

COMMUNICATIONS TERMINAL

AN/UGC-137A(V)2

(Single Subscriber Terminal-SST)



Developed for Project Manager, Multi-Service Communications Systems, U.S. Army Communications-Electronics Command, Fort Monmouth, N.J. Under Contract DAAK-80-80-C-0284

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Librascope

a division of The SINGER Company

Fully Militarized Single Subscriber Communications Terminal

INTRODUCTION

The Communications Terminal (CT), designed and manufactured by the Librascope Division of The Singer Company, is a fully militarized terminal developed for the U. S. Army. A member of the Modular Record Traffic Terminal (MRTT) family of equipment, the CT is compatible with existing and planned equipment using SSI, RS 232, and RS 449 interfaces. It consists of a plasma display panel, a standard keyboard, a control function keyboard, a communications interface, and interface equipment to provide communications with external peripheral devices such as a printer and an optical character reader.

The CT is a state of the art MC68000 microprocessor based distributed processing system providing Read Only Memory (ROM) and Random Access Memory (RAM) totalling 668k bytes. In addition, the CT incorporates bubble media for downloaded program or bulk storage of up to 256k bytes of communication data. (This storage is equivalent to approximately 160 20-line messages at 80 characters/line.) The CT is capable of storing, editing, displaying, refiling, transmitting, receiving, and/or monitoring record traffic in the R, U, and Y communities at all echelons of a tactical communications system. All of these elements, including required power supplies, are packaged in a single case 18 inches high, 17.25 inches wide, and 24 inches deep. In its transportation configuration, the unit is fully immersible to a depth of three feet. Cooling is accomplished entirely without the use of fans, either internal or external. The unit operates either from 28-volt DC vehicular power, or 115/230-volt AC at frequencies of 50, 60, or 400 hertz, and provides power-loss battery back-up for RAM.

COMMUNICATIONS INTERFACES

The CT communicates over three full duplex interfaces. One of these, the Single Subscriber Interface (SSI), has a wide selection of operational and test modes. The other two are called MRTT interfaces. They are identical and provide peripheral interfaces.

The SSI is designed for either asynchronous or synchronous communication at rates from 45.5 Baud to 32,000 bits per second. Electrically, this interface provides three initialization options:

- (a) MIL-STD-188-114 Low Level Unbalanced (this is compatible with both RS-232C and RS-449)
- (b) MIL-STD-188-114 Low Level Balanced
- (c) a CMOS interface for use with other military communications equipment.

Options (a) and (b) above may be used with either NRZ or conditioned diphas data.

The SSI operates either with or without rate conversion and error correction coding. The following rates are provided: 45.5, 50, 75, 150, 300, 600, 1200, 2400, 4800, 9600, and 16,000 Baud.

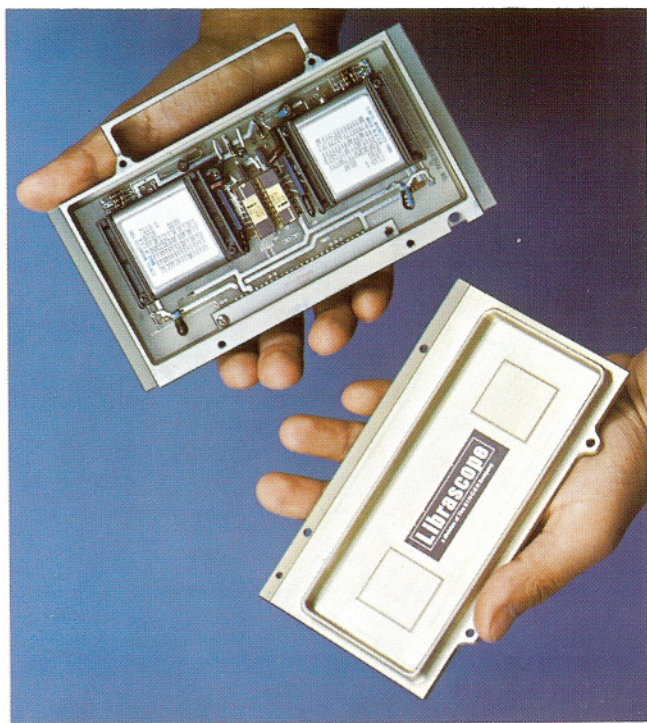
Rate conversion permits low rate data to be transmitted as a higher rate bit stream by either of two techniques: multiple sampling or bit stuffing. For each of the data rates listed above the following loop transmission rates may be chosen: 2400, 4800, 9600, 16,000, or 32,000 bits per second. The data rate must be less than or equal to the loop transmission rate, however. Multiple sampling yields a significant reduction in the bit error rate since each information bit is transmitted several times and at least half of these transmissions must be in error to cause the received data to be in error.

