EE161-HB-OMI-010/W106-UGC-136BX

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TECHNICAL MANUAL

OPERATION AND MAINTENANCE INSTRUCTIONS

ORGANIZATIONAL AND INTERMEDIATE MAINTENANCE

TELETYPEWRITER SET AN/UGC-136BX

E-Systems, Inc., ECI Division

Contract No. N00039-88-C-0118

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1 JULY 1991

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of this page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:
Original . . 0 . . 1 JULY 1991

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 474 CONSISTING OF THE FOLLOWING:

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i - vi	0	FP 5-29	0	FP 5-69	0
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3-92 blank	0	FP 5-35	0	FP 5-75	0
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RECORD OF CHANGES

Change No.	Date	Title or Brief Description	Entered By

VALIDATION PERFORMANCE

Technical Manual,
Operation and Maintenance Instruction,
Organizational and Intermediate Level
Teletypewriter Set AN/UGC-136BX

Contractor:

E-Systems, Inc.
ECI Division
P.O. Box 12248
St. Petersburg, Florida 33733

Subcontractor: (If performing validation)

Contract No(s) and Purchase Orders, if applicable

N00039-84-C-0197

Chapter	Section	Paragraph	Date Validation Completed	Check here if not validated
1	-	-	4-6-90	
2	-	-	4-6-90	
3	-	-	4-6-90	
4	-	-	4-6-90	
5	-	-	4-6-90	
6	1	-	4-6-90	
	2	-	4-6-90	
7	-	-		(Reviewed)
8	-	-	4-6-90	

Name & Authority of Validating Officer

John R. Schwarz
Supervisor, Logistics Support

Signature of Validation Officer

TABLE OF CONTENTS

NOTE

An alphabetical index is located at the back of this manual. The introduction explains the material covered in each chapter.

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LIST OF ILLUSTRATIONS-Continued

LIST OF ILLUSTRATIONS-Continued

LIST OF TABLES

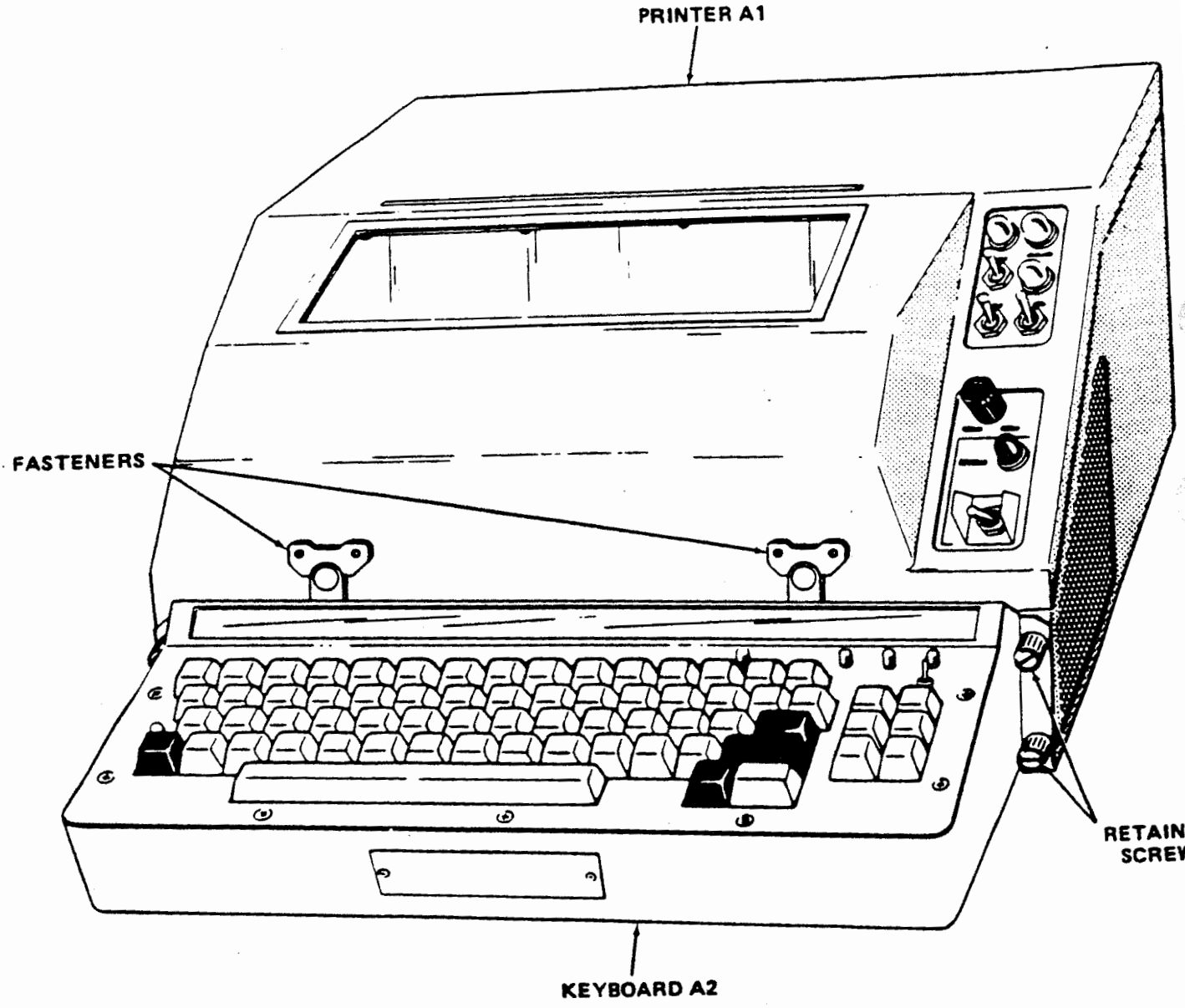


Figure 1-1. Teletypewriter Set, AN/UGC-136BX

CHAPTER 1

GENERAL INFORMATION AND SAFETY PRECAUTIONS

1-1. SAFETY PRECAUTIONS.

Standard safety precautions are to be observed when the modules are removed from the case during troubleshooting. The following warnings and cautions are applicable to Teletypewriter Set AN/UGC-136BX and are contained in this manual:

WARNING

Death or injury may occur if the power cable safety ground wire is not connected to a suitable AC receptacle safety ground return. Also, an additional safety ground strap must be connected to E1 ground stud at the rear of the Keyboard-Printer. (table 2-4, table 5-3, para 8-7.2)

WARNING

When using alcohol for cleaning, adequate ventilation must be provided. Avoid inhalation of the fumes and prolonged skin contact. (para 4-3)

WARNING

Wear protective eye gear when using pressurized air. (para 4-3)

WARNING

Dangerous voltages exist when power is on. (FO 5-9, sheet 3 of 4)

WARNING

Voltages as high as 115 volts are contained in the equipment discussed in this manual. Use standard safety precautions when the modules of this unit are removed from the case. Disconnect the power cable at J1 (figure 6-5, View B) before making any test connections, or before working inside the chassis. (para 6-4, para 6-4.6)

WARNING

The carton weighs 91 lbs complete. To prevent injury to personnel or damage to equipment, two persons are required for lifting and carrying. (para 8-3)

WARNING

The Keyboard-Printer weighs approximately 68 pounds. To avoid injury to personnel, two persons are required for lifting, carrying, and installing the Keyboard-Printer. (para 8-7)

CAUTION

Ensure carriage shaft lever is forward and properly adjusted (para 6-2.2). Firing of printhead into free air may damage printhead. (table 2-4, table 5-3, para 6-2)

CAUTION

To avoid bending left margin sensing tab, move printhead to center of machine before removing ribbon cassette. Press space bar and RPT key (28, figure 2-3) to move carriage. (table 2-8)

CAUTION

Damage will result to equipment if power is applied to print mechanism before zener diodes are checked. (figure FO 5-20)

CAUTION

Damage will result to printhead if power is left on for more than 2 seconds and pins are not flush with end of printhead. (figure FO 5-20)

CAUTION

Use extreme care while turning the timing disc to avoid bending its edges. (para 6-3.2)

CAUTION

The logic modules contain static sensitive devices. Care must be exercised to prevent electrostatic discharge which may damage the devices. (para 6-4.2)

CAUTION

Connector pins can be easily bent and equipment damaged if modules are not carefully removed and replaced. (para 6-4.2)

CAUTION

Do not move the printhead mechanism back away from the platen when the printhead is located at the left margin. Always move the printhead horizontally to a location in center of platen before moving printhead away from platen. This procedure must be adhered to in order to avoid damage to the left margin sensing tab. (para 6-4.5)

CAUTION

Connector pins on the underside of the Power Supply module can be bent and damaged if care is not exercised when removing and replacing this unit. (para 6-4.6)

CAUTION

Exercise care when removing locknut as it is under spring pressure. (para 6-4.9)

CAUTION

When performing steps j through p, exercise extreme caution so as not to damage ribbon connector or bend left margin sensor plate on carriage assembly. (para 6-4.9)

CAUTION

Exercise care in moving Motor Control assemblies to prevent damage to wiring. (para 6-4.19)

1-2. INTRODUCTION.

This manual contains operation and maintenance instructions for Teletypewriter Set AN/UGC-136BX (hereinafter referred to as the Keyboard-Printer), and is intended for use by operator and maintenance personnel. The following paragraphs provide general information pertaining to the Keyboard-Printer.

1-2.1 Scope. This manual provides information for operating, maintaining (preventive and corrective), troubleshooting and installing the Keyboard-Printer. Also contained in the manual is a functional description and parts list for the equipment.

1-2.2 Applicability Data. The information contained in this manual applies to the Keyboard-Printer, manufactured by E-Systems, Inc., ECI Division, part number 01-01344.

1-2.3 Unit Designator. In this manual, Teletypewriter Set AN/UGC-136BX is designated Unit 1. The unit designator (1) is omitted in the manual unless it is required for clarity.

1-3. EQUIPMENT DESCRIPTION.

The purpose of the Keyboard-Printer, shown in figure 1-1, is to provide a method of transmitting and receiving messages within a communications network. The Keyboard-Printer operates locally or remotely and allows the operator to create messages for transmission, using a compose/edit mode. Because of its design, the equipment allows the operator to transmit, receive, and compose messages simultaneously. The equipment can be operated at any location that meets the power and environment requirement and has access to the communications network. The Keyboard-Printer is easily installed in any standard 19-inch rack and does not require any external support equipment. Because of the multiple input/output (I/O) port design, the equipment is capable of operating with several peripherals (i.e., page displays, bulk storage devices, etc.).

1-3.1 Capabilities. The Keyboard-Printer is capable of transmitting and receiving data at rates from 45.5 to 4800 baud. The three I/O ports can be set to transmit or receive at any of the selectable baud rates in either ITA-2 or ITA-5 (ASCII) Codes. The transmitted or received data is stored in the message store module which is capable of storing up to 256 blocks of data. Each block contains 252 characters, which allows for a maximum storage area of 64,512 characters. With external memory devices, additional storage for messages is available. The message composing and editing functions are accomplished using a standard four-row MIL-STD-1280, Type 1, Class 1 keyboard and six memory control keys. Messages can be composed on-line and transmitted, or off-line and stored for future transmission. Received messages may be stored for later printout or printed as received. Messages in memory can be recalled and edited, which permits adding, deleting, or overwriting by line or character. Safeguards in the equipment prevent accidental deletion or overwriting of stored messages. Additional features provide a status review of messages in memory, recording of message and line numbers, priority routines, and error indications.

1-3.2 Limitations. The Keyboard-Printer is capable of storing 64 messages or 256 blocks of data. If 60 messages or 240 blocks of data are contained in memory, a forced delete operation will take place upon receipt of the next message. The forced delete operation will inform the operator that the message is being deleted and will then print the deleted message if it has not been previously printed.

1-4. REFERENCE DATA.

Reference data for the Keyboard-Printer is listed in table 1-1.

1-5. EQUIPMENT, ACCESSORIES, AND DOCUMENTS SUPPLIED.

Table 1-2 provides a list of all equipment, accessories, and documents supplied with the Keyboard-Printer.

1-6. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED.

Table 1-3 provides a list of equipment and publications required but not supplied to operate, test, and troubleshoot the Keyboard-Printer.

1-7. FIELD AND FACTORY CHANGES.

Table 1-4 is provided at the end of this chapter to record field and factory changes.

Table 1-1. Reference Data

Item	Characteristic
Manufacturer	E-Systems, Inc., ECI Division
Type	Teletypewriter Set AN/UGC-136BX
Model	01-01344-001
Repairable Identification Code (RIC)	EP00008610
Power input	115 Vac, 60 Hz, 250 watts maximum
Environmental Characteristics	
Humidity	Up to 95%
Ambient temperature	0° to 50°C
Functional Characteristics	
Code sets	ITA-2 or ITA-5 (ASCII)
Character font	7 by 9 matrix
Character spacing	10 per inch horizontal, 6 per inch vertical
Line length	Selectable 69-80 characters
Print speed	120 characters per second
Message storage capacity	256 blocks of 252 characters each
Paper type	Single-ply or multi-ply, Grade A, Type I Class I, White, 7530-00-142-9037
Paper size	Standard roll teletype paper (either 8-1/2 or 8-7/16 inches wide; diameter up to 5.0 inches)

Table 1-1. Reference Data-Continued

Item	Characteristic
Functional Characteristics -continued	
Ribbon	Cassette type, Mfr. 51809, Part No. 197939
Copy capability	Original plus two copies
Functional Operating Modes	
Remote mode	The Keyboard-Printer is under the control of a remote terminal.
Local mode	The Keyboard-Printer is under the control of the keyboard and operates as a typewriter when not placed in the transmit or compose mode.
Receive mode	The Keyboard-Printer is on-line to receive data in memory and print, or receive in memory for later printout.
Compose and edit mode	The Keyboard-Printer functions as an electric typewriter entering data into memory for later editing and/or transmission.
Transmit mode	The Keyboard-Printer transmits data directly from keyboard entry or from memory.
Signal Characteristics	
Signal type	Serial asynchronous/synchronous/isosynchronous
Signal level	±5-volt (bipolar operation) data and control, TTL internal control
Signal speeds (baud rate)	45.5, 50, 75, 100, 110, 150, 200, 300, 600, 1200, 2400, and 4800 baud rates (switch-selectable)
Mark/space sense	Either +5V or -5V (switch-selectable)
Signal distortion	
Transmitted signal	Transmit accuracy greater than 1 percent for all baud rates. Transmitted signal distortion less than 2 percent of an element at any speed.
Received signals	The Keyboard-Printer accurately prints received data, provided early and late (bias) distortion does not exceed 48 percent of a signal element at any speed.
Parity	Odd, even, or none (refer to table 2-7).

Table 1-2. Equipment, Accessories, and Documents Supplied

Quantity per equipment	Nomenclature	Overall dimensions			Weight (lbs)
		Height (in./cm)	Width (in./cm)	Depth (in./cm)	
1	Teletypewriter Set AN/UGC-136BX	8.5/ 21.59	15.75/ 40	24.5/ 62.2	68 (uncrated w/paper) 91 (crated w/paper)
2	Teletypewriter Set AN/UGC-136BX Operation and Maintenance Technical Manual	11.0	8.5	3.0	

Table 1-3. Equipment and Publications Required But Not Supplied

SCAT code	Category	Recommended equipment	Alternate	Test parameters	Applications
4212	Voltmeter	Digital Voltmeter (DVM) 8600A-01 FSCM 89536	None	0 to 1200 Vac 0 to ± 1200 Vdc 0 to 20 megohms	Troubleshooting or Corrective maintenance
	Instruction Manual	Operating & Service Manual, Digital Voltmeter (DVM) 8600A-01	N/A	N/A	Reference
	Retaining Ring Pliers	Waldes Truarc model no. 22	Equiv.	N/A	Corrective maintenance
	Insertion Tool	3M model no. 3522	Equiv.	N/A	Corrective maintenance
	Connector	MS3116F14-5SW	None	N/A	Power Connector J1
	Connector	M24308/3-3	None	N/A	Signal Connector J2

Table 1-3. Equipment and Publications Required But Not Supplied-Continued

SCAT code	Category	Recommended equipment	Alternate	Test parameters	Applications
4308	Oscilloscope	AN/USM-425(V)1	Equiv.	Dc to 100 MHz 0 to 100 Vac 0 to 100 Vdc	Troubleshooting or corrective maintenance
	Instruction Manual	Operating and Servicing Manual, Oscilloscope AN/USM-425(V)1	N/A	N/A	Reference
4245	Multimeter	55026-260-6XLP	Equiv.	0 to 250 Vac 0 to 250 Vdc 0 to ∞ ohms 0 to 10 mA	Troubleshooting
	Instruction Manual	Operating and Servicing Manual, Simpson 260-6XLP	N/A	N/A	Reference
4448	Megohm Tester	24655-1863	Equiv.	0 to 250 Wvdc 0 to ∞ ohms	Troubleshooting
	Instruction Manual	Operating and Servicing Manual, Model 1863	N/A	N/A	Reference
	Decade Box	24655-1432M	Equiv.	50-12K ohms	Corrective maintenance
	Instruction Manual	Operating and Servicing Manual, Model 1432M	N/A	N/A	Reference
	Force Gauge	Chatillon Model DPP5	Equiv.	0 to 5 Ft lbs	Corrective maintenance

Table 1-4. Record of Field and Factory Changes

Change number	Nomenclature	Description

CHAPTER 2

OPERATION

2-1. INTRODUCTION.

The Keyboard-Printer is intended to be used by an operator to transmit, receive, compose and edit messages. The messages are sent to and received from other stations on the communications network. The Keyboard-Printer can be controlled locally or remotely from a page display. The compose and edit mode allow the operator to compose or edit messages which are displayed on a one-line, 80 character display, and stored in memory. The operator may transmit the composed or edited message from memory, or transmit a message as it is being composed. Received messages are stored in memory and can be recalled and edited, which permits adding, deleting, or overwriting by character or by line. The edited received message may then be transmitted if required. The operator may review composed, edited and received messages stored in memory by initiating a message status report from the Keyboard-Printer. The Keyboard-Printer may be interfaced to an optional bulk storage disk drive unit. The disk drive unit reads and writes data and provides required status information to the Keyboard-Printer. This chapter describes the controls and indicators for the Keyboard-Printer and provides instructions for operation of the equipment. The information consists of descriptions of individual controls and indicators, and procedures for equipment turn-on, operation, and turnoff.

2-2. CONTROLS AND INDICATORS.

The controls and indicators are shown in figures 2-1, 2-2, and 2-3. Descriptions of the controls and indicators shown in these figures are provided in tables 2-1, 2-2, and 2-3.

2-2.1 Keyboard-Printer Control Panel. Figure 2-1 shows the Keyboard-Printer control panel and identifies all controls and indicators. Table 2-1 describes the functions of the controls, indicators, and audible alarm.

2-2.2 Configuration Control Panel. The configuration controls are located on the front of the printer chassis, and are accessible by releasing the two cover fasteners on the front panel and lifting the front cover to its lock-in position. These controls set the Keyboard-Printer to a specific configuration. The configuration controls are shown in figure 2-2, and are listed with their functions in table 2-2.

2-2.3 Keyboard and Message Memory Controls. Controls and indicators required for operation of the Keyboard-Printer are grouped together on the keyboard for ease of operation. The four-row MIL-STD-1280, Type I, Class 1 keyboard and special keys are shown in figure 2-3. The memory controls consist of a cluster of six special keys on the right of the keyboard, together with the EXIT/ENTER key as shown in figure 2-3. These keys control the manipulation of data for either internal or external memory. Table 2-3 describes the functions of the keyboard, memory controls, and indicators.

2-2.4 Loudspeaker Control. The loudspeaker control (A1A1R2) is located in the center-top of the Print Mechanism. The control is rotated cw and ccw to raise and lower, respectively, the volume of the audible alarm. The control is adjusted to the desired volume level of the operator.

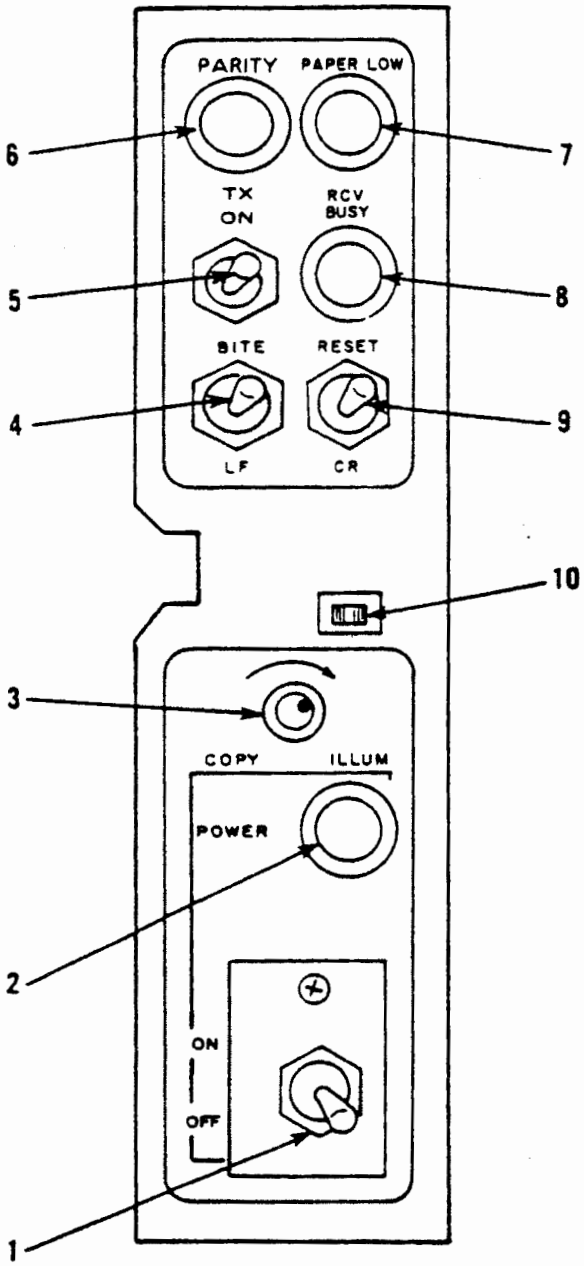


Figure 2-1. Keyboard-Printer Control Panel, Operating Controls and Indicators

Table 2-1. Keyboard-Printer Control Panel, Operating Controls and Indicators

Index no. figure 2-1	Control or indicator	Function
1	POWER ON/OFF switch (circuit breaker)	Two-position circuit breaker. When set to ON, Keyboard-Printer is energized. All logic is reset when switch is moved from OFF to ON. When set to OFF, Keyboard-Printer is deenergized and the memory is cleared of all information. Power Supply overload condition will cause the circuit breaker to trip, breaking the circuit, which will also erase the memory of all stored information. To reset, the switch must be set to OFF, then back to ON.
2	POWER indicator (green)	Indicates power is on and circuit breaker is closed.
3	COPY ILLUM (potentiometer)	Varies intensity of copy illumination lamps. This control also allows the lamps to be turned off.
4	BITE/LF switch (momentary, center off)	BITE position - Initiates self-test routine, performs lamp test while switch is depressed, and prints full character set at high speed. (See figure 2-4.) LF position - Causes Keyboard-Printer to perform a local line feed.
5	TX ON switch	Enables keying of the transmitter.
6	PARITY indicator (white)	Indicates that a parity error has been detected in the received data.

Table 2-1. Keyboard-Printer Control Panel, Operating Controls and Indicators-Continued

Index no. figure 2-1	Control or indicator	Function
7	PAPER LOW indicator (white)	Flashes when paper needs to be added.
8	RCV BUSY indicator (white)	Indicates open circuit or space condition; off during mark condition on receive line.
9	RESET/CR switch (momentary, center off)	RESET position - Resets PARITY and PAPER LOW indicators, external BELL line, and terminates BITE. CR position - Causes Keyboard-Printer to perform a local carriage return.
10	Safety interlock switch	Prevents the Keyboard-Printer from printing while the cover is open. The local line feed (LF) and carriage return (CR) switches are still active and can be actuated when the cover is open. Characters received while the cover is open will be stored in the message store memory and will be printed after the cover has been closed. The safety interlock switch can be placed in a locked position (bypassed), which will allow printing while the cover is open. This is done by pressing the switch slightly to the left and raising it to its detent position. To unlock the switch, simply press down on it to remove it from its detent position.

Table 2-1. Keyboard-Printer Control Panel, Operating Controls and Indicators-Continued

Index no. figure 2-1	Control or indicator	Function
In addition to the above listed switches and lights, the following audible alarms inform the operator of Keyboard-Printer operations:		
	End-of-line alarm (bell)	• Bell rings in compose/edit operation when the seventh character from the end of the line (69-80 characters) is entered. • Detection of parity error in received message. • Bell rings if operator commits control or data entry error.

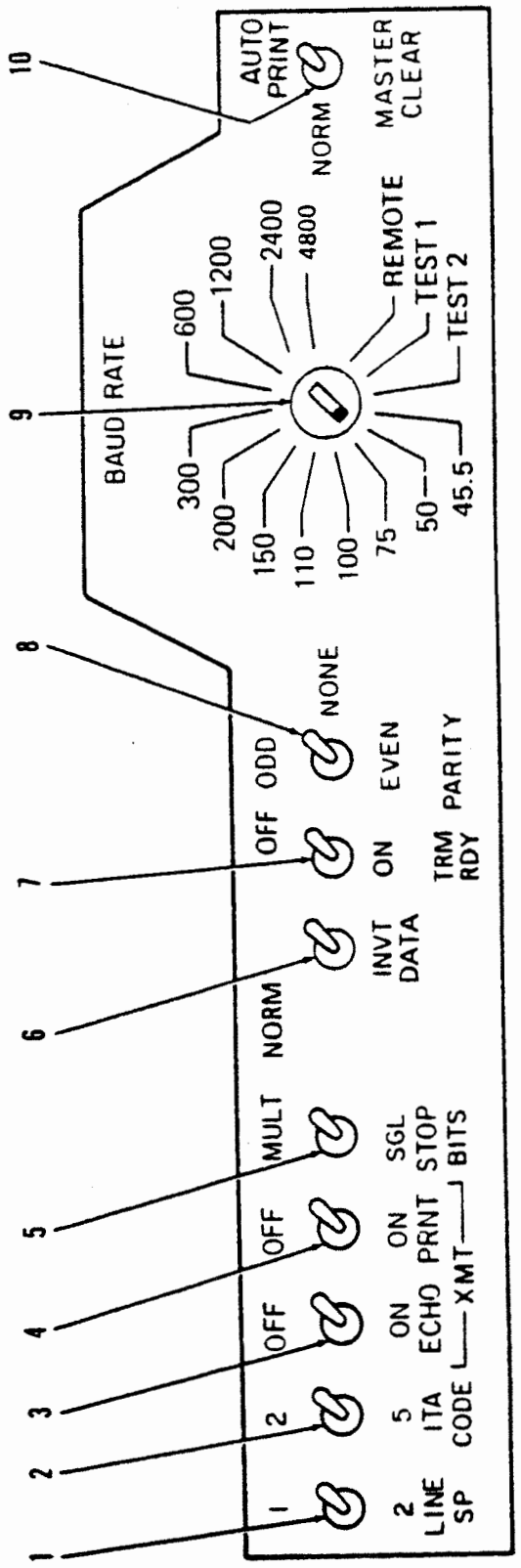


Figure 2-2. Configuration Control Panel, Operating Controls

Table 2-2. Configuration Control Panel, Operating Controls

Index no. figure 2-2	Control or indicator	Function
1	LINE SP 1/2 switch (toggle)	When set to 1, causes one line space for every line feed function received. When set to 2, causes two line spaces for every line feed function received.
2	ITA CODE 2/5 switch (toggle)	When set to 2, places Keyboard-Printer in ITA-2 configuration. When set to 5, places Keyboard-Printer in ITA-5 (ASCII) configuration.

NOTE

Non-valid ITA-2 characters entered on the keyboard while in the ITA-2 configuration will not be printed, stored in memory, or transmitted, and will result in an audible tone when the non-valid key is pressed.

3	XMT ECHO ON/OFF switch (toggle)	Affects handling of received messages when Keyboard-Printer is in a transmit mode of operation. In the OFF position, all messages received while actively transmitting are printed, stored in memory and assigned message numbers. In the ON position, all messages received while actively transmitting are assumed to be echoed messages and are printed, but are not stored or assigned message numbers.
4	XMT PRNT ON/OFF switch (toggle)	In the OFF position, the Keyboard-Printer will not print transmitted messages or data.

Table 2-2. Configuration Control Panel, Operating Controls-Continued

Index no. figure 2-2	Control or indicator	Function
4	XMT PRNT ON/OFF switch (toggle)-continued	In the ON position, activates the Keyboard-Printer and allows the operator to see, character by character, what is being transmitted from memory or the keyboard. If the PRINT ENABLE switch (10, figure 2-3) is in the ON position, messages received during transmit/print operation take priority. Printing of the transmitted message will then be interrupted until received messages have been printed, at which time the Keyboard-Printer will resume printout of the transmitted message. Otherwise, received messages will be stored in memory.
5	STOP BITS SGL/MULT switch (toggle)	Selects the minimum number of stop bits that are received and transmitted. In the SGL position, allows serial data to be received and transmitted with the minimum number of stop bits of one. In the MULT position, allows serial data to be received and transmitted with the minimum number of stop bits of: two stop bits if ITA CODE switch is set to 5 (ASCII). one and a half stop bits if ITA CODE switch is set to 2.

Table 2-2. Configuration Control Panel, Operating Controls-Continued

Index no. figure 2-2	Control or indicator	Function
6	DATA INVT/NORM switch (toggle)	Selects the mark/space sense of the transmit and receive data lines. In NORM position, mark is a logic high and space is a logic low. In INVT position, mark is a logic low and space is a logic high.
7	TRM RDY ON/OFF switch (toggle)	ON position terminal operates normally. OFF position communication port inhibit line is active inhibiting the receipt of data till the switch is set to ON.
8	PARITY ODD/EVEN/NONE switch (toggle)	ODD, EVEN, or NONE positions select the type of parity that is checked and transmitted. Its function depends on the position of the ITA CODE switch. Table 2-7 shows the data parity configuration for these switch settings. This switch is only active in the ITA-5 configuration. In the ITA-2 configuration, the switch is not used.
9	BAUD RATE switch (rotary)	Positions 45.5, 50, 75, 100, 110, 150, 200, 300, 600, 1200, 2400, 4800 select transmit and receive data rate. REMOTE position - Allows the baud rate to be set remotely at 50, 75, 1200, or 2400.

Table 2-2. Configuration Control Panel, Operating Controls-Continued

Index no. figure 2-2	Control or indicator	Function
9	BAUD RATE switch (rotary) -continued	Position TEST 1 allows the BITE test message to print continuously when the BITE (4, figure 2-1) switch is pressed. TEST 2 is used for RCV ONLY MODEL 2 to boot or unload bulk storage device.
10	AUTO PRINT/NORM/MASTER CLEAR switch (toggle)	AUTO PRINT position - Received messages are printed and not stored. NORM position - Received messages are printed and stored in memory (printing depends on PRINT ENABLE switch (10, figure 2-3) position on keyboard. MASTER CLEAR position - Initiates a power on sequence which performs a self test of the unit, prints out the configuration message and clears the memory.

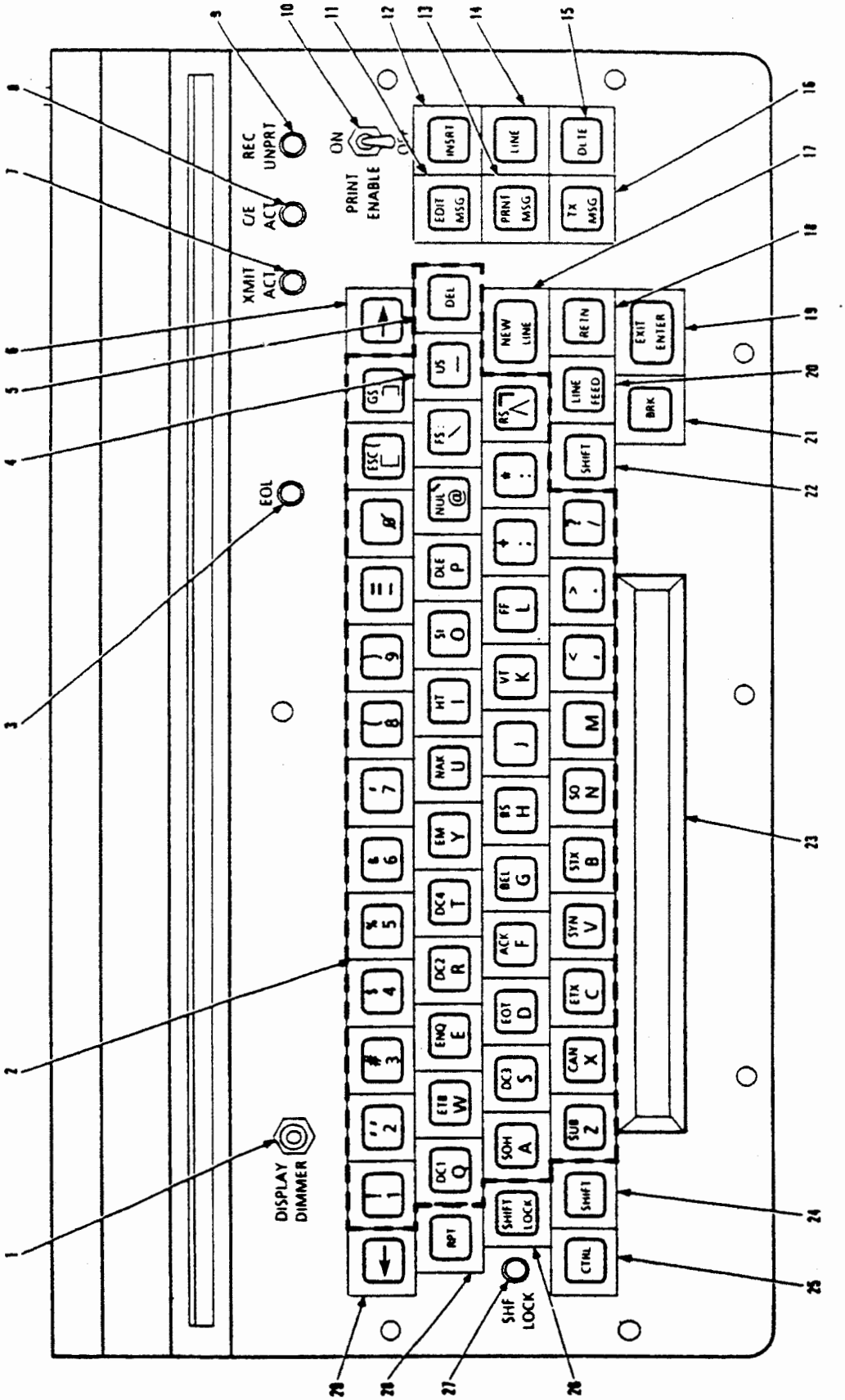


Figure 2-3. Keyboard, Operating Controls and Indicators

Table 2-3. Keyboard, Operating Controls and Indicators

Index no. figure 2-3	Control or indicator	Function
1	DISPLAY DIMMER control	When pressed and held causes display intensity to cycle until released.
2	Message character keys	Message character keys are standard ITA-5 design using QWERTY layout. The following keys also function as control keys when pressed along with the CTRL key. These keys are labeled on the front of the key with their control functions.

Lower	Front	Function
1	POR INIT	Used to control initializing of the ports.
2	POR STAT	Used to determine the current status of the ports.
3	SOM/ EOM	Used to change SOM or EOM.
4	LOC/ REM	Used to select local/remote control of Keyboard-Printer.
6	RCV TERM	Terminates received message with improper EOM.
8	LL SEL	Used to change line lengths.

Table 2-3. Keyboard, Operating Controls and Indicators-Continued

Index no. figure 2-3	Control or indicator	Function
2	Message character keys -continued	Lower / Front / Function 9 / OVR RIDE / Overrides automatic insertion of carriage return and line feed in compose/edit mode. Ø / CON TX / Used for continuous transmit.
3	EOL indicator	Illuminates to indicate only six character positions remain on the present line.
4	US/-/FIGS key	Used to manually shift from letters to figures in ITA-2. However, not normally used as the Keyboard-Printer automatically shifts from letters to figures when a figure key is pressed.
5	DEL/LTRS key	Used to manually shift from figures to letters in ITA-2. However, not normally used as the Keyboard-Printer automatically shifts from figures to letters when a letter key is pressed.
6	→ key	Moves carriage or cursor (one-line display) to the right one character position for each time pressed when in the character edit mode.
7	XMIT ACT indicator	Illuminates when the Keyboard-Printer is transmitting on any port.

Table 2-3. Keyboard, Operating Controls and Indicators-Continued

Index no. figure 2-3	Control or indicator	Function
8	C/E ACT indicator	Illuminates when Keyboard-Printer is in compose/edit mode. Flashes when there are less than 5,000 character positions remaining in memory or 62 message tables are active.
9	REC UNPRT indicator	Indicates memory contains a received unprinted message and will extinguish when all received messages have been printed.
10	PRINT ENABLE ON/OFF switch	In ON position, received messages are printed and stored in memory. In OFF position, received messages are stored in memory but not printed. Stored messages will be printed when switch is returned to the ON position.
11	EDIT MSG/READ key	Enables compose/edit mode. When used with SHIFT key enables reading of bulk storage device, (if connected).
12	INSRT/FMT key	Enables inserting of characters or lines. When used with SHIFT key enables formatting (scratching) of disk in bulk storage device, (if connected).
13	PRINT MSG/DIR key	Enables printing of a stored message. In compose/edit mode, prints messages stored in memory with line numbers. Also used to initiate memory status message. When used with SHIFT key provides directory listing for bulk storage device, (if connected).

Table 2-3. Keyboard, Operating Controls and Indicators-Continued

Index no. figure 2-3	Control or indicator	Function
14	LINE/BOOT key	Enables the printing and editing of a line. When used with SHIFT key provides booting (on-line) operation to bulk storage device, (if connected).
15	DLTE/UNLD key	Enables the deletion of characters lines, or messages. When used with SHIFT key places bulk storage device (if connected) in an off-line status.
16	TX MSG/WRITE key	Initiates the transmit message process. Printer will respond with "PORT=" if two or more ports are configured as communication ports. If equipment is configured with only one communication port, the Keyboard-Printer will default to that port and respond by printing "MPN=". When used with SHIFT key enables writing to the bulk storage device, (if connected).
17	NEW LINE key	Provides the standard end-of-line function (2 carriage returns and 1 line feed) on a single key.
18	RETN key	Performs a carriage return.
19	EXIT/ENTER key	Used to enter commands into the Keyboard-Printer and to enter a particular mode of operation. When used with the CTRL or SHIFT key it terminates the present mode of operation.
20	LINE FEED key	Performs a line feed.
21	BRK key	Puts continuous "space" condition on the transmit data line.

Table 2-3. Keyboard, Operating Controls and Indicators-Continued

Index no. figure 2-3	Control or indicator	Function
22	SHIFT key	Shifts carriage from upper case to lower case characters and, if pressed when in lower case (shift lock), causes Keyboard-Printer to be shifted back to upper case. Not normally used in ITA-2 except for some punctuations. May be used instead of the CTRL key to EXIT the compose/edit or transmit modes.
23	Space bar	Moves carriage or cursor to right one space.
24	SHIFT key	Same as index no. 22.
25	CTRL key	Puts keyboard in control mode of operation. Must be depressed when desired control key is pressed.
26	SHIFT LOCK key	Sets keyboard for lower case type until SHIFT key is pressed.
27	SHF LOCK indicator	Illuminates when keyboard is shifted to lower case.
28	RPT key	Initiates repeat of last key code which was depressed and continues until RPT key is released.
29	← key	Moves carriage or cursor (one-line display) to the left one character position each time pressed.

2-3. OPERATING PROCEDURES.

Operating procedures for the Keyboard-Printer encompass several configurations and modes. With the multiport interface capability, the Keyboard-Printer can be controlled locally or remotely and operate with supporting peripherals (i.e., page display, bulk storage device, etc.). The operating instructions are contained in table 2-4 and are divided into the following areas; preliminary startup, turn-on, performance check, modes of operation, turnoff, and emergency turnoff procedures. The following paragraphs provide information concerning each of these areas.

2-3.1 Preliminary Startup. The preliminary startup procedure involves verification of configuration switch settings and cable connections. Configuration switch settings, for the Keyboard-Printer, are dependent on the system requirements. Cable connections, as a minimum, involve power (J1), ground (E1), and signal (J2), but may also involve cables for peripherals. The preliminary startup procedure is contained in table 2-4, steps 1 through 5.

2-3.2 Turn-on. The turn-on procedure involves identifying the operating status of the equipment. The Keyboard-Printer will automatically determine the operating status and provide the operator with a printed status report, identified as the configuration message (see appendix A). The first step of the power-on sequence is to determine the operating status of the equipment, which is identified by the illumination and extinguishing of the indicators. The process for illuminating and extinguishing the indicators, is part of the power-on sequence and can be used as a troubleshooting aid for the maintenance technician (see table 5-3). Upon completing the operating status check, the Keyboard-Printer will print "READY", and the amount of memory available. The power-on sequence also determines the operating configuration by reading the configuration switches (1 through 10, figure 2-2), the three I/O ports, the keyboard port, and the non-volatile memory. This information is then printed for the operator (see appendix A). The turn-on procedure is contained in step 6 of table 2-4.

