

APPENDIX E

**COMMUNICATIONS, AUTOMATION, AND POSITION/NAVIGATION SYSTEMS**

**E-1. Operational Facility Rules and Equipment**

a. The ability to communicate is essential to C2 and the accomplishment of the assigned mission. To ensure effective communications, a system has evolved which authorizes specific types and numbers of radios for a unit or element. This appendix contains those operational facility (OPFAC) rules applicable to the FH and the GH.

b. The OPFAC rule is the tool used to determine where, type, and numbers of communication devices are needed. The OPFAC rule identifies the smallest element of a TOE to which a piece of communications equipment is assigned (such as the commander, staff officer, or section or platoon).

c. The OPFAC rules are the basis for documenting C2, communications, and computer equipment in the basis of issue plans (BOIPs) and TOEs. These determine the correct type and distribution of radios, MSE, POS/NAV devices, and tactical computers for each TOE. The OPFAC rule system is an ongoing validation. *These rules are subject to change.* The rules discussed here are current as of the date of this publication. Tables E-1, E-2, and E-3 depicts the OPFAC and the distribution of equipment for the FH and the GH.

*Table E-1. TOE 08736L200, HUB, Field Hospital*

PARA	USER/ POSITION	OPFAC RULE #	FM RADIO	AM RADIO	MSE	FAX	POS/NAV EQUIPMENT	ADP EQUIPMENT	ADP USE	COMM TERMINAL
01.01	HOSPITAL COMMANDER	D8201	90A		TA-1035, MSRT		PLGR			
01.03	HOSPITAL XO	D8210			TA-1035		PLGR			
01.06	HOSPITAL CHAPLAIN	D0640			TA-1035					
02.00	HOSPITAL OPERATIONS SECTION	D8811	89A	193A	TA-1035 (2)	FAX	PLGR		ADMIN	
04.00	ADMIN DIVISION	D8802			TA-1035 (2)			TACCS	SIDPERS	
05.00	PAD SECTION	D1204			TA-1035 (2)			MEDTCU	MEDPAR MEDREG	
07.00	SUPPLY & SVC DIV	DH920			TA-1035 (2)			MEDTCU MEDTCU TACCS	MEDSUP MEDMNT SPBS-R	RKVDU
09.00	TRIAGE/EMT	DH203	90A		TA-1035					
24.00	BLOOD BANK	DHKPO			TA-1035			DBSS	MEDBLD	

Table E-2. TOE 08736L300, HUB, General Hospital

PARA	USER/ POSITION	OPFAC RULE #	FM RADIO	AM RADIO	MSE	FAX	POS/NAV EQUIPMENT	ADP EQUIPMENT	ADP USE	COMM TERMINAL
01.01	HOSPITAL COMMANDER	D8203			TA-954					
01.03	HOSPITAL XO	D8213			TA-954					
01.06	HOSPITAL CHAPLAIN	D0641			TA-954					
02.00	HOSPITAL OPERATIONS SECTION	D8810	89A	193A	TA-954 TA-1042	FAX	PLGR		ADMIN	
04.00	ADMIN DIVISION	D8805			TA-954 (2)			TACCS	SIDPERS	
05.00	PAD SECTION	D1208			TA-954 (2)			MEDTCU	MEDPAR MEDREG	
07.00	SUPPLY & SVC DIV	DH922			TA-954 (2)			MEDTCU TACCS	MEDSUP MEDMNT MEDASM SPBS-R	RKVDU
09.00	TRIAGE/EMT	DH205	90A		TA-954					
24.00	BLOOD BANK	DHKP1			TA-954			DBSS	MEDBLD	

Table E-3. TOE 08737L000, HUS, General Hospital

PARA	USER/ POSITION	OPFAC RULE #	FM RADIO	AM RADIO	MSE	FAX	POS/NAV EQUIPMENT	ADP EQUIPMENT	ADP USE	COMM TERMINAL
01.01	HOSPITAL UNIT COMMANDER	D8203			TA-954					
04.00	TRIAGE/EMT	DH205	90A		TA-954					

## E-2. Communications Equipment

The OPFAC rules expressly impact on four types of communications equipment:

*a. Radios.* Frequency modulated and AM radios comprise the family of radios discussed in this appendix as CNRs. When dealing with OPFAC rules, the SINCGARS radios constitute the FM slice and the IHFR constitutes the AM component. The Alpha series of the FM SINCGARS radios have built-in capabilities for encrypting/decrypting voice traffic. The AM radios have secure voice capability when used with the KY-99 minterm (Figure E-1). For the purposes of this manual, the discussion of radios will be restricted to those authorized for the FH and the GH—the AN/VRC-89A, the AN/VRC-90A, and the AN/GRC-193A.

