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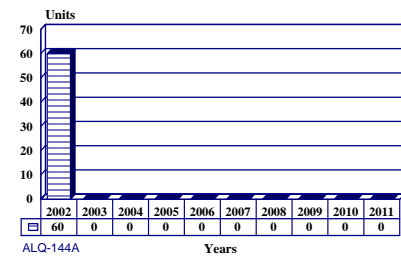
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ALQ-144(V) – Archive 05/2003

Outlook

- In production for FMS
- Logistics support continues
- Upgraded models ordered for Navy and Marine helicopters
- To be replaced by ALQ-212(V) ATIRCM/CMWS for many US applications

10 Year Unit Production Forecast
2002 - 2011



Orientation

Description. Infrared countermeasures (IRCM) set.

Status. In production, ongoing logistics support.

Sponsor

US Army
 Army Communications-Electronics Command
 (CECOM)
 AMSEL-IO
 Ft. Monmouth, New Jersey (NJ) 07703-5000
 USA
 Tel: +1 201 532 2534
 Web site: <http://www.monmouth.army.mil>

Total Produced. Through 2001, an estimated 6,706 ALQ-144(V) systems were produced. Most of those purchased by the US have been updated to the ALQ-144A standard.

Contractors

BAE Systems – North America
 Information and Electronic Warfare Systems
 95 Canal Street
 Nashua, New Hampshire (NH) 06060
 USA
 Tel: +1 603 885 4321
 Fax: +1 603 885 3655
 Web site: <http://www.baesystems.com>
 (Manufacturer of ALQ-144(V)1/3;
 Prime for ALQ-144A(V)1/3)

Application. (Army) AH-1S, AH-64A, EH-1H, EH-60A, UH-1H, UH-60A; (Marine Corps) AH-1J/T/W, OV-10D; and (Navy) HH-3A. The ALQ-144(V) has also been certified for other light and medium helicopters and fixed-wing aircraft such as the OH-58, A-109, A129, Tiger, Lynx, and Super Puma.

Price Range. Approximately US\$30,000 to US\$43,000 for the ALQ-144A.

Price is based on an analysis of contracting data and other available cost information, and a comparison with equivalent items. It represents the best-guess price of a typical system. Individual acquisitions may vary, depending on program factors.

Technical Data

	<u>Metric</u>	<u>US</u>
Dimensions		
Diameter	24.13 cm	9.5 in

	<u>Metric</u>	<u>US</u>
Height	33.65 cm	13.25 in
Weight		
Transmitter	12.71 kg	28 lb
Operator Control Unit	0.45 kg	1 lb
Characteristics		
Configuration	Hard-mounted to aircraft	
Coverage	360°	
Power	1,200 watts nominal, 28 Vdc	
MTBF	300 hrs (demonstrated)	
	Qualified to MIL-STD-810C	

Design Features. The ALQ-144(V)1/3 is an infrared countermeasures (IRCM) set designed to protect helicopters against portable infrared-seeking missiles. The active part of the system contains an electrically heated cylindrical ceramic block. Sometimes referred to as a HOT BRICK system, it radiates modulated IR energy 360 degrees around the aircraft.

The system is mounted close to the engine exhaust. Because the radiant energy emitted by the ALQ-144(V) is similar to that of the engine, operators can modulate the outputs of the ALQ-144(V) to confuse a missile's guidance system so the missile is steered away and/or triggered to detonate prematurely. Larger helicopters and fixed-wing aircraft are protected with multiple installations. The ALQ-144(V) may be fitted to either the top or bottom of the fuselage, in single- or dual-phase locked configurations.

Characteristics. Like any deceptive countermeasure, the ALQ-144(V) produces an output that resembles the signal an attacking missile receives from its target. The signal decoys the seeker head and creates false guidance commands in the missile, steering the weapon away from its intended target and causing it to explode harmlessly.

The conical-scan steering system typical of some smaller, simpler heat-seeking missiles is particularly vulnerable to such modulated deceptive inputs. But since these missiles tend to be the most significant threat to aircraft in contingency conflicts, the ALQ-144(V) and similar IRCM systems can be very effective in protecting particularly vulnerable helicopters and slow-moving, fixed-wing aircraft.

