight:	99.88 kg	220 lb
Configuration:	Hardmounted to aircraft	



Coverage:	360°
Power Rqmnt:	AC - 115V, 400 Hz main power DC - 28V, 5V panel lights and control
MTBF:	System - 215 hr Lamp - 330 hr
MTTR: System	30 min (O-level) 60 min (I-level)
Units:	External transmitter units (2) Internal control power supply, electromagnetic interference filter assembly, control indicator

Design Features. The ALQ-157(V) is a microprocessor-based, programmable infrared countermeasures (IRCM) system. The microprocessor also directs all operational sequences of the system. It has been upgraded from a 2 kW to 4 kW IR source to provide higher power jamming signals and increased reliability. This may permit some aircraft to operate without encumbering engine infrared suppressors that can restrict flight performance under hot, humid conditions.

The ALQ-157(V) provides full-time 360° protection by mounting one transmitter on each side of the platform. On the CH-53, units are mounted on the landing gear sponson just above the drop tank. On the CH-46, a transmitter is located on each side of the rear rotor/engine mount. It also features easy accessibility to all components through a modular design concept, continuous and automatic end-to-end self-testing, and

ambient air cooling. Special maintenance tools and equipment are not required. A simple mounting system makes it possible to add systems to helicopters almost on an as-needed basis, rather than mounting ALQ-157(V)s on every airframe.

Characteristics. The ALQ-157(V) IRCM jamming signal is selected from up to five jamming codes, each with wide frequency agility ranges which can be preprogrammed into the microprocessor. As new threats are defined, additional codes can be preprogrammed. It provides 360° coverage.

The IRCM generates an undulating, variable IR signal that puts false signals into a missile IR-seeker head, causing the missile's control system to generate false steering signals, which in turn causes the missile to steer away from the protected aircraft.

Variants/Upgrades

ALQ-157(V)1. System for the CH-46.

ALQ-57(V)2. System for the CH-7 and CH-3.

Matador/Challenger. Components of the ALQ-157(V) serve as the basis for two other Lockheed Martin infrared countermeasures (IRCM) products. One is Matador, an IRCM designed for large, multi-engine

transports such as the Boeing 747 or the McDonnell Douglas DC-10. The Matador transmitters are usually installed as aft-looking units under the wings or near the tail. The other, a new, lightweight variant called Challenger, is designed primarily for helicopter applications such as the Sikorsky UH-60, Westland Lynx (in use) or Bell UH-1.

Program Review

Background. In the mid-1970s, the threat to large helicopters from infrared guided missiles prompted the Naval Air Systems Command to initiate the development of a lightweight infrared countermeasures set specifically for such aircraft. Xerox was chosen to develop the system, and the first prototypes were delivered in early 1977.

The main focus of the test program was to determine the number of countermeasures units that would be needed

to protect CH-46 and CH-53 helicopters. Most of the test program was completed by early 1979, and in August a contract was awarded to Xerox for the final 12 prototypes that would be used for service evaluation. Approval for use was given in March 1983.

Loral acquired Xerox's aerospace and defense operations in July 1983 and was selected to produce the initial systems for the Navy in February 1984.

The ALQ-157(V) found a significant role in Bosnia in July 1992. That year transport aircraft from 20 air forces, including an RAF Hercules fleet, were flown into Sarajevo on behalf of the United Nations High Commissioner for Refugees (UNHCR). The RAF Hercules were equipped with a self-defense package that included the ALQ-157(V) IR jammer along with the Loral (now Lockheed Martin) AAR-47(V) MAWS (missile approach warning system), the Tracor

ALE-40(V) chaff/flare dispensers and the Racal MIR-2 Orange Blossom ESM (electronic support measures). The self-defense package theoretically should have been unnecessary, as all warring factions had agreed that these UNHCR aircraft would be off limits to weapons. However, the aircraft were soon targeted, an RAF Hercules recording the first radar threat of the Bosnian conflict.

In early 1996, Lockheed Martin acquired Loral.

Funding

Funding is from O&M and Common ECM Equipment funding lines.

Recent Contracts

There are no recent contracts over US\$ 5 million.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1975	Development initiated
Feb	1977	First prototypes delivered
Aug	1979	OT&E and service evaluation prototypes (12) contract awarded
Mar	1983	Approval for service use given
Jul	1983	Loral acquires defense/aerospace operations of Xerox
Feb	1984	Loral awarded production contract
Sep	1984	First production deliveries
	1985	First foreign sales of ALQ-157(V) (both airborne and shipborne versions for naval patrol boats), possibly to Saudi Arabia
Mid	1988	Full-scale production begins
	1998	Estimated end of production

Worldwide Distribution

In addition to **US** airframes, the ALQ-157 is carried by **British**, **Saudi Arabian** and other **Middle Eastern** users.

Forecast Rationale

While the need for protection from IR-guided missiles is proven, the ALQ-157(V) has never been fielded in large numbers. Applications tended to be for large helicopters. Foreign sales have been limited as well since other IRCM systems have been available. National Guard helicopters were among the latest to receive sizable orders of units. In 1994 it was selected by Lockheed to serve aboard the C-130J Hercules aircraft. Specific variants of aircraft receiving the sys-

tem can vary, although Special Operations rotary-wing platforms are generally equipped with this and other protective systems. However, details on which helicopters actually carry the system tend to be closely held.

Newer technology IRCMs have been developed and directed jamming systems are being perfected and fielded. They are now the preferred IRCM solution. Spares and repair support for the ALQ-157 will continue as long as systems are operational.

Ten-Year Outlook

No further production expected.