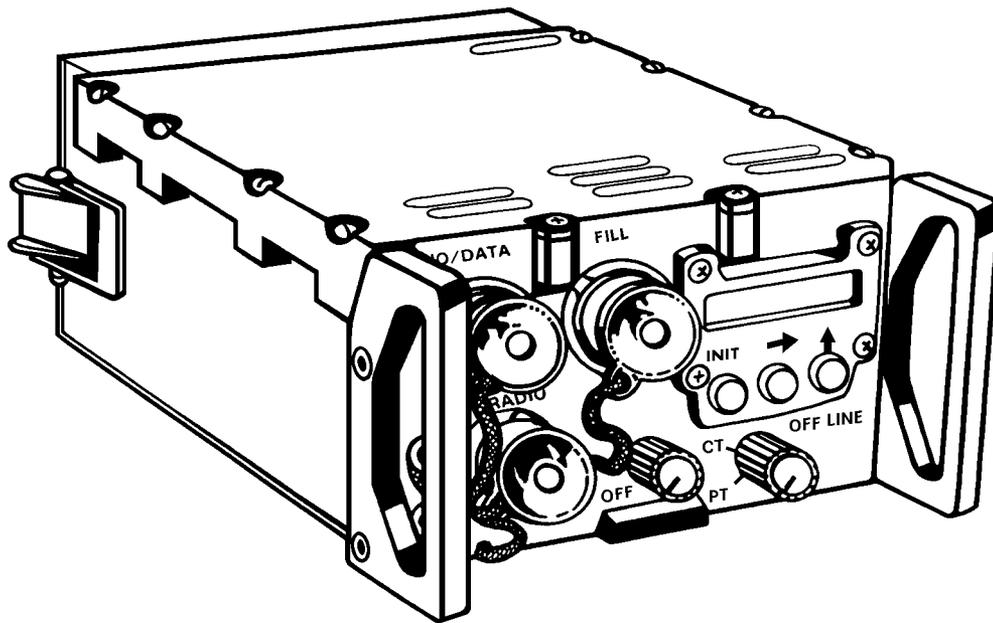


Figure E-1. KY-99 minterm.

(1) *Single channel airborne radio system.* The SINCGARS radios, AN/VRC-89A and AN/VRC-90A, operate in the 30- to 88-megahertz (MHz) frequency range in 25-kilohertz (kHz) steps for a total of 2,320 channels. They can operate in either a single-channel or frequency-hopping mode.

(a) *AN/VRC-89A.* The AN/VRC-89A radio is a vehicular-mounted, dual-configuration radio consisting of two short-range (approximately 8 kilometers [km]), solid state, securable transceivers mounted in a single vehicular mount. Included is a power amplifier (Figure E-2) that provides one of the radios with long-range communications capability (up to 35 km). This radio is authorized for the FH and GH (see Tables E-1 and E-2).

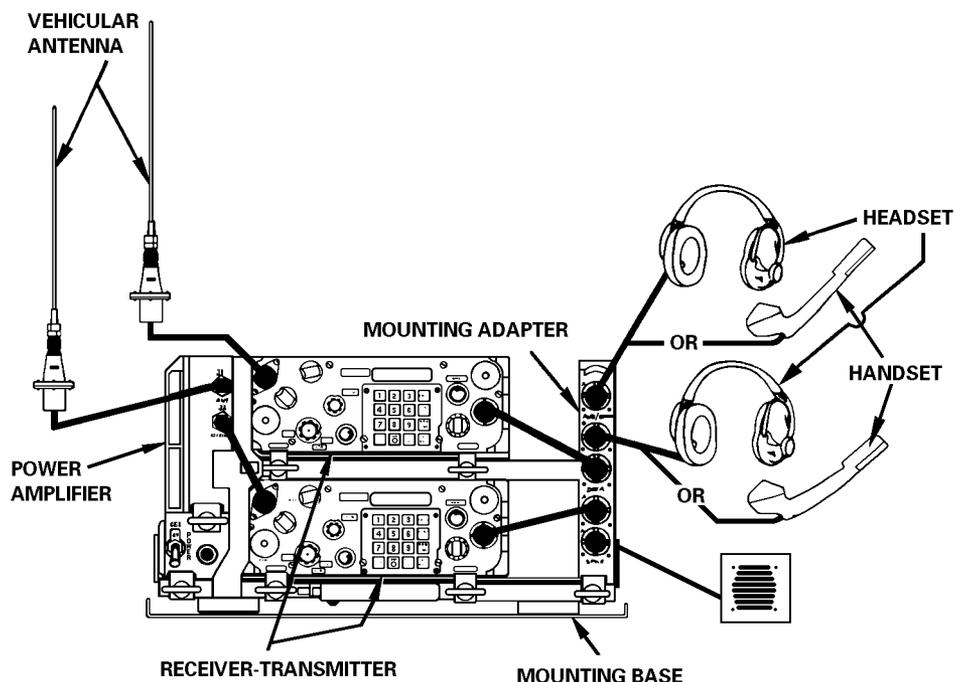


Figure E-2. Vehicular long-range/short-range radio, AN/VRC-89A.

(b) AN/VRC-90A. The AN/VRC-90A radio is an AN/VRC-87A with a power amplifier added for long-range capability. It is used for long-range communications (up to 35 km) (Figure E-3). This radio set is authorized for the FH and GH (see Tables E-1, E-2 and E-3).

(2) Improved high-frequency, amplitude-modulated radio.

