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PVS-5(V) - Archived 2/97

Outlook

- Future prospects limited to a few export sales, if any.
- System is being replaced by Generation III technology systems.

Orientation

Description. PVS-5(V) second-generation, head-mounted night vision goggles are lightweight and battery operated.

Sponsor

US Army
Communications & Electronics Command
Ft. Monmouth, New Jersey (NJ)
USA

Contractors

ITT Corp
Electro-Optical Products Division
7035 Plantation Road NW
Roanoke, Virginia (VA) 24019
USA
Tel: +1 703 563 0371
(PVS-5 production)

Litton Systems Inc
Electron Devices Division
860 Industrial Road
San Carlos, California (CA) 94070-4194
USA
Tel: +1 408 988 1331
(PVS-5 production)

Imo Industries Inc
3450 Princeton Pike
P.O. Box 6550
Lawrenceville, New Jersey (NJ) 08648

USA
Tel: +1 609 896 7600
(PVS-5 production)

Licensees

Arab International Optronics Co
P.O. Box 8182
Nasr City, Cairo
Egypt
Tel: +20 2 280 6078

EL-OP Electro Optics Industries Ltd
Advanced Technical Park
Kiryat Weizmann
P.O. Box 1165
76110 Rehovot
Israel
Tel: +97 2 8 386211
(Product improved version of PVS-5 for night driving)

Status. In service; production completed.

Total Produced. Through 1995, approximately 121,500 units of all variants, and by all producers, had been produced.

Application. Intended for use by drivers of all types of vehicles, and for sentries, foot patrols and helicopter pilots during low-level flight.

Price Range. Estimated unit cost is US\$4,300 per unit.

Technical Data

Design Features. PVS-5(V) night vision goggles are a lightweight, battery-powered, passive or active night vision sight worn on the head. The goggles can be used with or without a standard battle helmet or aviator helmet and provide capabilities for reading, performing manual tasks, patrolling, rendering medical aid, driving, walking, flying, and conducting surveillance. This sight has a 40° field of view. The system is normally operated in the passive mode; however, a built-in active infrared light source can be used to provide added illumination for close-up viewing within two meters. Weight is approximately 20 ounces. The goggles have a soft face pad which fits over the front of the face from the nose to the forehead. This supports the weight of the equipment, and allows it to be worn for long periods without fatigue. Range is 150 meters in the passive mode.

The PVS-5 is used in conjunction with the PAQ-4 infrared aiming light when firing the M-16 rifle. The PAQ-4 is mounted on the rifle and provides a laser aiming spot to the target that can only be seen by infantrymen wearing night vision goggles.

Variants/Upgrades

PVS-5A. The PVS-5A is the second-generation version and is lighter and smaller than the original. It uses second-generation microchannel wafer image intensifiers. An infrared diode is included for use in dimly lit areas, such as in a buttoned-down tank. Dim starlight, skyglow, or moonlight are amplified up to 40,000 times.

PVS-5C. This newest version of the PVS-5 includes added features such as the ability to operate on both military and AA-type batteries, high-light cutoff for tube

protection, self-contained IR illuminator, a faster f/1.05 objective lens, strengthened frame and facemask, and two 18-millimeter microchannel wafer image intensifiers.

M-909. Litton Electron Devices produces the M-909 which, while based on the PVS-5A, uses substantially improved objective lenses and higher-gain, brighter second-generation image intensifiers. This results in twice the system gain offered by the PVS-5A and a useful range increase of 33 percent.

Program Review

Background. Development of the PVS-5 began in the late 1960s and early 1970s. In 1972 the US Army initiated studies to evaluate the possible use of the PVS-5 for aviation night vision. The studies were conducted under the Modern Army Selected Systems Test Evaluation and Review (MASSTER) program.

Under the MASSTER program, the goggles were used in night vision tests onboard the AH-1G Cobra, OH-58 Scout, and UH-1H utility helicopters. Testing continued through the years, and in 1982 the Army approved a modification which incorporated provision for the PVS-5. This modification was a "cut-away" faceplate that allowed pilots to adjust instruments and maps and to focus on controls inside the cockpit.