2-3.3 Performance Check. The performance check procedure determines that the overall performance and quality of the print function is acceptable. The quality and completeness of the printed test message should be compared with figure 2-4. The performance check procedure is contained in step 7 of table 2-4.

2-3.3.1 Local Mode. The local mode provides the operator with control over the Keyboard-Printer for the keyboard. As a stand-alone terminal, without a remote control terminal, the keyboard is powered-up in the local mode. If the Keyboard-Printer is used as part of a system, with a remote control terminal (i.e., page display), the keyboard is powered-up inactive and in remote. When in remote, the operator can change the keyboard mode from remote to local, provided the proper conditions are met. When the keyboard is in local but not in an operational mode (i.e., transmit message, compose/edit, etc.) it will function the same as a normal typewriter. To return the keyboard to remote, the operator only needs to press and hold the CTRL key while pressing and releasing the 4, LOC/REM (figure 2-3). The local keyboard mode procedure is contained in steps 8 through 10, table 2-4.

2-3.3.2 Port Initialization. The port initialization procedure allows the operator to change the configuration of the ports. Each port goes through an initialization process during the power-up sequence. Port 1 is the primary communication port and is tested to determine if a communication line is connected. After the test is complete and determined to be operational, Port 1 is configured to match the settings of the configuration switches. Port 2 is used primarily as the external memory port and is tested to determine if an

external memory device is connected. If the external memory device is connected and operational, the Keyboard-Printer will initialize the port to bring the external memory device on-line. If the external memory device is not connected, Port 2 will not initialize. Port 3 is the remote control display port. During the power-on sequence, the port is tested to determine if a remote control device (i.e., page display) is connected. If a remote control device is connected, the port is initialized for remote operation and the keyboard is in the remote mode. If a remote control device is not connected, the port is initialized for one-line display operation and the keyboard is active. During operation of the Keyboard-Printer, it may be necessary to change the configuration of the ports because of an operational change (i.e., baud rate, data invert, etc.). Port initialization procedures are provided in steps 11 through 20, table 2-4.

2-3.4 Modes of Operation. The Keyboard-Printer is capable of operating in four different modes: receive, transmit, compose, and edit. The following paragraphs provide descriptions of each of these modes of operation.

2-3.4.1 Receive Modes. The Keyboard-Printer is always on-line to receive data and can be operated in any of the following receive modes: Receive, print, and store in memory - used when received messages need to be printed and stored when they are received; receive and store in memory, where messages may be printed later - used when it is desirable to operate the Keyboard-Printer in the compose/edit or transmit mode without being interrupted; receive and print - used when it is not necessary to store received messages after they have been printed. All messages received and stored in memory are assigned message numbers from 129 through 255. When the received message cannot be stored in memory, due to lack of room, a forced delete operation takes place. Refer to table 2-5 for priority of deletion of messages. Table 2-4, steps 26 through 28, contain procedures for the receive, print, and store in memory operation, and steps 29 and 30 contain procedures for the receive and store in memory operation. Step 31 is the procedure for printing but not storing received messages.

2-3.4.2 Transmit Mode. Transmitting messages from the Keyboard-Printer can be accomplished in two ways: directly from the keyboard or from memory. Table 2-4, steps 32 through 35, contain procedures for keyboard transmission, and steps 36 through 38 contain procedures for transmitting from memory. Step 39 is the procedure for manually terminating transmissions from memory.

2-3.4.3 Compose Mode. Messages can be composed from the keyboard, using the one-line display or the printer. Composed messages are stored in memory and are assigned message numbers from 1 to 127. The stored messages can be edited, printed, and/or transmitted. If the operator selects the compose/edit mode and either 60 messages or 240 blocks are already contained in memory, a forced delete operation takes place (see table 2-5). Table 2-4, steps 40 through 42, contains procedures to be followed when composing messages; steps 43 through 50, contains procedures for correcting errors; steps 51 through 54 are procedures to print messages.

2-3.4.4 Edit Mode. Messages in memory, whether received or composed, can be recalled for editing. Editing may be done by an entire message, a single line, or a single character. Additionally, the message may be printed with line numbers to assist in locating the area to be edited. The three edit mode capabilities are: The message edit mode which allows the printing of the message with line numbers and the deletion of the entire message; the line edit mode which allows the deletion of a line, an insertion of a line, or the replacement of a line; and the character edit mode which allows the deletion of characters, the insertion of characters,

or the replacement of characters within a line. Table 2-4, steps 55 through 85, contain procedures to be used when editing messages.

2-3.5 Special Operations. Special operations of the Keyboard-Printer include: clearing memory, memory status, manual termination of received messages, etc. The following paragraphs provide descriptions of these operations.

2-3.5.1 Clearing Memory. The memory can be cleared by opening the Keyboard-Printer cover and placing the AUTO PRINT/NORM/MASTER CLEAR switch (10, figure 2-2), located on the configuration control panel, to the MASTER CLEAR position, or by turning the machine off.

2-3.5.2 Querying Memory Status. Table 2-4, steps 86 and 87, contain procedures for determining contents and status of messages in memory as well as the memory storage capability (in number of blocks) available. An example of a status printout is shown in figure 2-5.

2-3.5.3 Manual Termination of a Received Message. The procedure for manually terminating a received message that did not include a valid end-of-message sequence is described in table 2-4, step 88.

2-3.5.4 Delete Message Mode. The procedure for deleting a message from memory is described in table 2-4, step 89.

2-3.5.5 Continuous Transmission of a Stored Message. The procedure for continuously transmitting a stored message is described in table 2-4, steps 90 and 91.

2-3.5.6 Override Mode. The procedure for entry to the override mode during transmit and compose operations is described in table 2-4, steps 92 and 93. The override mode allows the operator to compose a message and/or transmit it without using carriage return and line feed special characters.

2-3.5.7 Line Length. The procedure for entry to the 80/69-character line ITA-2 mode during transmit and compose operations is described in table 2-4, steps 94 and 95.

2-3.5.8 Letters and Figures Functions. Letters and figures functions are automatically inserted by the Keyboard-Printer when typing number and letter characters. Letters and figures functions can be manually inserted in compose, edit, or keyboard transmit mode by depressing the US/FIGS or DEL/LTRS key (4 or 5, figure 2-3).

2-3.5.9 Bell Function. The bell function may be used by pressing CTRL and BEL keys in all modes of operation. The receipt of a message containing a bell function will cause an audible tone and light the PARITY lamp (6, figure 2-1). The PARITY lamp may be extinguished by use of the RESET/CR switch (9). Additionally, the volume control for the audible bell tone is located on the print mechanism. To lower the volume, turn knob counterclockwise; to increase the volume, turn knob clockwise.

2-3.5.10 End-of-line Alarm and EOL Indicator. An end-of-line alarm will sound and the EOL indicator will illuminate when only 6 character positions are left until the end of line.

2-3.5.11 Compose/edit Active Light. When the C/E ACT indicator (8, figure 2-3) is illuminated, it indicates that a message(s) has been stored in memory. When flashing, it indicates only 5000 characters of storage capacity remains. Message(s) will be printed and deleted to clear memory space above 5000 characters and the C/E ACT indicator stops flashing.

Table 2-4. Operating Instructions

Step	Procedure	Indication/comments
	PRELIMINARY STARTUP	
1	Check POWER ON/OFF switch (1, figure 2-1) is in OFF position.	
2	To open cover, turn two cover fasteners 1/2 turn CCW and disengage cover fasteners from their catches on front of Keyboard-Printer cover, raise cover to lock-in position.	Check paper supply. Replace if necessary. Check to see if ribbon cassette is firmly in place.
3	Set configuration controls/ switches (1-10, figure 2-2) as necessary.	Settings are based on specific system requirements.

CAUTION

Ensure carriage shaft lever is forward and properly adjusted (para 6-2.2). Firing of printhead into free air may damage printhead.

4	Release cover latch, close Keyboard-Printer cover by engaging two cover fasteners with their catches and turning 1/2 turn CW. Place cover fastener handles in up position to prevent noise.	
5	Check cable connections for power, signal, ground and peripherals (if applicable) are properly made.	

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	TURN-ON	

WARNING

Death or injury may occur if the power cable safety ground wire is not connected to a suitable AC receptacle safety ground return. Also, an additional safety ground strap must be connected to E1 ground stud at the rear of the Keyboard-Printer.

6	Set POWER ON/OFF switch (1, figure 2-1) to ON.	POWER indicator (2, figure 2-1) illuminates. All other indicators, except SHF LOCK, illuminate and the end-of-line alarm sounds, for approximately one second. Upon completion of power-on sequence, the configuration message is printed. An example of a possible configuration message follows: READY C/E= 256 MEMORY BLOCKS AVAILABLE 2F A4 40 10 7F PAGE DISPLAY CONNECTED ASR INITIALIZATION COMPLETE SOM=VZCZC EOM= ≡NNNN LINE LENGTH= 80

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	PERFORMANCE CHECK	
7	Set BITE/LF switch (4, figure 2-1) to the BITE position, and then release.	Lamp test is performed while switch is in BITE position and stopped when switch is released. BITE position also initiates high speed printing of character set (see figure 2-4). Test message will stop after approximately 35 seconds. Momentarily setting RESET/CR switch to RESET position and then releasing will cause test message to stop.
	Local Mode	
		If the page display is connected, the keyboard is inactive and in the remote mode. If the page display is not connected, the keyboard is in the local mode. Perform step 8 to place keyboard in local mode, if necessary.
8	Press and hold CTRL key (25, figure 2-3) while pressing the 4, LOC/REM key (2, figure 2-3), then release.	After approximately 35 seconds "LOCAL KEYBOARD IS ACTIVE" will be printed. The keyboard will switch to the local mode and become active, if the page display is not in the edit mode. If the page display is actively being used, then, after approximately 35 seconds, "PAGE DISPLAY BUSY", will be printed. The operator must wait and then repeat this step to enter the local mode. Once in the local mode the keyboard will operate as a normal typewriter until an operational mode is selected (i.e., transmit message, print, compose/edit, etc.).

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	PERFORMANCE CHECK-continued	
8	-continued	If the page display is connected and active, "PRINTER REQUESTS KEYBOARD" is displayed at time of request. If page display is not actively being used, approximately 35 seconds later the Keyboard-Printer will enter local mode and "KEYBOARD IS INACTIVE" is displayed.

NOTE

When operating the keyboard as a typewriter, the PRINT ENABLE switch should be set to OFF to prevent incoming messages from printing while the operator is typing.

9	Set PRINT ENABLE ON/OFF switch (10, figure 2-3) to OFF position.	All characters typed on the keyboard will be printed, but not stored in memory. Keyboard-Printer will continue to monitor data lines for received messages and store them in memory.
10	Set PRINT ENABLE ON/OFF switch to ON position.	Any received messages stored in memory that have not been printed, will be printed.
	Port Initialization	
11	Press and hold CTRL key (25, figure 2-3) while pressing and releasing 2/PORT STAT (2, figure 2-3).	Configuration of each port is printed.
12	Verify each port is properly configured.	The port configuration data identifies the operational characteristics of the ports (ITA-2 or ITA-5, number of stop bits, normal/invert data, etc.). Compare this to your operational needs.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	PERFORMANCE CHECK-continued	
13	Press and hold CTRL key (25, figure 2-3) while pressing and releasing 1, PORT INIT key (2, figure 2-3).	"PORT INITIALIZATION: ENTER PORT # (1/2/3), OR DEPRESS EXIT KEY" will be printed.
14	Press and release 2 key (2, figure 2-3).	"2 ENTER PORT DEVICE N=N/C, C=COM LINE, B=BULK STORE" will be printed.
15	Press and release C key (2, figure 2-3).	"C SET CONFIG SWITCHES, THEN DEPRESS ENTER KEY" will be printed.
16	Press and release EXIT/ENTER key (19, figure 2-3).	"PORT INITIALIZED ENTER PORT # (1/2/3), OR DEPRESS EXIT KEY" will be printed. RCV BUSY lamp illuminates.
17	Press and hold CTRL key (25, figure 2-3) while pressing and releasing EXIT key (19, figure 2-3).	"EXIT" will be printed.
18	Repeat step 11.	Printout should reflect configuration changes made in steps 13 thru 17.
19	Repeat steps 13 thru 17 to return port 2 to original configuration. If in original configuration port 2 was disconnected during step 15, enter "N".	
20	Repeat step 11.	Port 2 configuration status should reflect original configuration.

NOTE

If any configuration switches are changed during operation, it will be necessary to reinitialize to affect the change.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	PERFORMANCE CHECK-continued	
	NOTE The SOM and EOM sequence is programmed by the operator. A maximum of five characters is allowed for either the SOM or EOM. The SOM or EOM can consist of any character except the null character.	
	Start of Message/End of Message	
21	Depress and hold CTRL key (25, figure 2-3) and press 3 (number) key (2, figure 2-3).	"SOM=" will be printed.
22	Type desired SOM.	Typed word will follow "SOM=".
23	Press the EXIT/ENTER key (19, figure 2-3).	"EOM=" will be printed.
24	Type desired EOM.	Typed word will follow "EOM=".
25	Press the EXIT/ENTER key (19, figure 2-3).	"SOM AND EOM INPUT COMPLETE" will be printed.
	MODES OF OPERATION	
	Receive Modes	
	Receive, Print and Store	
26	Change switches on configuration control panel for proper settings (step 3).	Keyboard-Printer is always on line to receive data.
27	Set AUTO PRINT/NORM/MASTER CLEAR switch (10, figure 2-2) to NORM.	
28	Set PRINT ENABLE ON/OFF switch (10, figure 2-3) switch to ON position.	REC UNPRT indicator (9, figure 2-3) will illuminate when characters are stored in memory. RCV BUSY indicator (8, figure 2-1) will flash as characters are being received. Incoming messages will be printed when they are

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
28	-continued	received, stored in memory, and assigned message numbers from 129 through 255. Received messages are assigned the next sequential message number, based on a valid end of message sequence and a valid start of message sequence. The memory capacity is 256 blocks, or 64 messages. When the memory has 240 blocks, or 60 messages in store, the C/E ACT indicator will start to flash and initiate a forced delete operation to prevent the memory from overflowing. "DELETE (message no.)" will be printed as messages are deleted. Refer to table 2-5.
	Receive and Store	
29	Set PRINT ENABLE ON/OFF switch (10, figure 2-3) to OFF position.	REC UNPRT indicator (9, figure 2-3) will illuminate when characters are received into the memory. RCV BUSY indicator will flash as characters are received. Incoming messages will be stored in memory and assigned message numbers 129 through 255. Messages will not be printed unless a forced delete operation takes place, or PRINT ENABLE ON/OFF switch is placed in ON position.
30	Set PRINT ENABLE ON/OFF switch in ON position.	Messages received while PRINT ENABLE switch was OFF will be printed.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
	Receive and Print	
31	Set AUTO PRINT/NORM/MASTER CLEAR switch (10, figure 2-2) to AUTO PRINT position.	Received data will be printed when received but not stored.
	Transmit Modes	
	Keyboard Transmit Mode	
32	Check switches on configuration control panel for proper settings (step 3).	
33	Press TX MSG key (16, figure 2-3).	"MPN=" will be printed.
34	Press EXIT/ENTER key (19, figure 2-3). Type message on keyboard.	"KB" will be printed after "MPN=". XMIT ACT indicator (7, figure 2-3) will illuminate. Keyboard is on-line for direct message transmission. If XMT PRNT ON/OFF switch (4, figure 2-2) is ON then "TX PORT 1" will be printed followed by the characters as entered from the keyboard.
35	To exit transmit mode, press and hold SHIFT key (22 or 24, figure 2-3) or CTRL (25, figure 2-3) key then press EXIT/ENTER key (19, figure 2-3).	XMIT ACT indicator (7, figure 2-3) extinguished and "EXIT" is printed.
	Transmit from Memory Mode	
36	Press TX MSG key (16, figure 2-3).	"MPN=" is printed.
37	Type MPN that is to be transmitted.	Typed message number will follow "MPN=".

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
38	Press EXIT/ENTER key (19, figure 2-3).	XMIT ACT indicator (7, figure 2-3) will illuminate indicating message is being transmitted from memory. Message will be printed character-by-character as it is transmitted if XMT/ PRNT ON/OFF switch (4, figure 2-2) is ON. XMIT ACT indicator (7, figure 2-3) will extinguish when transmission is completed. Keyboard-Printer automatically exits the transmit mode. If BREAK is printed, check configuration switch DATA INVT/NORM (6, figure 2-2).

NOTE

Up to three messages may be sent at the same time by separating the typed message numbers with commas.

39	To terminate transmissions from memory, press and hold SHIFT or CTRL key (22, 24 or 25, figure 2-3) and press the EXIT/ENTER key (19, figure 2-3).	Transmission will be terminated. XMIT ACT (7, figure 2-3) indicator will extinguish and EXIT is printed.
	Compose Mode	
	Composing Message	
40	Set PRINT ENABLE ON/OFF switch (10, figure 2-3) to the OFF position if composition is desired without being interrupted by a received message. If one-line display is active it is not necessary to set PRINT ENABLE ON/OFF switch to OFF.	Any received message will be stored in memory and numbered for later printout. REC UNPRT indicator will illuminate if any messages are received while composing and remain illuminated until all received messages are printed.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
41	Press EDIT MSG key (11, figure 2-3) and EXIT/ENTER key (19, figure 2-3).	C/E ACT indicator (8, figure 2-3) will illuminate. "MPN" followed by message number 1 through 127 will be printed or displayed (e.g. MPN1).
42	Using keyboard, type message.	Message prints out or is displayed and is entered in memory. If enough memory is not available for message, a forced delete operation will occur.
	Correcting Errors	
43	Position printhead or cursor over incorrect character/figure by using the backspace (◄——) key (29, figure 2-3).	Individual characters will be erased on one-line display as ◄—— key is depressed.
44	Type over error(s).	Incorrect character/figure will be corrected in memory.
45	Type remaining characters to complete the line of text.	
46	To delete entire line being typed, press LINE key (14, figure 2-3). Enter line number and press EXIT/ENTER key (19, figure 2-3).	"L (line number)" will be printed or displayed followed by text of selected line.
47	Press DLTE key (15, figure 2-3).	"D (line number)" will be printed. The next line is then printed or displayed. If last line has been deleted, previous line is printed or displayed.
48	Press INSRT key (12, figure 2-3) and retype correct line.	"I" will be printed followed by new text of line which will be printed or displayed.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
49	Press PRINT MSG key (13, figure 2-3) to print composed message with line numbers.	"P (message number)" followed by message with line numbers will be printed.
50	To exit compose mode, press and hold CTRL or SHIFT key (25, 22 or 24, figure 2-3) and press EXIT/ENTER key (19, figure 2-3).	C/E ACT indicator (8, figure 2-3) extinguished. EXIT is printed.
	Print Message	
51	To print a message without line numbers, exit compose mode as described in previous step.	
52	Press PRINT MSG key (13, figure 2-3).	"P" is printed.
53	Using keyboard, type message number (e.g. 3).	Message number is printed following "P".
54	Press EXIT/ENTER key (19, figure 2-3).	Composed message will be printed. To print any messages that were received while in compose mode perform step 30.
	Edit Mode	Messages may be edited by: 1. Specifying message to be edited (message may be deleted in its entirety at this point). 2. Specifying the line to be edited (entire line may be deleted, replaced or additional lines inserted at this point).

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
54	-continued	3. Specifying characters within the line to be deleted, inserted or corrected by use of the ◄—— and ——► keys.
	Message Edit	
55	To enter the edit mode, press EDIT MSG key (11, figure 2-3).	C/E ACT indicator (8, figure 2-3) will illuminate and "MPN" will be printed or displayed.
56	Set PRINT ENABLE ON/OFF switch (10, figure 2-3) to the OFF position (if operator does not want to be interrupted by a received message). If a received message is desired to be printed when it is received, or the operator is using the one-line display, place the PRINT ENABLE ON/OFF switch to the ON position.	Any messages received during editing activity will be stored in memory and numbered for later print out or printed when received if using the one-line display. REC UNPRT indicator will illuminate if any messages are received while PRINT ENABLE ON/OFF switch is set to OFF. When PRINT ENABLE switch is set to ON and messages are printed, REC UNPRT indicator will extinguish.
57	Using keyboard, type message number to be edited (e.g. 1).	"MPN (message number)" will be printed or displayed.
58	Press EXIT/ENTER key (19, figure 2-3).	

NOTE

The Keyboard-Printer is now in the edit mode and any of the following editing operations can be performed: print message, line edit mode, and character edit mode. To exit edit mode, press and hold SHIFT key (22 or 24, figure 2-3) and press EXIT/ENTER key (19, figure 2-3).

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
58	-continued	Depending on the equipment configuration this procedure will be different. In some configurations the first line of the message will be printed or displayed. To scroll forward through the message, press the LINE FEED key (20, figure 2-3). Pressing and holding the CTRL key (25, figure 2-3) and the LINE FEED key will enable the scrolling backwards through the message. In other configurations the line function key must select the numbered line.
59	To print message, press PRINT MSG key (13, figure 2-3).	Selected message will print out with line numbers in the left margin.
	Line Edit	
60	To perform only Line Edit function, press LINE key (14, figure 2-3).	"L" will be printed or displayed.
61	Using keyboard, type line number to be edited.	Typed "(Line number)" will be printed or displayed following "L".
62	Press EXIT/ENTER key (19, figure 2-3).	Line will be printed or displayed.
63	To delete this line, press DLTE key (15, figure 2-3).	"D" will be printed and line will be deleted. The remaining lines will be automatically renumbered and the next line will be printed or displayed. If line deleted was last line of message, then previous line will be printed or displayed.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
64	To insert new line at beginning of message, press LINE key (14, figure 2-3), type Ø (number).	"LØ" will be printed or displayed.
65	Press EXIT/ENTER key (19, figure 2-3).	"LØ" will be printed or display goes blank.
66	Press INSRT key (12, figure 2-3), and type a new line. Press NEW LINE key (17, figure 2-3).	"I" will be printed or cursor will appear at left side of display. New line is placed in memory, remaining lines are renumbered. If enough memory is not available to store the new data, a forced delete operation will occur. Inserts end-of-line function (2 carriage returns (CR), and 1 line feed (LF)).
67	Type any additional lines required by pressing NEW LINE key (17, figure 2-3) after each new line(s) is typed.	Same as step 66.
68	To insert a new line at other places in the message, press LINE key (14, figure 2-3) and type preceding line number.	"L (line number)" will be printed or displayed.
69	Press EXIT/ENTER key (19, figure 2-3), INSRT key (12, figure 2-3), type new line and press NEW LINE key (17, figure 2-3).	"I" will be printed or cursor will appear at left side of display. If one-line display is used after INSRT key is depressed, display is blank and new line will print. New line is placed in memory and remaining lines renumbered. Inserts end-of-line function (2 carriage returns (CR), and 1 line feed (LF)).

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
70	Type any additional lines required by pressing NEW LINE key (17, figure 2-3) after each new line(s) is typed.	Inserts end-of-line function (2 carriage returns (CR), and 1 line feed (LF)). Replacing a line is a combination of DELETE and INSERT operations.
71	To replace a line, press LINE key (14, figure 2-3), type line number to be deleted. Press EXIT/ENTER key (19, figure 2-3).	Line number and line will print out or line will be displayed.
72	Press DLTE key (15, figure 2-3).	"D" will be printed and the line called out will be deleted from memory. The lines are then renumbered and the next line is printed or displayed.
73	Press LINE key (14, figure 2-3) and select line number preceding the line number deleted, press EXIT/ENTER key (19, figure 2-3), then press INSRT key (12, figure 2-3). Type in new line or lines.	New line is printed and is inserted in memory.
74	Press NEW LINE key (17, figure 2-3).	Inserts end-of-line function (2 carriage returns (CR), and 1 line feed (LF)). Lines may be reviewed in a message by specifying a line (steps 60 thru 62) followed by a line feed. Next line will be printed each time the LINE FEED key (20, figure 2-3) is pressed.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
	Character Edit	
75	To initiate character edit operation, specify the line to be edited (perform steps 60 thru 62).	Line number and line will be printed.
76	Press EXIT/ENTER key (19, figure 2-3).	Printhead will move to left margin or cursor will move to left side of display.
77	To delete a character, locate the printhead (or cursor if using the one-line display) over the character to be deleted, using either → or ← key (6 or 29, figure 2-3).	Characters will be printed or the cursor moves to the right as → key is pressed.
78	Press the DLTE key (15, figure 2-3).	Character is deleted and * is printed or remaining characters displayed will move to the left with each key depression. In the character edit mode, activation of the → or ← keys positions the printhead to the character to be inserted, deleted or corrected. DO NOT use the space bar to locate character during character edit.
79	To insert a character, locate printhead over the insert point using → or ← keys (6 or 29, figure 2-3). If using one-line display, place cursor over insert character space.	
80	Press INSRT key (12, figure 2-3).	

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	MODES OF OPERATION-continued	
81	Type in new character(s).	New character(s) are inserted. Characters to the right are moved to the right each time a character is inserted. If enough memory is not available to add the new characters, a forced delete operation will occur.
82	To replace or overwrite a character, locate the printhead or cursor if using the one-line display over the character to be replaced using the → or ← key (6 or 29, figure 2-3).	
83	Type the correct character.	Correct character will be displayed and inserted in memory.
84	To exit the character edit mode, press the EXIT/ENTER key (19, figure 2-3).	Line will be printed or displayed as corrected. Additional lines, characters may be edited in the message by specifying another line as described in steps 61 thru 85.
85	To exit the edit mode (when the message has been corrected), depress and hold the SHIFT or CTRL key (22, 24 or 25). Depress the EXIT/ENTER key (19, figure 2-3).	"EXIT" will be printed or display will go blank. C/E ACT indicator will extinguish.
	SPECIAL OPERATIONS	
	Message Status Mode	
86	Depress PRINT MSG key (13, figure 2-3).	

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	SPECIAL OPERATIONS-continued	
87	Depress the S key (2, figure 2-3).	A printout will follow stating either "EMPTY", or a status message will be printed. An example is shown in figure 2-5.
	Manual Termination of a Received Message	
88	Depress and hold the CTRL key (25, figure 2-3), and depress the 6 key (2, figure 2-3).	Message will be terminated in memory and keyboard becomes active again. REC UNPRT indicator extinguishes.
	Delete Message Mode	
89	Depress the DLTE key. Type message number, depress EXIT/ENTER key (19, figure 2-3). Press Y for yes and N for no.	"MPN (message number)" will be printed or displayed. As a safeguard against inadvertent loss of messages, the Keyboard-Printer will respond with DELETE ?? If the message has not been printed, it will be printed prior to deletion. "EXIT" will be printed or display will go blank.
	Continuous Transmission from Storage	
90	Depress and hold the CTRL key (25, figure 2-3) and depress the Ø (number) key (2, figure 2-3). Press TX MSG key (16, figure 2-3). Type MPN that is to be transmitted. Press EXIT/ENTER key (19, figure 2-3).	"CONT. XMIT" will be printed. Any message transmitted from storage will be continuously transmitted. To terminate a message transmission, depress and hold the CTRL or SHIFT keys (25, 22 or 24, figure 2-3) and press EXIT/ENTER key (19, figure 2-3).

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	SPECIAL OPERATIONS-continued	
91	To exit the Keyboard-Printer from the "CONT. XMIT", depress and hold the CTRL key (25, figure 2-3) and press Ø (number) key (2, figure 2-3).	"NOT CONT. XMIT" will be printed. Any message transmitted from storage will not be continuously transmitted.
	Override Mode	
92	Depress and hold CTRL key (25, figure 2-3) and press 9 (number) key (2, figure 2-3).	"OVERRIDE MODE" will be printed. No CR/LF characters will be automatically inserted at the end of each line.
93	To exit the Keyboard-Printer from the "Override Mode", depress and hold CTRL key (25, figure 2-3) and press 9 (number) key (2, figure 2-3).	"NOT OVERRIDE MODE" will be printed. The Keyboard-Printer will now automatically insert CR/LF and the end of each line typed.
	Line Length	
94	Depress and hold CTRL key (25, figure 2-3) and press 8/LL SEL key (2, figure 2-3).	"LINE LENGTH=" will be printed.
95	Enter desired line length from 69 to 80 characters. Press EXIT/ ENTER key (19, figure 2-3).	"(number selected)" will be printed (e.g. "LINE LENGTH= 69").
	Bulk Storage Device Operations	
	Boot Operation	
96	Depress and hold SHIFT key (22 or 24, figure 2-3) and press LINE/BOOT key (14, figure 2-3).	XMIT ACT indicator illuminates and RCV BUSY lamp flashes during the booting operation. "MEDIA ID = (file or disk name) BOOT COMPLETE" will be printed. The bulk storage device is now on-line.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	SPECIAL OPERATIONS-continued	
96	-continued	If bulk storage device is on-line and a boot operation is attempted, the Keyboard-Printer will respond with "ERROR-UNLOAD B.S. BEFORE BOOTING" being printed.
	Formatting Operation	

NOTE

If bulk storage device is on-line (booted), bulk storage device must be unloaded (see step 106) prior to reformatting. Failure to unload bulk storage device prior to formatting will result in "ERROR-UNLOAD BEFORE FORMATTING MEDIA".

97	Depress and hold SHIFT key (22 or 24, figure 2-3) and press INSRT/FMT key (12, figure 2-3).	"FORMAT??" will be printed to prevent inadvertent loss of data from the bulk storage device media (disk).
98	Press Y for yes or N for no.	"INPUT MEDIA ID-TERM WITH ENTER" will be printed.
99	Type in a media name and press EXIT/ENTER key (19, figure 2-3).	"FORMAT COMPLETE" will be printed after the disk is erased and reformatted. XMIT ACT indicator only illuminates during formatting operation.
	Writing Operation	
100	Depress and hold SHIFT key (22 or 24, figure 2-3) and press TX MSG/WRITE key (16, figure 2-3).	"WRITE MPN=" will be printed.

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	SPECIAL OPERATIONS-continued	
101	Type number for message to be written to bulk storage device. Press EXIT/ENTER key (19, figure 2-3).	"(Selected MPN)" will be printed. XMIT ACT indicator will illuminate during writing operation. Upon completion of writing operation, XMIT ACT indicator extinguishes and "ASSIGNED BSN= (assigned number)" is printed.
	Reading Operation	
102	Depress and hold SHIFT key (24, figure 2-3) and press EDIT MSG/ READ key (11, figure 2-3).	"READ BSN=" will be printed.
103	Type bulk store number of message to be read from bulk storage device. Press EXIT/ ENTER key (19, figure 2-3).	XMIT ACT indicator illuminates and RCV BUSY lamp flashes during reading operation. "(selected BSN)" will be printed. After reading operation is complete, printer will respond by printing "MPN= (assigned number) BSN (selected BSN)" and data read from the bulk storage device.
	Directory Operation	
104	Depress and hold SHIFT key (22 or 24, figure 2-3) and press PRINT MSG/DIR key (13, figure 2-3).	"DIRECTORY BSN=" will be printed.
105	Type BSN that you desire to start directory listing at. Press EXIT/ENTER key (19, figure 2-3).	XMIT ACT indicator illuminates and RCV BUSY lamp flashes during directory operation. "(selected BSN)" will be printed and directory listing from BSN entered on, will be listed. Each BSN listed will contain 160 characters of the message, followed by "MSG LENGTH= (total number of characters in message)".

Table 2-4. Operating Instructions-Continued

Step	Procedure	Indication/comments
	SPECIAL OPERATIONS-continued	
	NOTE To stop directory operation, depress and hold CTRL key (25, figure 2-3) while pressing EXIT/ENTER key (19, figure 2-3).	
	Unloading Operation	
106	Depress and hold SHIFT key (24, figure 2-3) and press DLTE/ UNLD key (15, figure 2-3).	"BULK STORE UNLOADED" will be printed and bulk storage device is off-line.
	RO MODEL 2 Boot Operation	
107	Set BAUD RATE switch (9, figure 2-2) to the TEST 2 position. Set the BITE/LF switch (4, figure 2-1) to the BITE position.	RCV BUSY lamp flashes during booting operation. "MEDIA ID= (file or disk name) BOOT COMPLETE" will be printed. (Refer to step 96 for additional comments.)
	RO MODEL 2 Unload Operation	
108	Set BAUD RATE switch (9, figure 2-2) to the TEST 2 position. Set the BITE/LF switch (4, figure 2-1) to the LF position.	"BULK STORE UNLOADED" will be printed and bulk storage device is off-line.
	TURNOFF	
109	To turn Keyboard-Printer off, set the POWER ON/OFF switch (1, figure 2-1) to the OFF position.	POWER indicator (2, figure 2-1) extinguishes.
	EMERGENCY TURNOFF	
110	To turn the Keyboard-Printer off in an emergency, set the POWER ON/OFF switch (1, figure 2-1) to the OFF position.	POWER indicator (2, figure 2-1) extinguishes.

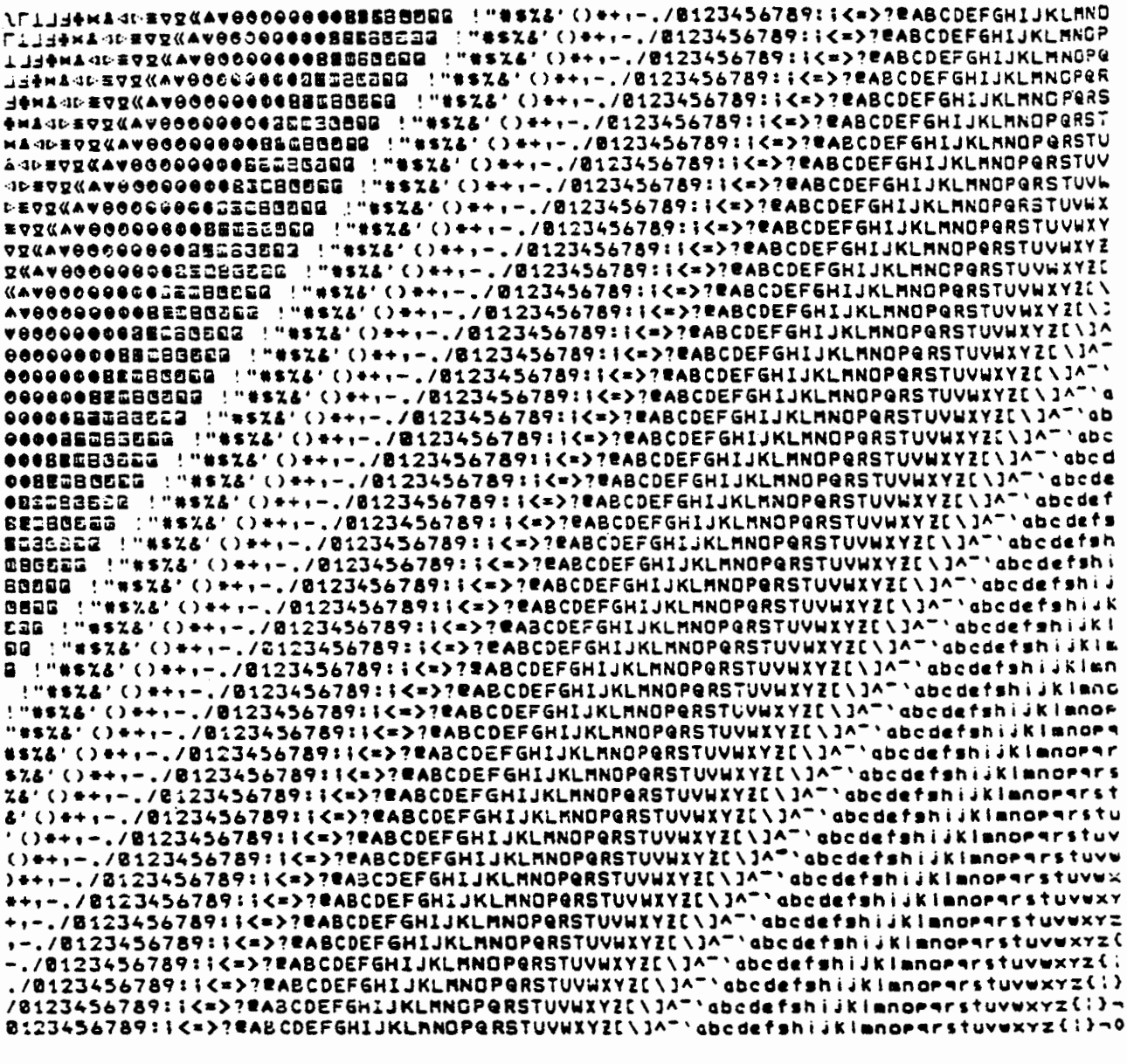


Figure 2-4. Print Test Pattern

Table 2-5. Priority for Deletion of Stored Messages

Priority	Description
1	Oldest received messages that have been printed.
2	Oldest received messages that have not been printed. Messages to be deleted are printed then annotated as having been deleted.
3	Messages being transmitted. Transmission will be terminated.
4	Messages being received. Message store will be completely clear at end of received data.

2-3.5.12 Bulk Storage Device Operation. When the Keyboard-Printer is configured to operate with external memory, it is usually in the form of a bulk storage device. If connected, the bulk storage device will be booted and brought on-line during the power-on sequence. Steps 96 through 108 of table 2-4 provide instructions for operating the bulk storage device. Messages stored in the bulk storage device, will not be deleted if the disk is full. The Keyboard-Printer will inform the operator when the disk is near capacity by printing "EARLY WARNING CHANGE MEDIA". This same message will be displayed on the page display if active.

2-3.6 Turnoff. To turn the Keyboard-Printer off, set the POWER ON/OFF switch (1, figure 2-1) to the OFF position.

2-3.7 Emergency Turnoff. To turn the equipment off in an emergency, set the POWER ON/OFF switch (1, figure 2-1) to the OFF position.

NOTE

When the POWER ON/OFF switch is set to the OFF position, all data in the message store memory is cleared.

2-4. KEYBOARD-PRINTER CHARACTERS.

The Keyboard-Printer characters are either International Telegraph Alphabet-2 (ITA-2) or International Telegraph Alphabet-5 (ITA-5) American National Standard Code for Information and Interchange (ASCII). The selection of the mode of operation is determined by the setting of the ITA CODE switch (2, figure 2-2) on the configuration control panel. The ITA-2 and ITA-5 characters are shown in figure 2-6 and figure 2-7, respectively. Table 2-6 lists the differences between the Keyboard-Printer keyboard and a Teletype keyboard when the ITA CODE switch is in the ITA-2 position.

2-5. OPERATOR MAINTENANCE.

Operator maintenance is limited to replacement of paper, ribbon cassette, control panel lamps, and general cleanliness of the Keyboard-Printer. Table 2-8 contains the procedures for replacing paper, ribbon cassette and control panel lamps. Figure 2-8 illustrates the paper feed mechanism.

```
P
MPN 1          C                    P                              400
MPN 2          C                    P          T         D         451
MPN 129        C          R         P                              345
MPN 130                   R         P                              6844
MPN 131                   R                                        1785
C/E = 214 memory blocks available
```

Note that MPN 1 and 2 were composed, and 129 was changed; 129 through 131 were received. All messages except 131 have previously been printed and mpn 2 has been printed, transmitted and displayed but is still retained in memory. c/e = 161 memory blocks available indicates the amount of storage capacity remaining in blocks of memory.