(a) The AN/GRC-193A is the AM radio that is designed to provide reliable, long-range, high-frequency voice and data communications for both mobile and fixed stations (Figure E-4). This radio is authorized for the FH and GH (see Tables E-1 and E-2). This radio is used to facilitate hospital net operations. It links the hospital with higher headquarters and the CHS operations net.

(b) The KY-99 minterm is designed to provide half-duplex, narrow-band secure voice and data communications for a variety of military applications. One KY-99 minterm is required for each AN/GRC-193A subscriber radio terminals.

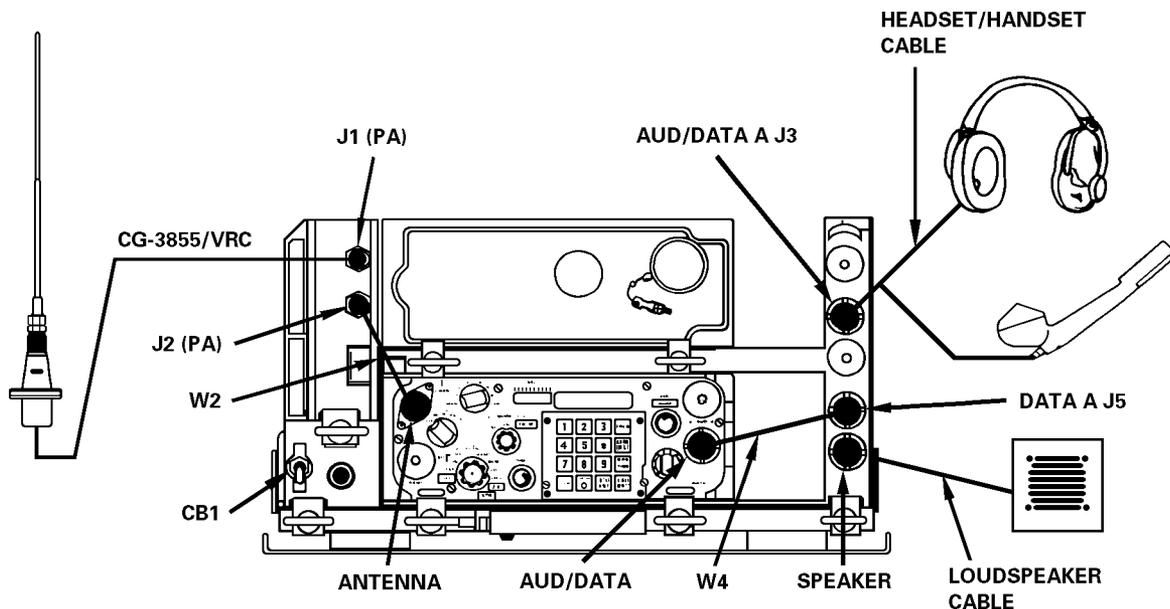


Figure E-3. Vehicular long-range radio, AN/VRC-90A.

b. *Mobile Subscriber Equipment.*

(1) *Digital nonsecure voice telephone (DNVT): TA-1035/U.* The DNVT TA-1035/U (Figure E-5) is a prime subscriber terminal that provides full-duplex digital voice communications and voltage reference signal for data subscribers in the MSE system. It is also equipped with a data port that allows users of the lightweight digital facsimile (LDF) AN/UXC-7 to access the MSE network. The TA-1035/U is found in the FH (see Table E-1).

(2) *Digital nonsecure voice telephone without data port: TA-954.* The DNVT TA-954 (Figure E-6) is a fixed/hard wire digital telephone designed for use at EAC in applications where a data port is not required. It provides a digital communications interface with TRI-TAC and MSE circuit switches. The TA-954 is found in the GH (see Tables E-2 and E-3).

(3) *Digital nonsecure voice telephone with data port: TA-1042.* The DNVT TA-1042 (Figure E-7) is a fixed/hard wire telephone designed for use at EAC where a data port is required for interface to either a FAX or computer. The TA-1042 is found in the GH (see Table E-2).

(4) *Tactical lightweight digital facsimile: AN/UXC-7.* The tactical LDF AN/UXC-7 (Figure E-8) is a prime subscriber terminal that provides full-duplex digital communications and voltage reference signal for data subscribers in the MSE system. It is also equipped with a data port that allows its users to access the MSE network. The AN/UXC-7 enables subminute transmission/reception of typed or handwritten

copy, sketches, or overlays up to 8" by 11 inches in black and white format (two shades of gray). The LDF operates directly into the TA-1035/U data port for MSE network access. It will also operate over radios and wire circuits and has full digital or analog data/voice capability. The AN/UXC-7's brief transmission (burst) reduces the chance of detection by the enemy. The critical advantages are made possible by the LDF set's ability to store data in memory and then send in short, high-speed transmission, requiring 7 to 15 seconds to transmit a full page. It is used to send and receive hard-copy data for supporting CHS at echelons above brigade. The AN/UXC-7 is found in the FH and GH (see Tables E-1 and E-2).