Variants/Upgrades

ALQ-144(V)1. Has a single control unit. This is considered the standard system.

ALQ-144(V)3. Has a dual control unit and is used by the US.

ALQ-144(VE). The export variant. The British procured 185 ALQ-144(VE)2s as part of their Desert Storm requirement.

ALQ-144(V)5. This version features amplified protection with a dual phase-locked version of the ALQ-144(V)1, delivered with a jam code selector switch on the Operator Control Unit.

ALQ-144A. More effective against the electro-optical guidance system in the newer heat-seeking missiles. It

has growth potential for staying current with the evolving threat. It is form-fit and test-compatible to the other ALQ-144(V)s.

ALQ-144A+. This features amplified protection with higher power and is form-fit to the ALQ-144(V)1 or (V)3.

ALQ-144A+(V)5. This version has amplified protection with the dual phase-locked version of the ALQ-144A+.

The dual phase-locked systems can be used for protection of larger-signature helicopters.

Program Review

Background. The electrically heated ALQ-144(V) and fuel-fired ALQ-147(V) IRCM systems were developed

in the early 1970s as the IR-seeking missile threat expanded to include shoulder-fired anti-aircraft missiles

such as the Soviet SA.7 Grail and SA.9 Gaskin. The ALQ-144(V) has been standard fit on most US Army helicopters such as the Bell UH-1, Sikorsky UH-60, Bell AH-1J/S, and McDonnell Douglas Helicopter AH-64, as well as on the USMC Bell UH-1N and AH-1T/W helicopters and the Rockwell OV-10. The ALQ-144(V) was certified for other light and medium helicopters and fixed-wing aircraft such as the Bell OH-58 and Agusta A129 Mangusta.

The ALQ-144A program was scrapped in 1986, but quickly reactivated in 1987 to fill an Army order. The Army had a total requirement for 3,262 ALQ-144As, in addition to the 1,800+ ALQ-144(V)1/3s on order at that time. Originally, plans called for upgrading about 1,700 ALQ-144(V)s to ALQ-144As. In February 1991, Sanders was awarded US\$15.4 million for production of 647 modification kits to convert existing ALQ-144(V)s to the new standard. The Navy procured the ALQ-144(V) for use on its HH-3A rescue helicopters, and the Marine Corps has used the system on its OV-10A/Bs, AH-1J/T Cobras, and UH-1Ns.

In October 1991, the Navy awarded a US\$18 million contract to Sanders, a Lockheed Martin Company, for the development of the tri-service Advanced Threat IR Countermeasures/Common Missile Warning System (ATIRCM/CMWS). This will be a missile warning and directable, laser-based countermeasure system for installation on US Army, US Navy, and US Air Force aircraft. Production approval was planned for 1999, with an IOC projected for 2000.

Although a series of planned procurement announcements continued, a *Commerce Business Daily* report in April 1999 announced a pending five-year Indefinite Delivery/Indefinite Quantity (ID/IQ) contract RFP for ALQ-144A(V) and ALQ-144(V) spares.

A May 1999 announcement by Sanders revealed the award of an ID/IQ contract from Army CECOM for ALQ-144A(V)1/3/5 sets with a not-to-exceed value of US\$30 million. The initial phase of the contract was for 133 units at a value of US\$4.8 million. The contract could be for up to 400 systems, and includes provisions for ALM-178A Test Sets, engineering support, open and closed loop simulation, aircraft installation, training, spares, and repair services.

In May 2001, BAE Systems began delivery of 240 upgraded ALQ-144A Countermeasures Sets to be mounted primarily on US Navy and US Marine AH-1 and UH-1 helicopters. Deliveries were to be completed by December 2001, with options for 60 additional units. Value of the effort could run to US\$7 million.

The ATIRCM/CMWS will replace the ALQ-144(V) for most active duty unit applications. Program delays, mostly due to developmental problems with the Common Missile Warning System (CMWS), continue.

In both the FY2002 and draft FY2003 National Guard and Reserve Equipment Lists, Army officials cited procuring more ALQ-144(V) survivability equipment as a must.