In 1985 it was announced that Egypt was establishing a production capability for PVS-5As, in a joint agreement with United Scientific Holdings. The facility is run by Arab International Optonics, which was guaranteed five

years of Egyptian Government procurement. The facility was also to produce a variety of other night vision and fire control systems. The PVS-5A is also being license-produced in the Republic of Korea. The People's Republic of China has bought a significant quantity of the PVS-5A, and is attempting to build the image intensifier tubes domestically with a view to eventually license-producing the goggles.

Night Vision Problems. Difficulties in training for night operations has led to an increase in the number of flight accidents. Night vision goggles of any type restrict the field of vision and decrease depth perception, thus making an already difficult mission even more dangerous. The PVS-5(V) complicates the task because the pilot's face is completely covered by the goggles, leaving him with no peripheral vision. Criticism of the PVS-5(V) continued subsequent to the fielding of the AVS-6, which is specifically designed for aviation use (and can be flipped up out of the way and provide peripheral vision).

Funding

We anticipate no further funding for PVS-5 procurement

Analysis. The PVS-5 has wrapped up production, and Generation III PVS-7A/B and AVS-6 are being gradually phased in to replace it. The newer-technology devices offer major advantages over the PVS-5. The PVS-7, for example, uses one third-generation image intensifier tube, while the PVS-5 uses two second-generation tubes. The PVS-7 can also be worn with a gas mask and weighs eight ounces less than the PVS-5. Furthermore, the PVS-7 can be removed from its headgear for use as a handheld night vision system. This increases its utility and allows map reading and equipment maintenance.

The PVS-7A/B will be used by the infantry, while the AVS-6 supersedes the PVS-5 for helicopter applications. The AVS-6 is only slowly trickling into inventory and thus the older PVS-5(V) still is scheduled to remain in use for training pilots until mid-decade. The Army has modified some of its PVS-5(V)s so that they can be flipped up, thus eliminating one of the unit's shortcomings (limited peripheral vision). PVS-5(V)s for aviation applications have already seen some modifications in the form of a standard cutaway faceplate to allow for the reading of cockpit instruments or maps.

Recent Contracts

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
ITT	Unspecified	Nov 1990 — Contract for 80 sets of PVS-5 goggles to Egypt. Price cannot be determined since it was added to a US\$70 million purchase that included recovery vehicles and machine guns as well.

Timetable

Early	1970s	Production began
	1972	PVS-5 evaluated in night flight tests with UH-1H, OH-58, and AH-1G helicopters
	1982	Sales to PRC began
	1982	Army approved a standard modified cutaway faceplate for those PVS-5(V)s used by aviators in order to facilitate the reading of cockpit instruments or maps
Sep	1984	US Army revamped its night vision procurement policy and consolidated its future procurement into one general contract for night vision gear
Sep	1985	First multiyear night vision contract issued
	1985	Egyptian deal to license-produce PVS-5A announced
	1987	Initial fielding of PVS-7

Worldwide Distribution

In addition to the **US, Egypt, Israel, the Republic of Korea, and the People's Republic of China**, are known to use the PVS-5(V) or one of its clones.

Forecast Rationale

Production has reached an end; any further procurement of the PVS-5A will be limited to foreign sales. Increasing production of Generation III systems has squeezed the PVS-5A out of the US market. Also curtailing its useful life has been the outcry over the safety issue — the aircraft

pilot's impeded peripheral vision on night training missions with the PVS-5(V). Procurement of parts for the huge inventory, such as replacement image intensifier tubes for the night goggles, was once strong — the US spent nearly US\$200 million toward MX-9916/UV image

intensifier assemblies in 1989. Due to the substantial improvements developed for the PVS-7B, however, the PVS-5 is steadily slipping from the market.

Ten-Year Outlook

With no further production envisioned, we are eliminating the forecast chart. This report will be dropped next year should matters remain as they stand.