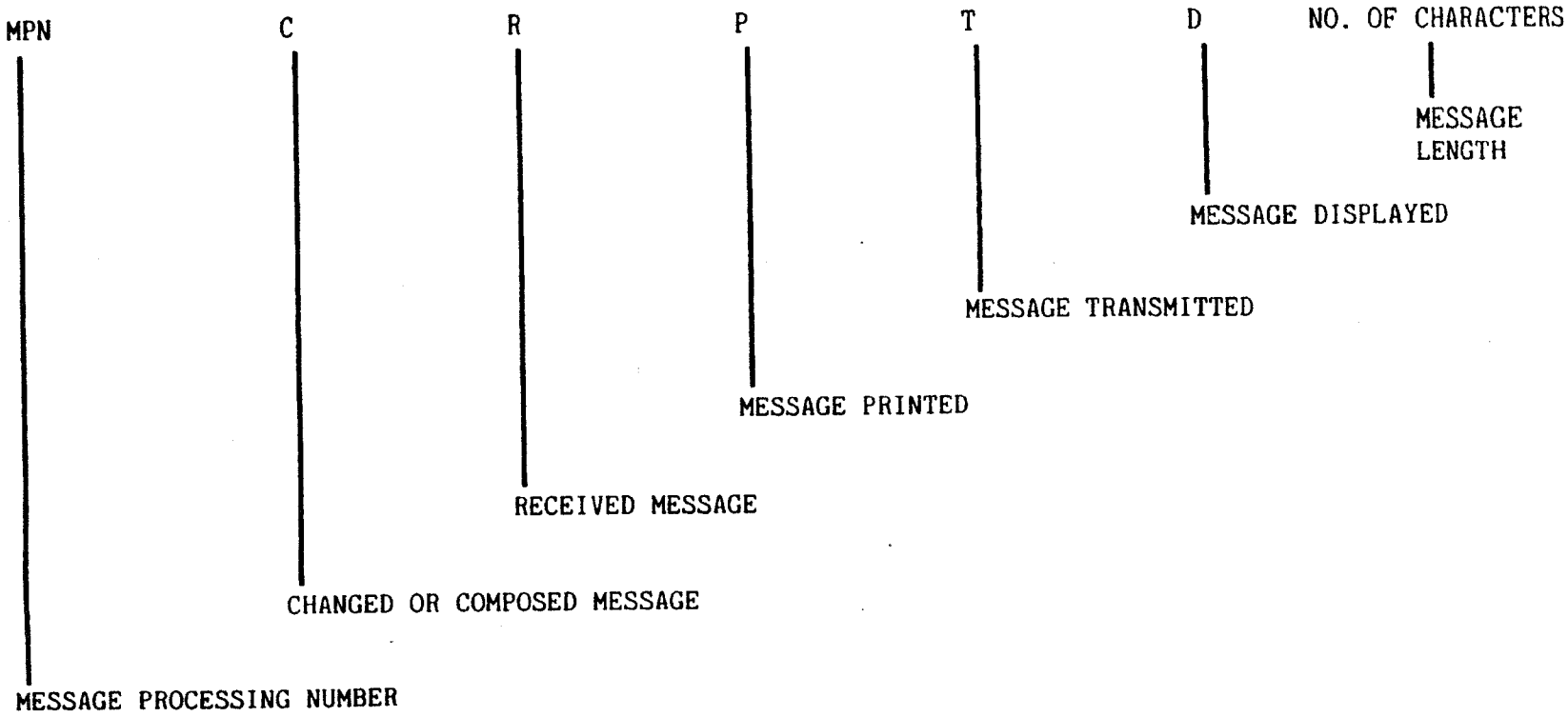


Figure 2-5. Sample Message Status Printout

Letters	Figures	Letters	Figures	Letters	Figures
A	-	J	'	S	BELL
B	?	K	(	T	5
C	:	L	)	U	7
D	$	M	.	V	;
E	3	N	,	W	2
F	!	O	9	X	/
G	&	P		Y	6
H	$	Q	1	Z	"
I	8	R	4		

NON-PRINTING CHARACTERS

- BLANK (NUL)
- SPACE
- CARRIAGE RETURN
- LINE FEED
- FIGURES (SO)
- LETTERS (SI)

Figure 2-6. ITA-2 Characters

	NUL	DLE	SP	0	@	P	`	p
	SOH	DC1	!	1	A	Q	a	q
	STX	DC2	"	2	B	R	b	r
	ETX	DC3	#	3	C	S	c	s
	EOT	DC4	$	4	D	T	d	t
	ENQ	NAK	%	5	E	U	e	u
	ACK	SYN	&	6	F	V	f	v
(Note)	BEL	ETB	' (APOS)	7	G	W	g	w
	BS	CAN	(	8	H	X	h	x
	HT	EM	)	9	I	Y	i	y
(Note)	LF	SUB	*	:	J	Z	j	z
	VT	ESC	+	;	K	[	k	{
	FF	FS	,	<	L	\	l	|
(Note)	CR	GS	-	=	M	]	m	}
	SO	RS	.	>	N	^	n	~
	SI	US	/	?	O	_	o	◇

Note: NON-PRINTING CHARACTERS (except in test message)

Figure 2-7. ITA-5 (ASCII) Characters

Table 2-6. Keyboard-Printer and Teletype Functional Differences

Teletype function	Keyboard-Printer function
LTRS	LTRS (DEL key) or CTRL + SI (O key)
FIGS	FIGS (US key) or CTRL + SO (N key)
BLANK	CTRL + NUL (to right of 0 key)
BELL	CTRL + BEL (G key)
2 CR 1 LF	NEW LINE key
#	SHIFT + 3 key

Table 2-7. Data Parity Configuration

ITA code	Parity	Notes
2	None	No parity accepted or transmitted in ITA mode.
5	Odd	Odd parity checked and transmitted.
5	Even	Even parity checked and transmitted.
5	None	No parity checked; parity bit exists but will not be set/reset to produce valid parity bits.

NOTE

Odd/even refers to the number of 1s in the word (excluding start and stop bits).

Table 2-8. Operator's Maintenance Actions

Step	Procedure
	NOTE It is not necessary to turn off the Keyboard-Printer power to change paper. Messages received while the cover is open will be stored in the memory and will be printed after the paper has been loaded, the cover closed, and the RESET/CR switch (9, figure 2-1) pushed to the RESET position. Carriage shaft lever (figure 6-2) is normally set to the most rearward position for single-ply paper, and should be moved forward for multi-ply paper. Carriage shaft level may be adjusted for desired print contrast.
	PAPER REPLACEMENT (Refer to figure 2-8.):
1	Release the two cover fasteners (figure 1-1) and raise the cover to the lock-in position.
2	Move the paper roll locking lever forward to release the paper roll.
3	Remove the paper roll and spindle from the paper storage tray by lifting straight up.
4	Remove the spindle from the old roll and install spindle in the new roll.
5	Install the paper in the storage tray with the paper being unwound from the bottom.
6	Lock the paper roll in place by moving the paper roll locking lever back to the lock position.
7	Feed the paper between the platen and paper guide. Pull out about one foot of paper to align paper in the assembly.
8	Momentarily depress the BITE/LF switch (4, figure 2-1) to LF position so that the paper is fed through to the front of the unit.
9	Lift the plastic retaining plate assembly and place the paper underneath it so that it exits toward the rear.

Table 2-8. Operator's Maintenance Actions-Continued

Step	Procedure
	PAPER REPLACEMENT (Refer to figure 2-8.):-continued
10	Place the retaining plate assembly back to the normal position and depress the local BITE/LF switch (4, figure 2-1) to LF position to see that the paper is feeding properly. Feed the paper through the cover, close the cover and engage two cover fasteners, and tear off the excess paper evenly.
	RIBBON CASSETTE REPLACEMENT:
11	Release the two cover fasteners (figure 1-1) and raise the cover to the lock-in position.

CAUTION

To avoid bending left margin sensing tab, move printhead to center of machine before removing ribbon cassette. Press space bar and RPT key (28, figure 2-3) to move carriage.

12	Unlock the cassette by pulling up the latch at the top of the cassette.
13	Lift the cassette upward to remove.
14	Replace with new cassette.
15	Push down on latch to lock cassette in place.
16	Close the cover and engage two cover fasteners.

NOTE

The cassette should be disposed of in a proper manner, observing any applicable security regulations.

	LAMP REPLACEMENT (Control Panel and Print Mechanism Module only):
17	Unscrew lens on Control Panel (figure 2-1) or Print Mechanism (figure 6-2).
18	Remove lamp from lens on Control Panel or unseat lamp from socket in Print Mechanism.
19	Replace the new lamp in the lens on Control Panel or install new lamp in socket on Print Mechanism and reinstall the lens.

Table 2-8. Operator's Maintenance Actions-Continued

Step	Procedure
	LAMP REPLACEMENT (Control Panel and Print Mechanism Module only): -continued
	NOTE Lamps on the keyboard are not replaceable by the operator because of internal solder connections.

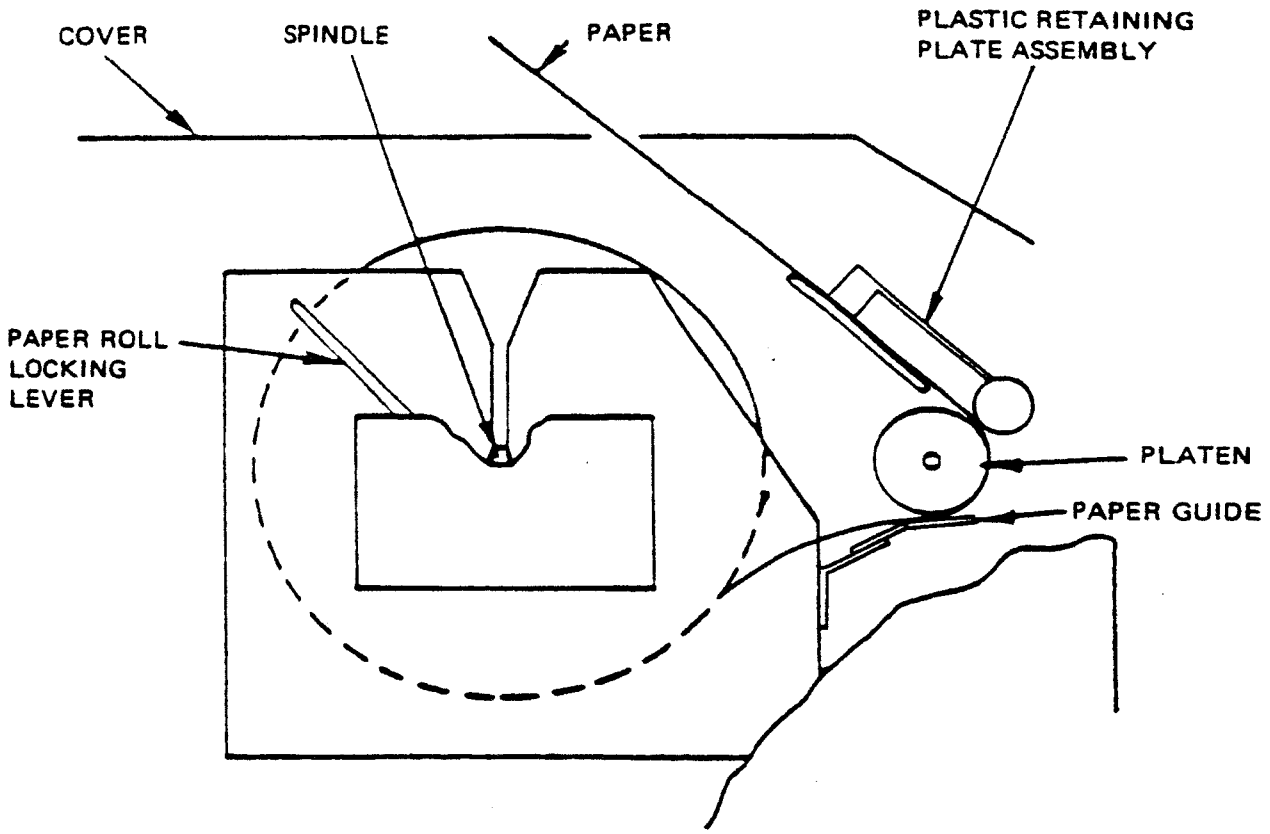


Figure 2-8. Paper Feed Mechanism (End View)

CHAPTER 3

FUNCTIONAL DESCRIPTION

3-1. INTRODUCTION.

This chapter provides the functional description of the Keyboard-Printer. The material is presented in three levels of description. The overall level describes the relationship of the six major functions to each other. The major level describes each major function in relation to the modules and assemblies. The circuit level provides a detailed description of the circuits within the modules and assemblies.

3-2. OVERALL (figure 3-1).

The primary purpose of the Keyboard-Printer is to print, transmit, and receive messages on a communications network. When power is applied to the Keyboard-Printer, a power signal is routed to the power distribution function. The power distribution function converts the 115 Vac 60 Hz single phase input to the dc operating voltages. The +5 Vdc is routed to the control function where it is used to reset the microprocessor and memory circuits. After the reset operation is complete the control function routes the configuration data to both the transmit and receive functions to configure the three input/output ports. The control function also distributes the control key inputs to select the mode of operation. If a message is to be created, the compose/edit function will be selected by the control key inputs. The compose/edit function receives the character data from the control function using the address and system data bus. When the message is complete, the control function can select the transmit function by using the control key inputs. The control function then transfers the message from the compose/edit function to the transmit function for transmission onto the communication lines. The data is transferred in a parallel, eight-bit data word using TTL logic levels (LOW = 0.0 - 0.8 Vdc and HIGH = 2.4 - 5.0 Vdc). The location information is transferred in a parallel, 16-bit address word also using TTL logic levels. The data is transmitted in a serial bipolar format (+5 Vdc or -5 Vdc). The baud rate at which the data is transmitted is determined by the configuration data supplied by the control function. The receive function receives the data in a serial, bipolar format and converts it to a parallel TTL format. The control function locates the received data using the address bus. The data is then transferred from the receive function to the compose/edit function memory (Message Store) using the system data bus. The control function provides the routing and location information for this transfer. If selected, the received data is printed. When the BITE function is selected by the operator, the control function routes the control key input to the BITE function circuits. During operation of the BITE a BITE interrupt is sent to the transmit function to inhibit transmission of data.

3-3. MAJOR.

The major level of functional description describes each of the six major functions in detail. Each description is supported by a signal flow diagram. The major function is described from the initial selection through each module to the resulting output.

3-4. TRANSMIT FUNCTION.

The transmit function allows the operator to transmit any message from memory. The message can be transmitted out of ports one, two, or three. To begin transmitting a message the operator depresses the TX MSG key. The equipment will respond by printing "PORT=" if two or more ports are configured as communication ports. If only one port is configured as a communication port, the

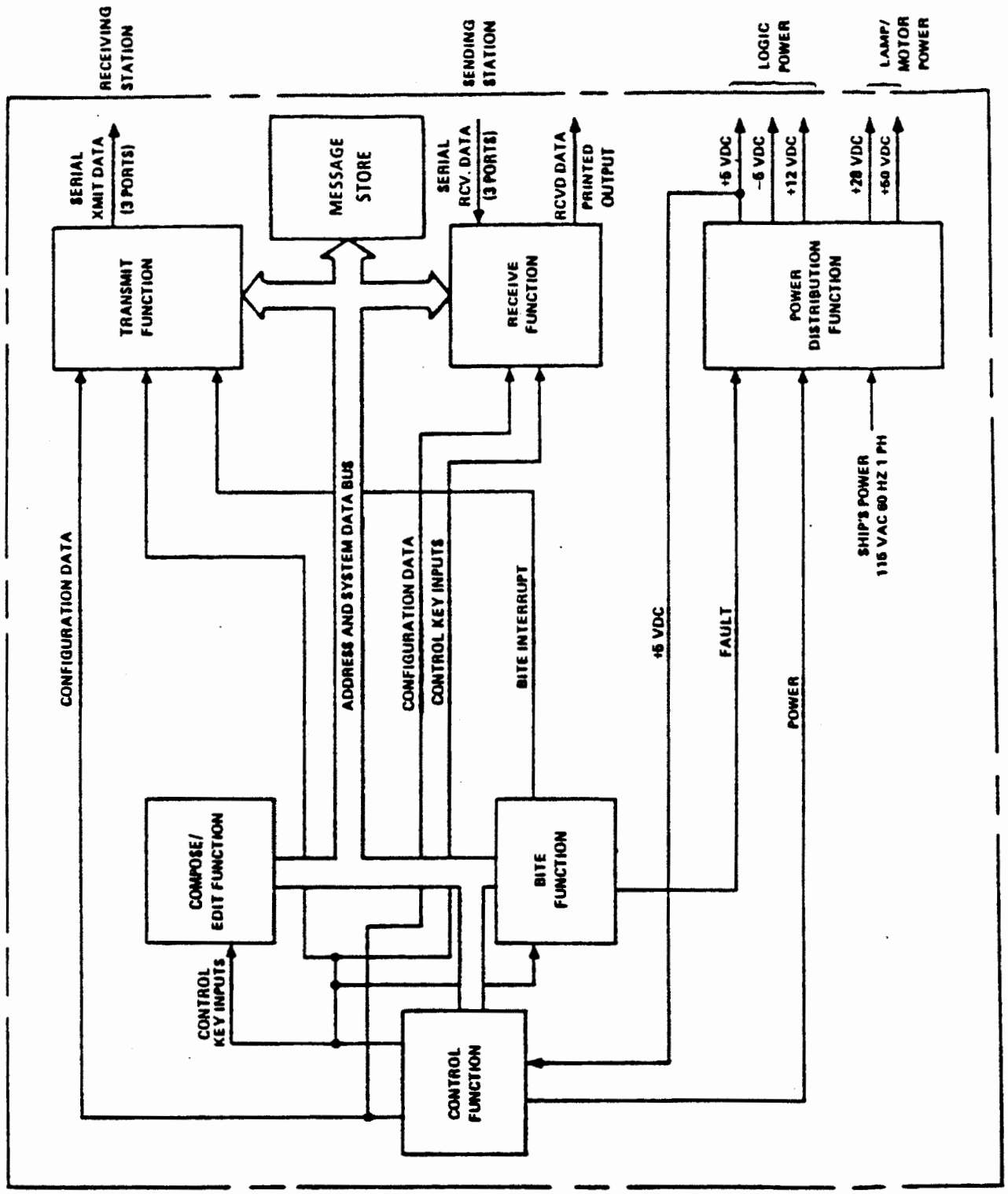


Figure 3-1. Overall, Functional Block Diagram

Keyboard-Printer will respond by defaulting to that port and printing "MPN=" (message processing number). The operator then types in the port(s) selected for transmission and depresses the EXIT/ENTER key. The equipment will respond by printing "MPN=". The operator then enters the number for the message(s) to be transmitted and depresses the ENTER key. The selected message(s) is then transmitted. The following paragraphs describe the select and print process and the message retrieve and transmit operations of the transmit function.

3-4.1 Select and Print Process (figure FO 5-1). To transmit a message from memory the operator depresses the TX MSG key, beginning the transmit function. The Y7C signal is fed through switch S75 in the Keyboard assembly A2A1A1. The output from S75 is a low level signal X5C. This signal is sent to the Keyboard Logic module A2A1A2. The A2A1A2 module detects the X5C signal as active and generates a keyboard interrupt (KBINTC). The KBINTC signal is detected by Microcomputer module A1A6. After determining which circuit generated the interrupt, the A1A6 module will read the Keyboard input. This input consists of an eight-bit word (KBD0-KBD7). The eight-bit word contains the code for the transmit mode. The A1A6 module decodes the word and activates the address bus. If the XMT PRINT ON/OFF switch is ON, the address bus will activate the Controller module A1A8, enabling it to detect the input/output write (IOWC) signal and system data bus. The system data bus will contain an eight-bit word that is decoded by the A1A8 module. The A1A8 module then generates; the dot signals (DOT2C through DOT8C), the carriage motor steps (CRØ1 through CRØ4), the ribbon drive (RIBDR), and the line feed (LFØ1 through LFØ4) signals. These signals are sent to the Print Mechanism module A1A1. The dot signals are sent to the Pin Driver Logic module A1A1A7A2 and Pin Drive Transistors module A1A1A7A1. The outputs from the A1A1A7A1 module are the printhead drive signals (PH2 through PH8). These signals are fed to the Carriage Assembly A1A1A3 firing the printhead. The carriage motor signals from the A1A8 module along with the line feed signals are fed to the Motor Driver module A1A1A6. The carriage motor signals are fed to the Carriage Driver module A1A1A6A1 generating the carriage motor steps (CRMOTØ1 through CRMOTØ4). The line feed signals are fed to the Line Feed Driver module A1A1A6A2 generating line feed motor steps (LFMOTØ1 through LFMOTØ4). The A1A8 module continues this action until "PORT=" is printed. The operator depresses the keys labeled 1 through 3 in any combination and the EXIT/ENTER key identifying the port(s) to be transmitted on. The operator's response is printed and the A1A8 module provides the necessary signals to print "MPN=". The operator depresses the keys to identify the message number(s) and then the ENTER key.

3-4.2 Message Retrieve and Transmit Operation. The A1A6 module decodes the message number and activates the MEMRC signal and the address bus. The address bus will contain the location in the Message Store module A1A5 where the operator selected message is located. The data contained in the first location is loaded onto the system data bus. The A1A6 module reads the data bus and then generates the IOWC signal and activates the address bus. The data is then sent to the Interface module A1A7 and loaded into the port(s) selected by the operator for transmission (TXD1, TXD2, or TXD3). The A1A6 module continues to transfer data from the A1A5 module to the A1A7 module until the complete message is sent.

3-5. RECEIVE FUNCTION.

The Keyboard-Printer is capable of receiving messages on any combination of the three ports. This capability is controlled by the configuration, which is determined by the operator, for each port. As each message is received it is stored in memory and then printed. The start-of-message (SOM)/end-of-message (EOM) characters determine if an MPN of Ø or the next available MPN is assigned

to a received message. If a message is received without an SOM or an unmatched SOM, the message is determined to be unformatted and assigned an MPN equal to Ø. If a message is received and the SOM characters match, the message is determined to be formatted and the next MPN is assigned. The SOM/EOM character sequence can consist of any five characters except the null character. In certain configurations, a special SOM/EOM character group can be assigned. When this special SOM/EOM character group is entered, special handling takes place. Since the special handling operations are designed for specific applications, they will not be discussed here. If the PRINT ENABLE ON/OFF switch is OFF, the received message will not be printed until it is set to ON. Once it has been set to ON it will automatically print the received message(s). If the AUTOPRINT/NORM/MASTER CLEAR switch is in the AUTOPRINT position, the received messages are printed and then automatically deleted from memory. The receive function performs two operations; received message store, and received message print. The following paragraphs describe these operations.

3-5.1 Received Message Store (figure FO 5-2). The externally transmitted signal (RXD1, RXD2, or RXD3), is received by the Keyboard-Printer and routed to the Interface module A1A7. The message is received in a serial format by the A1A7 module. After eight bits have been received, the A1A7 module sends a master interrupt number four (MINT4C) to the Microcomputer module A1A6. The A1A6 module will detect the interrupt and determine it is for a received message. The A1A6 module activates the address bus and the input output read (IORC) signal. The A1A6 module then reads the eight-bit data word using the system data bus. Then the address bus is reactivated and the memory write (MEMWC) signal is generated. The A1A6 module then transfers the eight-bit data word to the Message Store module A1A5 using the system data bus. This operation continues until the complete message is received and stored.

3-5.2 Received Message Print. When a message is being received and stored in memory it must be printed. The A1A6 module will activate the address bus and the input output read (IORC) signal to determine if the PRINT ENABLE ON/OFF switch is ON or the AUTOPRINT/NORM/MASTER CLEAR switch is in AUTOPRINT position. If the PRINT ENABLE ON/OFF switch is ON or the AUTOPRINT/NORM/MASTER CLEAR switch is in the AUTOPRINT position, the A1A6 module will generate the MEMRC and activate the address bus. The A1A6 module reads the message, one eight-bit data word at a time, from the A1A5 using the system data bus. After each word is read by the A1A6 module, the address bus and IOWC signal are activated again. The eight-bit data word is then transferred from the A1A6 module to Controller module A1A8. The A1A8 module generates the corresponding dot pattern signals (DOT2C through DOT8C) for the data word. The dot pattern signals are fed to Pin Driver Logic module A1A1A7A2. The dot pattern signals are then amplified by Pin Driver Transistor module A1A1A7A1. The amplified dot pattern signals are used to fire the printhead contained in Carriage assembly A1A1A3. The carriage motor, line feed, and ribbon drive signals are also generated as explained in the transmit function, paragraph 3-4.1.

3-6. COMPOSE/EDIT FUNCTION.

The compose/edit function allows the operator to create new messages or to edit messages contained in memory. The Keyboard contains an 80-character one-line display for displaying each line as it is composed or edited; however the one-line display is disabled if port three of the Interface module A1A7 is configured as a communications port. When port three is used as a communications port, composed information is printed by the Keyboard-Printer. The compose/edit function operates in either of these two different configurations; one-line display or printed display. The following paragraphs discuss these configurations.

3-6.1 One-Line Display (figure FO 5-3). To operate in the compose/edit mode, the operator depresses the EDIT MSG key and then the EXIT/ENTER key. The Keyboard assembly A2A1A1 routes the XOC and X1C signals (generated from Y7C) to the Keyboard Logic module A2A1A2. The A2A1A2 module decodes the XOC and X1C and generates a Keyboard interrupt signal (KBINTC). The KBINTC signal is routed to the Microcomputer module A1A6. The A1A6 module detects the interrupt and reads the eight-bit word (KBD0 through KBD7) from the A2A1A2 module. After decoding the word, the A1A6 module will activate the address bus and the input/output write (IOWC) signal. The A1A6 module assigns a message processing number (MPN) to the message to be composed. Using the system data bus, the A1A6 module transfers the MPN to the Interface module A1A7. The A1A7 module converts the parallel-formatted data into an eight-bit, serial-formatted, bipolar, data stream. The data stream (TXD3) is transmitted to a bipolar receiver in Display Logic module A2A2A1. The A2A2A1 module receives the data stream and converts it into a parallel-formatted data word. The data word is decoded and used to drive the light emitting diodes (LED's) on 1-Line Display module A2A2A2. This display informs the operator, of the MPN for the message he is composing. As the operator composes the message, each keystroke generates a KBINTC signal and an eight-bit word representing the depressed key. The A1A6 module detects the interrupt and reads the eight-bit word. The A1A6 module then activates the address bus and memory write (MEMWC) signal. The eight-bit word is then sent, using the system data bus, to Message Store module A1A5. The eight-bit word is then stored in memory. After being stored in the A1A5 module, the A1A6 module reads the stored word. This is done when the A1A6 module activates the address bus and the memory read (MEMRC) signal. The word is read back to the A1A6 module. The A1A7 module then receives the word for transmitting to the 1-Line Display the same as the MPN. After the operator completes the line, he depresses the NEW LINE key. The A1A6 module will clear the 1-Line Display by sending CR and LF characters to the A1A7 module for transmission to the A2A2A1 module. The CR and LF characters are stored in the A1A5 module as previously discussed. The 1-Line Display is then ready to display the next line.

3-6.2 Printer Display. If port 3 of the A1A7 module is configured as a communication port, it cannot be used to drive the 1-Line Display. The A1A6 module will send the data from memory to Controller module A1A8 instead of the A1A7 module. The A1A8 module and Print Mechanism A1A1 function the same as explained in the transmit function, paragraph 3-4.1.

3-7. BITE FUNCTION.

The Keyboard-Printer performs two separate BITE operations. The first BITE operation takes place during the power-on sequence or when the operator sets the AUTOPRINT/NORM/MASTER CLEAR switch to the MASTER CLEAR position. The power-on BITE tests the memory circuits and identifies the equipment configuration. The second BITE takes place when the operator sets the BITE/LF switch to the BITE. This BITE tests the operation of the Print Mechanism. The following paragraphs provide functional descriptions of both BITE operations.

3-7.1 Power-On BITE (figure FO 5-4). The power-on BITE begins when the dc voltages reach their operating level. The +5 Vdc normally applied to Microcomputer module A1A6, initiates the sequence by resetting all critical storage elements within the Keyboard-Printer. After the A1A6 module has been reset, it will begin to perform the instructions of the self-test process. The Keyboard-Printer lamps and indicators will be illuminated at the start of the self-test process. After one second, the lamps and indicators are extinguished. After all the lamps are extinguished, the Keyboard-Printer performs a RAM and a ROM test. The RAM test involves the A1A6 module writing data to and then reading data from each location ofmemory

contained on the A1A6 module and A1A5 module. After writing and then reading the data, the A1A6 module performs a comparison check to ensure the RAMs are operating properly. The writing and reading process is the same as defined in paragraph 3-6.1 for composing a message. The ROM test involves the A1A6 module reading the ROMs on the A1A5, A1A6, and A1A7 modules. The data contained in each ROM is read and added together. The sum of these addresses is compared to a check sum, stored in the ROM, to ensure proper operation. An internal ROM test is performed by the A1A8 module using the same process. When the A1A6 module completes the other ROM tests, it will generate the address bus and IORC signal to determine the status of the A1A8 ROMs. Upon completion of the memory test, the A1A6 module will read the configuration switch information. After obtaining the switch data, the A1A6 module selects the A1A7 receive and transmit configuration. In addition, the system configuration data (refer to appendix A) is transferred to A1A8 for printing. The printing process is the same as that explained in the transmit functional description (paragraph 3-4.1).

3-7.2 BITE Switch. The BITE function is used, by the operator, to determine the operability of the Keyboard-Printer. By setting the BITE/LF switch to the BITE position, the operator provides the low level BITEC signal to Controller module A1A8, Keyboard A2, and Interface module A1A7. The Keyboard and A1A7 module use the BITEC signal to illuminate the SHF lock lamp and RCV BUSY lamp, respectively. Periodically, the A1A6 module reads the switch inputs to the A1A8 module. When this takes place the address bus and IORC signal are active. The switch inputs are transferred to the A1A6 module using the system data bus. The microprocessor, in the A1A6 module, detects the BITE switch input as active and begins performance of the BITE function. The A1A6 module will activate the address bus and the MEMRC signal. These signals select the BITE instructions in the memory circuits and transfer them to the A1A6 module using the system data bus. The first instructions are processed and the A1A6 module activates the address bus and the IOWC signal. A control word is then generated and transferred to the A1A8 module using the system data bus. This control word will set up the A1A8 module to print the data words as they are received. The A1A6 module then begins to transfer data words representing characters. The A1A8 module will process the characters and generate the necessary dot pattern and control signals to print the characters received from the A1A6 module. The printing process is the same as explained in the transmit function paragraph 3-4.1.

3-8. CONTROL FUNCTION (figure FO 5-5).

The control function provides the operator interface with the equipment. The configuration switches in the control function allow the operator to configure the equipment as necessary to meet his needs. Each of the three pairs of transmit and receive ports can be configured differently by using the control function. The control function provides for selecting the characteristics of the data being transmitted and received. This includes the following:

a. ITA CODE (S2) - selects ITA-2 or ITA-5 code.

b. ECHO (S3) - enables/disables echo capability.

c. TX PRINT (S4) - enables/disables transmitted messages to be printed.

d. STOP BITS (S5) - selects number of stop bits (single or multiple).

e. DATA (S7) - selects normal or inverted transmitted data.

f. TRMRDY (S8) - selects automatic (on) or manual (off) control of receive inhibit line.

g. PARITY (S9) - selects odd, even or no parity for transmitted or received signal.

h. BAUD RATE (S10) - selects baud rate for transmit and receive port.

The control function also provides for manual control of printing operations. This includes the following:

a. LINE SP (S1) - selects either single or double spacing.

b. AUTO PRINT (S11) - selects auto-print and deletion of received messages.

c. LF (S13) - selects manual line feed.

d. CR (S14) - selects manual carriage return.

e. TX ON (S15) - enable transmitter keyline (not used).

The control function also allows the operator to control special operations as follows:

a. MASTER CLEAR (S11) - clears all circuits and memory.

b. BITE (S13) - initiates BITE test.

c. RESET (S14) - resets specified circuitry.

The transmit and receive configuration signals are routed to the Interface module A1A7. The A1A7 module provides this information to the Microcomputer module, when requested, to establish the configuration. The printing operation control signals are routed to the Control module A1A8. The A1A8 module generates the proper signals to perform the operator selected operation. The special operation signals are routed to various circuits to perform the selected operations.

3-9. POWER DISTRIBUTION (figure FO 5-6).

The power distribution function receives a 115 Vac input from the ship's supply. The input power is fed through the power filter to the POWER ON/OFF circuit breaker CB1. When CB1 is set to ON, the input power is fed to Power Supply module A1A3 and blower B1. The ac power is rectified and regulated into the dc operating voltages. These dc operating voltages are fed through the Card Cage assembly A1A2A1 to the Master Interconnect A1A2A1A4. The Master Interconnect distributes the dc operating voltages, throughout the equipment, to the modules and assemblies.

3-10. CIRCUIT.

The circuit level description provides the detail theory of operations of the circuitry within the Keyboard-Printer. The major operations performed by each module and the circuitry involved are described in detail. Integrated circuits are not described in detail during the circuit level description. The integrated circuit data is provided at the end of this description. Each circuit level description is supported by a wiring or schematic diagram.

3-11. KEYBOARD-PRINTER (figure FO 5-7).

The Keyboard-Printer interfaces with external equipment using I/O Signal Connector J2. J2 is hardwired to the Master Interconnect. The Master Interconnect provides the interface between the four logic modules and the other modules within the Keyboard-Printer. The Configuration and Keyboard-Printer control panel, switches and indicators are connected to plug P1 which mates to chassis mounted jack A1A2J6. The wire harness (W4) connects from J6 to plug P6. P6 mates with A1A2A1A4J6 which is hardwired to the Master Interconnect. The inputs from the control panels are routed, via the Master Interconnect, to the appropriate modules. The Power Supply module, A1A3, outputs are fed through A1A3P1 to A1A2A1J15 in the Card Cage assembly. A1A2A1J15 is hardwired to terminals E271 through E305, as applicable for this configuration, located on the Master Interconnect. The outputs from the Power Supply are routed

through the equipment via the Master Interconnect. The Print Mechanism is connected to the card cage assembly by A1A1A7P1, A1A1A1P1-1, and A1A1A6P2. The three plugs mate with A1A2J7, A1A2J8, and A1A2A1J9, respectively. The card cage jacks are connected to the Master Interconnect through; A1A2A1P7 and A1A2A1A4J7, A1A2A1P8 and A1A2A1A4J8, and A1A2A1P9 and A1A2A1A4J9. The Master Interconnect also receives and sends information to and from the Keyboard via a wire harness with W3P5 connected to A1A2A1A4J5 and W3J5 connected to A2A1P1.

3-12. PRINT MECHANISM A1A1 (figure FO 5-8).

The Print Mechanism contains the electronic circuits for the mechanical movement of the Keyboard-Printer. The Printer Mechanism responds to signals from the Controller module (A1A8) to print characters, move the carriage, and feed the paper. The Print Mechanism consists of the Motor and Timing Disk assembly A1A1A1, Carriage assembly A1A1A3, Line Feeder Motor A1A1A4, Zener Box A1A1A5, Motor Drive assembly A1A1A6, and Pin Driver A1A1A7.

3-12.1 Print Characters. When the Controller module receives a print command from the Microcomputer, it selects from memory the dot drive signals (DOT2C-DOT8C) necessary to print the desired character. These dot drive signals are routed to the Pin Driver module located in the Print Mechanism. The Pin Driver module contains the pin driver logic and the pin drivers. The seven dot drive circuits operate identically, therefore only one will be described here. When the DOT2C is active, it is applied to NOR-driver A7A2U3B as a logic low. This turns off A7A2U3B and places +12V on pin 1 of pin driver A7A1Q2. With +12V on pin 1, A7A1Q2 conducts allowing current to flow through the printhead coil A3PH2. This current flow will fire the printhead causing a dot to be displayed on the paper. As current flows through A7A1Q2, the voltage drop across A7A1R2 is routed through A7A2CR2 to comparator A7A2U2. If the current flow through A7A1R2 exceeds 4 amps, the potential on capacitor C8 is higher than the reference voltage on pin 6 of A7A2U2. The difference is outputted from A7A2U2 through the NOR gate in A7A2U3B to the driver. The driver will then conduct reducing the voltage on pin 1 of A7A1Q2, limiting the current flow through A7A1Q2. When the DOT2C signal becomes inactive, it is a logic high which is routed to A7A2U3B. The high will then turn on the driver in A7A2U3B causing the output to go low. The low output on pin 1 of A7A1Q2 will turn the pin driver off. The collapse of the magnetic field from A3PH2 will then allow the storage capacitor A7C1 (figure FO 5-8, sheet 3) to recharge through steering diode A7A1CR2 and zener diode A5CR2. The DOTC drive signals can be generated up to nine times to form a single character.

3-12.2 Carriage Movement. When the Controller module receives a carriage movement command, it will generate four carriage motor signals CRØ1-CRØ4 (figure FO 5-8, sheets 4 and 5). These signals are routed to the Motor Drive assembly A1A1A6 in the Print Mechanism, where they are applied to the Carriage Drive A1A1A6A1. The Carriage Drive assembly operates similarly to the Pin Driver explained in paragraph 3-12.1. The four signals are applied to the Motor and Timing Disk assembly A1A1A1, out of phase, causing the motor to step (turn 5 degrees). After the motor steps, the timing disk assemblies will generate an MOTC signal which is routed to the Controller module. Receipt of the MOTC signal causes the four signals to be phase shifted and the motor to step. This continues until the motor has stepped six times, which represents a character (4) and a space (2).

3-12.3 Paper Feed. When the Controller module receives a line feed command, it will generate four line feed signals LFØ1-LFØ4 (figure FO 5-8, sheet 6). These signals are routed to the Motor Driver module in the Print Mechanism. The line feed driver circuits operate similarly to that explained in paragraph 3-12.2.

3-12.4 Ribbon Feed. The ribbon is advanced each time the printhead is fired. The Controller module generates a RIBDR signal (figure FO 5-8, sheet 5) which is routed to the carriage driver in the Print Mechanism. The RIBDR signal is regulated by zener diode A6A1CR5 and routed to pin 1 of ribbon transistor A6A1Q5. With a logic high on pin 1, A6A1Q5 conducts allowing current to flow through the Ribbon Motor A3B1, causing the ribbon to advance.

3-12.5 Print Mechanism Control and Timing. Circuits for brake and paper low monitoring are contained within the A1A1 module. Microcircuit A1A1U1 (figure FO 5-8, sheet 7), containing an LED and a photo-sensitive transistor, is mounted on the A1A1 module. The light beam from the LED is aligned to the left side of the carriage bar. When the carriage breaks the light beam, the A1A1U1 photo-sensitive transistor turns off generating the BRKC signal. The BRKC is routed to the A1A8 module to stop the leftward movement of the carriage. The A1A1 module also contains a microcircuit A1A1A2U1 consisting of an LED and a photo-sensitive transistor for monitoring for a paper low condition. When the paper is low, the photo-sensitive transistor does not conduct, generating a PAPLOWC, which is routed to the A1A8 module. The timing for the A1A1 module is accomplished by Timing Disk assemblies A1A1A1A1 and A1A1A1A2. A timing disk is mounted on the shaft of the carriage motor. Mounted in back of the timing disk are three LEDs. In front of the timing disk is a board containing three photo-sensitive transistors and drive circuits. The timing disk assemblies are aligned to allow the light beam to travel through the openings in the timing disk to the photo-sensitive transistors. The timing disk assembly provides three outputs. A SYNCC signal for synchronizing the carriage operation; a PHDFC signal for controlling the timing for printhead firing; and an MOTC signal for the timing of the carriage motor.

3-13. POWER SUPPLY MODULE A1A3 (figure FO 5-9).

The A1A3 module receives 115 Vac, 60 Hz power from an external source and converts it to the necessary dc operating voltages. The 115 Vac is available to the A1A3 module whenever the POWER ON/OFF circuit breaker CB1 is set to the ON position. The A1A3 module consists of the Preregulator interconnect (INTERCON) A1A3A1A1 and the Preregulator (CONTROL) assembly A1A3A1A2.

3-13.1 Full Wave Rectifier and Filter. The ac input is filtered by an rc network consisting of A2R1 and A2C30 and applied to bridge rectifier A2U3. The rectified output from A2U3 is a nominal +150 Vdc. The +150 Vdc is filtered by inductor A2L1 and capacitor A2C1. Bleeder resistors A2R11 and A2R12 discharge A2C1 when power is removed. Two thermistors, A2RT1 and A2RT3, are used as surge limiters to protect the converter transistors. The filtered ac is also fed through the phase-shift capacitor A2C29 to the fan and through the primary winding of bias supply transformer A2T1. The output from the secondary winding of A2T1 is rectified by a half-wave bridge, consisting of A2CR2 and A2CR3, and filtered by capacitor A2C2 to produce a nominal +24 Vdc which is sent to the pulse width modulator circuits located on the Preregulator interconnect assembly.

3-13.2 Converter and Transformer. The +150 Vdc is applied to the converter transistors A2Q1 and A2Q2 (figure FO 5-9, sheet 3). The output from the converter is controlled by the pulse width modulator A1U3 located on the Preregulator interconnect assembly (figure FO 5-9, sheet 4). The output from A1U3 is a pulse-width controlled 55 kHz signal. The pulse-width modulator monitors the output voltages for overvoltage, overcurrent, and overtemperature conditions. The output from A1U3 is in a push-pull configuration, providing a high at one output when the other output is low. These two outputs (pin 12-CA and

pin 13-CB) are applied to the pulse-width modulator driver circuits. When the CA output is high and the CB output is low, transistors A1Q5 and A1Q3 are turned on and transistors A1Q6 and A1Q4 are turned off. When A1Q5 and A1Q3 are turned on, E59 (sheet 3) is at a ground potential. Transistors A1Q6 and A1Q4 are turned off putting E57 at a positive voltage level allowing current to flow through the primary of chopper transformer A2T2 in the preregulator assembly. When the CA and CB outputs alternate (CA-low and CB-high) E59 will be at a positive voltage and E57 at ground. When an overtemperature or an overvoltage condition exists, A1U3 shuts down and both outputs go high, placing ground potential on both E59 and E57 preventing current flow through the primary of A2T2. When current flows through the primary of A2T2 it is induced into the secondary. The chopper circuit consisting of A2Q1 and A2Q2, along with their associated components, control the charging and discharging of capacitors A2C5 and A2C6. The charging and discharging paths are through the primary windings of current transformer A2T3 and converter transformer A2T4 which are wired in series. The output from the secondary of the current transformer is applied to the fault circuits in the A1 board. The converter transformer contains three secondaries. The first secondary (pins 3, 4, 5, and 6) contains a full-wave bridge rectifier A2CR8 through A2CR11 and filter network A2L2, A2L3, A2C8 and A2C9 with an output of ±16V. The ±16V output is applied to the ±12V and -5V regulators. The second secondary (pins 7, 8, 9, 10) contains a full-wave bridge rectifier A2CR12 through A2CR15 and filter network A2L4, A2L5, A2C19, and A2C21 with an output of +56V and +28V. The +56V output is applied to the +50V regulator. The +28V is filtered and then routed out of the power supply as the unregulated +28V. The third secondary (pins 11, 12, 13, and 14) contains a half-wave bridge rectifier A2U4 and three filter networks A2R7 and A2C23, A2R8 and A2C24, and A2L6, A2L7, A2C25, and A2C26. The output from the third secondary is used as the unregulated +5V.

