Chapter 6

Milstar

6-1. System Description

a. The Army's tactical C^2 communications must be reliable, long range, transportable, and secure. These communications must survive in severe EW/NBC environments where ground relay networks that use prominent terrain may be disrupted. They must support the critical communications needs of the tactical commander. The Milstar satellite communications system provides these capabilities. It integrates satellite communications with an ECCM capability and balanced nuclear hardening into ground terminals for installation and operation in communications shelters. The Milstar satellite communications system provides the most survivable communications link on the battlefield in both intense jamming and nuclear environments.

b. The AN/TSC-124 will be the Army's Milstar terminal. It will be fielded in Army units in the early 1990s. It will provide antijamming scintillation-protected, tri-service interoperable satellite communications to support critical C^2 communications. Exclusive of the SCS, the AN/TSC-124 does not replace existing communications equipment on the battlefield; it augments the existing terrestrial C^2 nets when other communications means are degraded or destroyed. The traffic transmitted via the AN/TSC-124 terminals will normally be essential data communications. Voice communications, though possible, are not intended to be the primary method of communications through the Milstar system. System efficiency decreases as voice traffic levels increase. Therefore, data traffic will have a higher priority for channel access throughout the system.

6-2. Deployment

a. SCS. AN/TSC-124 terminals will replace AN/MsC-64s, currently used within the SCS, to operate the Flaming Arrow Net in Europe and Korea.

b. Theater. At EAC in Europe and Korea, AN/TSC-124s will provide for connectivity between the theater main, theater alternate, theater Army main, theater Army alternate, the theater Army Milstar control

center (TAMCC), and six discretionary headquarters such as major joint or allied unit headquarters, additional CINC support and the like. The theater TACSAT signal company will install, operate, and maintain the terminals.

c. Contingency support. The 235th Signal Detachment and 209th Signal Company will each employ AN/TSC-124 terminals in support of Army and JCS operations worldwide. They will augment the theater assets if necessary.

d. Special Operations Command (SOCOM). The l12th Signal Battalion will employ AN/TSC-124 terminals in support of SOCOM operations.

6-3. Employment

The AN/TSC-124 will be a commander's asset. Although regular and recurring association of terminals and headquarters will occur, the terminals can be employed at the commander's discretion. The commander can assign a priority of communications and fight the communications assets as a combat multiplier like any other weapons system.

a. Nets and networks. The unique characteristics and capabilities of the terminals and associated satellite systems make structured nets unnecessary. Because the terminals operate with a DAMA technique, there is no requirement for dedicated channels. Because of the processing capabilities of the satellites and the ability to address discretely any terminal within the system, Milstar terminals can communicate with any other Milstar terminals, whether located within the same theater of operations or not. Different protocols, however, will be required for in-theater and out-of-theater communications. For network identification and TRANSEC key management, all AN/TSC-124 terminals operating within the Army spotbeam footprint on each satellite will make up a network. Therefore, separate nets are unnecessary. However, partitions may be formed by selecting and distributing different COMSEC keys and addresses to the users; for example, distributing like keys to those users who want to operate together to the exclusion of others. The discrete addresses would then be furnished in a format similar to the telephone books now employed. Terminal-to-terminal connectivity would remain possible, with end-to-end communications being possible only if like COMSEC keys are employed at each 1/0 device.

b. System characteristics.

(1) The AN/TSC-124 will consist of the terminal, prime mover, antenna, and trailer-mounted power generator. The AN/TSC-124 will be installed in one S-250 or equivalent shelter. It will be transported under tactical conditions by a standard 1 l/4-ton truck. A 3 kilowatt

generator will be mounted on a standard 3/4-ton trailer that will be towed by the prime mover. Backup power will be provided by an under-hood power plant installed on the vehicle.

(2) The terminal can communicate at the halt; communicating while moving is a planned improvement that will come with future technology. Terminal setup and teardown times will not exceed 30 minutes by a team of three MOS 31C soldiers.