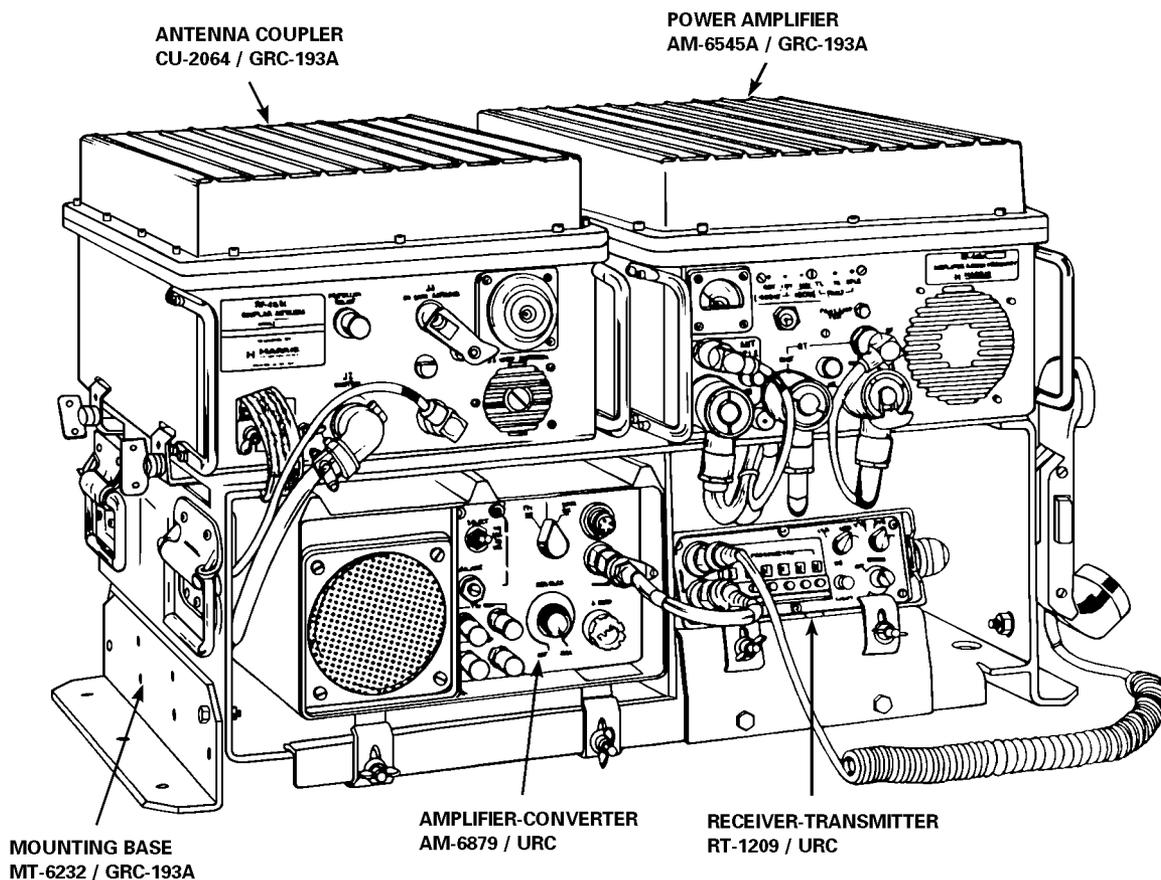


Figure E-4. Improved high-frequency radio.

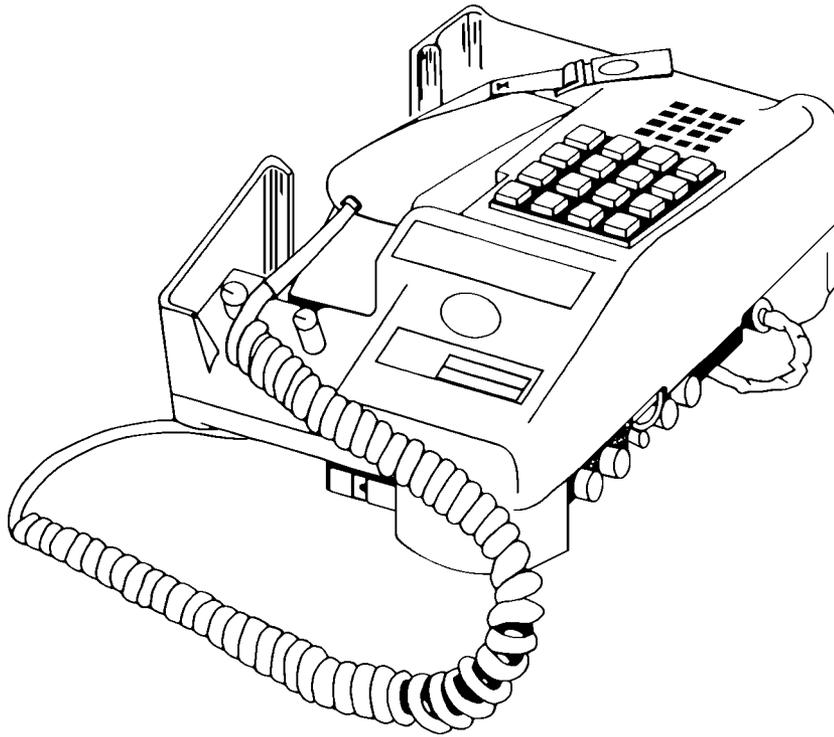


Figure E-5. Digital nonsecure voice telephone, TA-1035/U.

