

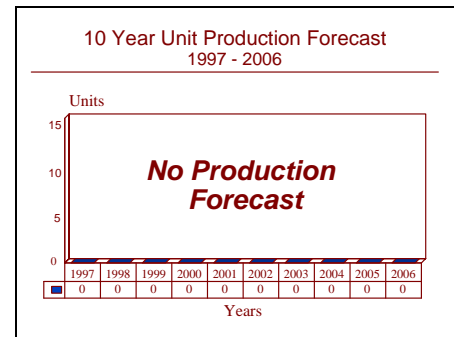
ARCHIVED REPORT

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PSC-3(V)/VSC-7(V) - Archive 8/98

Outlook

- Production complete; upgrade activity and spares support
- Program focus on development of EMUT upgrades/spares
- Available for foreign sales; no orders confirmed



Orientation

Description. Manpack and vehicular satellite UHF terminals.

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

Contractors
Cincinnati Electronics Corp
2630 Glendale-Milford Road
Cincinnati, Ohio (OH) 45241 3187
USA
Tel: +1 513 733 6100

Status. Production complete; upgrade activity and spares support.

Total Produced. Approximately 750 PSC-3(V)s and 145 VSC-7(V)s have been produced.

Application. Provides the US Army and Marine Corps with the ability to contact almost any point on Earth or in the atmosphere via satellite and can also double as a line-of-sight terrestrial transceiver.

Price Range. Unit costs are: PSC-3(V) - US\$24,000; VSC-7(V) - US\$42,000.

Technical Data

Design Features. The main components of the PSC-3(V) include the RT-1402A/G receiver/transmitter, the CY-8006/PSC-3 battery box, the H-250/U handset, the AS-3567/G medium gain antenna, the AS-3566/G low-gain antenna, and the OA-8990/P digital message device. The VSC-7 is a vehicular-mounted version with the addition of net control station applique, MT-1029 shock-mount/rack-mount trays, high-gain antenna, antenna mast, and H-250/U handset.

The PSC-3(V)/VSC-7(V) has 35,000 data channels and 7,000 voice channels. The transceivers operate in the UHF band from 225 MHz to 400 MHz in 25 kHz increments for the line-of-sight mode and 5 kHz increments for the satellite mode.

Electronic control of functions, such as frequency mode of operation and receive offset frequency, is provided by a microprocessor that works in conjunction with a six-pinlight display. Frequency control is provided by two

spring-loaded momentary switches. While in motion, a whip antenna is used for line-of-sight operation or call reception. An ancillary medium-gain (6 dB minimum) helical antenna is supplied for use in the satellite mode. The helical antenna is deployable in two minutes and can be collapsed for transport or storage.

Operational Characteristics. The 35-pound PSC-3(V) beams 27 W of transmitter power to a synchronous satellite for long-range, interference-free communications over a range of 9,000 terrestrial miles. With one satellite, manpack communications are possible over one third of the Earth. A three-satellite linkage virtually covers the globe.

Transmission can be voice or data through a handset or the keyboard-equipped digital message device group for composing several hundred character messages to transmit in very short bursts.

Terrestrial line-of-sight transmission mode power is 2 W. The transceiver uses phase-shift-keyed (PSK) modulation

for 300, 1,200 and 2,400 bits per second digital data. Both selective call and conference call capabilities are provided. Typically, all PSC-3(V) users will be under the VSC-7(V) NET control. The VSC-7(V) radioman acts as a "switchboard operator," and selectively connects the call initiator to a given PSC-3(V) installation. As a net control station, the VSC-7 can serve up to 15 PSC-3 terminals.

The PSC-3(V)/VSC-7(V) terminal setup takes one person about two minutes versus the previous requirement for a five-person team to set up a satellite radio link.

Compatibility. The PSC-3(V) now has narrowband secure voice compatibility with the CV-3591 Advanced Narrowband Digital Voice Terminal (ANDVT) and the PSC-2 Digital Communications Terminal. The PSC-3(V) is retransmit-compatible with the PRC-70, VRC-12, PRC-77, VRC-43 through -49, PRC-8, -9 and -25, PRT-4, PRR-9, GRC-3 through -8, ARC-54 and -131.

Variants/Upgrades

PSC-3/VSC-7 EMUT. As part of the Enhanced Manpack UHF Satellite Terminal effort (EMUT), the US Army has enhanced the PSC-3/VSC-7's basic RT-1402A/G terminal by adding Embedded COMSEC, Demand Assigned Multiple Access (DAMA), and Over-The-Air-Rekey

(OTAR) capabilities. These improvements could extend its utility throughout the 1990s.

