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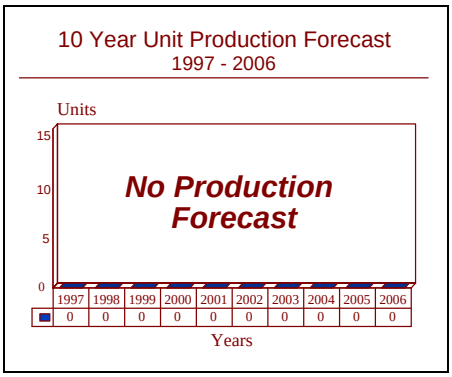
VLQ-8A IR Countermeasures Set - Archived 11/98

Outlook

- Existing stockpiles sufficient for future needs
- Used in combination with VLQ-6 multithreat jammer
- IR technology playing lesser role in future ATGM defense
- No further orders expected
- This report will be dropped next year, 1998.



Orientation

Description. Anti-Tank IR Missile Countermeasure Devices.

Sponsors

US Army
Communications Electronics Command (CECOM)
Night Vision and Electromagnetic Sensors Directorate
Survivability Equipment Division
Ft. Monmouth, New Jersey (NJ)
USA

Tank Automotive Command (TACOM)
PM for Survivability Systems
Warren, Michigan (MI)
USA

Contractor

Sanders, a Lockheed Martin Company
65 Spit Brook Road
Nashua, New Hampshire (NH) 03061-0868
USA
Tel: +1 603 885 4321
Fax: +1 603 885 3655

Status. Current production contracts complete. Operationally qualified on the US Army M1 Abrams and M2/M3 Bradley fighting vehicles.

Total Produced. More than 1,000 VLQ-8A units. All contracted production for the US Army was fulfilled in 1991.

Application. M1 Abrams series MBTs and M2/M3 Bradley series AFVs, in the US Army.

Price Range. Unit cost of the VLQ-8A is estimated at US$18,500.

Technical Data

Specifications	**Metric**	**US**
Dimensions (l/w/h):	40.6 x 26.7 x 25.4 cm	16 x 10.5 x 10 in
Weight:	11.4 kg	25 lb
Field of View:	Unknown	

Design Features. The VLQ-8A infrared missile countermeasure device is an active electro-optical system designed to provide armored vehicles with a self-defense capability against anti-tank guided missile (ATGM) threats that employ IR-guidance technology. The system comprises a small, lightweight but robust transmitter with an integral control unit. That in turn contains both the operator signal and a built-in test circuitry. It is believed that this particular system transmits or "flashes" a rapid series of signals in the IR frequency spectrum that interferes not with the missile itself but the ATGM launcher's IR tracking loop.

A large percentage of current-generation ATGMs employ semi-automatic command to line-of-sight guidance technology. Flight control is achieved through micro-thin wires that spool out behind the missile as it flies to the target and are connected to the launcher. An IR-source in the form of a flare is located at the back of the missile, enabling the optical sensor in the launcher sighting unit to detect the missile's position relative to the line-of-sight. The sighting unit guidance computer analyzes the line-of-sight offset between the missile and target, and feeds command signals back to the ATGM via the trailing control wires. The infantryman operating the launcher directs the ATGM to its target by keeping the target within the crosshairs of his optical sight.

By saturating the launcher's seeker with "bursts" of IR energy the VLQ-8A disrupts the ATGM operator's ability to acquire and control the flight of the ATGM to the target. The device is normally mounted at the front of the vehicle atop the turret structure, in order to maximize the field of view and allow it to face forward in the direction that the turret and main gun are traversed. The US Army uses the VLQ-8A in conjunction with the AN/VLQ-6 multithreat jammer on its armored-vehicle applications.

Variants/Upgrades

This is the only known production configuration.

Program Review

Background. In preparing to mount a ground offensive as part of its strategy to secure the separation of Iraq from Kuwait during the Second Gulf War (Operation Desert Storm, January to March, 1991), the US Army moved to expedite development of new, as yet unproven, technologies to enhance the survivability of its armored units. The level of ballistic protection enjoyed by the M1A1 Abrams and the British Challenger was rather the exception among the Allied mechanized vehicles.

In contrast, the bulk of the infantry fighting vehicles, self-propelled artillery and support vehicles relied upon much lighter forms of armor protection. In some cases, for example with the US Army M2/M3 Bradley and the US Marine Corps AAV7A1 vehicles, this armor was augmented by either reactive or passive armor arrays bolted on the exterior and spall liners that had been added to the crew compartment.