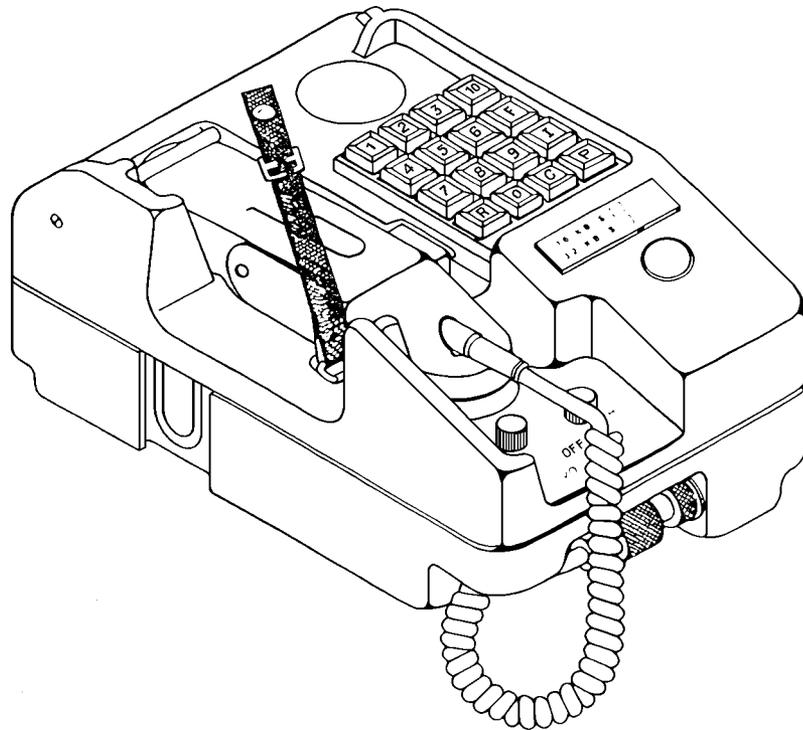


Figure E-6. Digital nonsecure voice telephone without data port, TA-954.

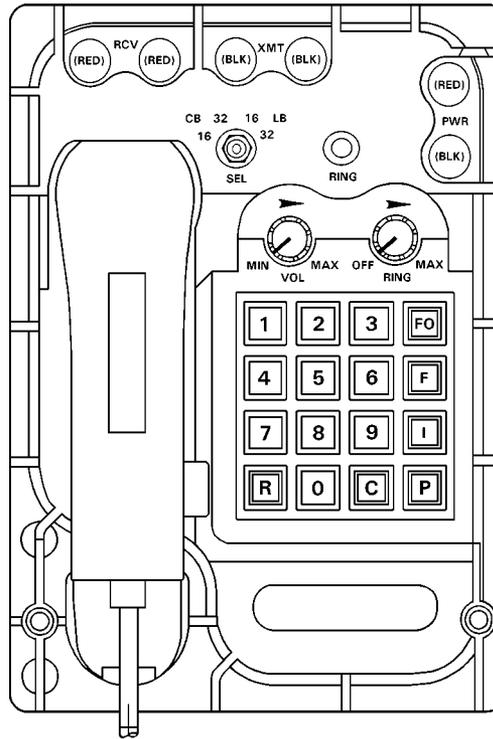


Figure E-7. Digital nonsecure voice telephone with data port, TA-1042.

