SINGLE-CHANNEL, ANTI-JAM, MAN-PORTABLE (SCAMP) TERMINAL BLOCK I (SCAMP)

Army ACAT III Program

Total Number of Systems:	314
Total Program Cost (TY$):	$210.6M
Average Unit Cost (TY$):	$.215M
Full-rate production:	1QFY94

Prime Contractor

Rockwell Collins, Inc.

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2010

The Single-Channel, Anti-jam, Man-Portable (SCAMP) terminal is the rapidly deployable, single-channel, individual-portable component of the Army's Military Strategic and Tactical Relay (MILSTAR) Advanced Satellite Terminal program. SCAMP will draw on the unique capabilities of the MILSTAR system and enable our forces to maintain ***information superiority*** during conflict and enhance ***full-dimensional protection*** by using anti-jam and low-probability-of-intercept technologies.

The primary mission of SCAMP is to provide survivable extended-range communications to Corps and Division tactical units for command and control. SCAMP's use of MILSTAR's low data rate (LDR) capabilities to interconnect small tactical units eliminates the line-of-sight limitations on battlefield operations imposed by land-based radio communications systems. The SCAMP operates in a half-duplex mode at a maximum data rate of 2.4 kbps. The SCAMP program is divided into two separate development efforts: Block I and Block II. The requirement of the Block I effort is to develop a 37-pound terminal; and the goal of the Block II effort is to develop a 12-pound terminal. The Block I terminal is being developed as an interim solution, prior to development of the Block II terminal.

BACKGROUND INFORMATION

The Milestone III production decision for Block I SCAMP occurred in November 1994. The full-scale production contract for Block I SCAMP was awarded in February 1996. FOT&E for SCAMP was conducted in October-November 1998. FOT&E evaluated the operational effectiveness and suitability of the end-to-end system to support the Army's fielding decision for the Block I terminal.

The Block I SCAMP was redesignated as an Acquisition Category (ACAT) III program in January 1995. The Block II SCAMP remains an ACAT IC program. The SCAMP Block II program is in acquisition Phase 0 awaiting determination of whether the terminal will use only the MILSTAR waveform or will include a modified Extremely High Frequency waveform compatible with other satellite programs under development. DOT&E continues oversight of the SCAMP program in order to maintain the system perspective in the oversight of the overall MILSTAR program.

TEST & EVALUATION ACTIVITY

A customer test was performed in a field and garrison environment in August 1996 to assess the terminal's progress in an operational environment. This test focused on three operational issues: (1) extending the range for voice and data communications in the field; (2) deployment, setup, and teardown of the equipment; and (3) interoperability with other MILSTAR terminals. On the basis of the customer test, Army Test and Evaluation Command (ATEC) performed an abbreviated OA of the Block I SCAMP terminal.

The SCAMP participated in the MILSTAR System Tests involving the Army, Navy, and Air Force terminals in July 1997 and August 1998. In these medium data rate (MDR) focused developmental tests, the Service terminals were connected to the MILSTAR Flight satellite payloads at the contractor's facility in Sunnyvale, CA. The tests examined the compatibility and interoperability of the SCAMP terminal with the MILSTAR LDR payload. The Army's LDR/MDR capable Secure, Mobile, Anti-jam, Reliable, Tactical Terminal (SMART-T) and the Navy EHF Satellite Program (NESP) terminal, equipped with an MDR appliqué, participated in both MDR and LDR tests, while the Air Force Command Post Terminal participated in the LDR tests.

The First Article Test (FAT) period ran from April 1997-October 1998. FAT contained subtest events that verify specific requirements and design characteristics from production specifications. The overall objective of the test was to verify that the SCAMP production terminal conformed to specifications in the requirements documents. FAT concluded with a confidence test, which indicated the terminal was ready for operational testing.

SCAMP FOT&E was conducted October-November 1998 at Ft. Bragg, NC. FOT&E involved a 15-day test of five production terminals in a simulated wartime field environment to evaluate effectiveness, suitability, and survivability. Each terminal was assigned to and operated by three general-purpose user soldiers from Corps staff organizations. The test scenarios exercised all of the functional capabilities of the terminals. Each test day was approximately 12 hours, with set up, communications, tear down, and movement activities each day. The terminal was required to demonstrate interoperability with Army Common User Equipment and communicate with higher headquarters and supporting elements of other Services.