Forward error correction with bit stuffing is used to provide error detection and correction with accompanying rate conversion for data rates of 300, 600, 1200, 2400, 4800, 9600, 2000, 4000, 8000, and 16,000 Baud. This technique appends an 11-bit cyclic redundancy code to each 12 data bits, providing for the correction of any three bit error pattern.

The SSI includes five control lines in each direction, which may be used for such functions as Clear to Send, Ready to Send, Data Set Ready, etc.

The SSI is implemented with a 16-bit M68000 microcomputer. This provides a flexible design capable of sophisticated processing for synchronization, error detection, and rate conversion.

The MRTT interfaces provide asynchronous communications at rates up to 9600 Baud. They provide NRZ data only and do not include rate conversion or error detection. RS-232C and RS-449 compatibility are



BUBBLE MEMORY CASSETTE

provided with each MRTT interface having two input and two output control lines. In the CT application, one is used to drive a printer and the other to receive optical character reader data.

SOFTWARE CAPABILITIES

Operational software has been developed using the Department of Defense recommended Ada language. The MC68000 CT is a distributed system, downloaded from bubble memory that can be easily tailored to accommodate other user/machine applications.

MESSAGE HANDLING CAPABILITIES

The CT has the capability of allowing the operator to enter text from the keyboard or receive text from one communication channel, display this on the plasma panel, and store and recall the messages using internal memory or magnetic media. Editing consists of those functions normally associated with character editors: insert, delete, search, replace, scrolling, paging, etc. As an operator aid, prompts are used to direct every aspect of system operation, including composition of messages. Message transmission and reception are controlled by protocol structures including AUTODIN Modes I, II, and IV, TRITAC Mode VI, and the supervisory protocol called Data Adapter Control Block (DACB). The operator also directs the peripheral devices and communications interface through use of the prompts displayed on the plasma panel.

NON-VOLATILE BUBBLE MEMORY

A fully militarized cassette containing 256k bytes of

non-volatile bubble memory provides downloaded program and bulk storage for communications data. Cassette access is through a hinged door above the terminal keyboard. Support electronics inside the terminal include a dedicated microprocessor that provides file management capabilities for data stored in the cassette. Effective average data rate to the cassette exceeds 100k bits/second with a page size of 1024 bits.

DISPLAY AND CONTROLS

The Display consists of an 8.5 x 4.25 inch Plasma Panel. Text is in English or can be in the language of the user. The TT-745/UGC-74A(V) keyboard is a standard 128-key ASCII keyboard utilizing Hall-effect solid-state switching elements. A separate control function keyboard is provided for discrete system operations (e.g., cursor control). This control panel utilizes membrane switches. Audio feedback is provided to confirm switch closure.

LOGISTICS SUPPORT PACKAGE

A complete logistics support package with tri-service applicability, will be provided with the CT, including an Operator and Organizational Maintenance Manual. Direct Support and General Support Maintenance Manual, IKP and SPAS Training Material and Courses, all normally associated repair parts and tools lists, test set instructions, and all necessary provisioning and ground support data. All information in the package will have been validated and verified via Small and Large Group Trials. In addition, spare parts for use at all echelons, and Automated Test Program Sets (for use with the AN/USM-105 Automated Test Support Facility) are provided for maintenance.