(3) Critical, operator-replaceable spares will be carried to enhance system survivability and ensure rapid repair and return to service. Additionally, crew, crew weapons, personal bags and equipment, camouflage netting, tents, and the like will be carried on the vehicle or in the terminal. C130/C141/STOL aircraft roll-on/roll-off with no preparation is possible.

(4) The terminal will be able to accept up to four individual user inputs of data or voice at rates of 75 bps to 2.4 kbps by using user-controlled interface devices (UCIDS). The devices can be remoted 2,500 feet (758 meters) from the terminal using conventional field wire. Four DR-8s, modified to accept and dispense WF-16 field wire, will be provided with the terminal. The DR-8s will provide a minimum remoting capability independent of customer field wire resources.

(5) Compatibility with the Milstar standard I/O and COMSEC devices (for data, the AN/UGC-74 and KG-84; for voice, the ANDVT) as well as the single subscriber terminal (SST), lightweight digital facsimile, and the Army Command and Control System (ACCS) hardware is provided. Each terminal will be furnished with one AN/UGC-74 and one ANDVT for operator use.

(6) It will be hardened to the effects of electromagnetic pulse (EMP)/high altitude EMP (HEMP) and will operate in EW/NBC environments.

(7) The system will adapt to changes in the jamming environment and changes in traffic demands regardless of environment. The terminal will use spread spectrum, burst, FH, and other techniques to reduce the vulnerability to RDF, interception, exploitation, and jamming. The AN/TSC-124 will be interoperable with all other Milstar terminals.

c. User-controlled interface device.

(1) UCIDs interface between the user of the I/O device and the terminal. It can accept inputs between 75 bps and 2.4 kbps and support full-duplex communications. The user requests service through the UCID. The UCID lets a user tell the terminal which specific I/O and COMSEC devices are attached to the two ports of the UCID. Information relating to the service requested, discrete addresses of sender and receiver(s),

and I/O device and COMSEC compatibility can be entered by the user. This alerts the terminal and the servicing satellite to establish the requested type of link between the sender and receiver(s). Once the link is established, the UCID must alert the sender that he may pass his traffic.

(2) Four UCIDs will be provided with each AN/TSC-124. Each can accept two inputs, though not at the same time. Three UCIDs will normally be provided to the remote users. The fourth UCID will be reserved within the shelter to allow the AN/TSC-124 operator access to the system for the operator I/O devices provided with the terminal (AN/UCG-74 and ANDVT).

(3) The UCID can be used by a general purpose user (GPU) of any grade or MOS. The UCID, although a component of the AN/TSC-124 terminal, will be provided to the user at the user's remote location. The UCID, associated COMSEC (that is, KG-84), and user-owned and provided I/O device will be operated by the user of the communications provided by the terminal.

6-4. Control and Management

a. Milstar.

(1) The USAF Milstar ground command post terminal (GCPT), the Navy EHF Satellite Program (NESP), and the Army SCOTT (AN/TSC-124) provide the services with control and access to the Milstar satellite constellation to support the National Command Authority.

(2) The Milstar mission control element, called the theater Milstar control center (TMCC), will exercise overall control within a theater of operations along with a number of constellation control stations. The specific roles for each and the requirements for interface are being developed by USAF Space Command. The Army Space Command is refining the specific responsibilities and procedures for Army-specific Milstar control.

b. TRANSEC/COMSEC management.

(1) The National Security Agency (NSA) distributes the TRANSEC keys. As part of the initial terminal start-up, the TRANSEC variables are distributed to the units' COMSEC accounts and the operator manually loads the TRANSEC keys. Before the TRANSEC period expires, the mission control element (MCE) distributes, over the air, the keys for the upcoming TRANSEC period. Emergency rekey also occurs over the air (for example, when a network terminal is compromised). Backup and future TRANSEC keys should be on hand with the unit COMSEC custodian to facilitate rekey in the event over-the-air rekey is not possible.

(2) The COMSEC keys are distributed to individual COMSEC accounts for dissemination to individual terminal users. Both the normal and emergency rekey for data and voice COMSEC devices are done manually. Backup and upcoming keys are on hand at the terminal-user locations. The number of variables issued to each terminal and user depends on the mission of that terminal or user and the network in which it operates.