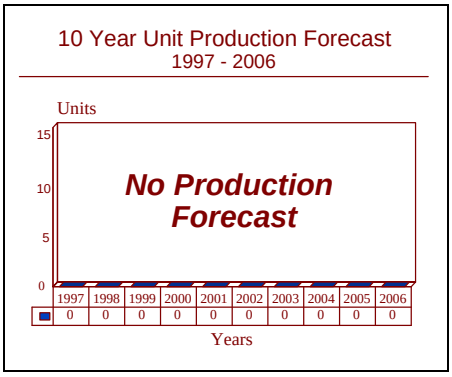
SCOTT (TSC-124) - Archived 11/98

Outlook

- Engineering development models produced in 1990
- Program terminated in FY93
- Hughes acquired Magnavox in December 1995
- This report will be dropped next year, 1998



Orientation

Description. The Single Channel Objective Tactical Terminal (SCOTT) is an EHF transportable ground terminal for the MILSTAR satellite communication system.

Sponsor

US Army Satellite Communications Agency
Ft. Monmouth, New Jersey (NJ) USA

Prime Contractors

Hughes Aircraft Co
Hughes Defense Communications
(formerly Magnavox Electronic Systems Co)
1700 Moore Street
Arlington, Virginia (VA) 22209
USA
Tel: +1 703 522 9610
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(Prime Contractor Manufacturing)

MIT Lincoln Laboratory
244 Wood Street
Lexington, Massachusetts (MA) 02173
USA
Tel: +1 617 981 5500
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(Initial Development)

Contractors

Bell Aerospace Textron
Buffalo, New York (NY) USA
(Antenna/RF group)

M/A-COM, Inc
Burlington, Massachusetts (MA) USA
(Modem)

Steinbrecher Corp
Woburn, Massachusetts (MA) USA
(Solid-state millimeter-wave transmitter)

Status. The SCOTT (TSC-124) program was terminated in FY93.

Total Produced. Fifteen engineering development models were produced and delivered by the end of 1990. No additional models have been produced or delivered since then. Refurbishment of the 15 was once considered to possibly take place in the future; however, there has been no word of such plans in the last few years.

Application. SCOTT terminals are designed to provide theater commanders-in-chief with secure communications capabilities that can continue to function even in the presence of the effects of nuclear, biological and chemical weapons.

Price Range. Available information indicates that the original system cost was in the area of US$750,000. However, any redesigned terminals are likely to be more expensive due to the small quantity to be procured.

Technical Data

The information below is for the engineering development models (EDM) versions delivered.

Characteristics

Low power transmitter bandwidth:	43.5-45.5 GHz
Integrated receiver bandwidth:	20.2-21.2 GHz

Design Features. The main components of the SCOTT include: the antenna/RF group assembly, a shelter, a mainframe group, and user control interface devices (UCID).

Antenna/RF group. The assembly includes a 5.5-foot reflector antenna (solid-state, gyrocompass north finding accurate to 0.7 degrees), a solid-state low power transmitter (IMPATT diodes), a double conversion solid state low power transmitter (performs de-hopping over a 1 GHz bandwidth), and a dual up-converter (integrated microstrip/stripline circuit design with equalization and limiting for RF cable interface).

Mainframe group. This assembly consists of a synthesizer (generates link frequency hopping), a time and frequency unit (supplies precision frequency reference to the terminal, 10-day battery backed timekeeping), a terminal resource control unit (terminal, antenna pointing and modem control as well as synchronization and terminal BIT management), and the modem (network control, signal processing including MILSTAR waveform, and KGV-11A COMSEC).

UCID. The user control interface device is capable of remote operation up to 2,500 feet from the S-250 shelter using common field wire. There are four UCIDs per terminal with each UCID having two input-output devices.

The SCOTT terminals provide four simultaneous channels, all with secure-voice, facsimile and data service. The data rate is 75/2,400 bps.

The shelter also includes a UGC-174 record traffic communications terminal and a KG-84A data encryption unit.

Operational Characteristics. SCOTT is the MILSTAR terminal for both conventional and nuclear ground forces, with the capability to provide survivable satellite communications in a severe EW, EMP, chemical and biological environment. SCOTT supplies an extremely robust ECCM system whose capabilities include extreme reliability (420 hour MTBOMF), very low probability of intercept, almost complete jam-proofing, long-distance communications, and a high degree of transportability (set-up time only 30 minutes). Field commanders using SCOTT will have access to survivable C^2 communications for positive control of nonstrategic nuclear forces, theater forces, special operations forces, classified special users, and for interoperability with other service MILSTAR terminals.

Variants/Upgrades

Only engineering development models have been produced. Magnavox was in the process of redesigning the terminals to meet emerging Army and Air Force requirements, including making the system lighter, smaller and more mobile; however, with the termination of the program by the Army, any further development is unlikely.