Funding

Funding comes from Operations & Maintenance as well as platform accounts.

Recent Contracts

(Contracts over \$5 million.)

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Sanders	30.0	Feb 1999 – FFP contract (appropriate number and dollar value to be issued with each delivery order) with an estimated not-to-exceed cumulative total of US\$30,000,000 for the acquisition of 400 ALQ-144A(V)1/3 or ALQ-144(V)5 IRCM sets, 100 ALM-178 test sets, support equipment, essential spare parts, maintenance training, and engineering/technical field training for FMS to Taiwan, Israel, and the Netherlands. Completed February 2002. (DAAB07-99-D-B605)
Sanders	28.1	May 2000 – FFP, ID/IQ contract for various spares for an estimated 6,366 ALQ-144A(V) and ALQ-144V Countermeasures Sets over a five year period. To be completed May 2005. (DAAB07-00-D-B034)

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1979	Development begun
Mar	1981	First production units delivered
	1984	Deliveries for Marine OV-10s begun
	1986	1,300 ALQ-144(V)s delivered to date, ALQ-144A scrapped
	1987	ALQ-144A program reactivated
Nov	1990	ALQ-144A enters production
Mar	1993	Sanders delivers 2,000th ALQ-144A to the US Army
Feb	1999	FMS contract for 400 units
	2000	Planned IOC of replacement ATIRCM/CMWS
May	2001	USN and USMC deliveries of ALQ-144A begun
Dec	2001	First deliveries of USN and USMC ALQ-144As completed
Feb	2002	End of FMS production contract

Worldwide Distribution

The ALQ-144(V) is deployed by the following identified users:

Israel. Ordered units FMS in 1999

Netherlands. Ordered units FMS in 1999

Jordan. Air Force: AH-1S

Pakistan. Army: AH-1S, UH-1B/H

Taiwan. Ordered units FMS in 1999

United Kingdom. Various helicopters and aircraft

United States. Army: AH-1S, AH-64A, EH-1H, EH-60A, UH-1H, UH-60A; Marine Corps: AH-1J/T/W, OV-10D; Navy: HH-3A

Forecast Rationale

IR countermeasures is a significant electronic warfare market since protection from the heat-seeking missile threat is a top priority. Several manufacturers have developed systems that compete with HOT BRICK active jammers, such as the ALQ-144(V), and newer techniques and capabilities, especially directable IR jammers, are beginning to capture the market.

The Army still equips its helicopters with ALQ-144(V)s to ensure that they are protected until the more advanced directable countermeasures are operational. Reports indicate that the systems were deemed effective during combat operations in the Persian Gulf and Balkans.

The ALQ-144(V) should see a long, active life in worldwide helicopter fleets, particularly in terms of ongoing support, production for new platforms, and replacements for high-use equipment.

BAE Systems–North America is developing the ALQ-212(V) Advanced Threat Infrared Countermea-

sure/Common Missile Warning System (ATIRCM/CMWS) to replace many of the ALQ-144A(V)s now in service on Army scout and attack helicopters and Special Electronic Mission Aircraft (SEMA). There have been program problems and changes, the latest of which has been the termination of the program by the Army and transfer of the effort to USSOCOM.

The ATIRCM system takes advantage of advances in warning systems, control circuits, and lasers. Using a directable laser source to focus a narrow beam of energy on the missile seeker head, the jammer destroys or interferes with the missile's guidance system. The ATIRCM will be more effective than the ALQ-144(V) because its lower power transmission, concentrated in a more confined angle, reduces the amount of transmitter power needed for 360-degree protection.

The large number of ALQ-144(V) systems in use worldwide ensures a long-term, active spare and repair parts requirement.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	Thru 01	<u>High Confidence Level</u>				<u>Good Confidence Level</u>				<u>Speculative</u>		Total 02-11	
			02	03	04	05	06	07	08	09	10	11		
ALQ-144(V)	Prior Prod'n:	6466	0	0	0	0	0	0	0	0	0	0	0	0
ALQ-144A	VARIOUS (USN/USMC)	240	60	0	0	0	0	0	0	0	0	0	0	60
Total Production		6706	60	0	0	0	0	0	0	0	0	0	0	60