While the development effort for perfecting lighter and more resilient armor packages is ongoing, there is a limit to how much weight can be added to a combat vehicle without taking a toll on the mobility and fuel consumption of the vehicle. By the time Desert Storm was mounted, the lethality of the anti-tank guided missile (ATGM) had evolved to the point where the survivability focus moved away from providing sufficient protection to survive an ATGM hit, to defeating or negating the wire-guided ATGM before it struck its target. To this end, it become apparent that EO countermeasure technologies long employed by the combat aviation community could be exploited to increase the survivability of ground vehicles as well.

The US Army awarded Sanders a contract valued at US$17.7 for 1000 VLQ-8As in late January 1991. At the same time, it is noted, Loral was awarded a US$25.3 million contract for the development/production of

1,377 VLQ-6 multithreat jammers, also used on AFVs against ATGMs. Both contractors delivered limited numbers of their development models to the Gulf for field trials during the ground phase of Desert Storm. Sanders and Loral designed, built, tested and delivered their respective products expeditiously, each fulfilling their contracts by the end of 1991.

Funding

Current procurement is complete. No additional procurement or R&D funding is identified for FY97.

Recent Contracts

Contractor	Award ($ millions)	Date/Description
Lockheed-Sanders	17.7	Jan 1991 – FFP contract for 1,000 missile countermeasure devices. (DAAB07-91-C-J514)

Timetable

Jan	1991	Development/production contract awarded to Sanders for IR Countermeasures Set
Oct	1991	Production of 1,000 VLQ-8A completed

Worldwide Distribution

US: The VLQ-8A IR countermeasures set is exclusive to the US Army.

Forecast Rationale

The Desert Shield/Desert Storm spurred the production of electronic countermeasure (ECM) devices for armored vehicles designed to negate the infrared-controlled/wire-guided ATGMs. A few developmental units were reportedly produced in time to see field service during Desert Storm. Based on that relatively limited experience, the VLQ-8A, in combination with the VLQ-6 jammer, presently is considered capable of handling the current-generation ATGMs whose launchers employ IR guidance techniques.

It is generally acknowledged, however, that neither version is able to counter every missile type in the market and that the threat environment is dynamic, i.e., the sophistication of the anti-tank threat employing IR and other technologies is continually growing. Furthermore, both systems are operationally constrained in that they require manual operation and have fields-of-regard which are dependent on turret orientation.

Consequently, the US Army and Marine Corps are supporting advanced countermeasure development efforts for armored vehicles as a means of improving vehicle survivability without impacting vehicle weight and mobility. US Army attention has subsequently turned to the preparation of performance criteria for a new- generation system.

Currently referred to as the ATGM Defense System (ADS), the proposed new system will be automatic, able to defeat a larger number of threats, and be able to detect threat weapons and use IR jamming to defeat all incoming command-guided ATGMs, including the semi-automatic line-of-sight weapons that are now being fielded.

Provision of a threat discrimination capability is a high priority, especially necessary for minimizing false detection caused by battlefield clutter such as weapons flashes. Relatively mature technologies are being explored due to the focus on low cost and near-term fielding.

In considering the place of wire-guided missile threats in the hierarchy of the expanding threat technology environment, it is important to understand that whereas the wire-guided missile is currently the most common

form of guided anti-tank munition, it is being increasingly replaced by munitions that are laser-guided, TV-guided (imaging IR), and millimeter-wave radar-guided.

Both US and foreign missile manufacturers are developing next-generation systems against vehicles that will prove difficult to counter with existing IR countermeasure devices. The fielding of a true "fire and forget" anti-tank missile that employs a dual-seeker will be a major challenge to the countermeasures development community still before the turn of the century. The dual seeker function enables the anti-tank missile to still acquire its target by using a second guidance method, even if one is negated by the target's countermeasures.

In order to counter wireless electro-optical fire control devices, including ATGM trackers, the US Army planned to field the VLQ-7 STINGRAY laser countermeasures system on selected Bradley fighting vehicles in the mid to late 1990s. In order to obtain complete coverage of the advanced threat spectrum, a radar warning receiver (RWR), as well as a millimeter-wave radar jammer, are currently in development for future armored vehicles. It should be noted that as a complement to countermeasure devices, the US Army is also investigating low observable technologies that will decrease armored vehicle detection by reducing the various signatures of the vehicle — i.e., visible, IR, RF, millimeter-wave and acoustic emissions.

The program forecast for VLQ-8A remains limited. Production for the original contract is complete and a large inventory is presumed to exist. The system does fill a near-term niche requirement but a changing, increasingly diverse and sophisticated threat environment is acknowledged with corresponding advanced countermeasures developments being in the pipeline.

Therefore, barring an unforeseen large-scale, near-term engagement, which would deplete the existing supply, additional future production is not anticipated for the VLQ-8A, or the VLQ-6 jammer used in conjunction with it on armored vehicle applications.

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