Program Review

Background. The SCOTT prototype terminals were developed by MIT's Lincoln Laboratory. Development of solid-state and traveling wave tube power amplifiers for use in SCOTT was begun in FY82. Feasibility testing was conducted on dismounted equipment and a prototype terminal was installed in an M-577 command post carrier for initial testing. Advanced development of EHF power amplifiers and evaluation of development models of the tube technologies was continued in FY83. Testing of the vehicle-mounted terminal was

completed in FY83. Advanced development continued for tactical anti-jam and integration packages in FY84. The Army restructured the program in FY85.

After about a year's delay, the Army awarded a US$105.8 million contract to Magnavox for the production of SCOTT in December 1985. The terms of the contract called for Magnavox to produce 15 SCOTT terminals using US$5.6 million that was obligated immediately. These terminals were to be used for test and evaluation of SCOTT. The FY86 procurement request was zeroed by Congress because the system was not ready for production, but Congress also added US$20 million to the R&D FY86 budget for continued development.

Full-scale engineering development for SCOTT was initiated in FY87. SCOTT hardware was demonstrated through the use of in-orbit satellites and Air Force remote terminals. SCOTT continued full-scale development in FY88. In FY89 the SCOTT EHF Test Facility began construction. By the end of 1990, 15 SCOTT EDMs were delivered.

Operational testing commenced in FY91 with IOT&E completed before the end of FY92. Additional project work for FY92 included: completing Reliability Growth Development Testing; conducting Acceptance Testing; completing OPEVAL; participating in MILSTAR MST 6000 end-to-end test with the development flight satellite; continuing medium power transmitter development; continuing training simulator development, continuing software upgrades and enhancements for over-the-air-rekey, red key overwrite, and in-band control; and releasing a production solicitation.

The Army canceled further development of SCOTT due to MILSTAR program restructuring in FY93. However, FY93 budget funding had been granted for the refurbishment of the 15 engineering development model terminals, installation and sparing of the seven ground command post terminals being procured by the Air Force and installed by the Army. Without these funds, the initial satellite, a US$500 million investment, would not have received an adequate checkout and the seven command post terminals, a US$50 million investment, could not have been placed in operation.

Hughes acquires Magnavox. Hughes acquired Magnavox in December 1995, and officially unveiled the new name, Hughes Defense Communications, August 1, 1996. The acquisition of the communications specialists added to the breadth and depth of Hughes' position in the market. It will remain part of the Hughes Defense and Communications Systems segment of Hughes Aircraft.

Funding

FY93 was the last year SCOTT was funded.

Recent Contracts

No recent contracts have been identified.

Timetable

Jan	1979	Letter of Agreement for Tactical Single Channel Vehicular Terminal
May	1980	IPR approved entering advanced development phase with Lincoln Laboratory on an EHF terminal
Feb	1982	OSD guidance provided to accelerate SCOTT program
Fall	1983	RFPs issued
	FY85	Program restructured
Aug	1985	ROC approved
Dec	1985	FSED contract issued to Magnavox
Jun	1986	Preliminary Design Review
Jan	1987	Critical Design Review
Jul	1987	Final Design Review
Jun	1988	Unit Level contractor technical testing began
Jul	1988	Successful Multi-Service Interoperability Test, Phase 1
Aug	1990	IOT&E test of FSED terminals began
Spring	1991	Operational testing began

FY92	IOT&E to be completed. FAT on three SCOTT EDM terminals
FY93	Complete SCOTT FAT
FY93	SCOTT development program terminated

Worldwide Distribution

This was a **US Army** program only.

Forecast Rationale

Right from the very start, the SCOTT program saw substantial reductions in its scope over the years. Now, world and economic events have seen the program reduced to zero. Originally, back in the mid-1980s, as many as 1,000 (1,400 according to one source) of the terminals were slated to be procured. Then the total was dropped down to 500, and then to 330. By 1991 the decision was made to procure only about 85 TSC-124s. In FY93, the program was terminated by the US Army after the delivery of only 15 SCOTT engineering development model terminals due to a major re-structuring of the MILSTAR program, which included SCOTT. There was some early talk about refurbishing the 15 models to current requirements, but this plan has not come to pass.

No new terminals are scheduled to be produced beyond the original 15 EDMs. SCOTT had received budget funding in FY93 for refurbishment of the units, as well as the sparing of seven ground command post terminals procured by the US Air Force and installed by the Army. If such funding had not been approved, over US$500 million for the initial satellite investment and some US$50 million for the command post terminals would have had to be written off as a total loss. It is highly unlikely that any additional funding, other than a minimal amount needed to protect the initial investment, will be approved by Congress.

Ten-Year Outlook

The forecast chart has been omitted. THIS REPORT WILL BE DROPPED NEXT YEAR, 1998.

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