3-13.3 +12V Regulator. The +12V regulator is a three-terminal, adjustable, positive, voltage regulator. The filtered +16V from the converter transformer is applied to the voltage input (pin 2) of voltage regulator A2U1. The adjustment input (pin 1) voltage level sets the output (case) voltage level. The potentiometer A1R3 is adjusted to maintain the desired output, during normal operation. At power turn-on, A2Q12 holds the adjustment input pin of A2U1 at ground potential until the -16V input to A2U6 reaches -12V, as determined by zener diode A1CR13. This assures that the -5V output is present before the +12V is applied to the user circuit. The output is filtered by capacitors A2C11, A2C12, and A2C13.

3-13.4 -12V Regulator. The -12V regulator A1U6 is a three-terminal, negative, voltage regulator. The -16V output from the converter transformer is applied to the voltage input (case), regulated to -12V, and routed to the equipment. The output is filtered by capacitors A2C18 and A2C23.

3-13.5 -5V Regulator. The -5V regulator A2U2 is a three-terminal, negative, voltage regulator. The -16 output from the converter transformer is applied to the voltage input (case), regulated to -5V, and routed to the equipment. The input is filtered by a capacitor A2C14 and the output is filtered by capacitors A2C15 and A2C16.

3-13.6 +50V Regulator. The +50V regulator is a series regulator with voltage and current control. The +56V output from the converter transformer is applied to the collector of the series regulator transistor A2Q3. When the series regulator is on, current flows from the +56V source through the series regulator transistor A1Q3, current monitoring resistor A1R88 and blocking diode A1CR17 to the +50V output. The +50V regulator is referenced to the +28V

output and regulates to a level which is 22V above the +28V. The output voltage is monitored by the voltage divider network, A1R90 and A1R91. As the output voltage varies the drop across the voltage divider network changes accordingly. The base of the voltage monitoring transistor A1Q14 is connected between the resistors of the voltage divider network. The emitter of the voltage monitoring transistor is connected through a diode A1CR19 and a zener diode A1CR20 to the +28V supply. The zener diode maintains the emitter at +15V referenced to the +28V output. As the voltage across the voltage divider network increases, the difference between the base-emitter junction increases causing current flow to increase through the voltage monitoring network A1R85, A1CR18, and A2R6. The increase in current flow causes the base potential of the series regulator transistor to be reduced, decreasing the current flow through the voltage divider network until the output voltage returns to normal. The current limiting circuit is inactive until the current, through the current monitoring resistor A1R88, increases beyond the rated amperage value 1.5 amps of the +50V supply. When this point is reached, the current limiting transistor A1Q13 conducts. When the current limiting transistor conducts the base potential of the series regulator is reduced, limiting the available output current. This operation will allow the current level to be maintained and the output voltage to drop until there is an 18-volt difference between the input and output voltages of the regulator. When this point is reached the base biasing zener diode network A1CR15 and A1R84 will conduct, reducing the conduction of the current limiting transistor. This action causes a foldback of the output current to a level approximately 0.3 amperes to reduce the power dissipated in A2Q3, due to an overload.

3-13.7 Protection Circuits. The Power Supply module provides overvoltage, short circuit, current overload, and overtemperature protection. Each of the six dc output voltages are protected against current overload and short circuits in the output stages. The +5-, and +12-, and -5-volt outputs are protected from overvoltage conditions. An overtemp circuit is used to monitor possible overtemperature condition within the equipment.

3-13.7.1 Overvoltage Protection. Overvoltage protection is accomplished by the use of a quad voltage comparator A1U4. The reference input to the voltage comparator is established by the output of the reference voltage regulator A1U1. The reference series regulator A1Q1 provides the input voltage to the reference voltage regulator from +24V bias supply. The voltage divider network A1R31, A1R32, and A1R1 is adjusted to provide a nominal +2.5V output from the reference voltage regulator. This output provides the reference voltage for the voltage comparators for the +5-, +12-, and -5-volt overvoltage protection circuits. If the +12V output increases, the input to the +12V voltage comparator A1U4A from the voltage divider network A1R35 and A1R36 increases and A1U4A switches to a low state. The ±5V overvoltage circuits operate basically the same as the +12V. In addition to monitoring the +5V, the +5V voltage comparator also monitors for an overtemp signal. When the overtemp signal is generated, it is routed through diode A1CR8 to the input of the +5V voltage comparator, generating a negative level out of the comparator. The open collector outputs from the voltage comparators are tied together and routed to the shut-down, D-flop A1U2A preset input. This sets the D-flop and the Q output goes high, which will shutdown the pulse width modulator, terminating the output from the converter. The converter remains off until input power is removed, the cause of the overvoltage is corrected, and the input power is reapplied.

3-13.7.2 Overtemperature Protection. A thermistor A2RT2 is placed near the converter transistors to monitor the heat dissipation. When an overtemperature condition exists the input to the

overtemperature voltage comparator U5A decreases causing a positive level out. The positive output is fed through resistor A1R50 and steering diode A1CR10 to turn on A1Q10, pulling the inverting input of A1U5D to ground. The output of A1U5D then goes positive and shuts down the pulse width modulator via the CS+ input. The pulse width modulator remains off until the temperature sensed by A2RT2 decreases by approximately 10°C, at which point A1U5A output switches low, A1Q10 turns off, and A1U5D output switches low.

3-13.7.3 +28V and +5V Overcurrent Protection. The current flow for +28V and +5V is controlled by monitoring the voltage drop across the current monitoring resistors A2R9 and A2R10. The reference voltages for the +5V and +28V current limiting amplifiers A1U5C and A1U5B is preset for the maximum allowable current flow from each of the supplies. If the current flow increases beyond the allowable limit, the voltage drop across the current monitoring resistors will be higher than the preset value. The operational amplifier will then produce an output proportional to the difference at the input. This output is fed through an amplifier, A1Q9 for +28V , A1Q11 for +5V, to the negative error input (pin 1) of the pulse-width modulator (A1U3 and overides the normal voltage feedback signal applied through resistors A1R68 and A1R70. The positive input is preset by reference voltage divider network A1R55, A1R2, and A1R56. The difference between the negative and positive error inputs is amplified internally in A1U3 and modulates the output pulse width so that the output current is limited under overload conditions. Under normal conditions, the output voltage level is regulated and the outputs of A1U5B and A1U5C are at ground potential.

3-13.8 Converter Transformer Current Limiting. The current flow through the primary of the converter transformer (A2T4) is monitored by use of a current transformer, A2T3, wired in series. The output from the secondary of A2T3 is fed through a rectifier A1CR5 and A1CR6 and filter network A1R21, A1R22, A1R23, and A1C3 to the negative input of a voltage comparator A1U4D. When the voltage level increases above the preset level, a negative output is generated and applied to the CLR input of the D-flop A1U2B. The Q output will be set to a low level and applied to the COMP input of the pulse-width modulator. This will shut off the output of the pulse-width modulator until the next cycle of the 55 kHz chopper frequency. This action produces pulse-by-pulse limiting of the primary current waveform.

3-14. MESSAGE STORE MODULE A1A5 (figure FO 5-10).

The A1A5 module provides memory storage for messages received from other equipment, messages composed by the operator for transmissions, and part of the operating program for the equipment. Storage and retrieval of data on the A1A5 module is controlled by Microcomputer module A1A6. The A1A5 module contains three circuits for performing the storage functions; the control circuit, the operating system circuit, and the message store circuit. The following paragraphs provide a detailed description of each of these circuits.

3-14.1 Control Circuits. The Control Circuits provide the selection and timing of the A1A5 module circuitry. The timing is provided by a 16.5888 MH oscillator consisting of crystal Y1 NAND gates U57A, U57C, and U57D, and th associated components. The selection o the A1A5 module circuits is performed i response to signals from the A1A6 mod ule. The address bus along with th IOWC, MEMRC, and MEMWC signals determin which circuitry will be selected. Th IOWC signal and address bus determine the selection of either EEPROM U or SRAMs U9 and U10. The IOWC signal i routed, along with the address bus, t the A1A5 module. The active IOWC signa is fed through buffer U50E to NAND gat U47C and NOR gate U51B. The high leve output from U47C, along with AB15 as high, enables NAND gate U45D. Th

results in the low level output from U45D clearing D-flop U48A. The set output from U48A goes low when it is cleared and enables bidirectional bus driver U11. Since the MEMRC signal is inactive, the high level is fed through U50G to U11. The high level controls the direction of data transfer from A to B in U11. The IOWC signal, along with select code 8XXXH, enables U51B resulting in a high level output being inverted by U49A. The output from U49A clocks octal D-flop U28, latching the information on the data bus to the output of U28. The state of DB5 (high or low) will determine if U1 or U9 and U10 are selected. The output from pin 19 of U28 is routed to inverter U49E and NOR gate U46A. If the output from U28 is high, U49E inverts it and the low level signal, along with the EXXXH select signal, enable NOR gate U46B providing a high level to NAND gate U45A. If the output from U28 is low and select signal EXXXH is active a high output results from NOR gate U46A, partially enabling NAND gates U47A and U47B. This action allows the A1A6 module to select either U1, or U9 and U10. When the MEMRC signal is active the A1A6 module is capable of reading from any part of memory and therefore it must use the address bus to select the appropriate area of memory. The address bus is fed through buffers U27 and U44 for distribution to both memory circuits. The low-level MEMRC signal is fed through U50G, enabling U11 in same manner as the IOWC signal. The MEMRC signal is also routed to U11 to establish the direction of data flow, and to the operating system memory circuit. The MEMRC signal is also fed to NAND gate U57B. The high level output from U57B is fed to U45A, U47A and U47B for reading the operating system memory circuit enabled by the IOWC signal, previously explained. The high level from U57B is also fed to NOR gate U46C and D-flop U56B. The output from U46C is the row address select (RAS) signal for the message store memory circuit. The other input to U46C is the output from inverter U49D which is a continuous low in this configuration. The high level input to U56B, is clocked through to the set output and distributed to D-flop U56A, NAND gate U55C, and buffer U50A. With D-flop U56A reset (until receipt of the next clock pulse) and U56B set, U55C is enabled resulting in a low level signal being fed to NAND gate U55D and shift register U53. At the next clock pulse U56A and U54A are set and the low level at U53 is clocked to the next register. The low level output from the reset output from U54A is output as the column address enable (COLADDENC) which is sent to the message store memory and U55D. The high output from U55D maintains U54A set. The output from register B of U53 is low which is sent to NAND gate U55B resulting in a high D-flop U54B input. The next clock pulse sets U54B resulting in the set output enabling NAND gate U52B and U52C. The reset output from U54B is sent to U55B maintaining the set condition. Receipt of the last clock pulse resulted in the "C" registers output going low. Two clock pulses later the "E" registers output will go low resetting U54A. When the MEMRC signal becomes inactive (high) U54B is reset. If the dynamic ram is selected, address FXXXH signal from U5 will go low. This low is fed through NOR gate U46D providing a high input to NAND gate U45B. The output from U45B is a low which is routed to NAND gates U45C and U52D, and NOR gates U51C and U51D. The upper/lower signal from the message store memory circuit will activate either U51C (via U49B), or U51D. If lower is selected, the high level output from U51D will enable U52B generating the column address select 0 (CAS0C) signal for routing to the message store memory.

3-14.2 Operating System Circuits. The operating system circuits consist of five 4K x 8 EPROMs, U2, U3, U4, U6, and U7. These EPROMs contain part of the operating system program for the Keyboard-Printer. The MEMRC signal is activated by the A1A6 module when the operating system program is being used by the microprocessor. The MEMRC is fed through U50G to U47C, U57B, U11, and the EPROM's. The address bus from the A1A6 module is fed through bus drivers U27

and U44 to decoder U5, and the EPROM's. Address bits AB00 through AB11, are used to select the area in memory containing the desired instruction or data. Address bits AB12 through AB15 are decoded by U5 to select which EPROM the information is to be read from. When the decoder U5 activates the chip select signal for the EPROM, (8XXXH through CXXXH) the information is loaded onto the system data bus from bidirectional bus driver U11.

3-14.3 Message Store Circuits. The message store circuits consist of eight 64K x 1 dynamic RAMs (U19 through U26) and the row and column address components. Three operations are performed within the message store circuits; write to memory, read from memory, and refresh memory. The write operation involves the outputs from U28, U31 and address bits AB08 through AB11. When the dynamic RAM select signal (DRAMSELC) is active and the column address enable signal (COLADDENC) is inactive, the row address enable signal (ROWADDENC) is active. The logic low from NAND gate U52A enables octal line driver U31. The outputs from U31 are fed through quad AND gates U17 and U34 to quad NAND gates U18 and U35. The outputs from U18 and U35 are fed to the address inputs of RAMs U19 through U26. When the COLADDENC signal becomes active the ROWADDENC signal becomes inactive. The low level COLADDENC signal enables octal line driver U29. The outputs from U29 are fed through U18 and U35 to the RAMs address inputs. When the row and column address select signals (RASC and CASOC) are active, the memory location is selected and the character is loaded from the system data bus into memory, when the MEMWC signal becomes active. The memory read operation is basically the same except the MEMWC is inactive and the data is loaded from memory onto the data bus for transfer to the A1A6 module. When the dynamic RAM select signal (DRAMSEL) is inactive and the RASC signal becomes active, NOR gate U51A is enabled. The output from U51A is fed through inverter U49F to counters U13 and U14. With the DRAMSELC and COLADDENC signals inactive the output from U52D, REFADDENC, is active, enabling octal driver U15. The output from the counters is then fed through U17 and U34, and through U18 and U35 to the RAMs. The address selected is refreshed in all the RAMs. On the deactivation of the RASC signal the counter clocks one count and the next row of memory can be refreshed.

3-15. MICROCOMPUTER MODULE A1A6 (figure FO 5-11).

The Microcomputer Module controls and monitors the operation of the Keyboard-Printer. The Microprocessor U3 initiates and performs the activities necessary to operate the equipment. Five basic commands are used to perform the required functions; memory read, memory write, input/output read, input/output write, and interrupt monitoring. The sequence of the activities performed by the microprocessor is controlled by a program that is contained in read-only-memory (ROM) circuits of the Keyboard-Printer. The ROM's information will contain each instruction necessary to perform an operation and the order in which they are to be performed. The microprocessor will address and read from the ROM the instruction, perform it, and then read the next instruction. This process will continue until the operation is completed. The following paragraphs describe the power-on condition and the operation of the five operations within the Microcomputer Module.

3-15.1 Power-on. When power is first applied to the equipment, a reset operation takes place to clear the logic. Resistor R6 and capacitor C4 form an RC network on the RESIN input of clock generator/driver U2. At power on, the slow transition from 0 to +5 Vdc, across the RC network, is monitored by a Schmitt trigger on the RESIN input. When the RC network has charged to a sufficient level, the Schmitt trigger will fire and a high level pulse is applied to the D input of a D-flop within U2. As long as the RESIN is low

enough, a RESET signal is generated. The D-flop is set when it receives the next clock pulse from the oscillator contained in U2. At this time the RESET signal becomes inactive. The oscillator's output frequency is determined by crystal Y1. The crystal frequency (16.5888 MHz) is divided by nine within U2 and generates three clock signals at 1.8432 MHz; Ø1, Ø2, and Ø2 TTL. The Ø2 clock is delayed and used as a clock pulse to the D-flops within U2. The output from the Schmitt trigger and the delayed Ø2 clock are used to generate the RESET signal. The RESET signal is sent to the microprocessor where the program counter is cleared. The Ø1 and Ø2 clocks are also applied to the microprocessor along with the READY signal. The READY signal is available from U2 whenever the RDYIN input is a logic high. In this configuration, the RDYIN input is at a logic high at all times, and the READY signal is applied to the microprocessor continuously. At the beginning of each machine cycle the microprocessor will generate the sync signal, which is applied to U2. The sync signal and the Ø1 clock are ANDed and generate the status strobe (STSTBC) signal. The STSTBC is routed to the system controller and bus driver U1 where it is used to strobe the status and data information from the microprocessor. The write enable (WR) and data bus in (DBIN) signals are combined with the status information (D0 - D7) to generate the control signals.

3-15.2 Memory Read. To perform the memory read activity the microprocessor will place an eight-bit status word on the data bus to U1. The sync signal is generated and the data is strobed into U1 by the STSTBC signal. The microprocessor will also generate a unique set of address bits to select from memory the data it requires. The 16-address bits are buffered by U12A, U13, and U14, and placed on the address bus. The address bus is connected to two scratchpad random-access-memories (RAM) U16 and U17, an erasable PROM U4, two 1-of-8 decoder/multiplexers U31 and U34, and external modules. During the memory read activity, the data is read from either the RAMs, the external modules or the ROMs. Address bits AB00 through AB15 contain the address code in memory where the data is to be read from. Address bits AB10 through AB15 also contain the chip selection code (CSXXC) for selecting which memory circuit on this board is to be read. The chip select input for U4 is grounded, enabling U4 continuously. If AB10 through AB12 are a logic high and AB13, AB14 and AB15 are logic low, U34 will generate the CSICC signal. When the CSICC is̄ active, U16 and U17 are enabled. The memory read (MEMRC) signal is routed to the scratch pad RAM memory circuits and gate U10A. The MEMRC signal loads the data from memory onto the local data bus. The MEMRC signal and either the CSØØC signal, for the ROM, or the CSICC signal, for the RAMs, are gated through NAND gate U10D to generate an enable signal for buffer/drivers U6 (lines 5 and 6) and U7. The buffer/drivers will load the information from the local data bus onto the system data bus where it is routed to U1. The microprocessor will then enable the DBIN line and U1 will transfer the data from the system data bus into U3 for processing.

3-15.3 Memory Write. To perform the memory write activity, the microprocessor will place an eight-bit status word on the data bus to U1. The sync signal is generated and the data is strobed into U1 by the STSTBC signal. The microprocessor then generates a unique set of address bits to select the area of memory into which the data is to be written. The 16-address bits are buffered and placed on the address bus. After U1 decodes the eight-bit word and receives the WR signal from the microprocessor it will activate the memory write (MEMWC) signal. The MEMWC signal is routed to U16, U17, U27D, U22A, and external circuits. When the MEMWC signal is active, both RAM's (U16 and U17) read/write (R/W) inputs are set to write. Gate, U27D, inverts the MEMWC signal and routes it to U16 and U17 to enable them. The MEMWC signal is also inverted by gate U22A, and routed

through U9A where it is inverted, to buffer/drivers U5 (lines 1 through 4) and U6 (lines 1 through 4). The MEMWC signal at U5 and U6 enables the buffer/driver to transfer information from the system data bus onto the local data bus. The information on the local data bus is then routed to memory where it is written into the selected addresses.

3-15.4 Input/Output Write. To perform an input/output write activity, the microprocessor will place an eight-bit status word on the data bus to U1. The microprocessor generates the sync signal causing U2 to generate the STSTBC signal. The STSTBC is routed to U1 where it is used to strobe the data on the data bus into U1. When the WR signal, from the microprocessor, becomes active, the input/output write (IOWC) signal will be generated. The IOWC signal is routed to gate U22A and decoder U31. The IOWC signal is applied to U22A where it is inverted, and routed through U9 to buffer/drivers U5 and U6. The IOWC signal enables U5 (lines 1 through 4) and U6 (lines 1 through 4) to place the data from the system data bus onto the local data bus. The decoder, U31, receives the IOWC signal, CSICC, AB08 and AB09. These four signals are decoded to generate the write select (WXXC) signal for routing of the information on the local data bus. If AB08 and AB09 are both a logic low, the WØØC signal is generated and routed to latches U25 and U26. The WØØC signal will clock the information from the local data bus through to the input of bus drivers U8F and U33. The bus drivers route the information to the appropriate external circuits. If AB08 is a logic high and AB09 is a logic low, the WØ1C signal is generated and routed to latch U29 of the interrupt circuit. The WØ1C signal will clock the information from the local data bus into the latch. The outputs from U29 will enable the interrupt monitoring circuits U27 and U28 allowing selected interrupts to be routed to the microprocessor. If AB08 is a logic low and AB09 is a logic high, the WØ2C signal is generated and routed to timer-counter U18 and U20, and to gate U11A. The WØ2C signal is applied to the load input of the timer-counter to load the information from the local data bus into the timer-counter. This information determines the count the timer-counter will count from. At the end of the count, carryout signal C04 will go to a logic high. This logic high, along with the Ø2 TTL clock, is applied to NAND gate U10C producing a logic low output that is applied to gate U10B. Gate U10B is part of the SMINT2 latch. This latch is set and generates the SMINT2 signal when the timer-counter has timed out. The WØ2C is also fed to U11A to ensure the latch is reset prior to starting of the timer-counter. When both AB08 and AB09 are a logic high, the WØ3C signal from U31 becomes active. The WØ3C signal is routed to the keyboard interrupt latch, U11C and U27B, where it resets the latch.

3-15.5 Input/Output Read. To perform an input/output read activity the microprocessor will place an eight-bit status word on the data bus to U1. The microprocessor will then generate the sync signal, which is routed to U2, to generate the STSTBC signal. The STSTBC signal is routed to U1 to strobe the eight-bit word from the data bus into U1. When the microprocessor DBIN signal becomes active the input/output read (IORC) signal is generated. The IORC signal is routed to multiplexers U23 and U24, to gate U10A, and to external circuits. AB08 from the microprocessor is also routed to the multiplexers to select either the timer inputs (AB08 = logic low) or the keyboard inputs (AB08 = logic high). When the IORC signal is applied to U23 and U24, the selected data is loaded onto the local data bus. The IORC signal applied to U10A is inverted and routed to NAND gate U10D. The other input to U10D is from gate U11B. With both inputs high, a logic low from U10D is routed to buffer/drivers U6 and U7, enabling them. With the enable signal present, U6 (lines 5 and 6) and U7 transfer the selected data from the local data bus to the system data bus for transfer to the microprocessor.

3-15.6 Interrupt Acknowledge. The interrupt acknowledge activity is performed as a result of selected interrupts being generated. Before the microprocessor conducts an operation it will select certain interrupts to respond to during that operation. The microprocessor performs an IOWC activity placing the selected interrupt enables on the system data bus. The selected interrupts on the system data bus are routed through U5 (lines 1 through 4) and U6 (lines 1 through 4), onto the local data bus to latch U29. AB08 is a logic high and AB09 is a logic low generating the WØ1C signal. The WØ1C is routed to U29 where it clocks the selected interrupt data from the local data bus into U29. The outputs from U29 enable the selected gates U27 and U28 for monitoring the interrupts. When one or more of the selected interrupts are generated, U27 and U28 route a logic low to latch U35. At the next Ø2 TTL transition U35 is clocked, placing the interrupts on the input to priority encoder U37. U37 places on its output lines a three-bit code representative of the priority level. U37 is designed so that the I7 input has the highest priority and I0 the lowest. The receipt of any interrupt by U37 will cause the gate select (GS) output to become active. This output is routed from U37 through inverter U9B to interrupt input of U3. Upon receipt of the interrupt, U3 will lower the INTE signal. The INTE signal is routed through an external interconnect from P1B-21 to P1A-16, through U9F to the clock input of latch U30. Receipt of the logic high will latch the input from U37 to the output lines of U30. The outputs from U30 are routed to buffer drivers U12B and U5 (line 6), and to decoder U36. The microprocessor will then perform the interrupt acknowledge activity and the U1 INTA output will go active. The INTA signal is routed to U5 and U12B, enabling the interrupt to be loaded onto the system data bus. The INTA signal is also routed to U36 generating reset signals to reset the interrupt circuits.

3-16. INTERFACE MODULE A1A7 (figure FO 5-12).

The A1A7 module provides the communication interface to other communications equipment, via three individually controlled ports. Control of these ports is provided by Microcomputer module A1A6. The A1A7 module contains three circuits which are used to perform the communications function; the input/output circuit, the timing circuit, and the receive/transmit circuit. The following paragraphs provide a detailed description of each of these circuits.

3-16.1 Input/Output (I/O) Circuit. The A1A7 module receives control information and data from the A1A6 module via the input/output circuit. The communications between the two modules is controlled by the address bus and the input/output read (IORC) and write (IOWC) signals. The system address bus is fed to buffers U14 and U15 which are continuously enabled. Whenever the A1A6 module activates the address bus it is automatically routed throughout the A1A7 module. Selection of the devices receiving the address bus is accomplished by other devices within the I/O circuit. Selection of one of the three ROM's (U1, U2, or U3) that contain part of the system operating program is provided by decoder U12. The selection of the Y4, Y5, or Y6 outputs of U12 is determined by the code on address bits AB12 through AB15. The G1 input of U12 is controlled by the reset output of D-flop U31B, which in this configuration is not used. This provides a constant reset condition to enable the G1 input of U12. The selected output from U12 is routed to the selected ROM and gate U11C. The low level select signal is fed through U11C to OR gate U24B. The low level input to U24B, combined with the active memory read (MEMRC) signal from the A1A6 module, will generate a low level signal from U24B. This output is routed to the output enable (OE) inputs of the three ROMs and gate U11B.

The remaining address bits (AB00 through AB11) locate the data requested by the A1A6 module. Since the chip enable (CE) and output enable (OE) are activated, the information is loaded onto the system data bus. The low level output from U11B enables bi-directional buffer U33. With the MEMRC signal active the IOWC signal is inactive. This high level signal is fed through exclusive OR gate U17B, to the "D" input of D-flop U31A. At the next transition of the system clock (Ø2 TTL) U31A is set, and the reset output goes to a low level. The low level is fed to the direction port of U33, causing the data on the "B" inputs to be transferred to the "A" inputs for routing to the A1A6 module. This completes the reading of memory by the A1A6 module. The A1A7 module also provides switch information to the A1A6 module in a similar manner. To read the switch data the A1A6 module will activate the address bus and the IORC signal. The IORC signal is fed through OR gate U32B to gate U25A and gates U32A, C, and D. The high level output from U25A along with high level AB06 enables NAND gate U25B producing a low level to gate U24C. The other input to U24C is from OR gate U24A whose inputs are AB05 and AB07, which are both low. The low output from U24C is fed through U11B to enable U33. With U33 enabled and the IOWC signal inactive, U33 is able to transfer from the "B" inputs to the "A" inputs. The switch inputs are routed to buffers U34 and U35. Decoder U13, decodes the remaining address bits and generates the select signal from port Y5 or Y6. The generated select signal is fed through the appropriate gate (U32C or U32D) to enable U35 or U34, resulting in the switch data being loaded onto the data bus and transferred to the A1A6 module via U33. A similar operation takes place when the A1A6 module receives an interrupt from the receive/transmit circuit. In this situation, the address bus is decoded by U13 selecting the Y7 port. This enables U32A and the low level output enables latch U8 loading the system data bus with the signal(s) that generated the interrupt.

3-16.2 Timing Circuits. The timing circuit consists of a baud rate generator and an external clock filter. The baud rate generator (U4) is a programmable interval timer controlled by the A1A6 module. There are three separate timing circuits contained in U4. Each timing circuit generates the internal clocks for the three ports in the receive/transmit circuit. The frequency of each clock is programmed by the A1A6 module. To program U4, the address bus and IOWC signal are activated by the A1A6 module. Address bits AB00 and AB01 are used to select which of the three counters will receive the preset count. The remaining address bits AB02 through AB07 are decoded by U13 to select U4. The preset count is supplied by the A1A6 module via the system data bus. The clock input for U4 is the system clock Ø2 TTL. Each counter will count down from the preset count using the system clock. When the counters reach zero the appropriate internal clock output will change to the opposite state, establishing the baud rate for that port in the receiver/transmitter circuit. The A1A6 module, by activating the IORC signal and address bus, can check the count on any of the three counters at the time the IORC signal is activated. The clock filter provides for the filtering of the external clock received from another equipment. The system clock is fed to binary counters U39 and U28. The output from U39 (RCO) is the Ø2 TTL signal divided by sixteen, which is fed to U28, enable (EP) input, pin 7. The system clock, at U28 pin 2, will clock the counter every sixteenth pulse, when EP goes high. The outputs from U28 are the Ø2 TTL; divided by 32 (pin 14), divided by 128 (pin 12), and divided by 256 (pin 11). These three outputs are fed to the inputs of multiplexer U22. The selection of one of the three inputs is determined by the selection inputs pin 9, 10, and 11. Pin 10 is held low in this application by ground. The state (active or inactive) of the D1CAPC signal is determined by the selected baud rate. If the baud rate is less than 4800 the D1CAPC signal is active

(low), selecting the input at pin 4 or pin 15 depending on the position of switch U20. If U20 is on, the input at pin 15 is selected, and if U20 is off, the input at pin 4 is selected. If the selected baud rate is 4800, the D1CAPC signal is inactive (high) and the input at pin 14 is selected. The selected input is sent to the clock inputs of dual D-flop U23. The D-inputs for U23 are the extclk1 and extclk2 from the receive/ transmit circuit. By clocking U23 periodically the external clocks are stabilized, removing noise on the clock lines.

3-16.3 Receive/Transmit (R/T) Circuit. The R/T circuit provides the necessary conditioning of the signals for communicating with other equipment. The R/T circuit contains three ports for communications. All three ports operate in an asynchronous mode. Port 1 can also operate synchronous or isosynchronous. Port 3 will primarily operate as the port for supporting the 1-Line Display but can also operate as a communication port. The operation of the ports is determined by the A1A6 module and the positions of dip switches U10, U16, U20, and U21. Table 8-2 contains the conditions established by each of the switch positions. Each port consists of a USART (U5, U6, and U7), a bi-polar receiver (U29 and U30), a bi-polar transmitter (U26 and U27), and an analog switch (U38A and U38B). Since the three ports operate almost identically only the operation of U5 will be described. The A1A6 module transfers either control or data to U5, and receives either status or data from U5. To transfer a control word to U5, the A1A6 module will activate the address bus with AB00 high and the IOWC signal. The control word is then loaded on the system data bus for transfer to U5. The system clock (Ø2 TTL), IOWC signal and address bus will load the control word into U5. The transfer of a data word is the same with the exception of address bit AB00 being low. Once the data word is transmitted, the transmit ready port 3 (TXRDY 3) signal is activated. The high level is routed to octal latch U8 and NOR gate U18A. The output from U18A is the master interrupt five (MINT5) signal which is routed to the A1A6 module to indicate a port is ready to accept data for transmit. Since the A1A6 module does not know which of the three ports is ready, it will activate the address bus and the IORC signal to generate the U8 select signal from U13. When U8 is enabled, the TXRDY3 signal is loaded on the system data bus and transferred to the A1A6 module. The A1A6 module will then generate a data word which is sent to U5 and the transmit cycle begins. Although the data word was received by U5 in a parallel format, it must be transmitted in a serial format. The data word is fed serially through exclusive OR gate U17A to bi-polar transmitter U26. If the port is configured to transmit with the signal inverted, the INV3C signal is active. The configuration of the transmitting and receiving signals are established by the operator (See Chapter 2). The output from U26 contains capacitors which are selected by analog switch U38. The purpose of selecting these capacitors is to control the rise and fall time of the transmitted signal. The serial data (TXD3) is transmitted from U26 to the receiving equipment. The receiving operation of port 3 is basically the same as the transmit with the difference being the serial data is received from the transmitting equipment. The synchronous and isosynchronous communications of U7 operate similarly to the asynchronous communications of U5. The difference is the transmit and receive clocks. The synchronous and isosynchronous modes can receive their transmit and receive clocks from the internal baud rate generator or from one (isosynchronous) or both (synchronous) of the external clocks. See table 8-2 for switch settings for clock selection.

3-17. CONTROLLER MODULE A1A8 (figure FO 5-13).

The A1A8 module provides the necessary signals to Print Mechanism A1A1 for performing the print function. The signals are initiated by receipt of data by

the A1A8 module from Microcomputer module A1A6. The A1A8 module also monitors certain conditions of the teleprinter. The conditions consist of operational conditions (i.e., local line feed, BITE, print enable, etc.) and fault conditions (i.e., paper low, cover up, overtemp, etc.). The functions, previously described, are performed by four major circuits; input/output, central processing unit (CPU), control, and monitoring. The following paragraphs provide a detailed description of the operation of these circuits.

3-17.1 Input/Output Circuit. When the Microcomputer module (A1A6) wants to communicate with the Controller module (A1A8) it must first determine the status of the parallel input/output (PIO) device A1A8U10. This is accomplished through a series of events controlled by the A1A6 module. If the A1A6 module wants to transfer data to the controller module it must first determine if the "A" register in the PIO (U10) is ready to receive it. The A1A6 module will activate the IOWC signal which is inverted by gate U35A partially enabling decoder U31. At the same time, the address bus is activated by the A1A6 module. AB03 through AB07 contains the proper code (AB03, 4, 6, 7 = 1 and AB05 = 0) to fully enable U31. The code on AB00 through AB02 is then decoded by U31 activating the D8C control signal. At the same time the address bus is activated the A1A6 module will activate the system data bus with the SDB0 bit high and the remaining bits low. When the D8C signal from U31 goes high, it will clock D-flops U32A and U32B. With SDB0 high as the D input to U32B the set output will go high generating the AENB signal. The set output from U32A remains low since SDB1 is low. The AENB signal is routed to NAND gate U34C, enabling the gate. If the "A" register in the PIO is ready to receive data, the ARDY output is high and the output from U34C is low. The low output is inverted by gate U34A and fed to pin 17 of buffer/line driver U33A. With pin 19 of U33A grounded, the input at pin 17 is always enabled, and outputted immediately as the MINT3 signal to the A1A6 module. The A1A6 module will then generate an IORC signal to determine the reason for the interrupt. Along with the IORC signal the A1A6 module will also activate the system address bus with proper code (D9H) for U31 to decode and generate the D9C control signal. The D9C control signal is routed to pin 1 of U33A to enable the 1Y outputs. Since the interrupt was generated by the "A" register from U10, the low output from U34C is inverted by U33A and loaded onto the system data bus, bit SDB0, for transfer to the A1A6 module. The A1A6 module will then generate the IOWC signal and activate the system address bus. The data to be transferred is loaded onto the system data bus and fed to the A inputs of U10. The system address bus is decoded by U31 and the DD control signal is generated. The DD control signal is fed to pin 16 of U10 causing the "A" inputs to be loaded into the "A" register. At this time the ARDY output from U10 goes low removing the interrupt to the A1A6 module. If the A1A6 module does not need to continue to transfer data to the A1A8 module it will disable the output from U32B in the same manner it enabled it. If data is to be transferred from the A1A8 module to the A1A6 module it is accomplished in basically the same manner. The only differences are the use of the SDB1 to the D input of U32A causing the set output to go high generating the BENB to U34D, the BRDY output of U10-21, and the generation of the DC control signal by U31 to strobe the data from the "B" register onto the data bus via buffer U30.

3-17.2 Central Processing Unit (CPU) Circuit. The CPU circuit controls the internal operation of the A1A8 module. The operations controlled by the CPU circuit involve; communicating with the I/O circuit, controlling the monitoring and control circuit, and memory read and write. The communications with the I/O circuit is different for receiving and sending data and therefore will be described separately.

3-17.2.1 When an eight-bit data word, from the A1A6 module, has been loaded into the "A" register of the PIO, the ARDY output will go low and the interrupt port (INT) is activated. The low level INT signal is received by the CPU (U17) and an interrupt acknowledge is generated. The interrupt acknowledge consists of the generation of the machine cycle one (M1) signal and the input/output request (IORQ). Upon receipt of the interrupt acknowledge the PIO will output, out of an internal register, an interrupt vector. The interrupt vector eight-bit word is loaded onto the data bus and read into U17. The eight-bit word is added to an eight-bit word contained in the internal memory of U17 to create a 16-bit address. This 16-bit address identifies the location in EPROM U12 that contains the instructions that coincide with that specific interrupt. The CPU will activate the address bus, and memory request (MREQ) outputs. These signals enable U17 to read the instructions from U12 via the data bus. The CPU will then activate the address bus to select the PIO, and activate the IORQ and RD signals to enable the received data to be transferred from the PIO to the CPU via the data bus. After receiving the data from the PIO, the CPU will again activate the address bus and generate the MREQ and write (WR) signal, loading the received data into SRAMs U14 and U15. When data is to be sent from the A1A8 module to the A1A6 module, it is accomplished in a similar manner. The difference being the data is read from U14 and U15 and sent to U10 via U17, for transfer.

3-17.2.2 The control function of the CPU circuit involves both the monitoring circuit and the control circuits. The monitoring circuits provide the A1A6 module with the status of certain circuit conditions within the equipment. The A1A6 module will transfer a control word to the I/O circuit which is read by the A1A8 CPU. The control word consists of an instruction to transfer status of the monitoring circuits to the A1A6 module. The CPU monitors the status by activating the address bus containing the proper code for selecting the monitoring circuits. The MREQ and RFSH signals are used to generate the enable for decoder U13. The address code is decoded by U13 generating select signals which are routed to the buffers (U23 and U25) for the monitoring circuits. The buffers are enabled transferring the status of the monitoring circuits to U17 via the data bus. The status is then sent to memory for storage. On status requests, the status is taken from memory and transferred to the I/O circuits for transfer to the A1A6 module. The CPU circuit controls the motor stepping, character font storage, and monitors the timing of the controller circuits. Stepping of the carriage motor, line feed motor, and ribbon drive motor is controlled by the CPU. When the CPU receives an instruction that requires one of the motors to be stepped, it will activate the address bus with the code corresponding to the specific motor step signal. The address bus is routed to U13 where the code is decoded once U17 generates the MREQ signal. The decoded output from U13 is then routed to the appropriate stepping circuit. When an eight-bit data word is received from the A1A6 module representing address for a dot pattern, it is sent from the I/O circuit to the CPU. The A1A6 module will send only one address for a dot pattern for each printed character. The eight-bit address is combined with an eight-bit address contained within U17. The two eight-bit addresses are combined to create a 16-bit address which is loaded on the address bus. The CPU will generate the MREQ signal and, combined with the 16-bit address, will identify a location within the font EPROM U20. The output from U20 represents the dot pattern that corresponds to the selected address. The dot pattern is loaded onto the data bus for transfer to the CPU. The CPU will then generate the necessary address for generating the clock pulse from U13 to the output buffer U27. With the dot pattern loaded onto the data bus by the CPU, the clock pulse is routed to octal D-flop U27 latching the dot pattern into

U27. When the next printhead fire pulse (PHDFPC) is generated, the dot pattern is sent to print mechanism A1A1 for printing. The operations of the controller circuit are monitored for timing by counter/timer U11. When a given count is reached by U11, an interrupt will be generated. The CPU will detect the interrupt and generate an interrupt acknowledge. The CPU will then query U11 which will respond with the interrupt vector corresponding to the timer or counter that reached the predefined count. The sequence of events that takes place by the CPU after the receipt of the interrupt vector is essentially the same as that previously explained in the PIO program retrieval operation. The program functions performed will depend upon the counter/timer responsible for the interrupt.

3-17.3 Control Circuit. The control circuit establishes the operating conditions for Print Mechanism module A1A1. The conditions are initially established by U17 activating the address with a port code of 4000H. At the same time, the data bus is loaded with the control information. The 4000H port code will be decoded by U13 with the Y0 select port signal becoming active. When this signal becomes active, it will clock latch U26 placing the information on the data bus at the output of U26. These output signals from U26 are used to establish either the operating conditions of the A1A1 module, or are used as control signals in the control circuit. The output signals used by the A1A1 module are: high speed (HISPC), line feed hold (LFHLDC), ribbon drive (RIBDR), and paper low (PRLWC). The two signals used for internal control on the controller are print head enabled signal (PEDS) and forward/reverse (FWDC). The PEDS signal is routed to NAND gate U5D. When the next print head fire (PHDFC) signal is received it is routed through op-amp U21A and inverter U33B to U5D. With the PEDS signal active the output of U5D clocks D-flop U2A and the PHDFPC is activated. The PHDFPC signal is used to enable the output from U27, which is the dot pattern. The inverted PHDF signal is also fed to the trigger input of channel zero of the counter/timer circuit U11. Upon receipt of the PHDFC signal the counter will begin to countdown. When the count reaches zero the ZC/TO output goes high. This high is inverted by NOR gate U9C and fed to the clear input of U2A, resetting U2A and disabling the PHDFPC signal. The FWDC output from U26 is fed to two exclusive OR gates U38C and U38D of the motor stepping circuit. The other inputs to U38C and U38D are the set output from D-flop U41A and reset output from D-flop U41B. The use of the exclusive OR gate allows the motor circuit to step forward when the FWDC signal is active or backwards (reverse) when the FWDC signal is inactive. The stepping is controlled by the motor step (MOTSTEP) signal from D-flop U2B. The MOTSTEP signal is generated by the motor stepping circuit after the MOTC signal is received by U11 channel 1's clock input. When channel 1 receives the MOTC signal as a clock it counts down from 1 to 0, generating an interrupt to U17. The interrupt is detected and an interrupt acknowledge is generated by U17 resulting in an interrupt vector from U11. After processing the interrupt, U17 will generate the signals necessary to activate the Y7 port of U13. The output from U13 port Y7 is the CSTEP signal. This signal is fed to D-flop U4B clocking it to a set condition. If D-flop U2B is reset, AND gate U3D is enabled and the set output from U4B is fed to the D-input of D-flop U4A. The next system clock pulse will set U4A, causing the reset output to go low, clocking U2B, and resetting U4B. When U2B is set the MOTSTEP signal is active and the output from U3D is disabled. A second step can then be activated by generating another CSTEP signal to U4B. When channel 2 times out, the ZC/TO output from U11 goes high. The high is inverted by U7B, passing through U3A, and resetting U2B. This process starts the generation of the second step by the same process as the first step. Each MOTSTEP clocks U41A and U41B whose outputs are sent to the Print Mechanism module A1A1 to move the carriage motor.