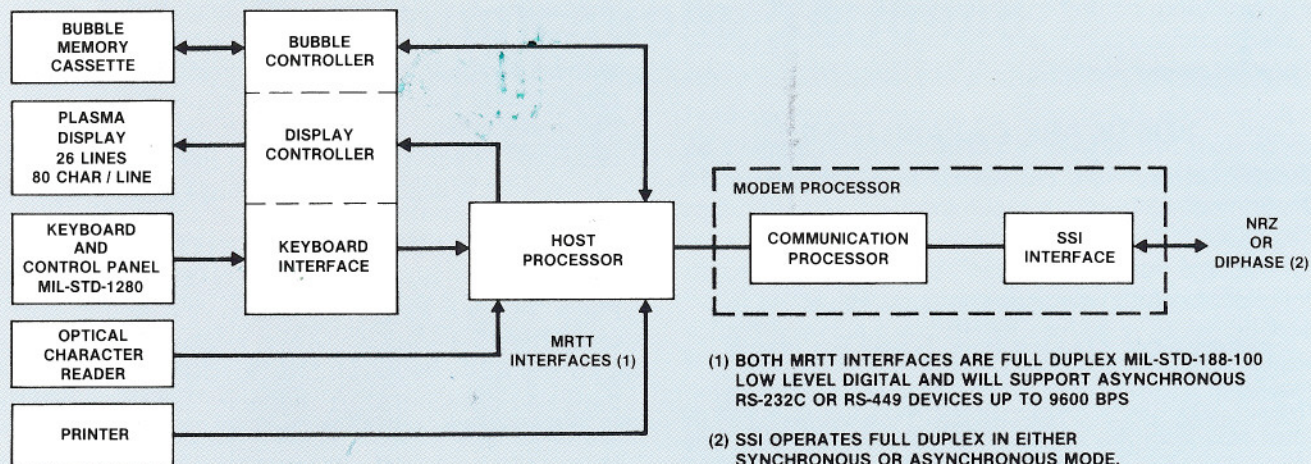


BUBBLE MEMORY CASSETTE FITS INTO SLOT ABOVE KEYBOARD

DISPLAY CHARACTERISTICS

Display Medium:	Plasma panel.
Element Resolution:	60 pixels per inch 512 x 256 matrix.
Character Size:	5 elements wide 7 elements high.
Character Capacity:	25 lines of 80 characters each.
Writing Rate:	23 microseconds per element.
Character Writing Period:	800 microseconds maximum.
Variable Display Intensity:	50 foot-lamberts max- imum adjustable to 12.5 foot-lamberts.
Refresh:	No refresh required.

CT ARCHITECTURE



ENVIRONMENTAL SPECIFICATIONS

Altitude:	Operation to 10,000 ft. Transport to 40,000 ft.	Rain:	MIL-STD-810C, Method 506.1, Procedure I.
Temperature:	MIL-STD-810C, Method 501, Procedure II. Operational -32°C to +63°C Storage -57°C to +71°C.	Sand and Dust:	MIL-STD-810C, Method 510.1, Procedure I.
Humidity:	MIL-STD-810C, Method 507, Procedure III.	Salt Fog:	MIL-STD-810C, Method 509.1, Procedure I.
Vibration:	5.0 to 5.5 Hz at 1.0 inch double amplitude. 5.5 to 30 Hz at 1.5G. 30 to 48 Hz at 0.036 inch double amplitude. 48 to 500 Hz at 4.2G.	Acoustic Noise:	MIL-STD-1474A Category F.
Shock:	MIL-STD-810C, 40G, 11 milli-second shocks on three mutually perpendicular axes.	Fungus:	MIL-STD-810C, Method 508.1 Procedure I
Immersion:	MIL-STD-810C, Method 512.1, Procedure 1.	Bench Handling:	MIL-STD-810C
Loose Cargo:	MIL-STD-810C, Method 514.2, Procedure XI, Part 2.	Electromagnetic Interference:	MIL-STD-461, Notice 4. CE01 CS01 RE02 RS02 CE02 CS02 RE02.1 RS03 CE03 CS06 CE04 CS05
		Chemical, Biological, Radiological:	TM3-220

POWER REQUIREMENTS

Voltage: 22 to 30 VDC vehicular power
50/60/400 HERTZ,
115/230 VAC

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