

# ARCHIVED REPORT

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## PLQ-5 Laser Countermeasures System - Archived 12/96

### Orientation

**Description.** Individual-carried laser detection and disruption device.

**Sponsor**

US Army  
Army Communications-Electronics Command  
(CECOM)  
Ft. Monmouth, New Jersey (NJ) 07703-5000  
USA  
Tel: +1 201 532 2534

**Contractors**

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95 Canal St

Nashua, New Hampshire (NH) 06060  
USA  
Tel: +1 603 885 4321  
Fax: +1 603 885 3655

**Status.** An EMD contract was awarded then canceled.

**Total Produced.** Four training systems and an unknown number of test systems had been produced.

**Application.** Carried by individual soldier, mounts on M-16A3 rifle-mounted equipment.

**Price Range.** N/A.

### Technical Data

**Design Features.** The Laser Countermeasures System (LCMS) was designed to be carried by an individual soldier. The sensor would find threat optical and electro-optical surveillance devices and suppress them with a transmitted laser beam. It would also be able to provide covert illumination for fire direction with its generated laser light.

The Target Acquisition System (TAS) is used to sight, or find, optical targets. It can intensify images, and find optical threats. It is fitted with a zoom lens for various fields of vision. A high peak power pulsed laser is used to disrupt targeted optics.

A Phase II was to include adding range determination, target designation, wavelength diversity, and a longer effective range. The range of the original system was estimated to be 2,000 meters in daylight and 3,000 meters at night.

**Operational Characteristics.** The PLQ-5 would have been mounted on an individual soldier's M-16A3 rifle. The generated laser light would make it possible to detect the presence of optical systems and the LCMS would generate a laser beam powerful enough to disrupt or damage the optical system involved. It also had the potential to damage the eyes of individuals operating the optical systems.

### Variants/Upgrades

None.

### Program Review

**Background.** Optical systems have become commonplace on the battlefield and are an important part of combat operations. They are used for detection, sighting, ranging, and target detection. Unlike radio frequency systems, such as radar, these electro-optical sensors are covert when used against an unequipped soldier. The idea of developing some sort of hand-held laser countermeasure system was originated by the Marine Corps in 1983.

When technology made it feasible, the development of the PLQ-5 Laser Countermeasures System began in 1992. Delivery of initial systems and testing took place through 1994, with a production decision made and production contact awarded in 1995. In December of 1994, the Army announced that it intended to procure up to 450 units in a contract with three one-year options after the tests were complete. Plans were to field the systems in FY97.

The United States and China have gone just about the furthest of most nations in developing portable or rifle-mounted lasers. Representatives from nearly 50 countries met to oppose such systems by tightening a 1980 treaty governing the use of land mines. Some delegates saw a chance to demand a new section on laser weapons. Sweden proposed banning laser weapons designed to blind people, and at least 20 other countries supported the idea. Humanitarian agencies noted that laser weapons not intended to blind people still could do so and "Whatever the intention of producers may be, like land mines, once they proliferate, laser weapons are likely to be used indiscriminately," said Cornelio Sommaruga, president of the International Committee of the Red Cross.

At first, the United States opposed the ban of such systems. On September, 1995, Secretary of Defense Perry issued a new DoD policy on blinding lasers. The policy read:

The Department of Defense prohibits the use of lasers specifically designed to cause permanent blindness of un-enhanced vision and supports negotiations prohibiting the use of such weapons. However, laser systems are absolutely vital to our modern military. Among other things, they are currently used for detection, targeting, range-finding, communications and target destruction.

## Funding

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Program terminated.

**Analysis.** Optical systems have been on the battlefield many years. Since World War II, their capabilities have increased significantly and, in the last decade, electro-optical systems have begun to be perfected and are widespread among combatants. They give forces an opportunity to see at night, covertly detect and observe forces, function as target designators, and are used for

They provide a critical technological edge to US forces and allow our forces to fight, win and survive on an increasingly lethal battlefield. In addition, lasers provide significant humanitarian benefits. They allow weapons systems to be increasingly discriminate, thereby reducing collateral damage to civilian lives and property. The Department of Defense recognizes that accidental or incidental eye injuries may occur on the battlefield as the result of the use of legitimate laser systems. Therefore, we continue to strive, through training and doctrine, to minimize these injuries.

On October 5th, 1995, Deputy Secretary of Defense John White sent a memo to the Army instructing it to terminate the LCMS program. He had determined that the PLQ-5 did not fit in under the proscription against lasers intended to blind. Although the LCMS was not specifically designed to blind enemy soldiers, it could prove harmful if the laser energy was focused through an in-use optical system.

The United States had changed its policy and told a UN conference that it would back an international ban on laser weapons designed to blind people, but not for other military uses. "We have reviewed our position, and we now support negotiation of a new protocol that would prohibit the use of lasers specifically designed to cause permanent blindness in (normal) vision," the head of the US delegation, Michael J. Matheson, said. He explained that the US would not accept restrictions on the use of lasers designed for other purposes. This included target seeking, range finding or countering enemy optical devices. Matheson referred to normal vision to distinguish it from enemy soldiers using gunsights, night-vision goggles or other optical devices. The UN statement reiterated an Administration policy.

Although the Army had decided to terminate the PLQ-5 LCMS, it planned to continue developing weapons such as the Laser Countermeasure System, insisting that they are intended to find and disable enemy electro-optical devices such as gunsights, not to blind soldiers.

range determination. It became a tactical necessity to find a way to counteract such systems, taking away the advantage they offered the users.

The LCMS was one way of doing this. As the systems developed, so did the objections to them. A major fear at the UN was the proliferation of such systems, especially

among belligerents who would purposefully use them to blind enemy soldiers. Although the US did not design the PLQ-5 with blinding in mind, it was a possible side effect. The system uses the reflections of its laser light from optical devices as a way of finding them. Then, a beam can be transmitted directly at the sensor to dazzle the optics and make it impossible to provide valid detection, sighting, or ranging. If the angle of coincidence is just right, though, enough energy could be focused back through the optical components to burn out the light sensing elements. Unfortunately, it could also do harm to

the eyes of humans using the optics. Thus the system was terminated. The LCMS complied with the letter of the law, but could be considered as contrary to the spirit of the non-blinding laser prohibition. Politically, it was a way of reducing a UN fear and making cooperation with some US goals more likely.

Humanitarian concerns were not the only incentives for terminating the PLQ-5 program. The system was proving costly and heavy. A soldier carrying an LCMS could not carry much of anything else.

## Recent Contracts

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<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Sanders	12.0	Aug 1995 - FFP contract for 20 PLQ-5 Laser Countermeasures Systems. Complete Jul 1997 (DAAB07-95-C-J786).

## Timetable

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	1983	Hand-held laser countermeasure concept originated
1Q	FY93	EMD start
4Q	FY93	FDT&E, DT II start
1Q	FY94	OT II start, DT II finish
3Q	FY94	FDT&E OT II complete
1Q	FY95	MS III

## Worldwide Distribution

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This is a US-only program.

## Forecast Rationale

The Army has terminated the production of the PLQ-5, but intends to salvage what it can of the program. The Target Acquisition System is the most sophisticated and most valuable part of the equipment. This is the unit that detects otherwise invisible optical sensors. It is considered the only way to protect soldiers from sophisticated electro-optical threats, and the only Generation III rifle sight.

The laser transmitter is a relatively simple, brute force system. So the Army is evaluating its termination options so it can salvage as much as possible from the TAS development. This may well be folded into a new program which features the sensor without the offensive laser section.

## Ten-Year Outlook

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Program and production terminated.