The line feed step (LFSTPC) signal is used to clock U40A and U40B. The LFSTPC signal is generated by U17 when it receives a LOCLF signal from a front panel switch or a line feed command from the A1A6 module. Receipt of either signal by U17 will result in the generation of the proper signals to activate the Y1 port from U13.

3-17.4 Monitor Circuit. The state of eight panel switches and seven control signals are input to U17 from the monitor circuits. The two tri-state buffers U23 and U25 act as individual ports for receiving the data and transferring to U17. The eight switches and seven control signals are read by U17 when the Y4 and Y5 ports of U13 are activated selecting U25 and U23 respectively.

3-18. KEYBOARD A2.

The Keyboard provides the necessary interface between the operator and the equipment. The Keyboard operates as both an input and output device. It allows the operator to; select the mode of operation, create messages, and establish certain equipment condition. The Keyboard also provides indications of equipment conditions and a 1-Line Display for creating messages. The Keyboard consists of two assemblies; Keyboard module assembly A2A1 and 1-Line Display A2A2. The following paragraphs provide detailed descriptions of these assemblies.

3-18.1 Keyboard Module Assembly A2A1 (figure FO 5-14). The A2A1 assembly consists of Keyswitch module A2A1A1 and Keyboard Logic module A2A1A2. The A2A1A1 module contains switches and indicators used during the operation of the equipment. The A2A1A2 module continuously monitors to the keypad. When the operator depresses a key, the result is an output corresponding to an X-Y code. This code is converted into a data word and sent to the microprocessor for distribution. The A2A1A2 also provides inputs for illuminating the keyboard indicator, and it monitors the control switches. The following paragraphs contain detailed description of the individual modules.

3-18.1.1 Keyboard Module A2A1A1. The Keyboard module contains an 8 x 8 switch matrix which receives the column enable signals (Y0C through Y7C) on an alternating basis. These enable signals are generated beginning with Y0C. Only one enabling signal is active at a time. When one of the keys is depressed, the switch is closed, and an output signal (X0C through X7C) is generated. Since only one enabling signal is active, the A2A1A2 module reads the output signal and knows which key was depressed, based on the X-Y code. The A2A1A1 module also contains eight control switches. The PRINT ENABLE switch (S1) is a two position switch. When set to ON the print enable (PRTENBC) is active and sent to the A2A1A2 module. The DISPLAY DIMMER switch (S2) is a push button which when held down activates the dimmer signal (DMMRC). The signal is also sent to the A2A1A2 module. The remaining six switches are keys that while depressed activate the corresponding signals for routing to the A2A1A2 module. The A2A1A1 module also contains five indicators. The five indicators are each connected to the +5 Volt lamp supply (+5V LPSV), from the A2A1A2 module. The low level outputs from the A2A1A2 module, when active will cause the lamps to illuminate.

3-18.1.2 Keyboard Logic module A2A1A2. The A2A1A2 generates the column enable signals (Y0C through Y7C). These signals are cycled and generated continuously by microcomputer U5. The read output from U5-8 goes low, enabling buffer U10. When a key is depressed a row output signal (X0C through X7C) goes low. The low is fed through U10 to U5 using the data bus. The RD signal then becomes inactive. The column enable and row output signals are decoded by U5 and an eight-bit data word is generated. This data word is loaded onto the data bus. The write signal becomes active causing the eight-bit data word to be latched into octal D-flop U8. The output from

U8 is buffered by line driver U7 and is available for reading by the printer. A keyboard interrupt signal is then generated by U5 and sent to U9D and U9E. When the KBINTC signal is detected by microcomputer module, the eight-bit keyboard word (KBD0 through KBD7) is read. The master shift signal (MSHIFTC) is generated when one of the SHIFT keys is depressed. The status of the MSHIFTC signal and the shift lock (SHFTLKC) signal determines what code is selected for the representative X-Y code. When the SHIFT LOCK key is depressed, the SHFTLKC signal becomes active and U5 generates the SHFTLCKC signal. This SHFTLCKC signal is fed through U9A to driver U4, causing the SHF LOCK lamp to illuminate. When the REPEAT key is depressed the REPEATC signal will be active and the low level signal is fed to the T0 input of U5. With the T0 input low the KBINTC signal from U5 (P21) is generated until the REPEATC signal returns to a high level. The last eight-bit word latched into U8 will be read each time by the A1A6 module. When the CONTROL key is depressed the CONTROLC signal is active. The low level CONTROLC signal is fed to the P22 input of U5. When active the CONTROLC signal affects the code selection the same as the MSHIFTC signal. The RESET input to the U5 is connected to the RESINC signal input. When RESINC is active U5 will reset. The print enable (PRTENBC), break (BREAKC), and dimmer (DMMRC) signals are fed through the A2A1A2 module for routing to the Printer. When the BITE (BITEC), end of line (EOL), transmit active (TRACT), compose/edit active (CEACT), and received unprinted (RXUNP) are received active they are sent through drivers U2, U3, and U4 illuminating their respective lamps.

3-18.2 1-Line Display A2A2 (figure FO 5-15). The A2A2 assembly displays a single line of data during the operation of the compose/edit mode. During the compose operation the characters are displayed as they are entered by the operator. During the edit mode the operator selects a line from memory and it is displayed. The A2A2 assembly contains two modules; Display Logic A2A2A1 and Display A2A2A2.

3-18.2.1 Display Logic A2A2A1. The A2A2A1 module receives the transmitted data (TXD3) from port three of Interface module A1A7. Bi-polar receiver U1 converts the bi-polar signal to TTL and sends it to UART U10. The serial data is clocked into U10 by the output RCO from counter U2 and NAND gate U12A and converted to a parallel format. When the output register of U10 is full (contains a complete eight-bit data word) the receiver ready (RXRDY) output goes high. Inverter U15D converts the high level to a low. The low signal is routed to the interrupt input of microcomputer U9. The interrupt is detected and U9 activates the read (RD) output and sets line P23 low to select U10. The read signal is inverted twice for buffering, once each by NAND gates U8D and U8B. The resultant low level is fed to U10 and the eight-bit data word in the output register is sent to U9. Control, status, and command instructions to and from U9 and U10 use the same approach. The control/data port of U10 receives a high or low input from U9 (P24). If the select output (P24) is high and the read signal is active, the status of U10 is sent to U9. If P24 is high and the write signal is active a control word is transferred to U10 from U9. When P24 is low data is either read from or written to U10 depending on the read and write signals. After U9 receives the data from U10, an address is loaded onto the data bus and the address latch enable (ALE) signal is activated. The ALE signal will clock the address on the data bus into latch U7. The output from U7 is always enabled, providing a constant address to RAM's U5 and U6. With the memory location selected, U9 will load the received data word onto the data bus. The write signal (U9-10) is activated and sent to gate U16B. The P23 output from U9 is also high since U10 has not been selected. The high from P23 is inverted and is also sent to U16B. The high output from U16B is fed through NOR gate U16D to U5 and U6. The output from U16

acts as the chip select (CS). The write signal, which is also directly routed to U5 and U6, acts as the write enable at U5-10 and U6-10. After being stored in memory the data word is read from memory for display. This is accomplished by U9 activating the read signal and generating the proper control signals (SA0 through SA3). The read signal is used to generate the chip select for U5 and U6 the same as the write signal. With the write input to U5 and U6 high, the eight-bit word from memory is loaded onto the data bus. The eight-bit word and control signals are routed to the font ROM U4. The output from U4 is a seven-bit dot pattern representing the character from memory. This seven-bit dot pattern is sent to parallel-to-serial converter U11. During this same period of time the active read signal is fed through inverter U15C and gate U12B to the S/L input of U11. The low at the S/L input allows the seven-bit word from U4 to be loaded into U11. When the read signal becomes inactive, the low to high transition loads counter U13, resets D-flop U14A and sets U14B. The TO output from U9 is used as the clock for the output circuits. The TO output is fed through NOR gate U16C and inverter U15E to the clock inputs of counters U2 and U13. The RCO output from U2 is used as the transmit and receive clocks for U10. The TO clock is also fed to NAND gate U8C. The other input to U8C is from the clock control circuit. During the shifting operation of U11 the P26 output from U9 is high. The P26 high level signal is fed to NAND gate U12C. The other input to U12C is the high from the reset output of U14A. This results in a low output from U12C which is fed through inverter U15A to U8C. As long as the output from U15A is high the clock (TO) is fed to U11 and the data is shifted out (QH). The output from U11 is fed through gate U8A to Display module A2A2A2 as the display data. When the seven-bit word is loaded in U11, U13 was set to a count of eight. Each clock pulse for shifting data from U11 is counted by U13. The output from U13 is used to disable the shifting of U11. At a full count, the RCO output from U13 goes high. This, along with the TO, enables NAND gate U12D. The resultant low is fed to the preset input of U14A, causing it to set. The set output of U14A is fed to U11 as the clock inhibit, preventing further shifting of the register. With the reset output of U14A low the control circuit disables the clock to U11 by disabling U12C. This state remains until the next read cycle takes place. The D input to U14B is data bit 7 from U6. This is used as a blanking signal during the read operation. As the clock (TO) is shifting data from U11 it is also fed to line driver U3. This clock is output from U3 as the CLK 1 and CLK 2 signal for the A2A2A2 module. During this period of time the column drive signals are disabled. The column drive signals will be active after all the dot patterns have been output. The column drive signals are fed through U3 and a driver network consisting of transistors Q1 through Q12 and their associated components. In the driver network Q4 and Q5, with their associated components act as a current limiter for the driver network. The outputs from the driver network are fed to the A2A2A2 module as the column select (COL 1 through COL 5) signals.

3-18.2.2 Display Module A2A2A2. The Display module is a device that receives all of its inputs from the logic module. The A2A2A2 module consists of 20 quad-light emitting diode matrix integrated circuits (U1 through U20) and seven capacitors. The column select signals are connected in parallel to all of the LEDs. The clock 1 is used to shift the display data from U1's input to U10's output. Clock 2 shifts the output from U10 through the LED's to the output of U20.

3-19. INTEGRATED CIRCUIT DATA.

Integrated circuit data for the Keyboard-Printer is provided in the integrated circuit index, table 3-1. Table 3-1 lists the reference designation, name, and figure for each integrated circuits used within the Keyboard-Printer.

Table 3-1. Integrated Circuit Index

Reference designation	Name	Figure number
	A1A3A1 HEAT SINK ASSEMBLY	
U1	Three-Terminal Adjustable Regulator	3-55
U2	Three-Terminal Negative Regulator	3-56
U3	Single-Phase Full-Wave Bridge Rectifier	3-59
U4	Schottky Barrier Power Rectifier	3-58
	A1A3A1A1 AC POWER SUPPLY	
U1	Voltage Regulator	3-57
U2	Dual D-Type Flip-Flop	3-12
U3	Regulating Pulse Width Modulator	3-48
U4	Low Power Comparator	3-40
U5	Operational Amplifier/Buffer	3-49
U6	Three-Terminal Negative Regulator	3-56
	A1A5 MESSAGE STORE MODULE	
U1	Electrically Erasable PROM	3-51
U2-U4	32K (4K X 8) Erasable PROM	3-33
U5	1-of-8 Decoder/Demultiplexer	3-13
U6 and U7	32K (4K X 8) Erasable PROM	3-33
U8	Not Used	
U9 and U10	16K (2K X 8) Static RAM	3-52
U11	Octal Bus Transceiver	3-22
U12	10K Resistor Network	3-39
U13 and U14	4-Bit Binary Counter	3-16
U15	Octal Buffer/Line Driver	3-21
U16	10K Resistor Network	3-39
U17	Quad 2-Input AND Gate	3-5
U18	Quad 2-Input NAND Gate	3-2
U19 thru U26	64K X 1 Dynamic RAM	3-53
U27	Octal Buffer/Line Driver	3-20
U28	Octal D-Type Flip-Flop	3-25
U29	Octal Buffer/Line Driver	3-21
U30	10K Resistor Network	3-39
U31	Octal Buffer/Line Driver	3-21
U32 and U33	10K Resistor Network	3-39
U34	Quad 2-Input AND Gate	3-5
U35 and U45	Quad 2-Input NAND Gate	3-2
U44	Octal Buffer/Line Driver	3-20
U46	Quad 2-Input NOR Gate	3-3
U47	Triple 3-Input NAND Gate	3-6
U48	Dual D-Type Flip-Flop	3-12
U49	Hex Inverter	3-4
U50	Octal Buffer/Line Driver	3-20
U51	Quad 2-Input NOR Gate	3-3
U52	Quad 2-Input NAND Gate	3-2
U53	Serial-In, Parallel-Out Shift Register	3-17
U54	Dual D-Type Flip-Flop	3-12
U55	Quad 2-Input NAND Gate	3-2
U56	Dual D-Type Flip-Flop	3-12
U57	Quad 2-Input NAND Gate	3-2

Table 3-1. Integrated Circuit Index-Continued

Reference designation	Name	Figure number
	A1A6 MICROCOMPUTER MODULE	
U1	System Controller and Bus Driver	3-28
U2	Clock Generator, Driver	3-27
U3	8-Bit Microprocessor	3-26
U4	8K (1K X 8) Erasable PROM	3-29
U5 thru U8	Hex Buffer Driver	3-24
U9	Hex Inverter	3-4
U10	Quad 2-Input NAND Gate	3-2
U11	Triple 3-Input NAND Gate	3-6
U12 thru U14	Hex Buffer Driver	3-24
U15	Hex Inverter Schmitt Trigger	3-8
U16 and U17	1024-Bit Random Access Memory (RAM)	3-30
U18 thru U21	4-Bit Binary Counter	3-16
U22	Quad 2-Input NAND Gate	3-2
U23 and U24	Quad 2-Line to 1-Line Data Selector/ Multiplexer	3-23
U25 and U26	Hex D Flip-Flop	3-19
U27 and U28	Quad 2-Input NAND Gate	3-2
U29 and U30	Hex D Flip-Flop	3-19
U31	1-of-8 Decoder/Demultiplexer	3-13
U32	1K Resistor Network	3-47
U33	Hex Buffer Driver	3-24
U34	1-of-8 Decoder/Demultiplexer	3-13
U35	Hex D Flip-Flop	3-19
U36	1-of-8 Decoder/Demultiplexer	3-13
U37	8-Input Priority Encoder	3-14
	A1A1A6A2 MOTOR DRIVE	
U1 and U3	Dual Positive NOR Drivers	3-34
U2	Dual 1 of 4 Decoder/Demultiplexer	3-54
	A1A7 INTERFACE MODULE	
U1 thru U3	32K (4K X 8) Erasable PROM	3-33
U4	Programmable Interval Timer	3-32
U5 thru U7	Programmable Communication Interface	3-31
U8 and U9	Octal D-Type Flip-Flop	3-25
U10	Quad Dip Switch	3-46
U11	Triple 3-Input AND Gate	3-7
U12 and U13	1-of-8 Decoder/Demultiplexer	3-13
U14 and U15	Octal Buffer/Line Driver	3-20
U16	Quad Dip Switch	3-46
U17	Quad 2-Input Exclusive OR Gate	3-11
U18	Triple 3-Input NOR Gate	3-9
U19	Quad 2-Input Exclusive OR Gate	3-11
U20 and U21	Quad Dip Switch	3-46
U22	8-Input Multiplexer	3-15
U23	Dual D-Type Flip-Flop	3-12
U24	Quad 2-Input OR Gate	3-10
U25	Triple 3-Input NAND Gate	3-6

Table 3-1. Integrated Circuit Index-Continued

Reference designation	Name	Figure number
	A1A7 INTERFACE MODULE-continued	
U26 and U27	Quad Differential Line Drivers	3-44
U28	4-Bit Binary Counter	3-16
U29 and U30	Quad Differential Line Receivers	3-37
U31	Dual D-Type Flip-Flop	3-12
U32	Quad 2-Input OR Gate	3-10
U33	Octal Bus Transceiver	3-22
U34 and U35	Octal Buffer/Line Driver	3-20
U36	Hex Inverter Schmitt Trigger	3-8
U37	Dual Positive NOR Drivers	3-34
U38	Quad Analog Switch	3-45
U39	4-Bit Binary Counter	3-16
U42 and U43	10K Resistor Network	3-39
U44	56K Resistor Network	3-50
	A1A1A7A2 PIN DRIVER LOGIC	
U2,4, and 7	Low Power Comparators	3-40
U3,5,6, and 8	Dual Positive NOR Drivers	3-34
	A1A8 CONTROLLER MODULE	
U1	Quad 2-Input NAND Gate	3-2
U2	Dual D-Type Flip-Flop	3-12
U3	Quad 2-Input AND Gate	3-5
U4	Dual D-Type Flip-Flop	3-12
U5	Quad 2-Input NAND Gate	3-2
U6	Quad 2-Input NOR Gate	3-3
U7	Hex Inverter	3-4
U8	Triple 3-Input NAND Gate	3-6
U9	Quad 2-Input NOR Gate	3-3
U10	Parallel Input/Output Controller	3-42
U11	Counter/Timer Circuit	3-43
U12	32K (4K X 8) Erasable PROM	3-33
U13	1-of-8 Decoder/Demultiplexer	3-13
U14 and U15	1024 X 4 Static RAM	3-35
U16	Octal Buffer/Line Driver	3-20
U17	Central Processing Unit	3-41
U18	Octal Buffer/Line Driver	3-20
U19	Not Used	
U20	32K (4K X 8) Erasable PROM	3-33
U21 and U22	Low Power Comparators	3-40
U23	Octal Buffer/Line Driver	3-20
U24	10K Resistor Network	3-39
U25	Octal Buffer/Line Driver	3-20
U26 and U27	Octal D-Type Flip-Flop	3-25
U30	Octal Buffer/Line Driver	3-20
U31	1-of-8 Decoder/Demultiplexer	3-13
U32	Dual-D-Type Flip-Flop	3-12

Table 3-1. Integrated Circuit Index-Continued

Reference designation	Name	Figure number
	A1A8 CONTROLLER MODULE-continued	
U33	Octal Buffer/Line Driver	3-21
U34 and U35	Quad 2-Input NAND Gate	3-2
U36 and U37	Dual Positive NOR Drivers	3-34
U38	Quad 2-Input Exclusive OR Gate	3-11
U39	Octal Buffer/Line Driver	3-20
U40 and U41	Dual D-Type Flip-Flop	3-12
U42	Not Used	
U43	10K Resistor Network	3-39
	A2A1A2 KEYBOARD LOGIC	
U1	10K Resistor Network	3-39
U2 thru U4	Dual Positive NOR Drivers	3-34
U5	Single Component 8-Bit Microprocessor	3-36
U6	10K Resistor Network	3-39
	A2A1A2 KEYBOARD LOGIC (Cont)	
U7	Octal Buffer/Line Driver	3-20
U8	Octal D-Type Flip-Flop	3-25
U9	Hex Inverter Schmitt Trigger	3-8
U10	Octal Buffer/Line Driver	3-20
	A2A2A1 DISPLAY LOGIC	
U1	Quad Differential Line Receivers	3-37
U2	4-Bit Binary Counter	3-16
U3	Octal Buffer/Line Driver	3-21
U4	32K (4K X 8) Erasable PROM	3-33
U5 and U6	1024 X 4 Static RAM	3-35
U7	Octal D-Type Flip-Flop	3-25
U8	Quad 2-Input NAND Gate	3-2
U9	Single Component 8-Bit Microprocessor	3-36
U10	Programmable Communications Interface	3-31
U11	8-Bit Parallel-to-Serial Converter	3-18
U12	Quad 2-Input NAND Gate	3-2
U13	4-Bit Binary Counter	3-16
U14	Dual D-Type Flip-Flop	3-12
U15	Hex Inverter	3-4
U16	Quad 2-Input NOR Gate	3-3
	A2A2A2 DISPLAY	
U1 thru U20	Quad LED Alphanumeric Display	3-38

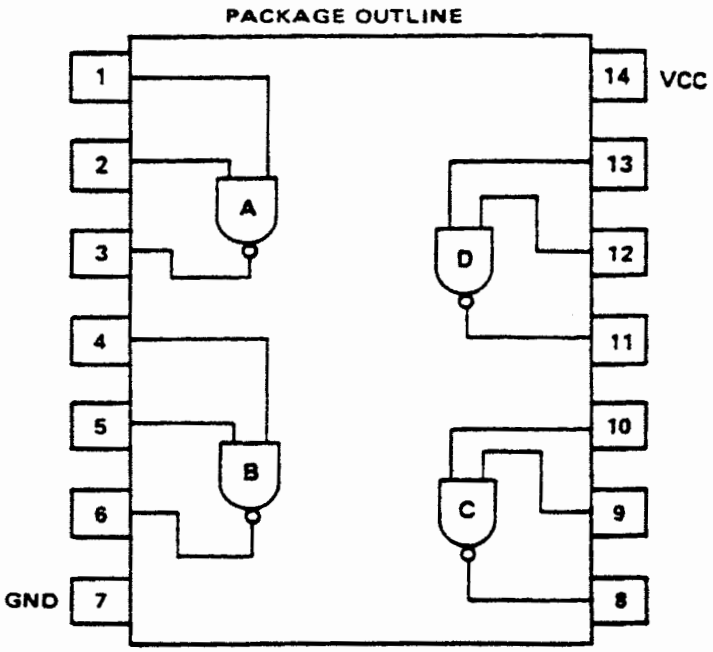


Figure 3-2. Quad 2-Input NAND Gate

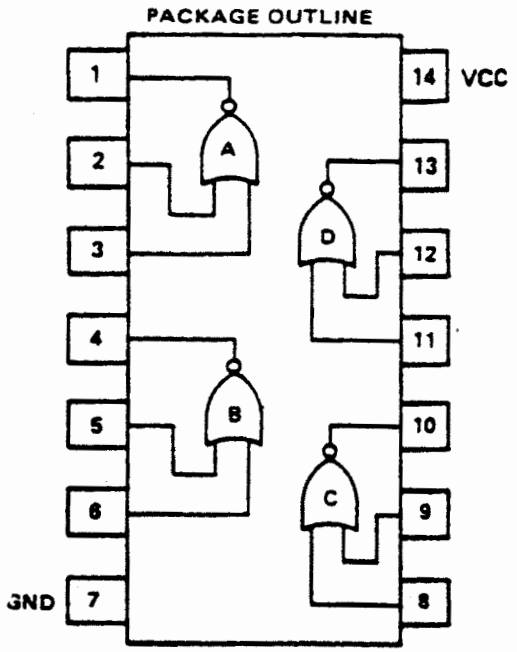


Figure 3-3. Quad 2-Input NOR Gate

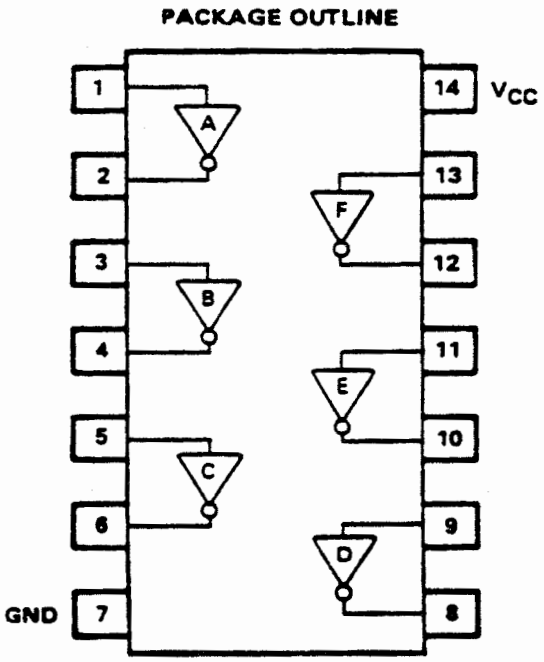


Figure 3-4. Hex Inverter

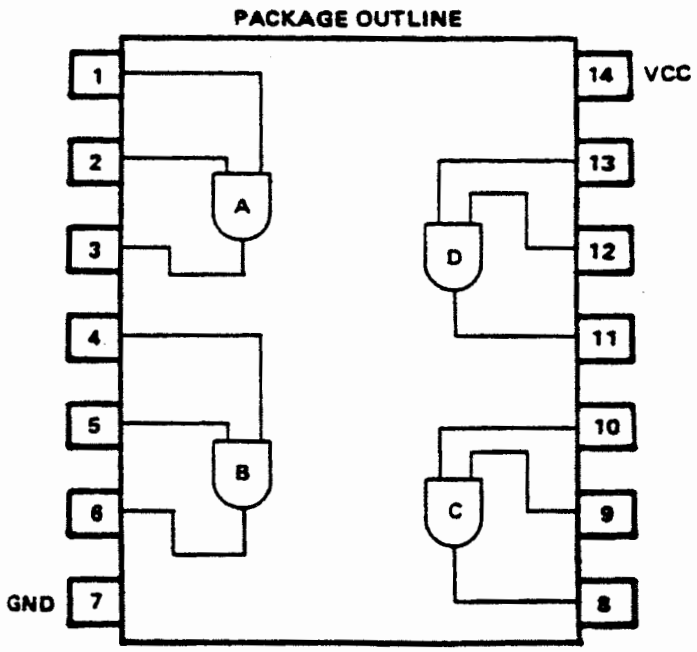


Figure 3-5. Quad 2-Input AND Gate

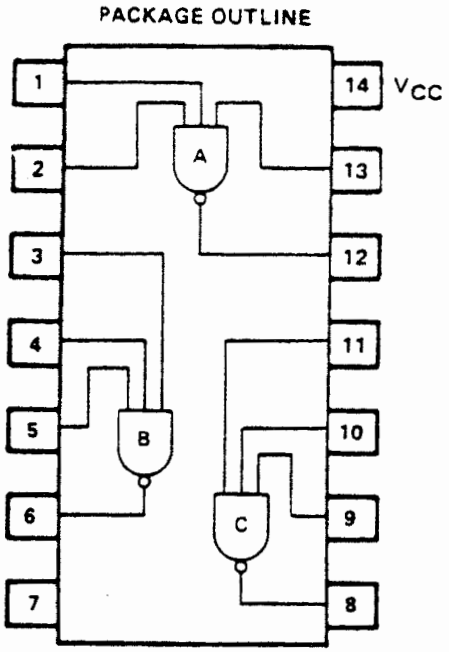


Figure 3-6. Triple 3-Input NAND Gate

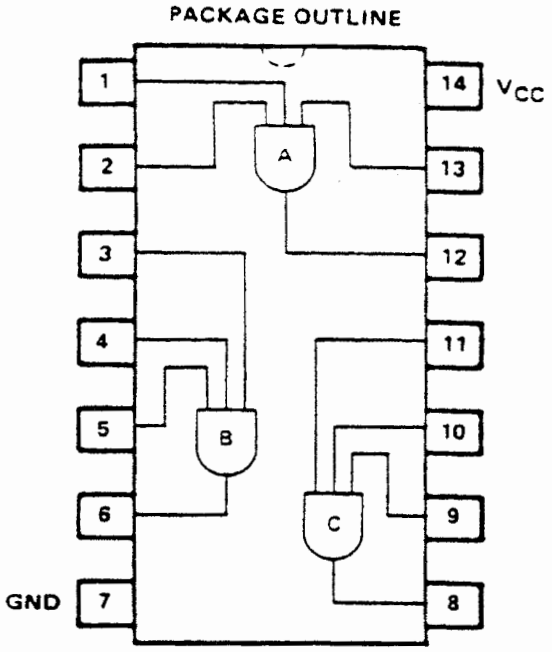


Figure 3-7. Triple 3-Input AND Gate

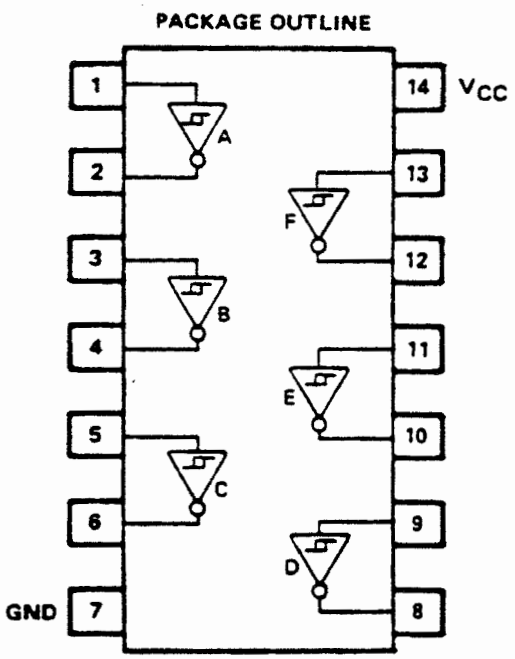


Figure 3-8. Hex Inverter Schmitt Trigger

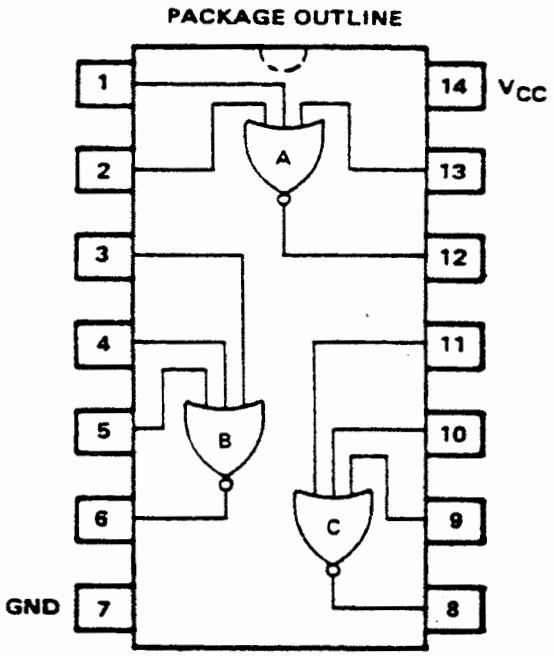


Figure 3-9. Triple 3-Input NOR Gate

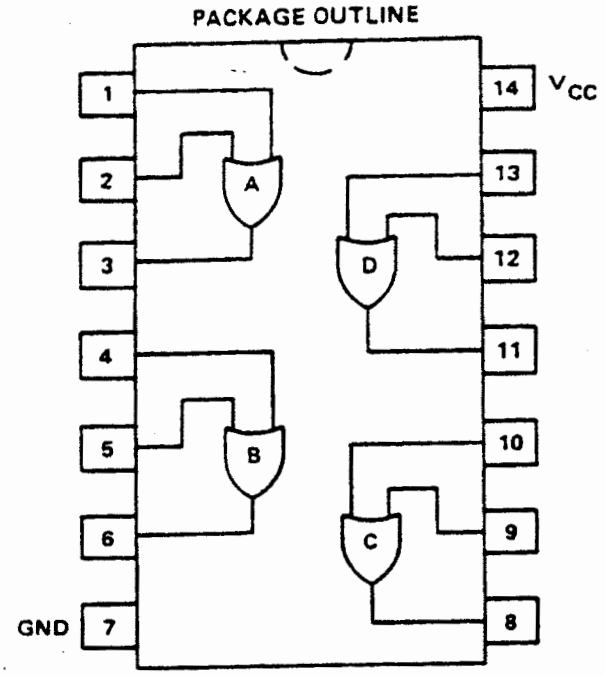


Figure 3-10. Quad 2-Input OR Gate

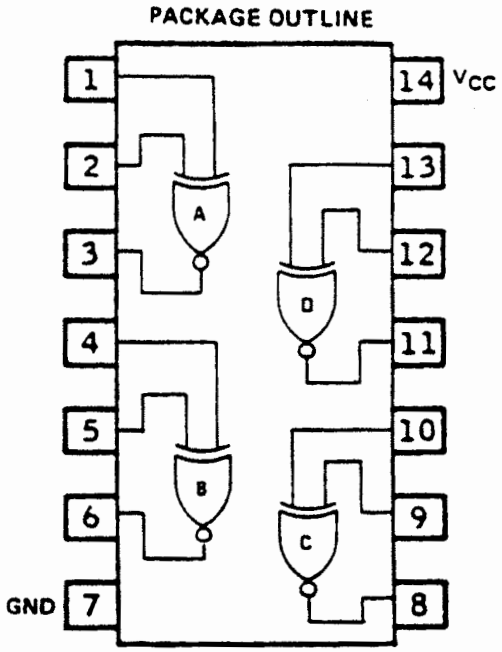
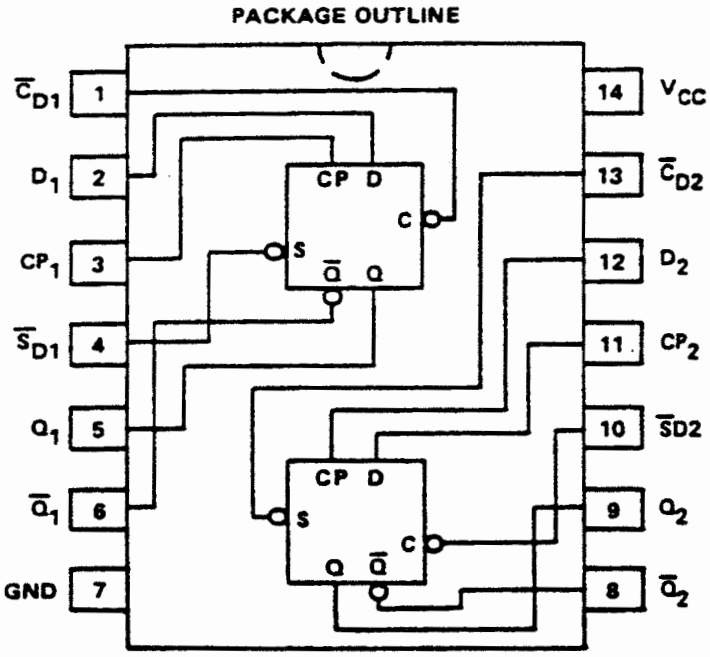


Figure 3-11. Quad 2-Input Exclusive OR Gate



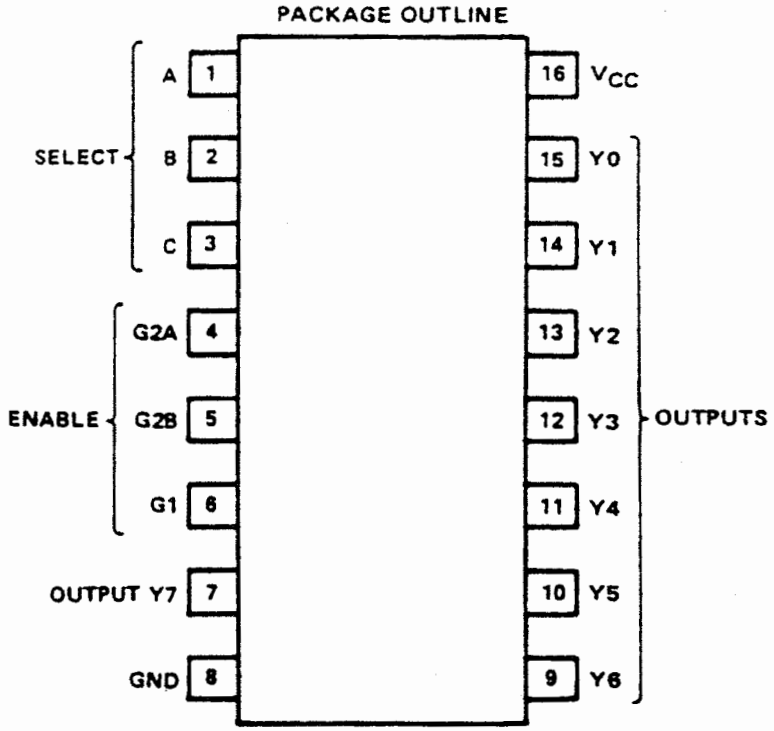
TRUTH TABLE

INPUTS				OUTPUTS	
PRESET	CLEAR	CLOCK	D	Q	Q̄
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H*	H*
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q₀	Q̄₀

*These conditions are unstable.

H = HIGH level
L = LOW level
↑ = Transition from low to high level
X = IRRELEVANT
Q₀ = The level of Q before the indicated input conditions were established.

Figure 3-12. Dual D-Type Flip-Flop



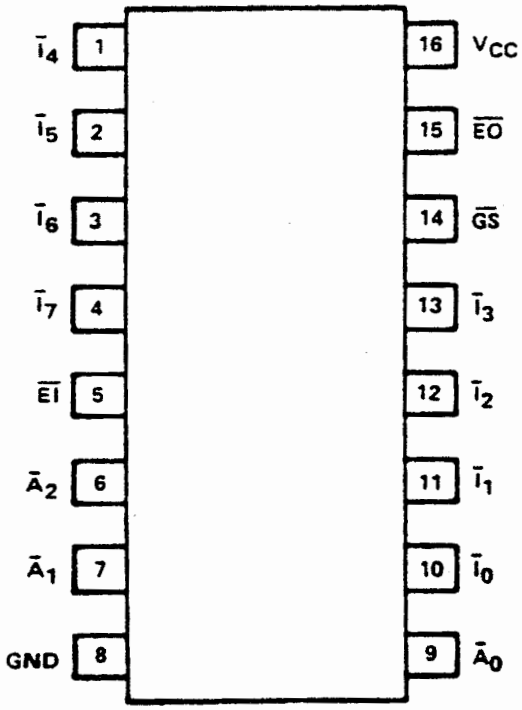
TRUTH TABLE

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

H = HIGH LEVEL, L = LOW LEVEL, X = IRRELEVANT.
*G2 = G2A AND G2B
TO ENABLE OUTPUT: G1 = H, G2A = L, G2B = L.

Figure 3-13. 1-of-8 Decoder/Demultiplexer

PACKAGE OUTLINE



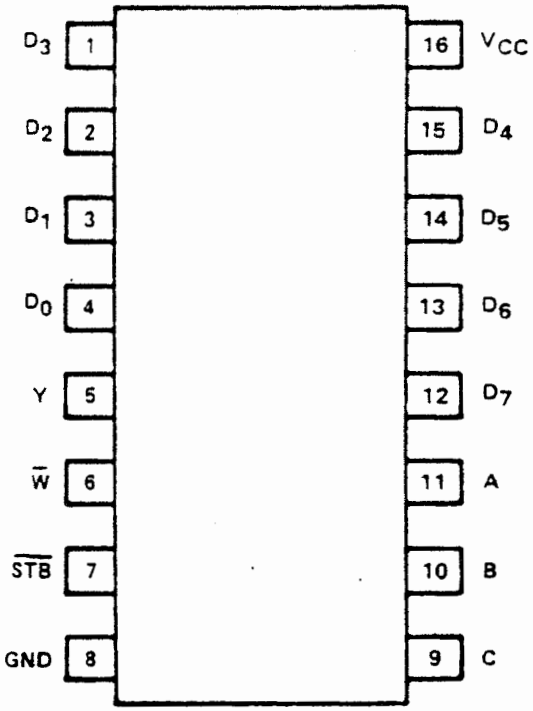
TRUTH TABLE

INPUTS									OUTPUTS				
$\overline{EI}$	$\overline{I}_0$	$\overline{I}_1$	$\overline{I}_2$	$\overline{I}_3$	$\overline{I}_4$	$\overline{I}_5$	$\overline{I}_6$	$\overline{I}_7$	$\overline{GS}$	$\overline{A}_0$	$\overline{A}_1$	$\overline{A}_2$	$\overline{EO}$
H	X	X	X	X	X	X	X	X	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	L
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	X	X	X	X	X	X	L	H	L	H	L	L	H
L	X	X	X	X	X	L	H	H	L	L	H	L	H
L	X	X	X	X	L	H	H	H	L	H	H	L	H
L	X	X	X	L	H	H	H	H	L	L	L	H	H
L	X	X	L	H	H	H	H	H	L	H	L	H	H
L	X	L	H	H	H	H	H	H	L	L	H	H	H
L	L	H	H	H	H	H	H	H	L	H	H	H	H

H = HIGH level.
L = LOW level.
X = Irrelevant.

Figure 3-14. 8-Input Priority Encoder

PACKAGE OUTLINE



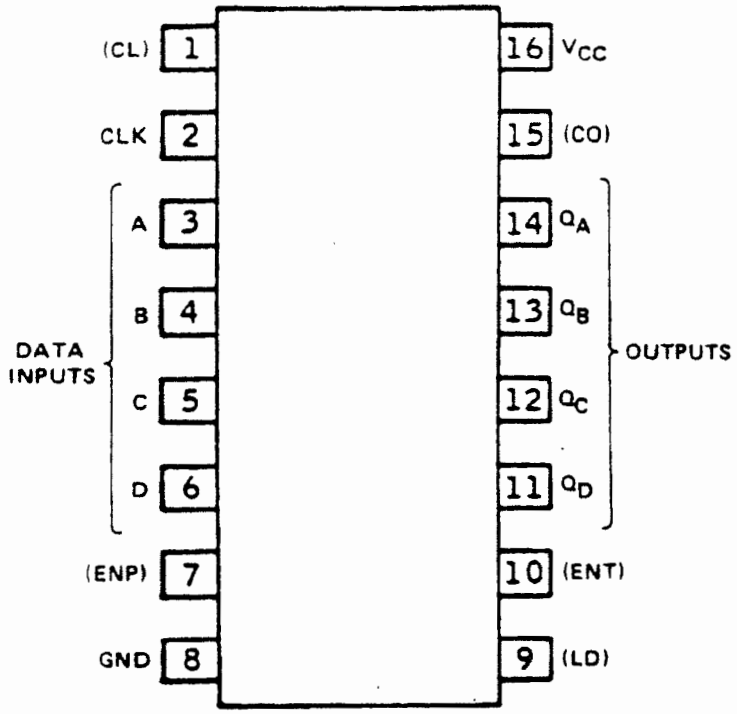
TRUTH TABLE

INPUTS												OUTPUTS	
STB	C	B	A	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7	$\overline{W}$	Y
H	X	X	X	X	X	X	X	X	X	X	X	H	L
L	L	L	L	L	X	X	X	X	X	X	X	H	L
L	L	L	L	H	X	X	X	X	X	X	X	L	H
L	L	L	H	X	L	X	X	X	X	X	X	H	L
L	L	L	H	X	H	X	X	X	X	X	X	L	H
L	L	H	L	X	X	L	X	X	X	X	X	H	L
L	L	H	L	X	X	H	X	X	X	X	X	L	H
L	L	H	H	X	X	X	L	X	X	X	X	H	L
L	L	H	H	X	X	X	H	X	X	X	X	L	H
L	H	L	L	X	X	X	X	L	X	X	X	H	L
L	H	L	L	X	X	X	X	H	X	X	X	L	H
L	H	L	H	X	X	X	X	X	L	X	X	H	L
L	H	L	H	X	X	X	X	X	H	X	X	L	H
L	H	H	L	X	X	X	X	X	X	L	X	H	L
L	H	H	L	X	X	X	X	X	X	H	X	L	H
L	H	H	H	X	X	X	X	X	X	X	L	H	L
L	H	H	H	X	X	X	X	X	X	X	H	L	H

H = HIGH level.
L = LOW level.
X = Irrelevant.