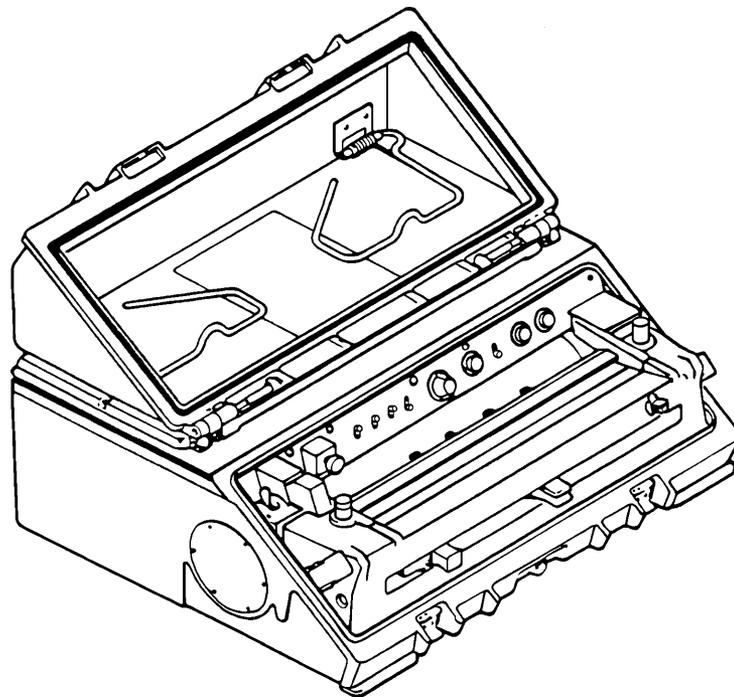


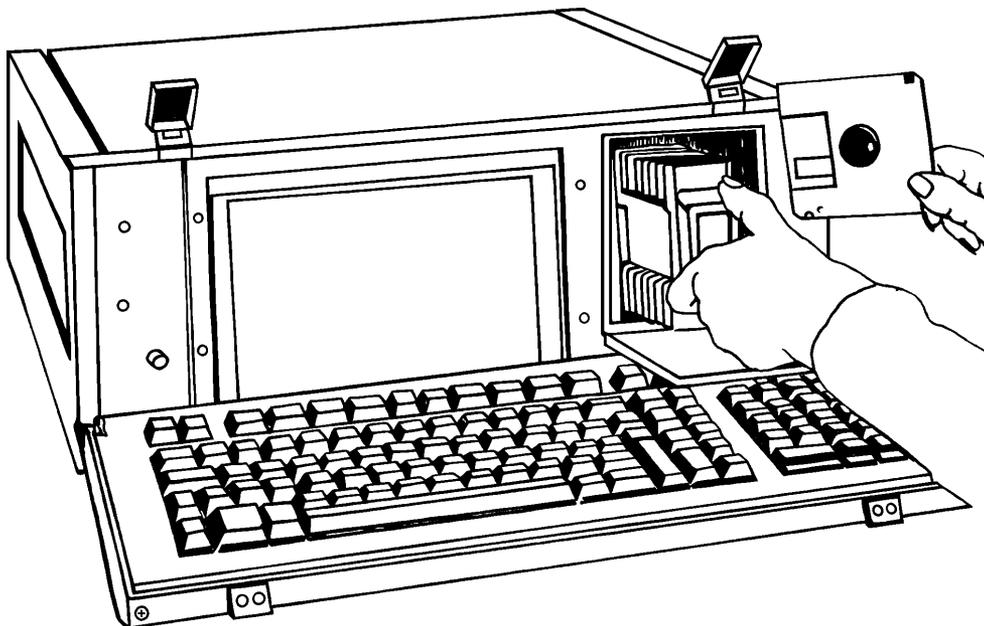
Figure E-8. Tactical lightweight digital facsimile, AN/UXC-7.

c. *Tactical Computers.*

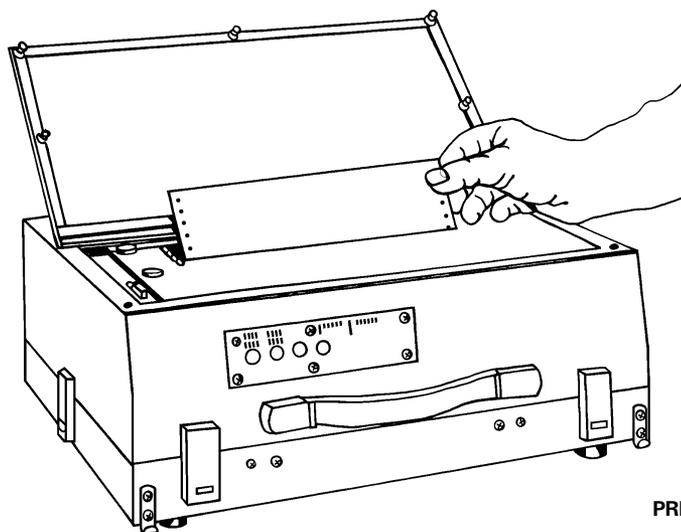
(1) *Medical transportable computer unit.* The MEDTCU is the specific computer hardware system configured to perform the TAMMIS software applications of MEDASM, MEDMNT, MEDPAR, MEDREG and MEDSUP. The TACCS is also a computer hardware system configured to perform the TAMMIS software applications; it will be replaced by the MEDTCU. The MEDTCU may be a commercial off-the-shelf (COTS) system; see paragraph (a) below. The MEDTCU is used in the PAD and supply and service sections of the FH and GH (see Tables E-1 and E-2). The MEDTCU is comprised of a transportable computer unit, color monitor device, printer unit, and an archives device (Figure E-9).

**NOTE**

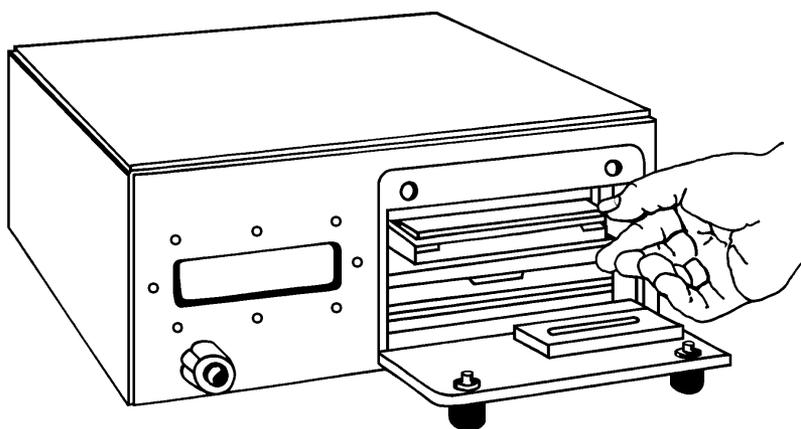
There is no TAMMIS software application for medical blood. The Defense Blood Standard System (DBSS) is under development and should be the automated information system to support Armed Services Blood Program in SASO and war. The DBSS will most likely be fielded on a COTS system.