A Joint Chiefs of Staff directive mandated that all UHF satellite users be able to use secure voice and multiple access capabilities by 1996.

Program Review

Background. The PSC-3(V) and VSC-7(V) are the latest versions of the PSC-1, also developed and tested by Cincinnati Electronics, which was the world's first man-portable satellite terminal. The US Army successfully tested the PSC-1 under real-time satellite conditions, which included electronic warfare, operator training, RAM evaluation and logistics, and static interference tests. Destructive testing at White Sands Missile Range, and chemical, biological and radiological (CBR) testing at Dugway Proving Grounds, Utah, showed adequate tolerance to physical abuse and CBR damage.

In June 1977, two PSC-1s communicated with each other for the first time via satellite link. This marked the first time militarized manpack radios achieved highly reliable, interference-free, UHF satellite communications. The two

radios communicated by means of a stationary MARISAT satellite orbiting some 22,300 miles above the Earth's surface and situated above West Africa over the equator. The test configuration had the two sets located 150 yards away from each other. The signal traveled 50,000 miles from one set, to the satellite, and back to the other set in a quarter of a second.

While the US Army is the principal user of the PSC-3(V) and VSC-7(V), other DoD users include the US Marine Corps and the Drug Enforcement Administration, and judging by the relatively high volume of orders, there has been significant interest outside the Army as well. The PSC-3(V) received its baptism by fire in Operation Urgent Fury, the Grenada invasion, in 1983.

Funding

<u>US FUNDING</u>							
RDT&E (US Army)							
PE#0303142A, Project #D456 ^(a)							
<u>FY96</u>		<u>FY97</u>		<u>FY98</u>		<u>FY99</u>	
<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
-	4.1		4.5		4.2		4.1
<u>FY00</u>		<u>FY01</u>		<u>FY02</u>		<u>FY03</u>	
<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
-	4.7		4.9		4.9		4.9

All US\$ are in millions.

^(a)Development of the EMUT upgrades are funded within PE#0303142A - SATCOM Ground Environment, under Project D456 - Tactical Satellite Communications (TACSATCOM) System. Spares funding is incorporated into Operations & Maintenance accounts.

Recent Contracts

Contractor	Award (\$ millions)	Date/Description
Cincinnati Electronics	1.2	Dec 1991 — Circuit card assembly conversions for PSC-3 (DAAB07-91-C-D025)
Cincinnati Electronics	0.1	Aug 1992 — Frequency control panel & electronic components applicable to PSC-3 (DAAB07-92-C-D278)

Timetable

Jun	1977	PSC-1 first tested
Oct	1981	Initial contract awarded for PSC-3/VSC-7 radios by US Army
Oct	1983	PSC-3 used in Grenada
	1983	Radio successfully tested for compatibility with PSC-2 DCT and CV-3591 ANDVT
	1985	Special Forces issued PSC-3/VSC-7
Aug	1986	Final production contract awarded
Dec	1990	New power amplifier approved; all fieldings were halted during Operation Desert Storm
Apr	1991	Completion of US Army procurement of PSC-3(V)/VSC-7(V)
Feb	1993	DA directed procurement for EMUT amended
	1994	Deadline for secure voice capability for all UHF satellite users
	1996	Deadline for multiple access capability for all UHF satellite users

Worldwide Distribution

The PSC-3(V)/VSC-7(V) are currently in service with the US Army and US Marine Corps.

Forecast Rationale

Production of the PSC-3(V)/VSC-7(V) for US procurement was completed in FY91. The Army and Marine Corps are jointly developing the Enhanced Manpack UHF Satellite Terminal (EMUT) to provide a small, lightweight terminal for half-duplex, secure, data, and digital voice communications through UHF satellites. According to the FY94 Army Command, Control, Communications, Computers and Intelligence Warfare (C4IEW) project book, the EMUT will focus on technology insertion for the

PSC-3/VRC-7 involving Embedded COMSEC, DAMA, and OTAR capabilities. These improvements were completed in 1996. However, all references to future EMUT work in FY95 funding documents pertain to the PSC-5.

While the PSC-3(V)/VRC-7(V) is available for foreign sales, we have not been able to confirm any orders as of this writing.

Ten-Year Outlook

With Army procurement complete, program work focuses on the development of various EMUT upgrades and on spares support.

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