Figure 3-15. 8-Input Multiplexer

PACKAGE OUTLINE



TRUTH TABLE

INPUTS						OUTPUTS	
$\overline{CL}$	CLK	ENP	ENT	$\overline{LD}$	Dn	Qn	CO
L	X	X	X	X	X	L	L
H	▲	X	X	l	l	L	L
H	▲	X	X	l	h	H	(a)
H	▲	h	h	h(c)	X	count	(a)
H	X	l(b)	X	h(c)	X	q	(a)
H	X	X	l(b)	h(c)	X	q	L

H = HIGH LEVEL (STEADY STATE).
L = LOW LEVEL (STEADY STATE).
h, l, q = LOWER CASE LETTERS INDICATE THE STATE OF THE REFERENCE ONE SETUP TIME PRIOR TO A LOW-TO-HIGH CLOCK TRANSITION.
X = IRRELEVANT.

NOTES:
(a) CO OUTPUT IS H WHEN ENT IS H AND COUNTER IS AT A TERMINAL COUNT (HHHH).
(b) THE HIGH-TO-LOW TRANSITION OF ENP OR ENT SHOULD ONLY OCCUR WHERE CLK IS HIGH.
(c) THE ↑ TRANSITION OF LD SHOULD ONLY OCCUR WHILE CLK IS HIGH.

Figure 3-16. 4-Bit Binary Counter (Sheet 1 of 2)

TIMING DIAGRAM

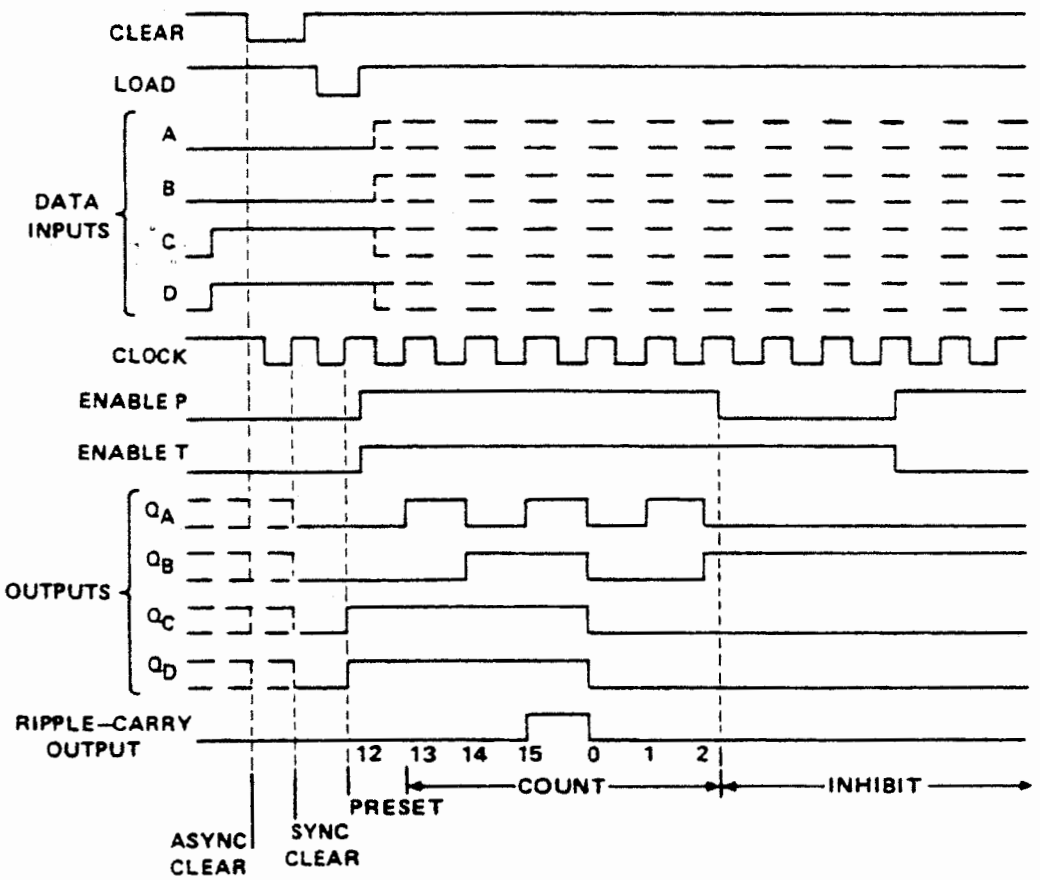
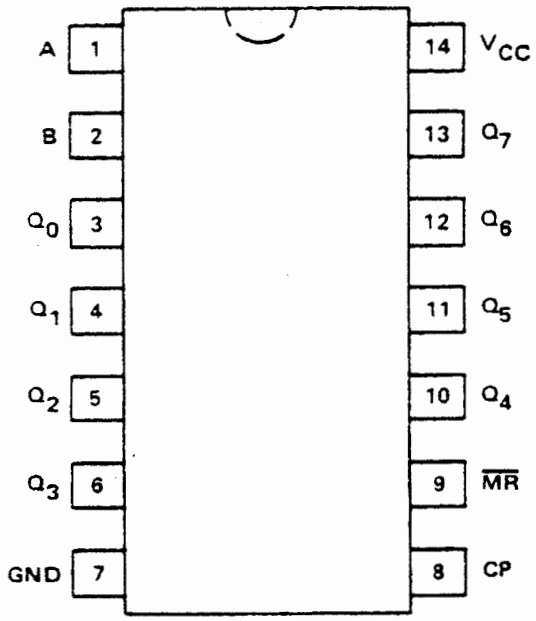


Figure 3-16. 4-Bit Binary Counter (Sheet 2 of 2)

PACKAGE OUTLINE



MODE SELECT TABLE

OPERATING MODE	INPUTS			OUTPUTS	
	$\overline{MR}$	A	B	Q_0	Q_1—Q_7
Reset (Clear)	L	X	X	L	L — L
Shift	H	L	L	L	Q_0–Q_6
	H	L	H	L	Q_0–Q_6
	H	H	L	L	Q_0–Q_6
	H	H	H	H	Q_0–Q_6

LOGIC DIAGRAM

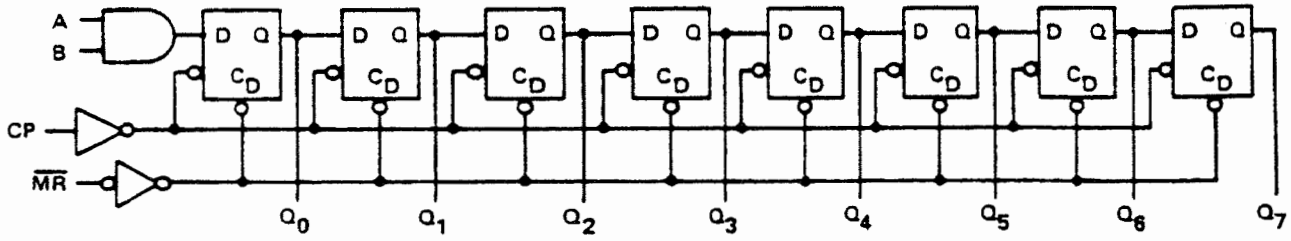
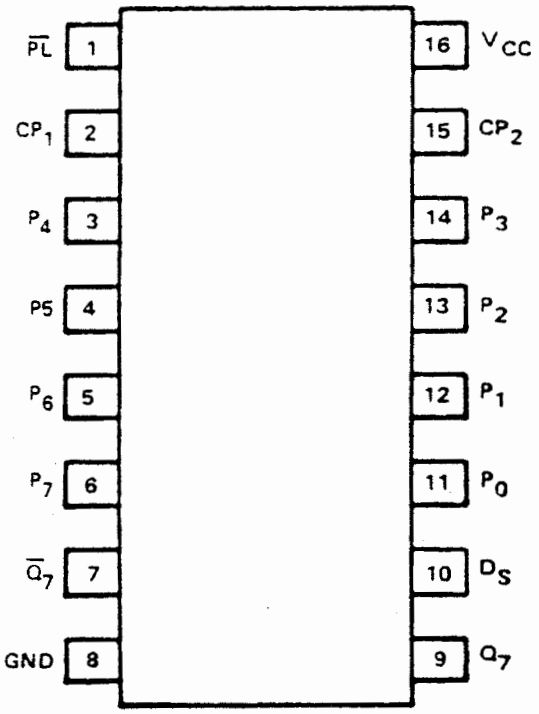


Figure 3-17. Serial-In, Parallel-Out Shift Register

PACKAGE OUTLINE



TRUTH TABLE

PL	CP 1	CP 2	CONTENTS Q_0	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	RESPONSE
L	X	X	P_0	P_1	P_2	P_3	P_4	P_5	P_6	P_7	Parallel Entry
H	L	⌐	D_S	Q_0	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Right Shift
H	H	⌐	Q_0	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	No Change
H	⌐	L	D_S	Q_0	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Right Shift
H	⌐	H	Q_0	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	No Change

H = HIGH Level
L = LOW Level
X = IRRELEVANT

Figure 3-18. 8-Bit Parallel-to-Serial Converter (Sheet 1 of 2)

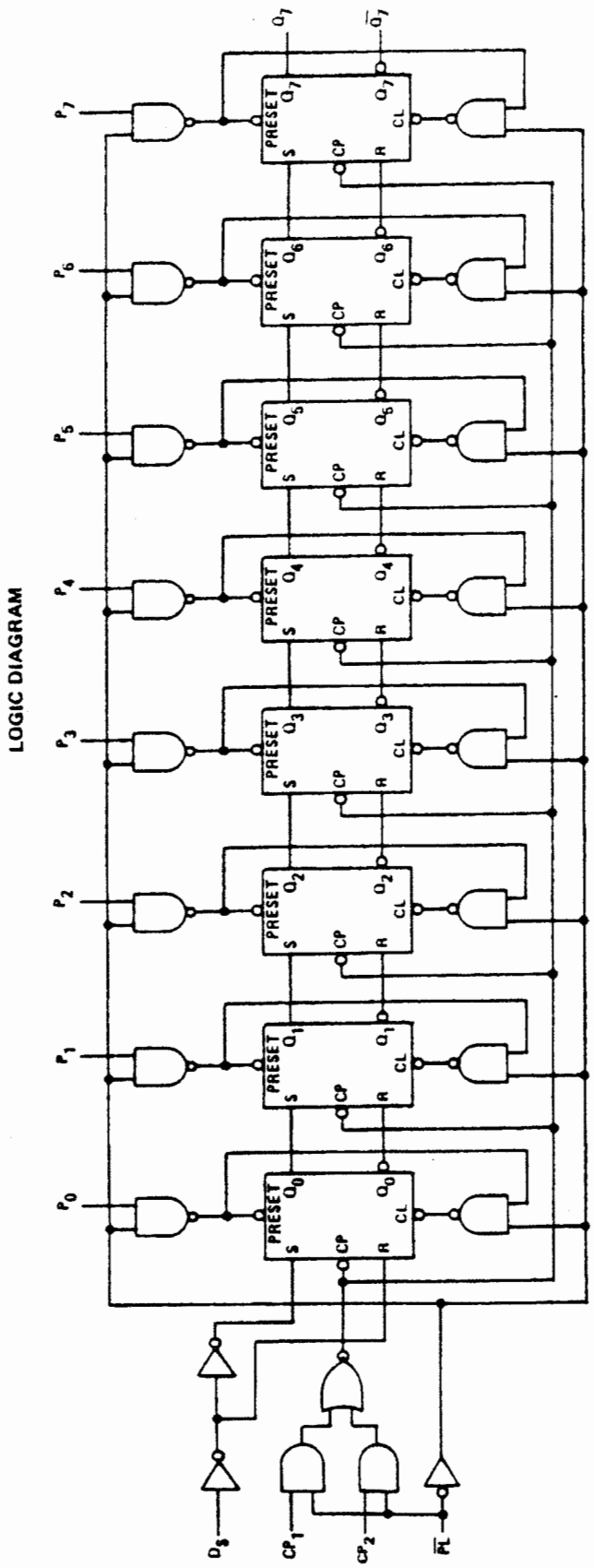
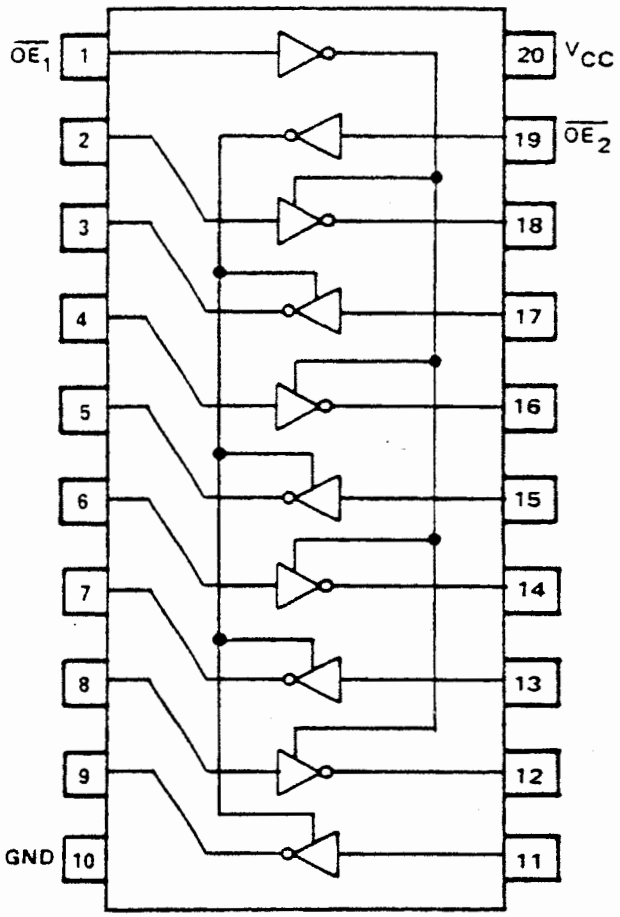


Figure 3-18. 8-Bit Parallel-to-Serial Converter (Sheet 2 of 2)

PACKAGE OUTLINE

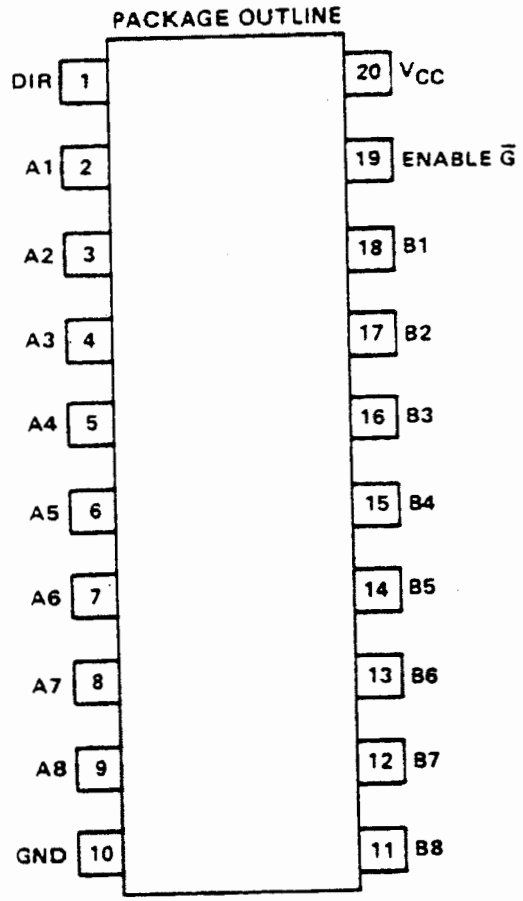


TRUTH TABLE

INPUTS			OUTPUT
$\overline{OE}_1$	$\overline{OE}_2$	D	
L	L	L	H
L	H	H	L
H	X		Z

H = HIGH level
L = LOW level
X = IRRELEVANT
Z = HIGH IMPEDANCE

Figure 3-21. Octal Buffer/Line Driver



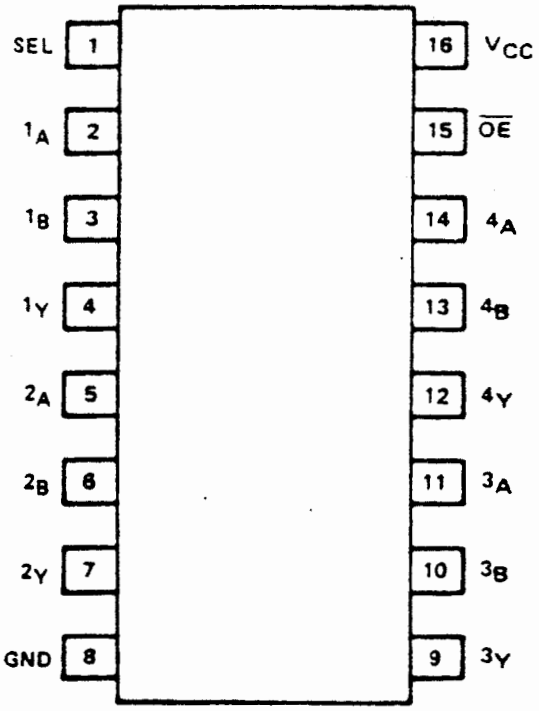
FUNCTION TABLE

INPUTS		OPERATION
ENABLE $\overline{G}$	DIR CNTRL	
L	L	B DATA TO A BUS
L	H	A DATA TO B BUS
H	X	ISOLATION

H = HIGH level.
L = LOW level.
X = IRRELEVANT

Figure 3-22. Octal Bus Transceiver

PACKAGE OUTLINE



TRUTH TABLE

ENABLE	SELECT INPUT	INPUTS		OUTPUT
$\overline{OE}$	SEL	A	B	Y
H	X	X	X	(Z)
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

H = HIGH level.
L = LOW level.
X = IRRELEVANT.
(Z) = High impedance (off) state.

Figure 3-23. Quad 2-Line to 1-Line Data Selector/Multiplexer

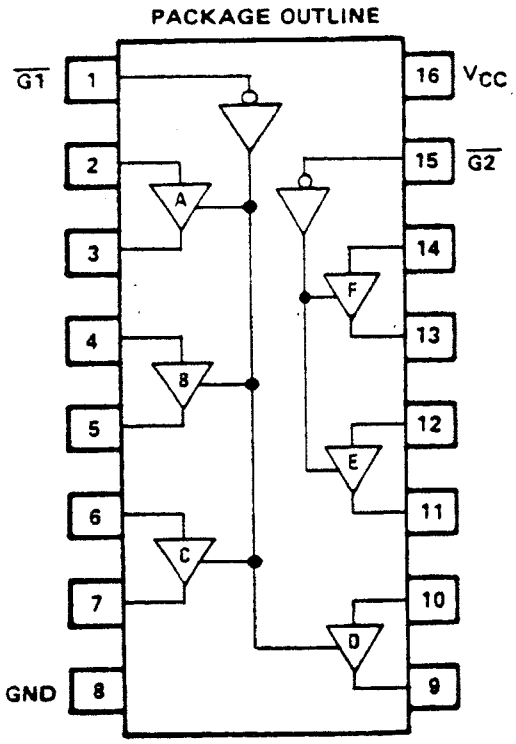
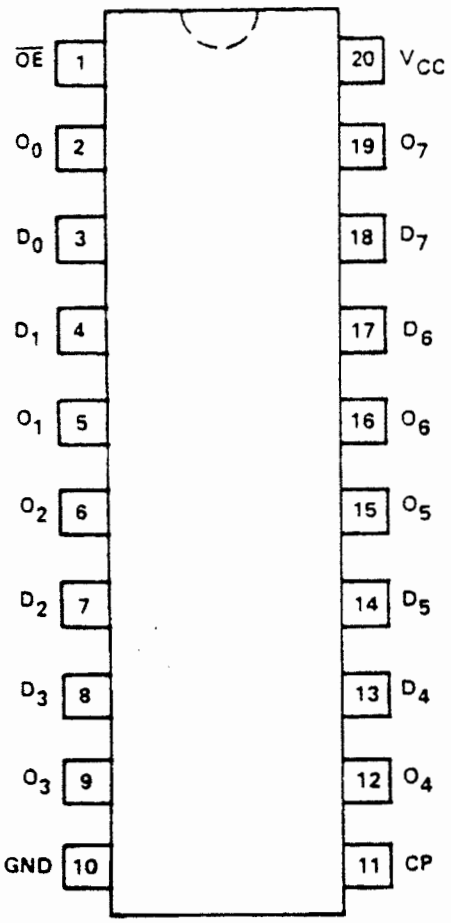


Figure 3-24. Hex Buffer Driver

PACKAGE OUTLINE



TRUTH TABLE

INPUTS			OUTPUTS
D_n	CP	OE	O_n
H	⌐⌐	L	H
L	⌐⌐	L	L
X	X	H	Z

H = HIGH level
L = LOW level
X = IRRELEVANT
Z = High impedance

LOGIC DIAGRAM

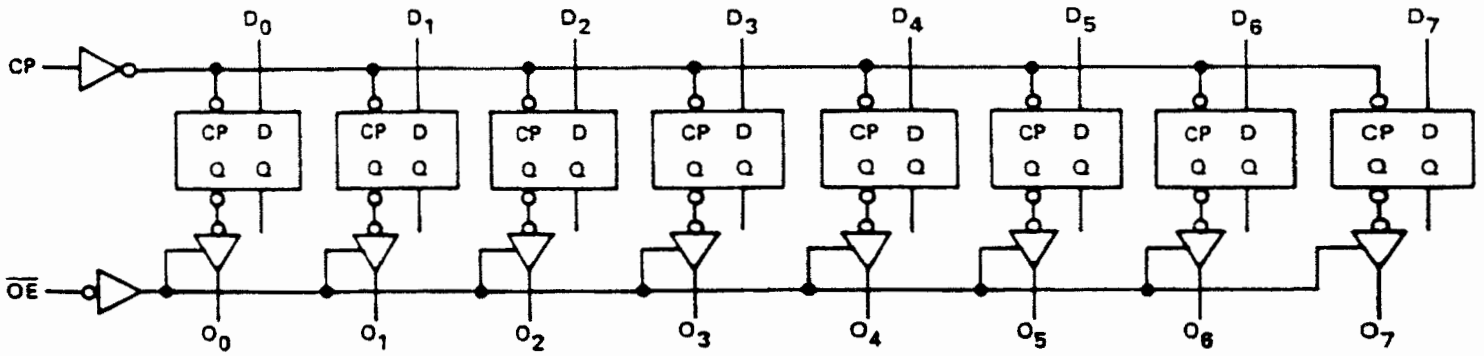


Figure 3-25. Octal D-Type Flip-Flop

FUNCTIONAL DESCRIPTION

THE 8-BIT MICROPROCESSOR, AS SHOWN IN THE BLOCK DIAGRAM, RECEIVES AND TRANSMITS DATA, ADDRESS INFORMATION AND CONTROL SIGNALS. UPON RECEIPT OF THE RESET SIGNAL THE MICROPROCESSOR IS SET TO LOCATION 0 OF THE REGISTER ARRAY. RECEIPT OF LOGIC HIGH READY SIGNAL INFORMS THE MICROPROCESSOR THAT VALID DATA IS AVAILABLE ON THE DATA BUS. IF THE READY SIGNAL IS A LOGIC LOW THE MICROPROCESSOR WILL ENTER A WAIT STATE AND REMAIN THERE UNTIL THE READY SIGNAL RETURNS TO A HIGH STATE. THE MICROPROCESSOR OPERATES USING TWO, EXTERNALLY SUPPLIED, CLOCKS (Ø1 AND Ø2). DATA IS RECEIVED AND TRANSMITTED USING AN 8-BIT BIDIRECTIONAL DATA BUS. WHEN THE MICROPROCESSOR TRANSMITS DATA A UNIQUE ADDRESS IS ALSO GENERATED FOR CONTROL AND ROUTING OF THE DATA. AT THE END OF EACH INSTRUCTION THE MICROPROCESSOR WILL ENSURE THAT AN INTERRUPT HAS NOT BEEN RECEIVED. IF AN INTERRUPT (INT) HAS BEEN RECEIVED, THE MICROPROCESSOR WILL GENERATE AN INTERRUPT ENABLE (INTE) HALTING THE PROCESSING UNTIL THE INTERRUPT HAS BEEN CLEARED.

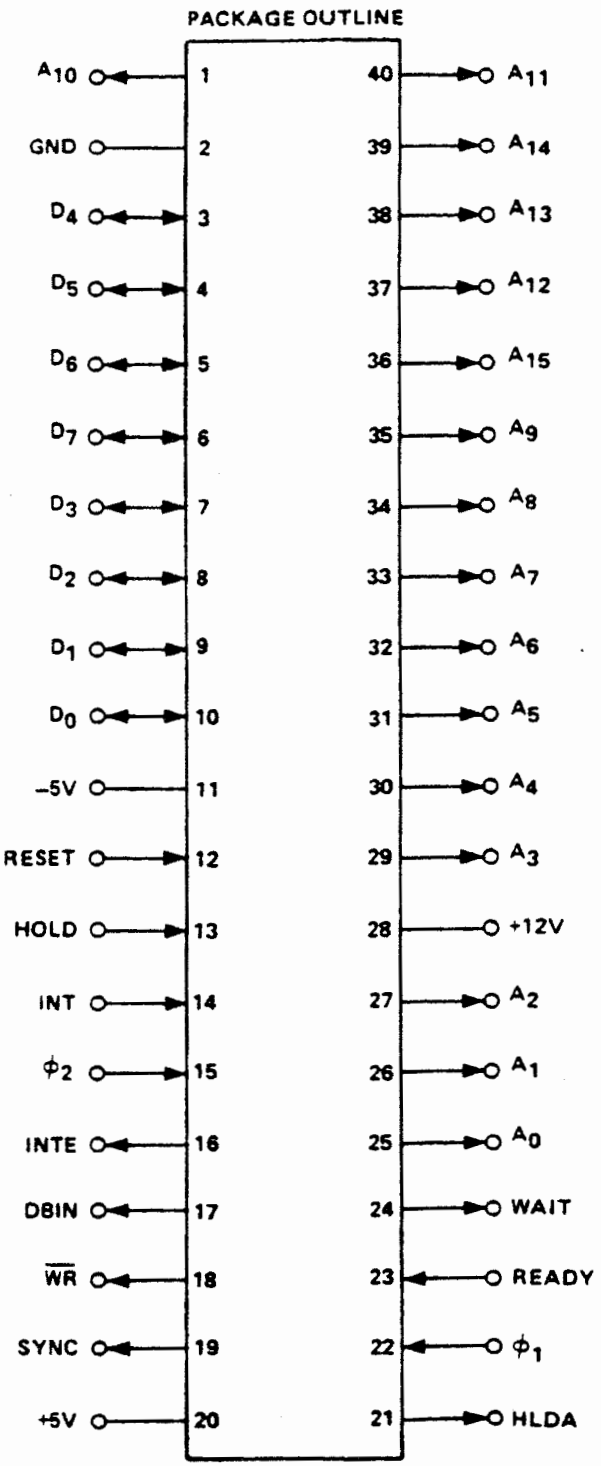


Figure 3-26. 8-Bit Microprocessor (Sheet 1 of 2)

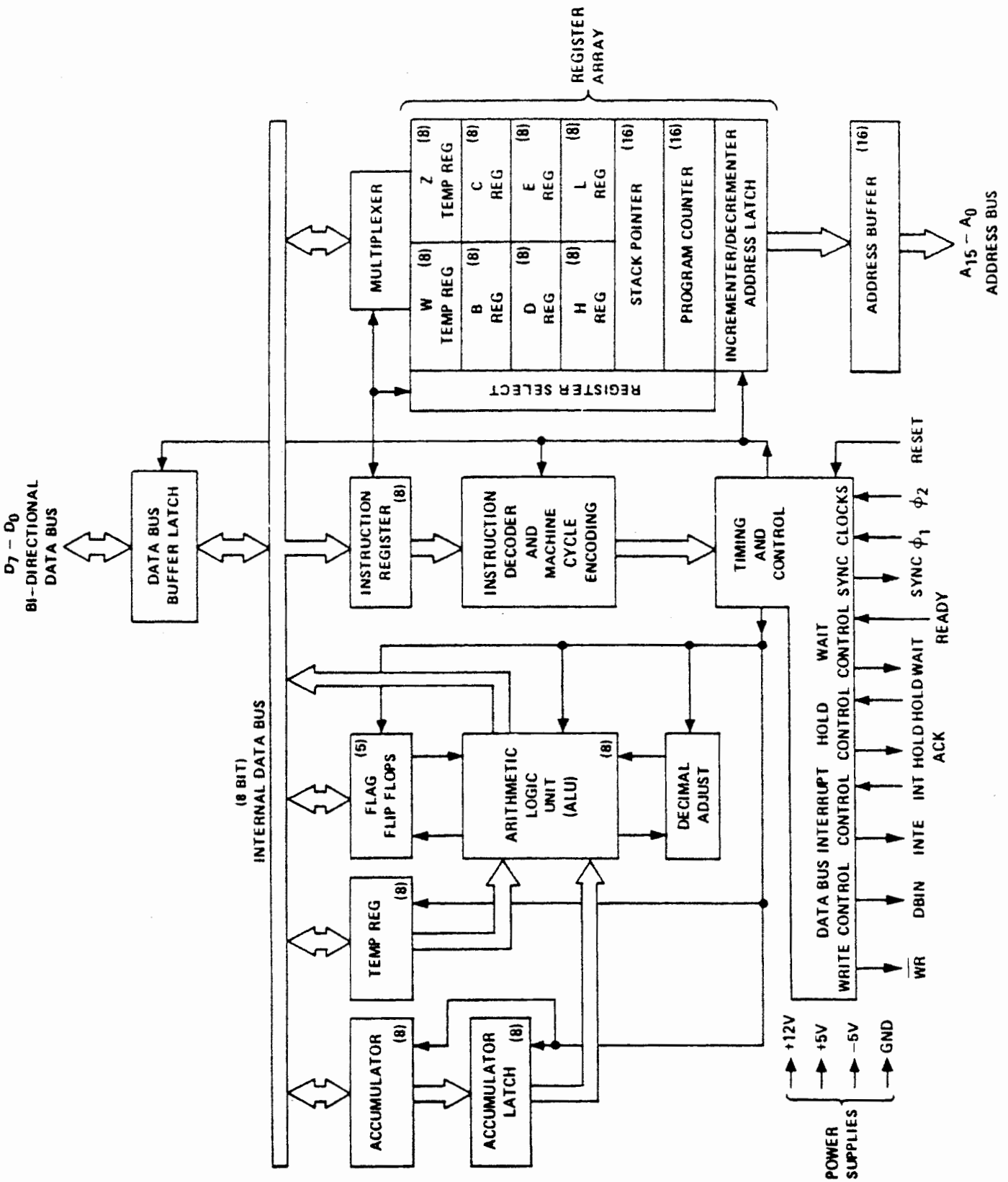
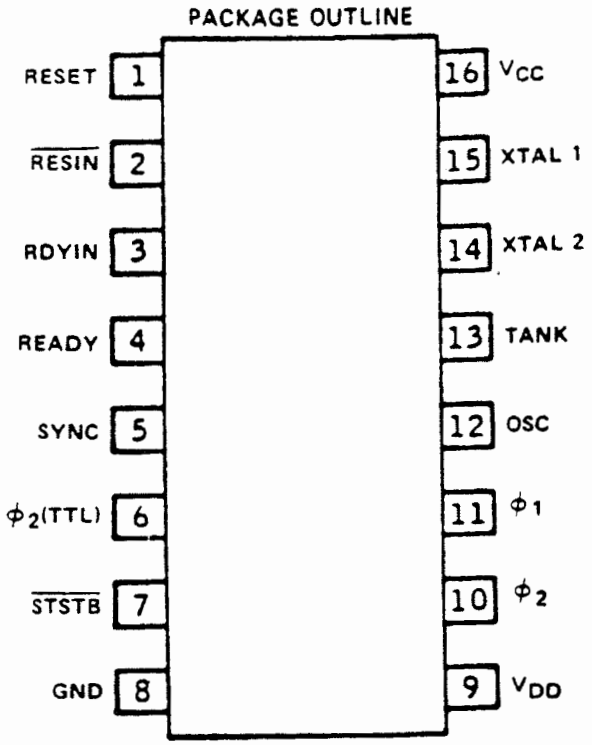


Figure 3-26. 8-Bit Microprocessor (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE CLOCK GENERATOR AND DRIVER, AS SHOWN IN THE BLOCK DIAGRAM, CONSISTS OF A CRYSTAL CONTROLLED OSCILLATOR, A DIVIDE BY NINE COUNTER, AND TWO FLIP-FLOPS FOR THE OPERATION OF THE READY AND RESET SIGNAL. THE OSCILLATORS BASIC FREQUENCY IS DETERMINED BY AN EXTERNAL CRYSTAL. THE OSCILLATORS OUTPUT IS FED TO THE CLOCK GENERATOR WHERE TWO CLOCKING SIGNALS FOR THE MICROPROCESSOR (∅1 AND ∅2) ARE PRODUCED, ALONG WITH THE SYSTEM TIMING SIGNAL (∅2TTL). THE SYNC INPUT IS ANDED WITH AN AUXILIARY CLOCK FROM THE CLOCK GENERATOR TO GENERATE THE STSTB OUTPUT. THE OUTPUT FROM THE FLIP-FLOPS ARE DETERMINED BY THE RESIN INPUT, FOR THE RESET FLIP-FLOP, AND THE RDYIN INPUT, FOR THE READY FLIP-FLOP.



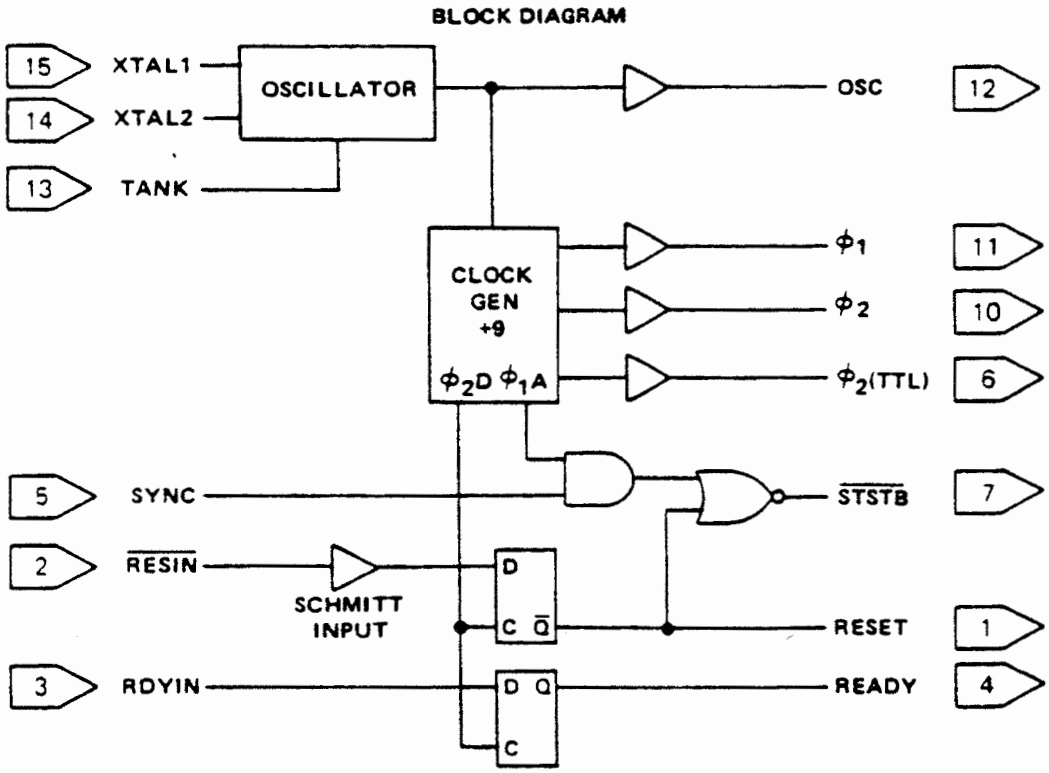


Figure 3-27. Clock Generator, Driver

FUNCTIONAL DESCRIPTION

THE SYSTEM CONTROLLER AND BUS DRIVER, AS SHOWN IN THE BLOCK DIAGRAM, CONSISTS OF A BIDIRECTIONAL BUS DRIVER, STATUS LATCH, AND GATING ARRAY. THE EIGHT BIT, BIDIRECTIONAL BUS DRIVER BUFFERS THE MICROPROCESSOR DATA BUS FROM MEMORY, AND I/O DEVICES. THE BIDIRECTIONAL BUS DRIVER IS CONTROLLED BY SIGNALS FROM THE GATING ARRAY SO THAT THE PROPER BUS FLOW IS MAINTAINED. AT THE BEGINNING OF EACH MACHINE CYCLE THE MICROPROCESSOR ISSUES STATUS INFORMATION ON ITS DATA BUS THAT INDICATES THE TYPE OF ACTIVITY THAT WILL OCCUR DURING THE CYCLE. THE SYSTEM CONTROLLER AND BUS DRIVER STORES THIS INFORMATION IN THE STATUS LATCH WHEN THE STSTB SIGNAL GOES TO A LOGIC LOW. THE OUTPUT OF THE STATUS LATCH IS ROUTED TO THE GATING ARRAY AND IS PART OF THE CONTROL SIGNAL GENERATION (MEM R, MEM W, I/O R, I/O W, AND INTA). THE READ CONTROL SIGNALS (MEM R, I/O R, AND INTA) ARE DERIVED FROM THE LOGICAL COMBINATION OF THE APPROPRIATE STATUS BITS AND THE DBIN INPUT FROM THE MICROPROCESSOR. THE WRITE CONTROL SIGNALS (MEM W AND I/O W) ARE DERIVED FROM THE LOGICAL COMBINATION OF STATUS BITS AND THE WR INPUT FROM THE MICROPROCESSOR.

