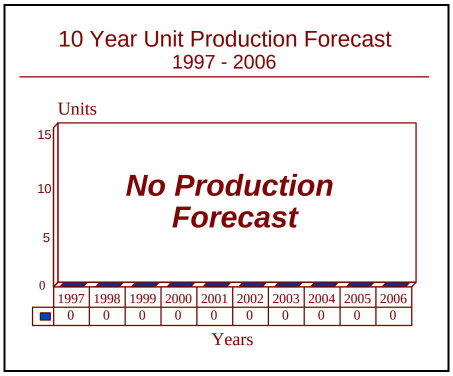
VLQ-6 ATGM Jammer - Archived 11/98

Outlook

- Production completed
- Large stockpile exists that should satisfy replacement demand
- Units installed on Bradley Fighting Vehicle during Operation Desert Storm
- Growing technologically obsolete vis-à-vis newest ATGMs
- This report will be dropped next year, 1998.



Orientation

Description. Multithreat jammer for armored fighting vehicles, against guided missiles.

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
Lockheed Martin Electronics & Missiles
5600 Sand Lake Road
Orlando, Florida (FL) 32819-8907
USA
Tel: +1 407 356 2000

Status. In service.

Total Produced. An estimated 2,600 VLQ-6 units had been produced through 1991. Production of existing contracts was completed at that time.

Application. A wide range of tracked and wheeled vehicles, as well as armored fighting vehicles (AFVs); primary platform M2/M3 Bradley AFVs.

Price Range. Unit cost of the VLQ-6 is estimated at US$17,000.

Technical Data

Specifications	**Metric**	**US**
Dimensions (h/w/d):	320 x 457 x 356 mm	12.5 x 18 x 14 in
Weight (w/o armor):	12.7 kg	28 lb
Field of View:	40º horizontal, 12º vertical	
Power:	600 W	
Voltage:	28 V DC	

Design Features. The VLQ-6 missile countermeasure device (MCD) is an active electro-optical countermeasure system designed to provide armored vehicles with a self-defense capability against a wide range of ground- or air-launched anti-tank guided missile (ATGM) threats.

A large percentage of current-generation ATGMs employ semi-automatic command to line-of-sight guidance technology. Flight control is achieved through microscopically thin wires connected to the launcher that spool out behind the missile as it flies to the target. An infra-red source, in the form of a flare, is located at the back of the missile and it enables 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 missile control wires. The infantryman operating the launcher directs the ATGM to its target by keeping the target within the crosshairs of the optical sight. The multithreat jammer disrupts the enemy ATGM operator's ability to acquire and control the missile’s flight to the intended target.

The rugged and cost-effective VLQ-6 is normally mounted on the roof of the vehicle atop the turret structure, in order to maximize the field of view and allow the device to face the direction that the turret and main gun are traversed.

Operating directly off the vehicle’s 28-Volt DC power, the system can used either in an open loop stand-alone mode or it can be integrated with other vehicle warning and/or self-protection equipment. In the standard version, the display and control box are normally positioned near the vehicle commander.

Variants/Upgrades

The preceding version of the same device was physically larger and weighed almost twice as much (305 x 457 x 508 mm; 20.4 kg). One or more VLQ-6 jammers can be configured to operate as a group, to cover the maximum obtainable field of vision for the theater of operations as needed.

As an option, the roof-mounted system can be provided with an optional gimbal system and external armor plate, to allow slewing in response to threat warning sensor inputs.

An interface connector allows remote operation and/or activation by threat warning sensors.

Another option offered is a pop-up optical assembly for enhanced survivability.

The larger point is, however, the availability of an entirely upgraded version of the system, now under development. The new system will be all-automatic and able to counter a number of threats, using IR jamming technology.

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 the exception among 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 Corp AAV7A1 vehicles, this armor was augmented by either reactive or passive armor arrays bolted on the exterior and spall liners 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 technology long employed by the combat aviation community could be exploited to increase the survivability of ground vehicles.

The Army awarded Loral a US$25.3 million contract for the development/production of 1,377 VLQ-6s in late January 1991. Loral delivered limited numbers of development models to the Gulf for field trials during the ground phase of Desert Storm. It was able to design, build, test and deliver the product in an expeditious manner, completing the contract by the fall of 1991.

Funding

The product was developed as a private venture by Loral Electro-Optical Systems. Current procurement is considered complete, and no additional procurement or R&D funding is identified for FY97.

Recent Contracts

Contractor	Award ($ millions)	Date/Description
Loral Corp	25.3	Jan 1991 – FFP contract for 1,377 missile countermeasure devices. (DAAB07-91-C-J513). It is believed, however, that eventually the total order reached about 2,600 units.

Timetable

Jan	1991	Development/production contract awarded to Loral for MCDs
Aug	1991	Production of 1,377 VLQ-6 completed

Worldwide Distribution

US: The VLQ-6 ATGM jammer is exclusive to the US Army.

Forecast Rationale

The Gulf War spurred the production of electronic countermeasure devices for armored vehicles designed to negate the infrared controlled/wire-guided anti-tank guided missiles (ATGMs). A few developmental units were reportedly produced in time to see field service during Desert Storm. As result of this limited experience base, the ALQ-6 and its IR counterpart, the ALQ-8A, at present are considered capable of handling 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. Both systems mentioned are operationally constrained in that they require manual operation and have fields-of-regard which are dependent on turret orientation.

As a consequence, 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. The Army's attention has subsequently turned to the preparation of the performance criteria for a new-generation system.

Presently referred to as the ATGM Defense System (ADS), the proposed new system will be automatic, able to defeat a larger number of threats, and able to detect threat weapons and use IR jamming to defeat all incoming command-guided ATGMs, including the semi-automatic line-of-sight weapons currently being fielded. Provision of a threat discrimination capability is a high priority, needed particularly to minimize false detections brought on by battlefield clutter such as weapons flashes. Relatively mature technologies are being explored, however, 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 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 that will prove difficult to counter with existing countermeasure devices. The fielding of a true "fire and forget" anti-tank missile that employs a dual-seeker, so that if one guidance mode is negated by countermeasures it can still acquire its target using the second guidance method, will be a major challenge to the countermeasures development community before the turn of the century.

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

The forecast for VLQ-6 remains limited, due to the above considerations. The production run was completed in 1991, and a large inventory is presumed to exist for filling future requirements. The system fills a near-term requirement, but a changing, diverse and sophisticated threat environment is acknowledged, with corresponding advanced countermeasures under development. Further production is not anticipated.

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