*Figure E-9. Medical transportable computer unit.*



PRINTER UNIT



ARCHIVE DEVICE

Figure E-9. Medical transportable computer unit (continued).

(a) *Transportable computer unit.* This unit connects with the archive device and printer unit and provides multitasking software resources for computational and graphic capability, word processing, and data base management. It operates from standard 115 or 230 volt alternating current (AC). The unit comes with a full-size, hinged/detachable keyboard that can be detached and relocated up to 24 inches from the computer unit.

(b) *Color monitor device.* This monitor device has four to eight color planes and is driven by a video card installed in the host computer.

(c) *Printer.* This unit is a rugged printer designed to satisfy 80-column printer applications in an adverse environment where size, weight, and power consumption are prime considerations. The printer unit is a portable device. It employs solid state, dot matrix, printing technology.

(d) *Archive device.* The archive device is a rugged L-inch (disk drive) streaming magnetic tape cartridge system intended to provide backup or archiving. The capacity of each cartridge is 67 megabytes. The archive device tape system is supported on the transportable computer unit.

(2) *Commercial off-the-shelf system.* The COTS system is the computer system designed to support the TAMMIS software applications of MEDASM, MEDMNT, MEDPAR, MEDREG and MEDSUP. (For additional information on TAMMIS, see Chapter 6.) The COTS system is comprised of a 486 Everex Tower central processing unit (CPU), color monitor, printer, dumb terminals, and an uninterruptible power supply (UPS).

(a) *Central processing unit.* The CPU connects the monitor, printer, modem, terminals, and UPS and provides multitasking software resources for both TAMMIS and disk operating systems (DOS) (word processing, graphics, spreadsheets, and data base management) applications. The CPU operates from standard 110 and 220 volt AC. The CPU has an internal streaming magnetic tape drive cartridge system intended to provide data backup and archiving. The capacity of each tape cartridge is 250 megabytes. Some systems also have a compact disk-read only memory (CD-ROM) drive.

(b) *Color monitor.* The monitor is a super video graphics applications (SVGA) monitor with a 14-inch screen and is driven by a video card installed in the CPU.

(c) *Printer.* The printer is a lightweight, small footprint printer designed to support 80-132 column dot matrix printer applications.

(d) *Modem.* The modem is an external 9600 band modem designed to provide data telecommunication support over commercial telephone lines.

(e) *Terminals.* The COTS system can support 8 to 32 additional dumb terminals (depending on the system).

(f) *Uninterruptible power supply.* The UPS protects the COTS system hardware from power fluctuations and provides temporary power when the primary power supply is lost.

(3) *Tactical Army Combat Service Support Computer System.* The TACCS is the tactical hardware which operates the SIDPERS and the SPBS-R (Figure E-10). This system is used in the FH and GH (see Tables E-1 and E-2).

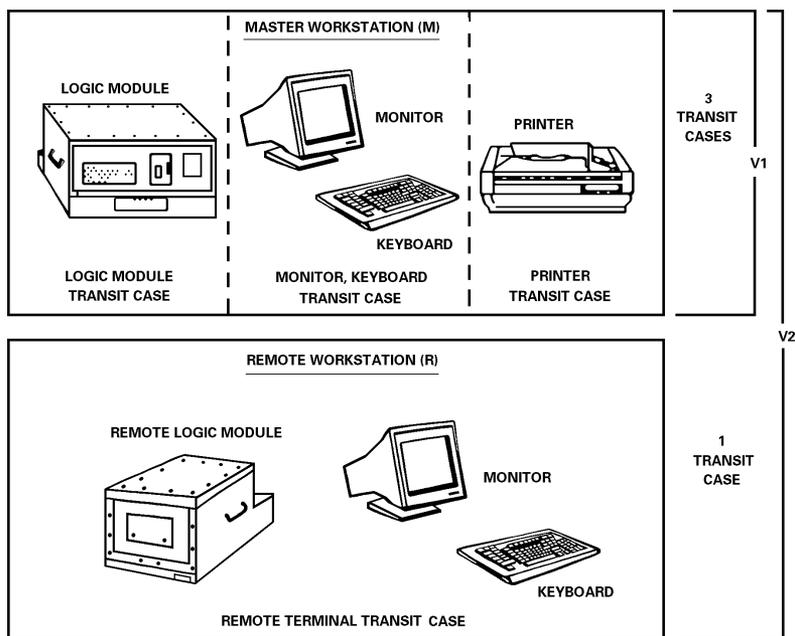


Figure E-10. Tactical Army Combat Service Support Computer System

(4) *Remote keyboard visual display unit.* This unit is a remote (COMM terminal) monitor and keyboard designed for use with the TACCS equipment. It provides the capability for data to be retrieved or entered by more than one operator simultaneously. The remote keyboard visual display unit is used in the FH and GH supply and service divisions.