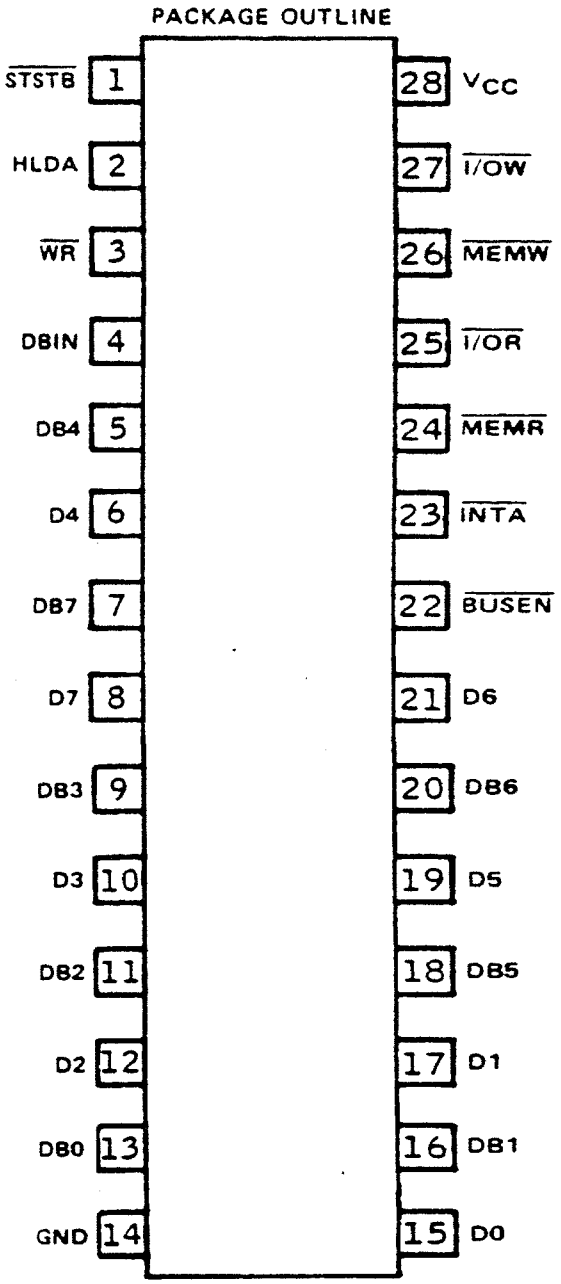


Figure 3-28. System Controller and Bus Driver (Sheet 1 of 2)

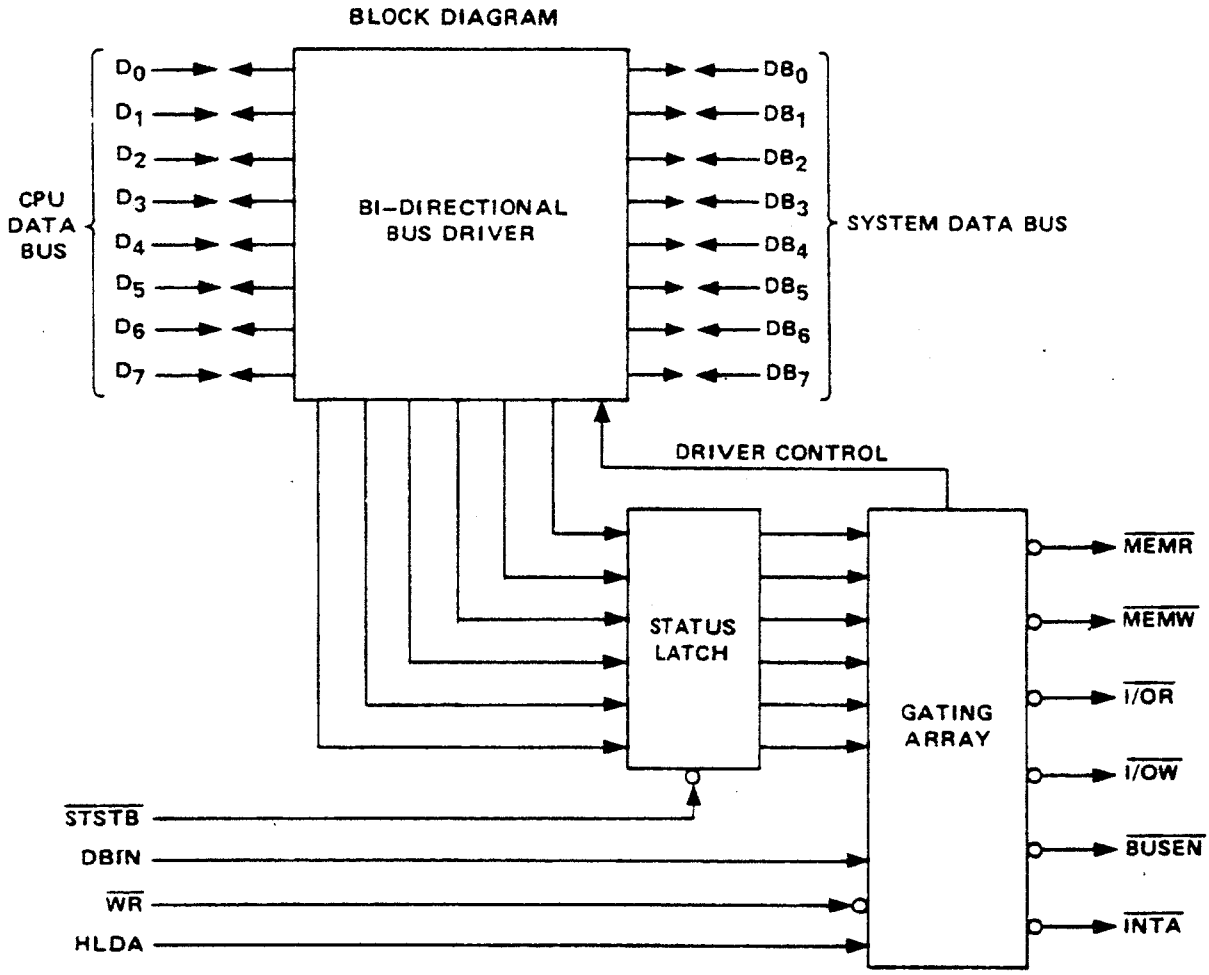
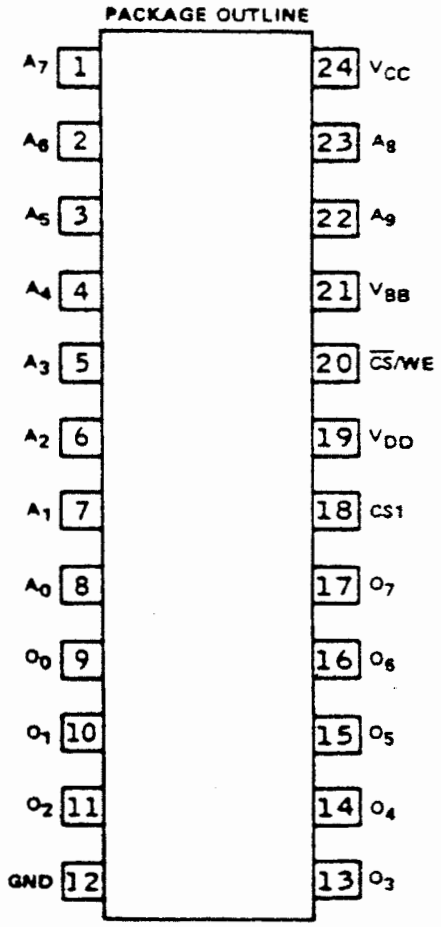


Figure 3-28. System Controller and Bus Driver (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE 8K PROM, AS SHOWN IN THE BLOCK DIAGRAM, RECEIVES 10 ADDRESS INPUTS AND A CHIP SELECT/ WRITE ENABLE (CS/WE) SIGNAL. THE PROM IS PROGRAMMED PRIOR TO INSERTION INTO THE EQUIPMENT AND CAN BE REMOVED, ERASED, AND REPROGRAMMED IF NECESSARY. THE ADDRESS INPUTS CONTAIN THE X-Y CODE FOR A SPECIFIC ADDRESS IN THE PROM. A_0 THROUGH A_3 CONTAIN THE Y-CODE WHICH IS APPLIED TO THE Y-DECODER AND THEN SENT TO THE Y-GATING CIRCUITS. A_4 THROUGH A_9 CONTAIN THE X-CODE, WHICH IS APPLIED TO THE X-DECODER, WHERE IT IS DECODED AND APPLIED, ALONG WITH THE Y-GATING DATA, TO THE ROM ARRAY. THE SELECTED ADDRESS CONTAINS AN 8-BIT DATA WORD WHICH IS ROUTED TO THE OUTPUT BUFFERS. WHEN THE CS/WE SIGNAL BECOMES A LOGIC LOW THE DATA OUTPUT (O_0 - O_7) IS MADE AVAILABLE TO THE EQUIPMENT. THE PACKAGE OUTLINE IDENTIFIES THE EXTERNAL INPUTS AND OUTPUTS AND THE PINS AT WHICH THEY ARE PRESENT.



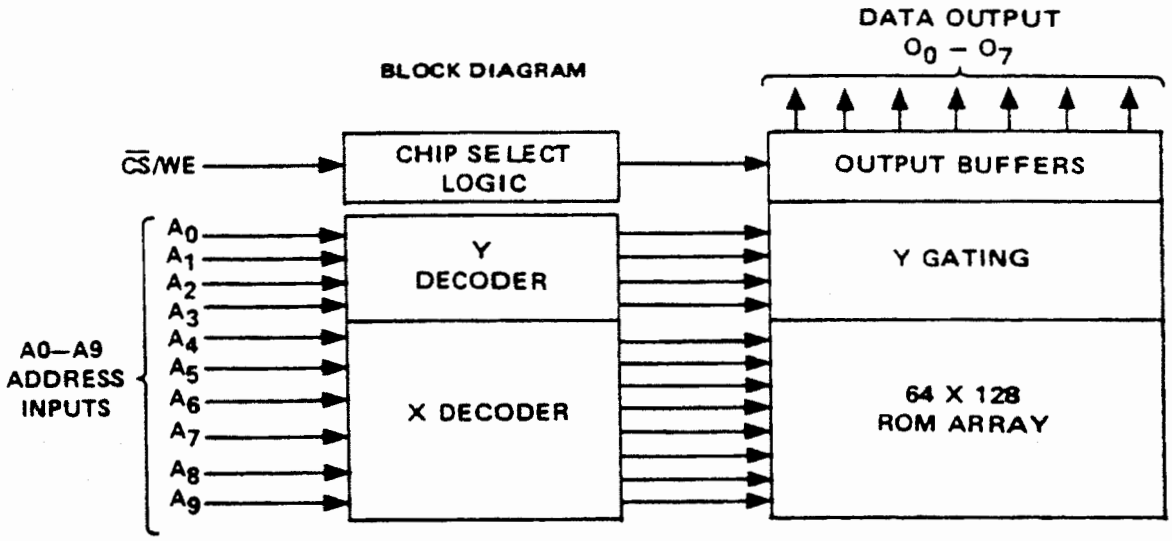
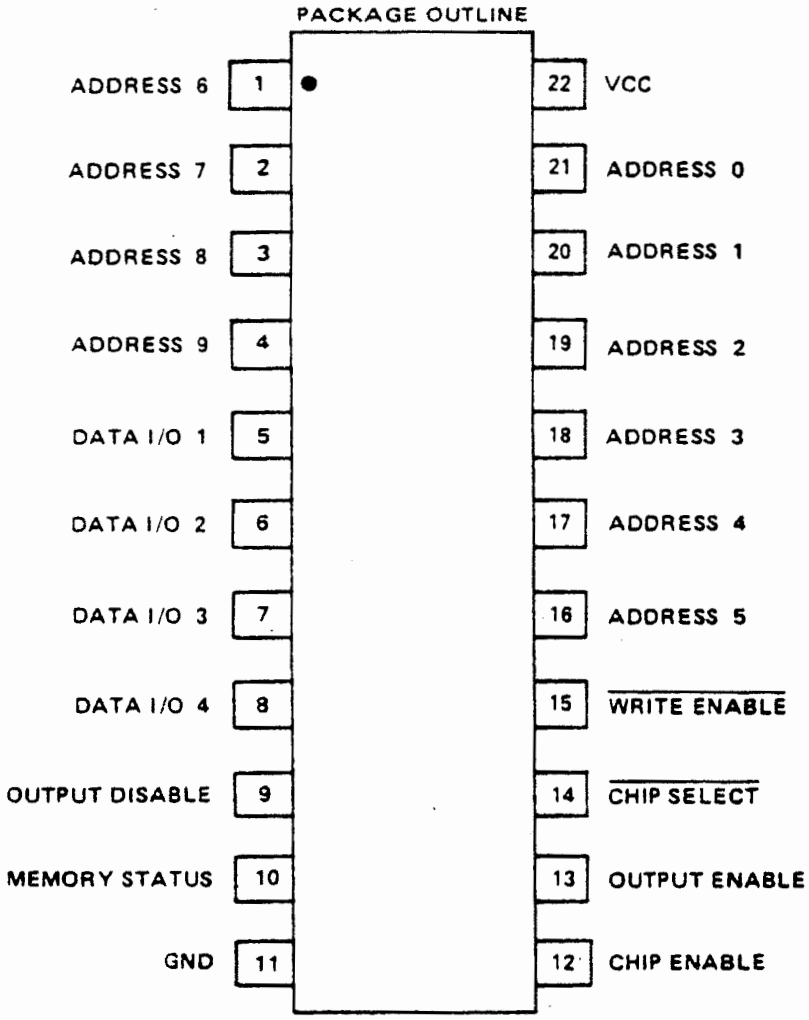


Figure 3-29. 8K (1K X 8) Erasable PROM



FUNCTIONAL DESCRIPTION

THE 1024 X 4 R/W RANDOM ACCESS MEMORY (RAM), AS SHOWN IN THE BLOCK DIAGRAM, RECEIVES 10 ADDRESS INPUTS, A CHIP ENABLE (CE), A CHIP SELECT (CS), AN OUTPUT ENABLE (OE), OUT DISABLE (OD), AND A WRITE ENABLE (WE). IT HAS FOUR INPUT/OUTPUT (I/O) LINES AND A MEMORY STATUS (MS) OUTPUT. OPERATIONAL CYCLES ARE INITIATED WHEN THE CHIP ENABLE CLOCK GOES HIGH. WHEN THE READ OR WRITE IS COMPLETE, CHIP ENABLE GOES LOW TO PRESET THE MEMORY FOR THE NEXT CYCLE. ADDRESS AND CHIP SELECT SIGNALS ARE LATCHED ON-CHIP TO SIMPLIFY SYSTEM TIMING. OUTPUT DATA IS ALSO LATCHED AND IS AVAILABLE UNTIL THE NEXT OPERATING CYCLE. THE WE SIGNAL IS HIGH FOR ALL READ OPERATIONS AND IS LOW DURING THE CHIP ENABLE TIME TO PERFORM A WRITE. DATA IN AND DATA OUT SIGNALS SHARE COMMON I/O PINS.

Figure 3-30. 1024-Bit Random Access Memory (RAM) (Sheet 1 of 2)

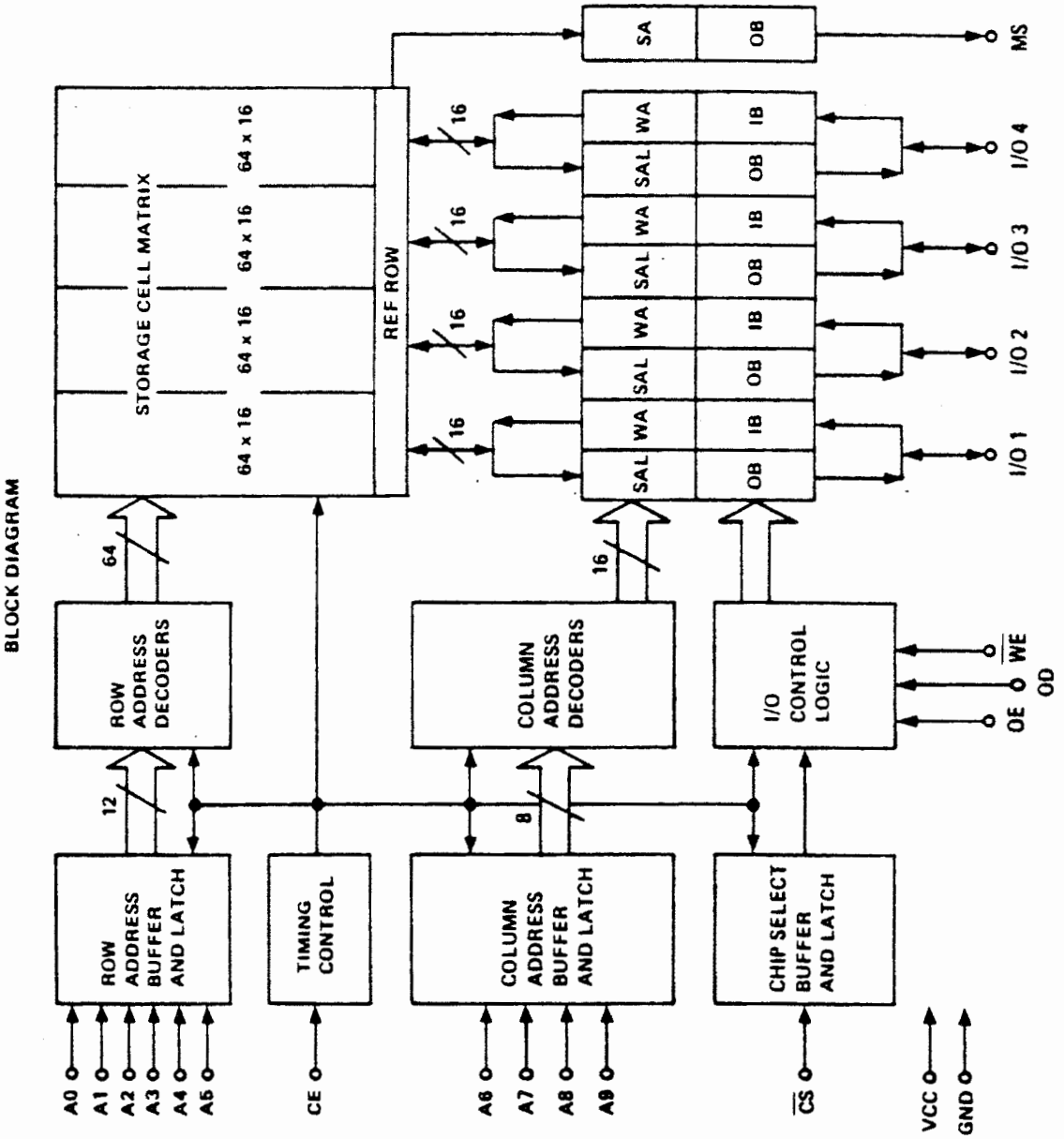


Figure 3-30. 1024-Bit Random Access Memory (RAM) (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE PROGRAMMABLE COMMUNICATION INTERFACE AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS A DATA BUS BUFFER, READ/WRITE CONTROL LOGIC, MODEM CONTROL, TRANSMIT BUFFER AND CONTROL AND RECEIVER BUFFER AND CONTROL. THE DATA BUS BUFFER IS A 3-STATE BIDIRECTIONAL 8-BIT DEVICE. DATA IS TRANSMITTED OR RECEIVED BY THE BUFFER UPON EXECUTION OF INPUT OR OUTPUT COMMANDS FROM THE CPU. THE READ/WRITE CONTROL LOGIC ACCEPTS INPUTS FROM THE SYSTEM CONTROL BUS AND CONTROLS OVERALL DEVICE OPERATION. THE MODEM CONTROL INPUTS AND OUTPUTS SIMPLIFY THE INTERFACE TO ANY MODEM. THE TRANSMIT BUFFER ACCEPTS PARALLEL DATA FROM THE DATA BUS BUFFER AND CONVERTS IT TO A SERIAL BIT STREAM. IT IS FULLY CONTROLLED BY THE TRANSMIT CONTROL WHICH ACCEPTS AND ISSUES SIGNALS EXTERNALLY OR INTERNALLY. THE RECEIVER BUFFER ACCEPTS SERIAL DATA AND CONVERTS IT TO A PARALLEL FORMAT. THE RECEIVER CONTROL MANAGES ALL RECEIVE RELATED ACTIVITIES.

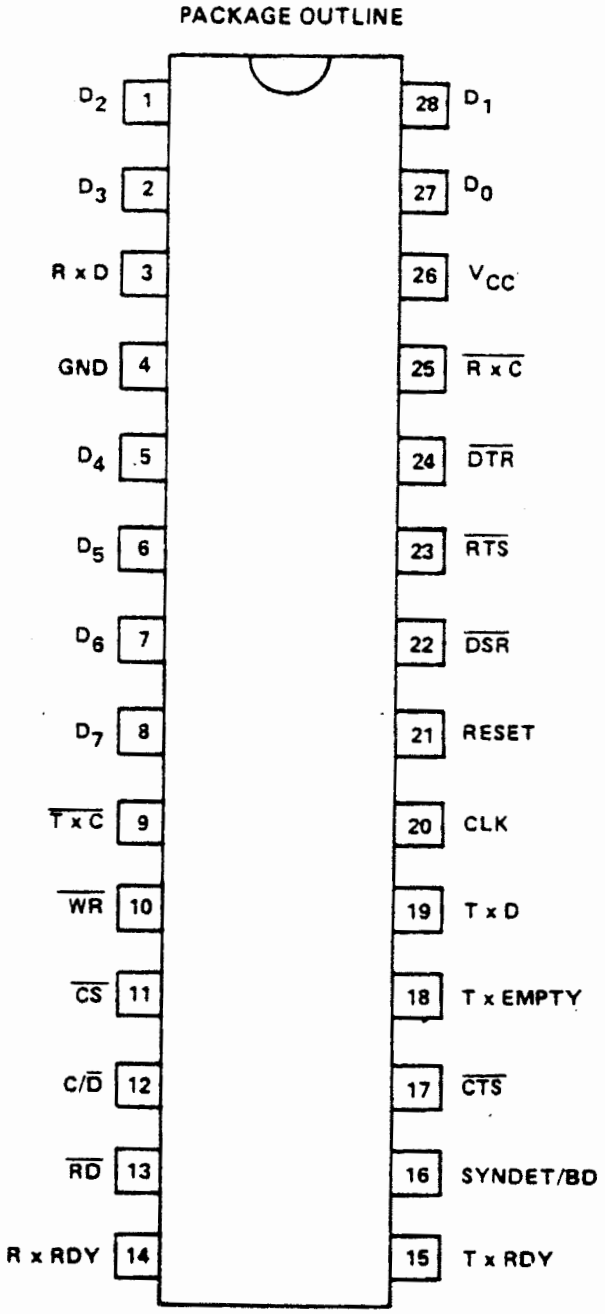


Figure 3-31. Programmable Communication Interface (Sheet 1 of 2)

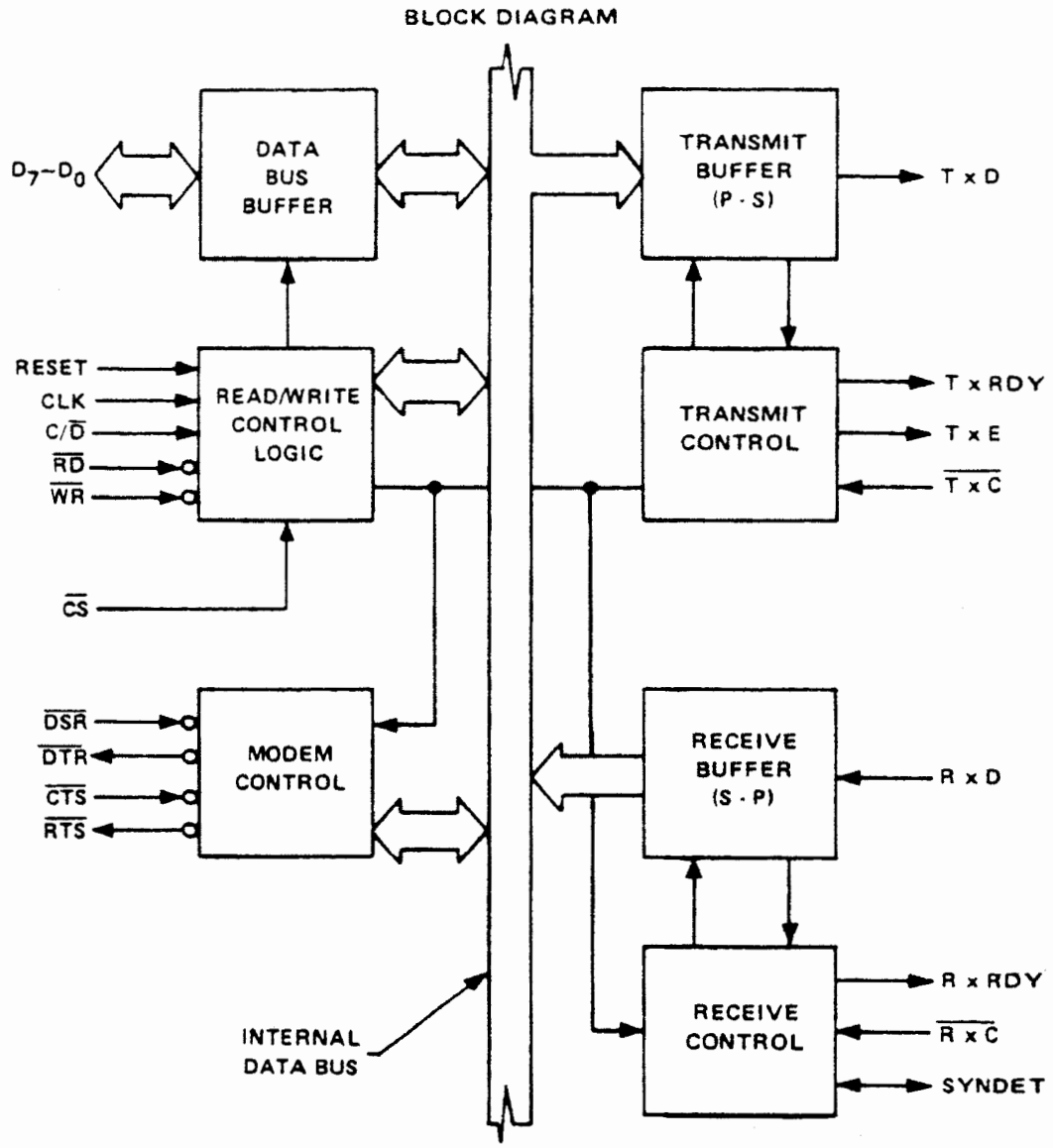


Figure 3-31. Programmable Communication Interface (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE PROGRAMMABLE INTERVAL TIMER AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS A BIDIRECTIONAL BUS BUFFER, READ/WRITE LOGIC CONTROL, CONTROL WORD REGISTER AND THREE IDENTICAL COUNTERS. THE 3-STATE BIDIRECTIONAL BUS BUFFER INTERFACES THE DATA BUS TO THE CHIP. DATA IS TRANSMITTED OR RECEIVED UPON RECEIPT OF A CPU GENERATED INPUT OR OUTPUT INSTRUCTION. THE READ/WRITE LOGIC WILL SELECT THE READ FUNCTION WHEN THE RD COMMAND IS AT "0" AND THE WR COMMAND IS AT "1". THE WRITE FUNCTION WILL BE SELECTED WHEN THE REVERSE HAPPENS. WHEN THE CS IS LOW, THE CHIP IS ENABLED. ADDRESS BITES A_0 AND A_1 SELECT COUNTERS FOR LOADING, READING OR WRITING. THE CONTROL WORD REGISTER IS OPERATIONAL WHEN A_0 AND A_1 ARE BOTH HIGH. IT ACCEPTS DATA FROM THE BUS BUFFER THAT CONTROLS EACH COUNTER AS TO MODE, BINARY OR BCD COUNTING AND LOADING EACH COUNTER. THE COUNTERS ARE IDENTICAL IN OPERATION. EACH COUNTER CONSISTS OF A 16-BIT PRE-SETTABLE DOWN COUNTER. THE COUNTERS ARE FULLY INDEPENDENT AND CAN HAVE SEPARATE MODE CONFIGURATION, COUNTING OPERATION, BINARY OR BCD. A READ COMMAND WILL MAKE THE CONTENTS OF EACH COUNTER AVAILABLE FOR EVENT COUNTING APPLICATIONS.

PACKAGE OUTLINE

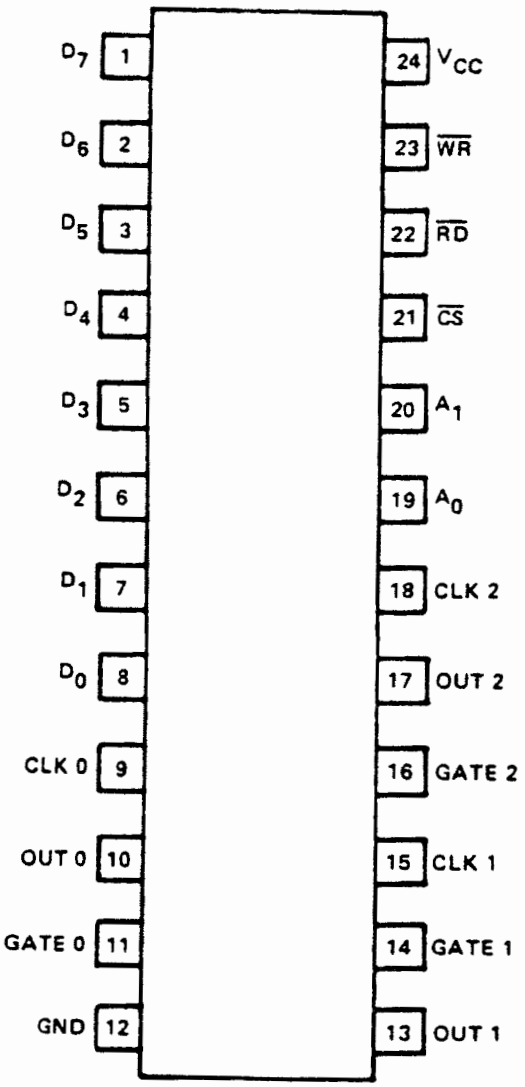


Figure 3-32. Programmable Interval Timer (Sheet 1 of 2)

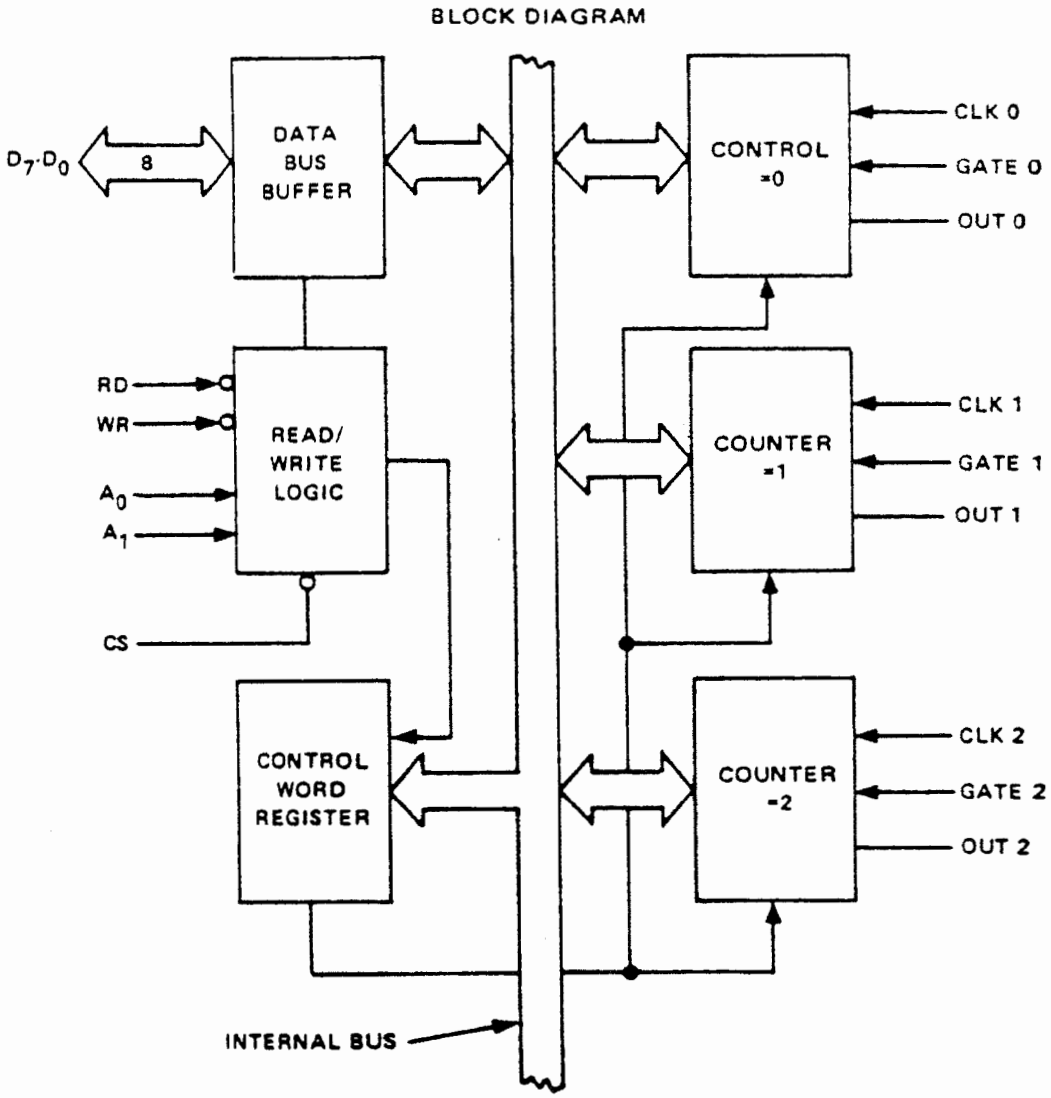
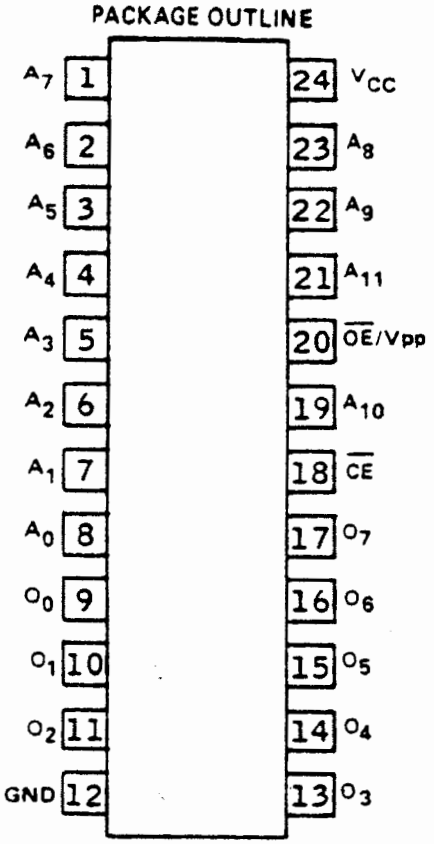


Figure 3-32. Programmable Interval Time (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE 32K (4K X 8) ERASABLE PROM, AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS THE OUTPUT AND CHIP ENABLE LOGIC, X AND Y DECODERS, Y-GATING, CELL MATRIX AND OUTPUT BUFFERS. THE 32K ERASABLE PROM RECEIVES 11 ADDRESS INPUTS WHICH ARE DECODED BY THE X AND Y DECODERS WHEN THE CHIP ENABLE (CE) SIGNAL IS ACTIVE. THE DATA IN THE CELL MATRIX LOCATION, IS SELCTED BY THE ADDRESS INPUTS FROM THE X DECODER AND FED TO THE Y-GATING LOGIC. THE ADDRESS INPUTS FROM THE Y-DECODER SELECT THE DATA IN Y-GATING LOGIC AND LOAD IT INTO THE OUTPUT BUFFERS. WHEN THE OUTPUT ENABLE (OE) SIGNAL IS ACTIVE THE DATA FROM THE OUTPUT BUFFERS IS TRANSFERRED.



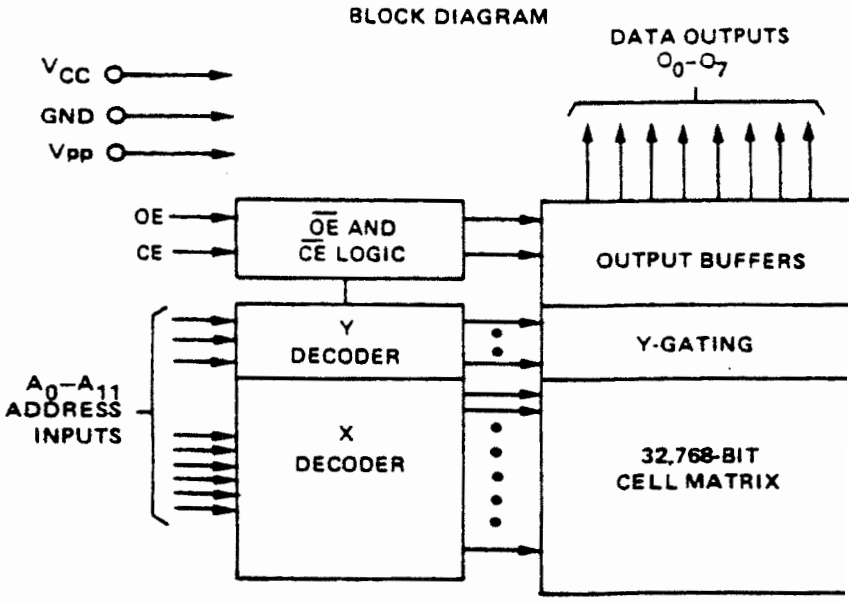
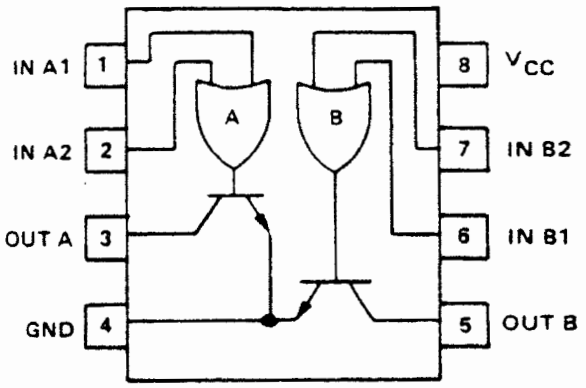


Figure 3-33. 32K (4K X 8) Erasable PROM



TRUTH TABLE

INPUT		OUTPUT	
1	2		
L	L	H	(off state)
L	H	L	(on state)
H	L	L	(on state)
H	H	L	(on state)

H = HIGH level, L = LOW level

Figure 3-34. Dual Positive NOR Drivers

FUNCTIONAL DESCRIPTION

THE 1024 X 4 STATIC RANDOM ACCESS MEMORY (RAM) AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS A MEMORY ARRAY (64 ROWS BY 64 COLUMNS), COLUMN INPUT/OUTPUT CIRCUIT, COLUMN SELECT, INPUT DATA CONTROL AND A ROW SELECT CIRCUIT. THE CHIP IS SELECTED BY THE CPU BY SETTING THE CS LOW. THE CPU CAN WRITE DATA TO RAM BY SETTING THE WE LOW, OR CAN READ DATA BY SETTING THE WE HIGH. ADDRESS BITS A_0 THROUGH A_5 SELECT 1 OF 64 ROWS, AND ADDRESS BITS A_6 THROUGH A_9 SELECT 1 OF 16 COLUMNS OF 4 BITS (1024 X 4). COLUMN I/O CIRCUITS ARE USED TO ROUT DATA INTO OR OUT OF THE MEMORY ARRAY WHEN WRITING OR READING DATA FROM OR TO THE DATA BUS.