ATEC will conduct FOT&E Phase II for the SCAMP Block I terminal in October-November 1999. The purpose of this test is to provide an evaluation of the corrective actions taken to address the

effectiveness and suitability of the terminal. Additionally, this test will provide input into the material release and fielding decision. For effectiveness, voice quality and message completion rates will be re-evaluated. For suitability, reliability, availability, maintainability, training, technical manuals and troubleshooting will be evaluated. The test will consist of seven terminals over 1800 hours of operation. ATEC will conduct a three-day pilot test and three 96-hour operational scenarios. The test will be conducted in accordance with the Army's approved operational mission profiles.

Y2K compliance testing consisted of two major events. Rockwell conducted functional performance testing at the Rockwell-Collins plant in Richardson, TX, from April 21-23, 1998. Lockheed Martin conducted Y2K testing in Sunnyvale, CA, as part of intersegment testing, from April 20-24, 1998. The test included Army and Air Force terminals as well as the MILSTAR satellite. No Y2K issues were found. The Army Program Executive Officer certified Y2K compliance for the SCAMP in December 1998.

TEST & EVALUATION ASSESSMENT

The 1998 FOT&E evaluated SCAMP operational effectiveness, suitability, and survivability. ATEC found shortcomings in effectiveness and suitability, which were significant enough to warrant a failed rating in these two areas. Survivability was rated as marginal based on the need to do further electromagnetic environmental effects testing. The terminal was determined to be survivable in all areas that were adequately tested.

The SCAMP terminal is required to transmit and receive voice and data messages legibly with a 90 percent call completion rate on a first attempt basis in a wartime mode of operations. The completion rate for point-to-point and network data messages was 95 percent. However, the completion rate for voice messages was only 85 percent. Additionally, SCAMP fell just short of the requirement for voice quality equal to or better than the standard Secure Telephone Unit III (STU III) voice quality. Although operators were able to pass voice messages once communications were established, the reduced quality affected intelligibility and recognition.

The SCAMP is intended to be a general-purpose user terminal that can be set up or torn down in ten minutes 90 percent of the time. This requirement applies to all conditions and success is rated on a first-time basis in a wartime mode of operations. Success rates ranged from a high of 72 percent for daylight operations to a low of 39 percent for night operations. Set-up difficulties are attributable to system complexity, poor troubleshooting procedures, poor terminal position selection (lack of line-of-sight to the on-orbit satellite), and inadequate training. Teardown times were significantly better, ranging from 91 percent success during daylight operations to 67 percent while wearing specialized protective equipment.

The SCAMP terminal is required to achieve a Meant Time Between Operational Mission Failure (MTBOMF) of 600 hours (80 percent lower confidence level) in order to provide tactical forces with reliable communications on the move. Despite success during developmental tests, the system demonstrated only 12 hours MTBOMF during FOT&E. Operational availability during FOT&E was .22, in comparison to the peacetime requirement of .91 and the wartime requirement of .92.

CONCLUSIONS

The SCAMP terminal is not operationally effective as a tactical system. Voice quality, voice message completion rates, terminal set-up problems, complexity of terminal operations, and poor troubleshooting procedures are the major factors contributing to this conclusion.

The SCAMP is not operationally suitable for use in the tactical environment. The shortcomings in reliability and availability, as evidenced under operational test conditions, demonstrate that the system is not ready for fielding.

RECOMMENDATIONS

- The Program Office should take aggressive action to correct the shortcomings in operational effectiveness and operational suitability.
- SCAMP must not be fielded until its most significant effectiveness and suitability shortcomings are corrected. Fixes must be verified by operationally realistic testing.
- Further testing must be conducted to fully determine SCAMP's ability to operate under a full range of electromagnetic environmental conditions.
- SCAMP operations may be too complicated to qualify it as a general-purpose user terminal. If this situation does not improve, the Army will need to designate a Military Occupational Specialty for SCAMP operators in conjunction with significantly improving the training program and supporting documentation.
- Considering the large number of SCAMP terminals to be deployed, and the wide variety of environments they will operate in, SCAMP should be operationally tested in tropic and cold region environments as well as in environmental test chambers.