d. *Position Location/Navigation Device.* The precision lightweight global positioning system (GPS) receiver (Figure E-11) is a hand-held, battery-powered POS/NAV set that receives its signal from GPS satellites. The device provides a very accurate position location capability for determining and/or reporting self-location; however, it is *not* a communications device. The GPS is authorized for selected sections of the FH and the GH (see Tables E-1 and E-2). The device is designed for individual or vehicle use.

e. *Mobile Subscriber Radiotelephone.* This telephone is issued with MSE for primary use in vehicles. It is allocated to the FH commander (see Figure E-12 and Table E-1).

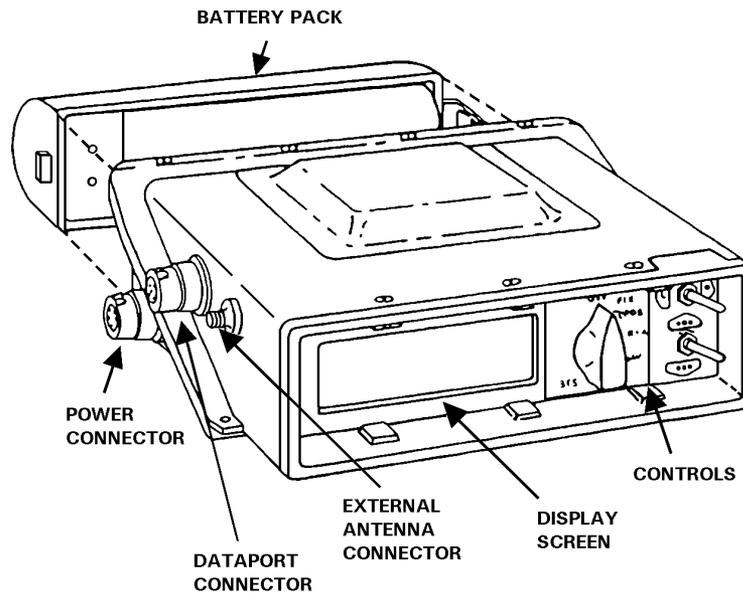


Figure E-11. Precision lightweight global positioning system receiver.

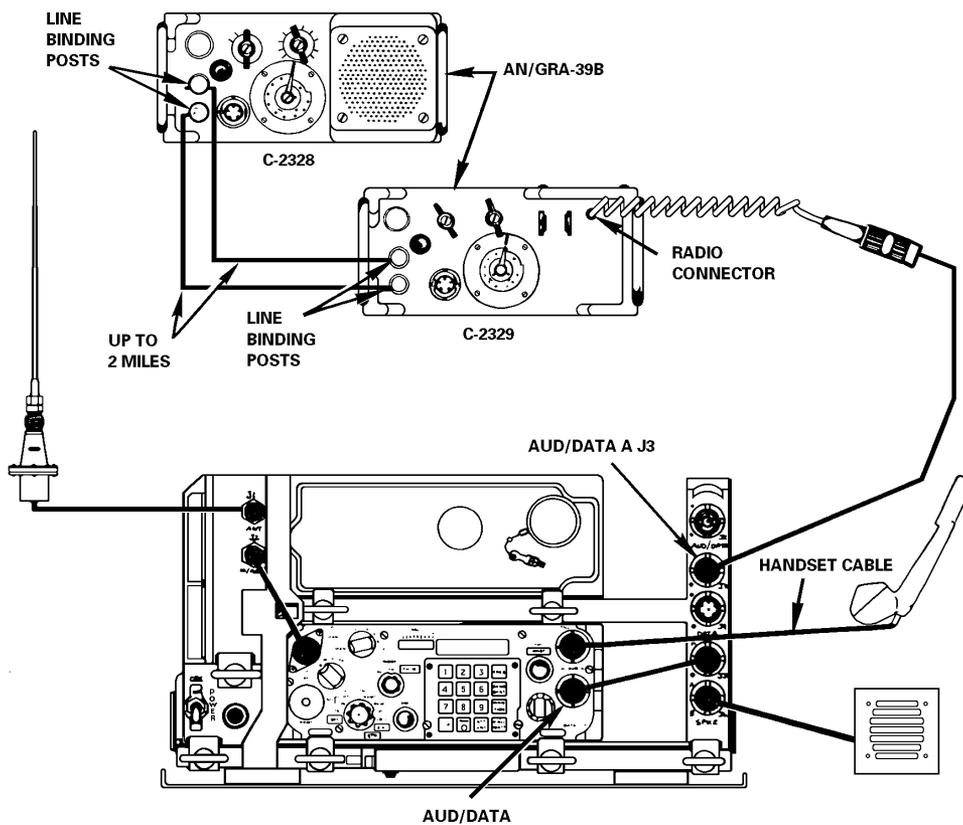


Figure E-12. Typical mobile subscriber radiotelephone installation.