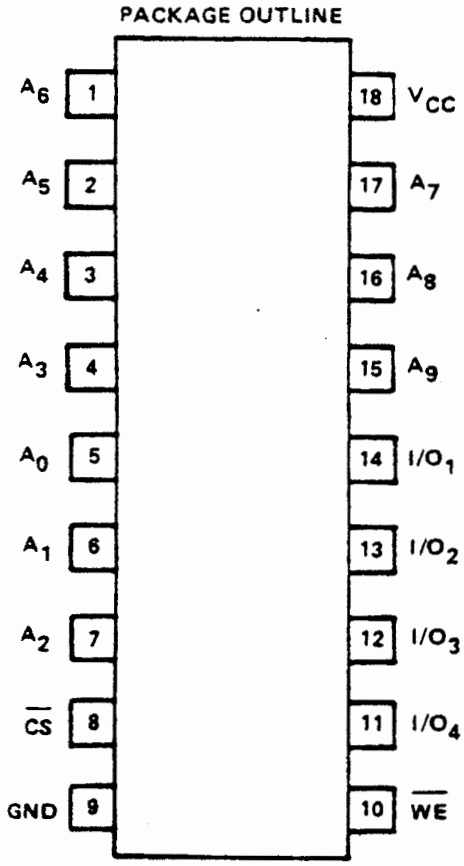


Figure 3-35. 1024 X 4 Static RAM (Sheet 1 of 2)

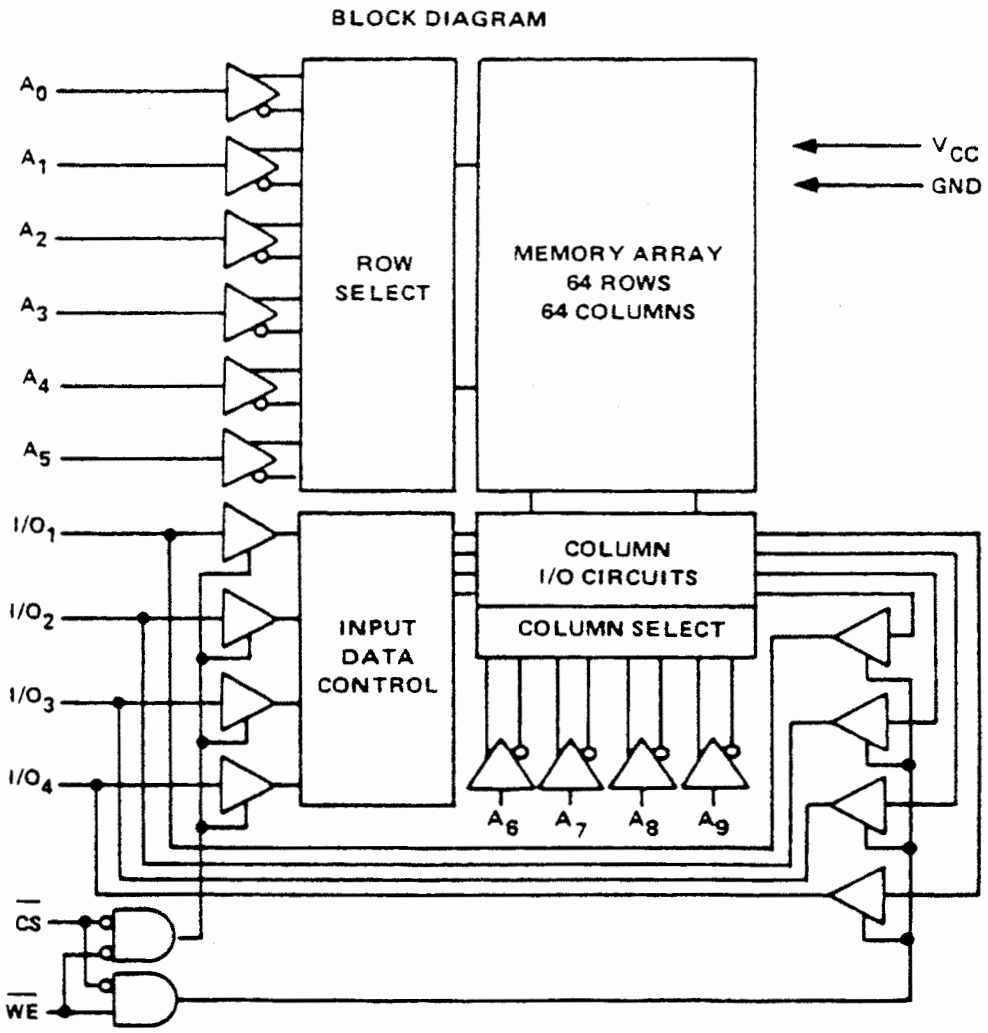
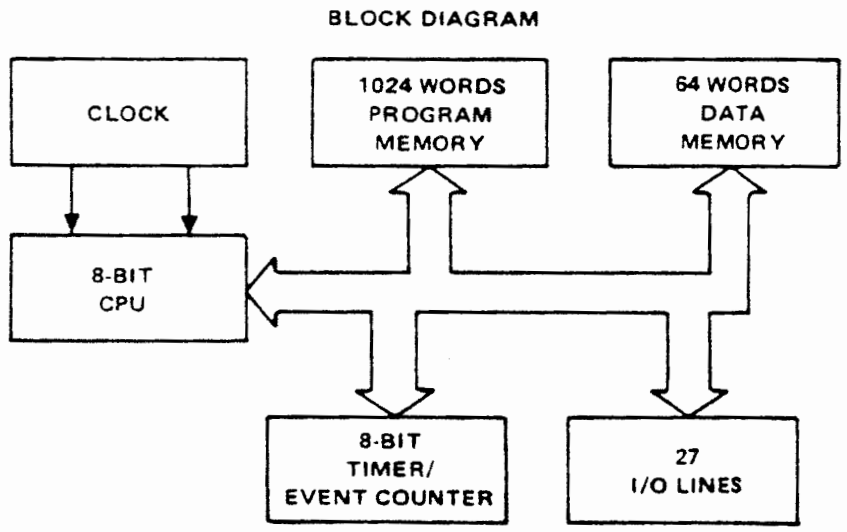


Figure 3-35. 1024 X 4 Static RAM (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE SINGLE COMPONENT 8-BIT MICROPROCESSOR, AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS A CLOCK, 8-BIT CPU, 1024 WORD PROGRAM MEMORY, 64 WORD DATA MEMORY, 8-BIT TIMER/EVENT COUNTER, AND 27 I/O LINES. THE CLOCK CIRCUIT USES AN EXTERNAL CRYSTAL AND PROVIDES THE SYSTEM TIMING SIGNAL FOR THE MICROPROCESSOR. THE OPERATING INSTRUCTIONS FOR THE 8-BIT CPU ARE STORED IN THE 1024 WORD PROGRAM MEMORY. THE 64 WORD DATA MEMORY IS USED AS A SCRATCH PAD RAM FOR TEMPORARY STORAGE OF INPUT/OUTPUT DATA WORDS RECEIVED FROM THE 8-BIT CPU. THE 8-BIT TIMER/EVENT COUNTER PROVIDES THE INTERNAL OPERATION TIMING FOR THE 8-BIT CPU. THE 27 I/O LINES INCLUDE THE CONTROL LINES PLUS 2 8-BIT PROGRAMMABLE PORTS AND THE 8-BIT DATA BUS.



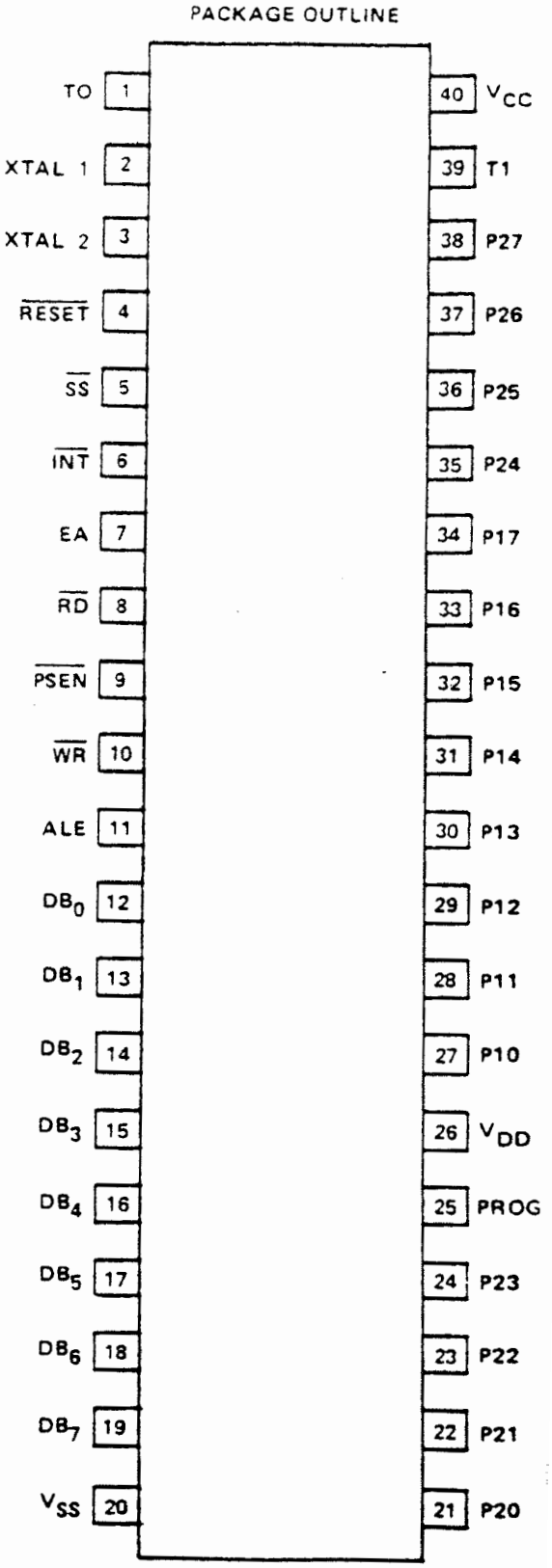


Figure 3-36. Single Component 8-Bit Microprocessor

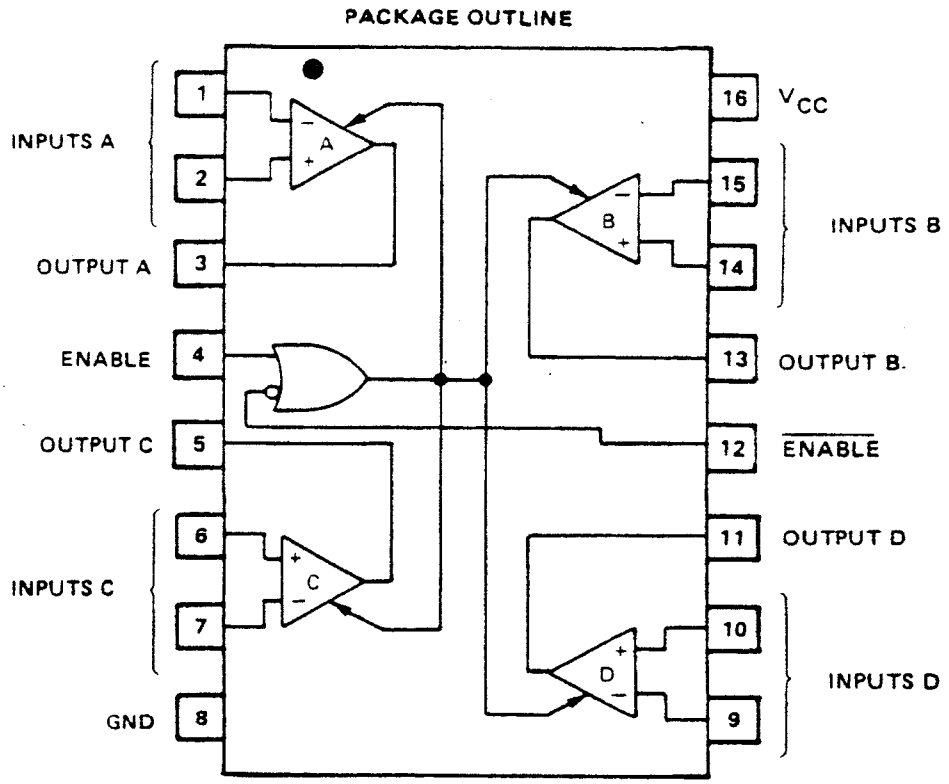
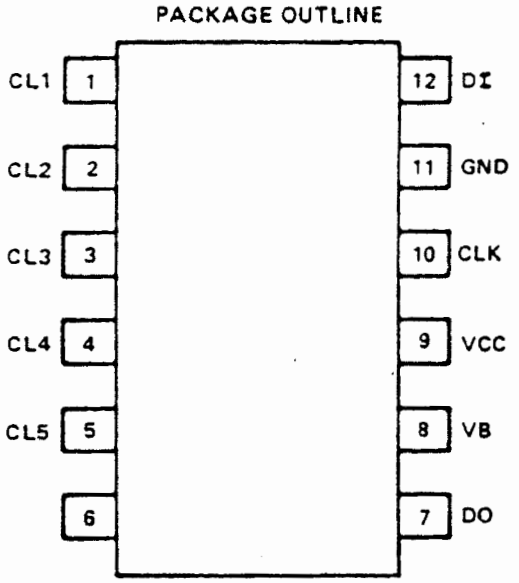


Figure 3-37. Quad Differential Line Receivers



FUNCTIONAL DESCRIPTION

THE QUAD LED ALPHANUMERIC DISPLAY, AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS A 28-BIT SERIAL-IN PARALLEL-OUT (SIPO) SHIFT REGISTER, THE CONSTANT CURRENT SINKING LED DRIVERS, AND FOUR LED MATRIXES. THE DISPLAY DATA SERIALLY LOADED INTO THE SHIFT REGISTER BY THE CLOCK SIGNAL. IF THE DATA STREAM IS LONGER THAN 28 BITS IT WILL BE SHIFTED OUT. THE PARALLEL OUTPUT FROM THE SHIFT IS FED TO THE LED DRIVERS. A BLANKING CONTROL SIGNAL GATES THE DRIVERS ON AND OFF. THE OUTPUT FROM THE LED DRIVERS ARE THE ROW SELECT SIGNALS WHICH ARE FED TO THE LED MATRIXES. WHEN THE ROW AND COLUMN SELECT SIGNALS ARE BOTH ACTIVE THE LED WILL LIGHT.

Figure 3-38. Quad LED Alphanumeric Display (Sheet 1 of 2)

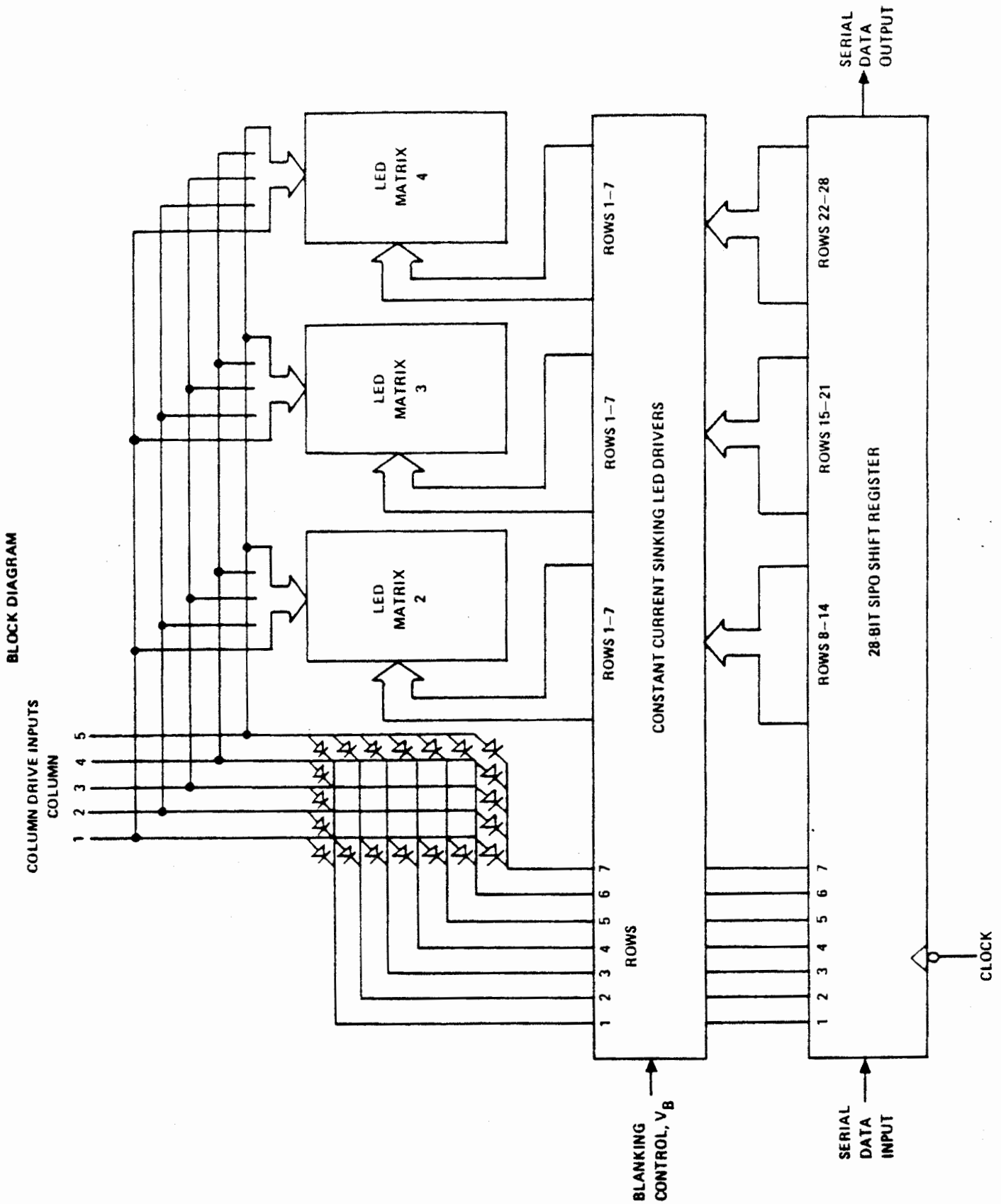


Figure 3-38. Quad LED Alphanumeric Display (Sheet 2 of 2)

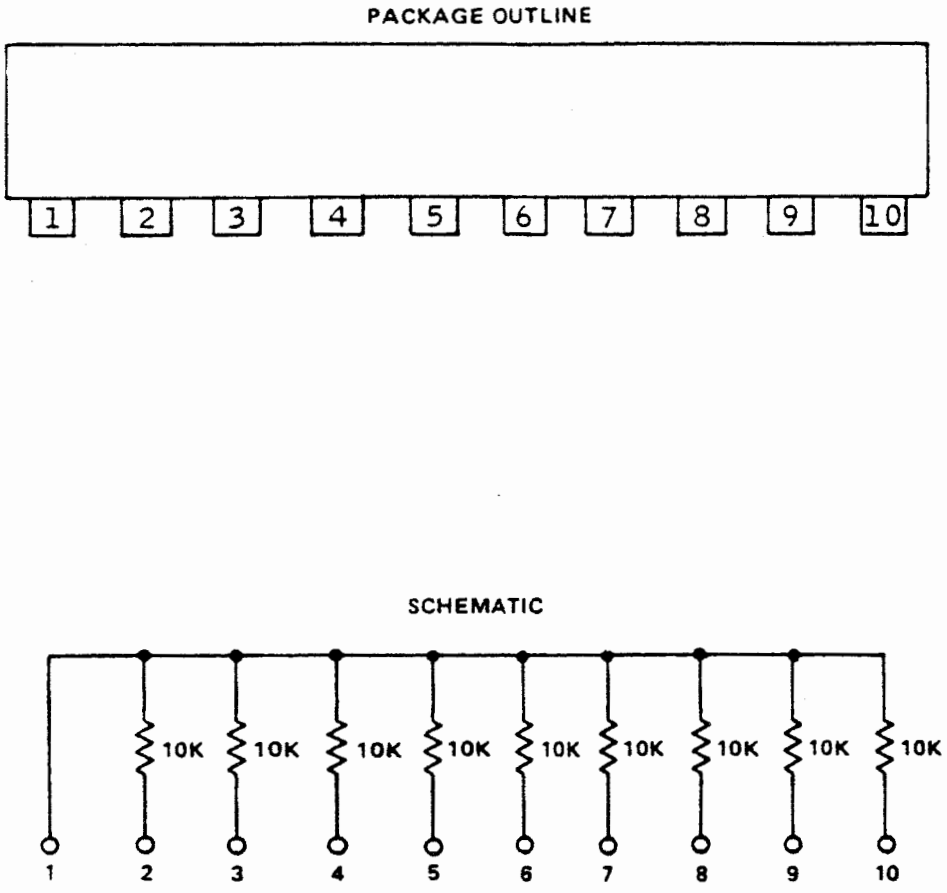


Figure 3-39. 10K Resistor Network

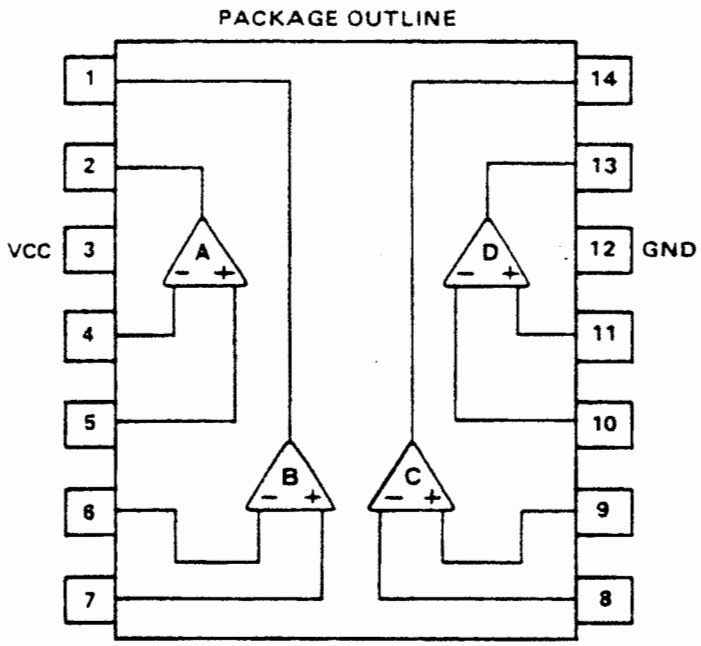


Figure 3-40. Low Power Comparators

FUNCTIONAL DESCRIPTION

THE CENTRAL PROCESSING UNIT AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS AN 8-BIT DATA BUS INTERFACE ARITHMETIC LOGIC UNIT, INSTRUCTION REGISTER, INSTRUCTION DECODER, CPU TIMING CONTROL, REGISTER ARRAY AND ADDRESS LOGIC AND BUFFERS. DATA IS RECEIVED AND TRANSMITTED VIA THE 8-BIT BI-DIRECTIONAL DATA BUS INTERFACE. WHEN THE CPU TRANSMITS DATA A UNIQUE ADDRESS IS GENERATED FOR CONTROL AND ROUTING OF THE DATA. AT THE END OF EACH INSTRUCTION THE MICROPROCESSOR WILL ENSURE THAN AN INTERRUPT HAS NOT BEEN RECEIVED. IF AN INTERRUPT (INT) HAS BEEN RECEIVED, THE CPUT WILL GENERATE AN INTERRUPT ENABLE (INTE) HALTING THE PROCESSING UNTIL THE INTERRUPT HAS BEEN CLEARED.

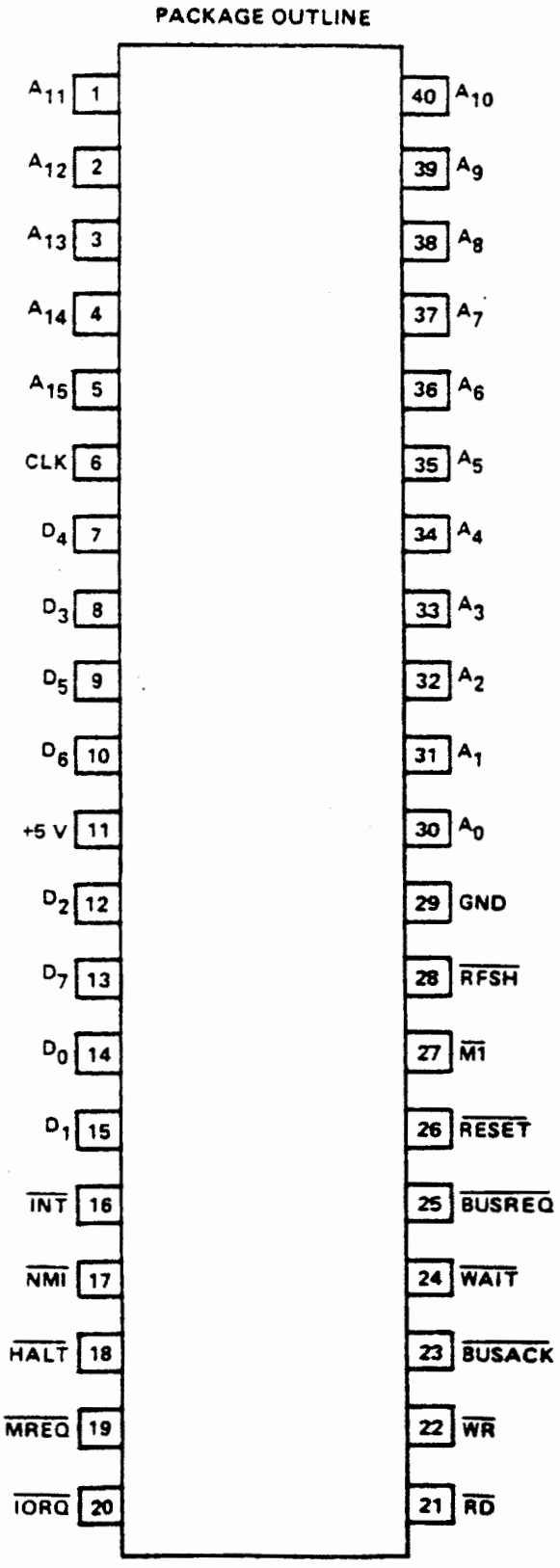


Figure 3-41. Central Processing Unit (Sheet 1 of 2)

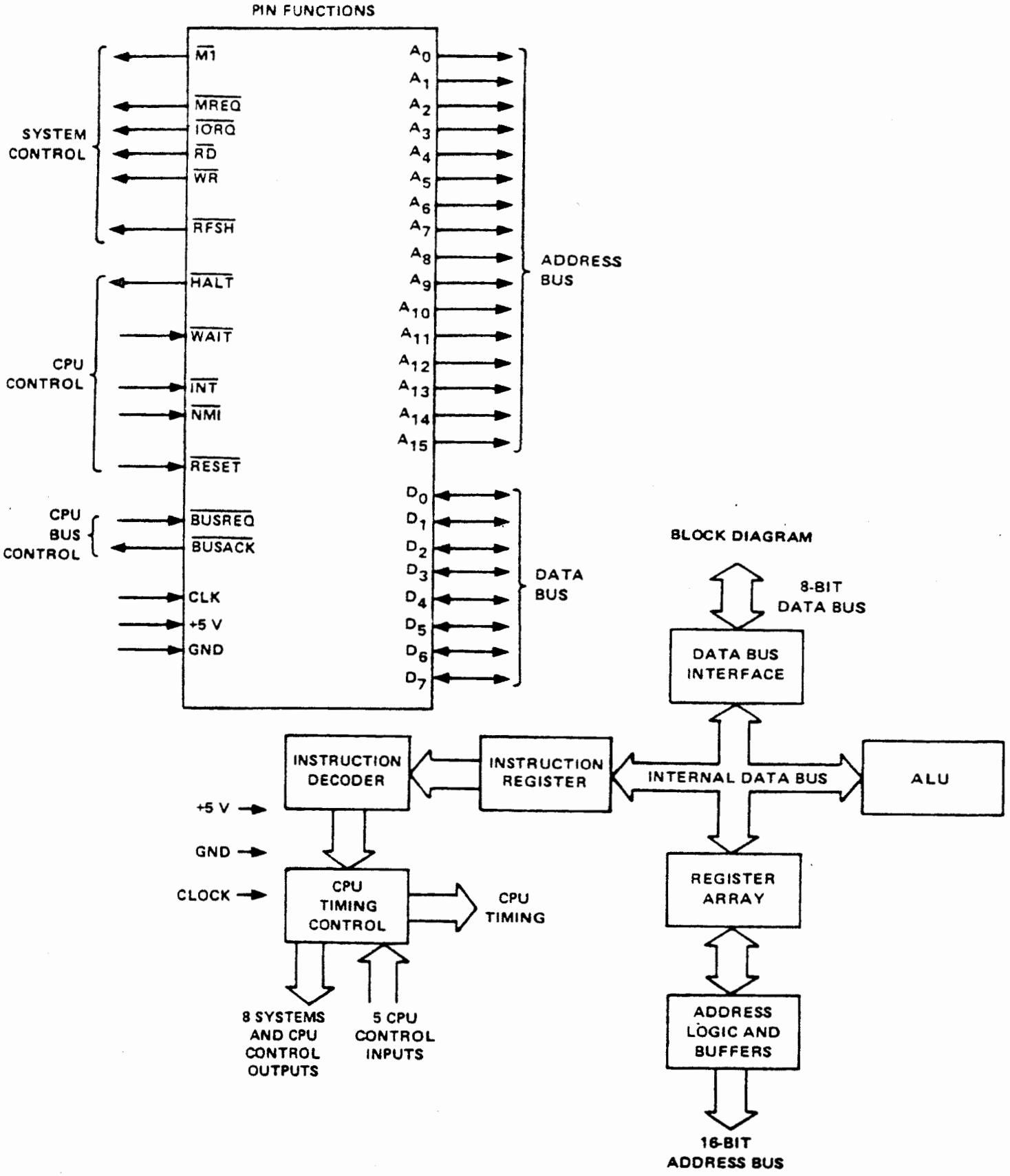


Figure 3-41. Central Processing Unit (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE PARALLEL INPUT/OUTPUT (I/O) CONTROLLER, AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS A CPU BUS I/O, THE INTERAL CONTROL LOGIC, THE INTERRUPT CONTROL, AND TWO I/O PORTS (A AND B). THE CPU BUS I/O PROVIDES THE INTERFACE FOR THE 8 DATA AND 6 CONTROL LINES BETWEEN THE CPU AND THE CONTROLLER. THE INTERNAL CONTROL LOGIC CONTROLS THE TRANSFER OF DATA BETWEEN THE INTERNAL LOGIC. THE INTERUUPT CONTROL PROVIDES THE LOGIC CIRCUITRY FOR GENERATING AND RECEIVING INTERRUPTS. THE I/O PORT BLOCK DIAGRAM SHOWS THE RELATIONSHIP OF THE LOGIC IN EACH OF THE TWO I/O PORTS. EACH PORT CONTAINS SEPARATE INPUT AND OUTPUT REGISTERS, HANDSHAKE CONTROL LOGIC, AND THE CONTROL REGISTERS. THE MODE CONTROL REGISTER USES TWO BITS TO ESTABLISH THE OPERATING MODE FOR THE PORTS. THE MASK CONTROL AND REGISTER DETERMINE THE SITUATION NECESSARY TO GENERATE AN INTERRUPT. THE INTERRUPT CONTROL LOGIC ESTABLISHES THE INTERRUPT PRIORITY IN CONJUNCTION WITH THE HANDSHAKE CONTROL LOGIC.

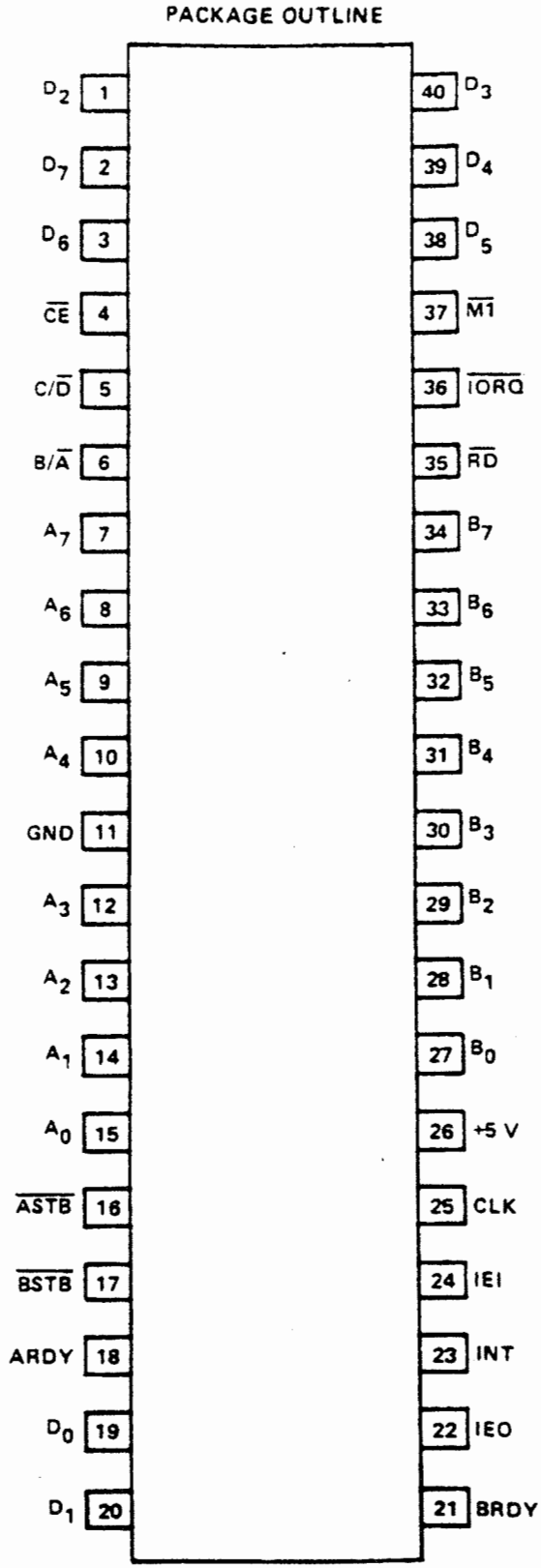
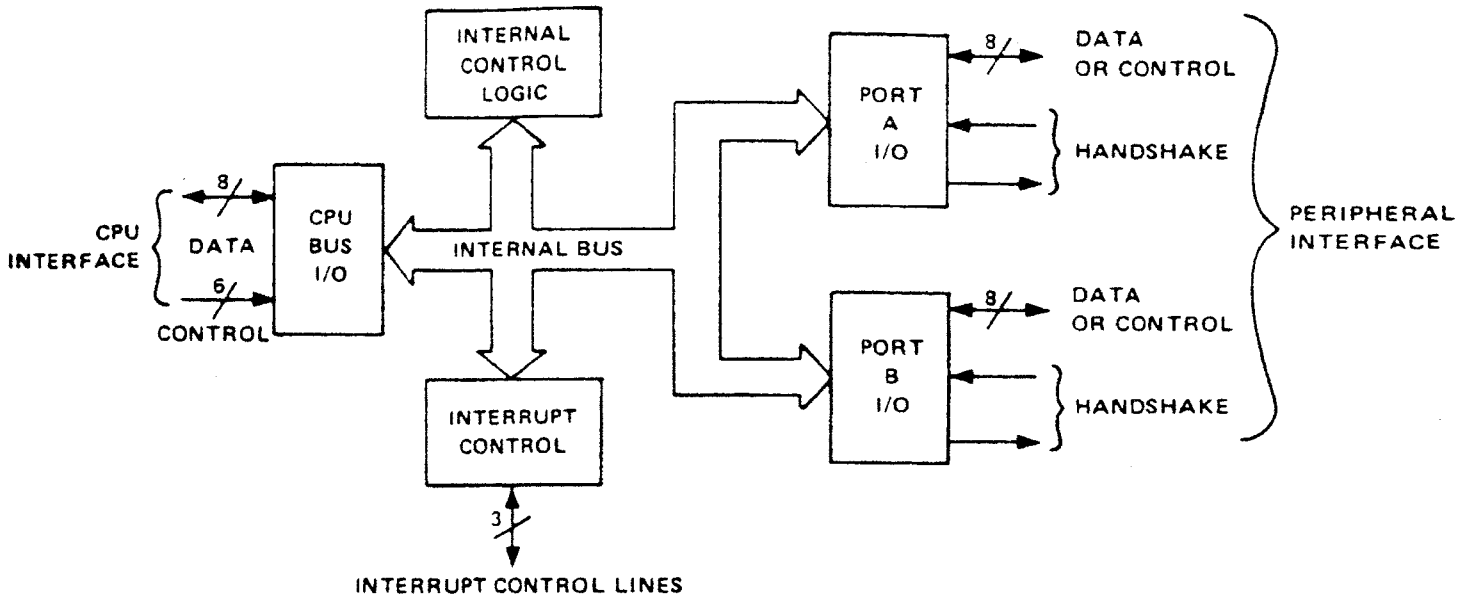
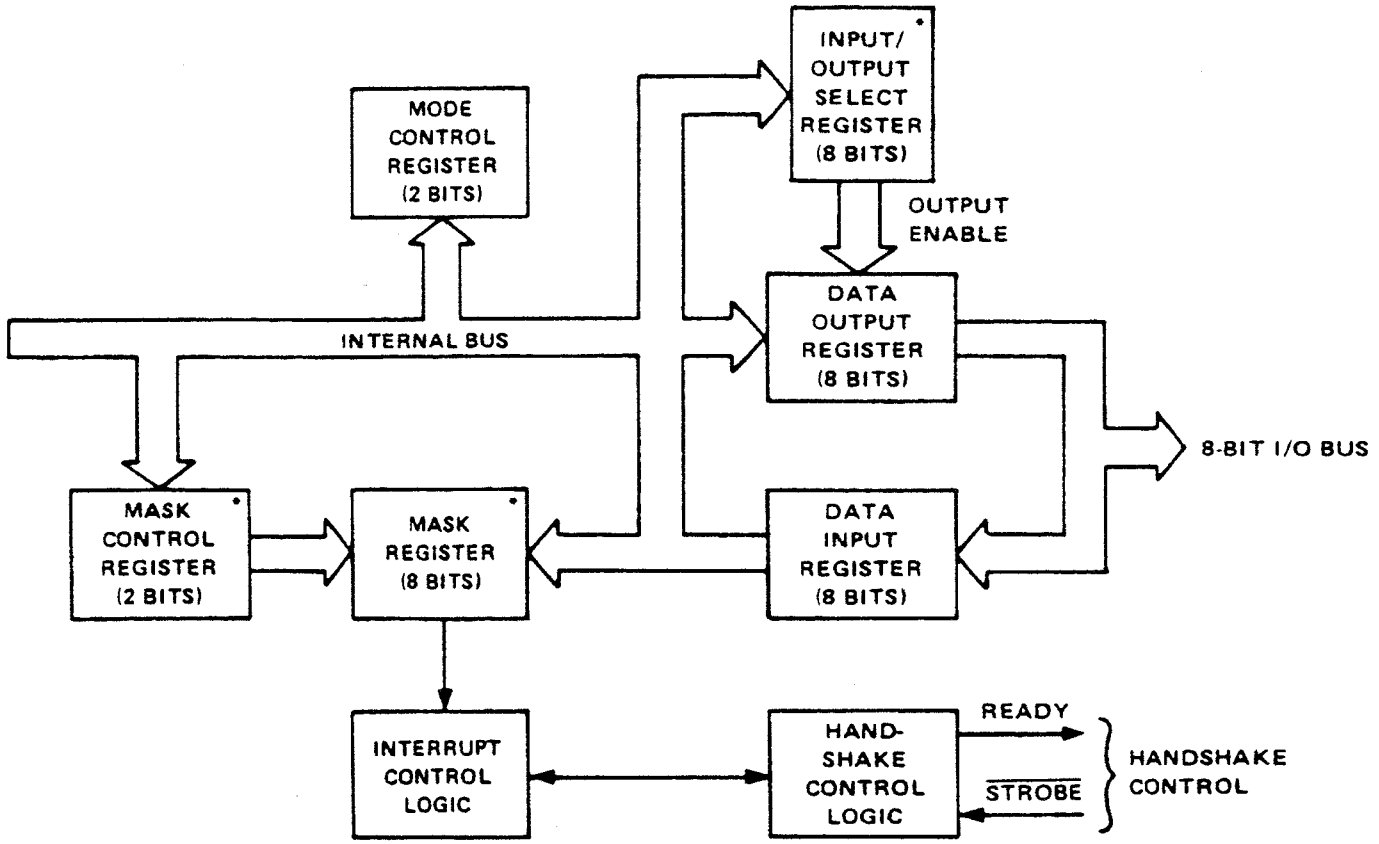


Figure 3-42. Parallel Input/Output Controller (Sheet 1 of 2)

BLOCK DIAGRAM



I/O PORT BLOCK DIAGRAM



*Used in the bit mode only to allow generation of an interrupt if the peripheral I/O pins go to the specified state.

Figure 3-42. Parallel Input/Output Controller (Sheet 2 of 2)

FUNCTIONAL DESCRIPTION

THE COUNTER/TIMER CIRCUIT (CTC) AS SHOWN IN THE BLOCK DIAGRAM, CONTAINS THE CPU BUS I/O, INTERNAL CONTROL LOGIC, TIME CONSTANT REGISTER, 8-BIT DOWN-COUNTER, AND PRESEALER. THE CPU BUS I/O PROVIDES THE NECESSARY INTERFACE FOR DATA AND CONTROL TRANSFER TO AND FROM THE CPU. THE INTERNAL CONTROL LOGIC CONTAINS THE NECESSARY INSTRUCTIONS FOR INTERNAL OPERATION OF THE CTC. INTERRUPT ENABLING AND GENERATION ARE PERFORMED BY THE INTERRUPT LOGIC. THE CTC CONTAINS FOUR SEPARATE COUNTER/TIMER LOGIC CIRCUITS. AS SHOWN IN THE COUNTER BLOCK DIAGRAM, EACH COUNTER CONTAINS THE CHANNEL CONTROL LOGIC, TIME CONSTANT REGISTER, 8-BIT DOWN-COUNTER AND PRESEALER. THE INTERNAL BUS TRANSFERS DATA FROM THE I/O TO THE CHANNEL CONTROL LOGIC, TIME CONSTANT REGISTER AND 8-BIT DOWN-COUNTER. THE CLOCK/TRIGGER INPUT CLOCKS THE RECEIVED COUNT THROUGH THE DOWN-COUNTER.

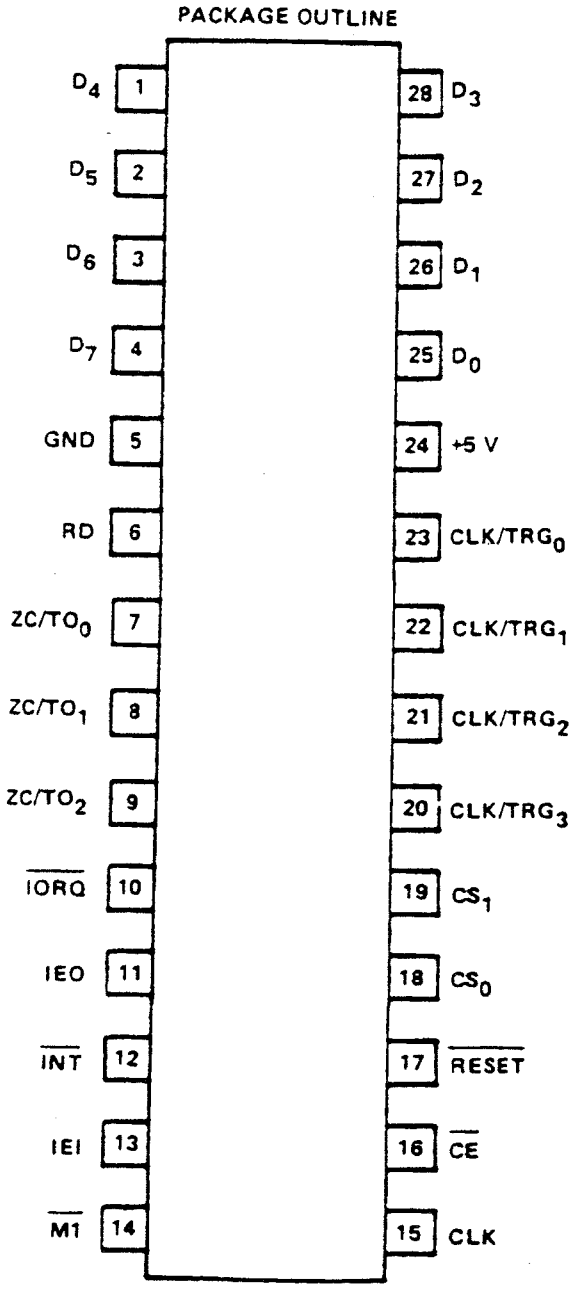
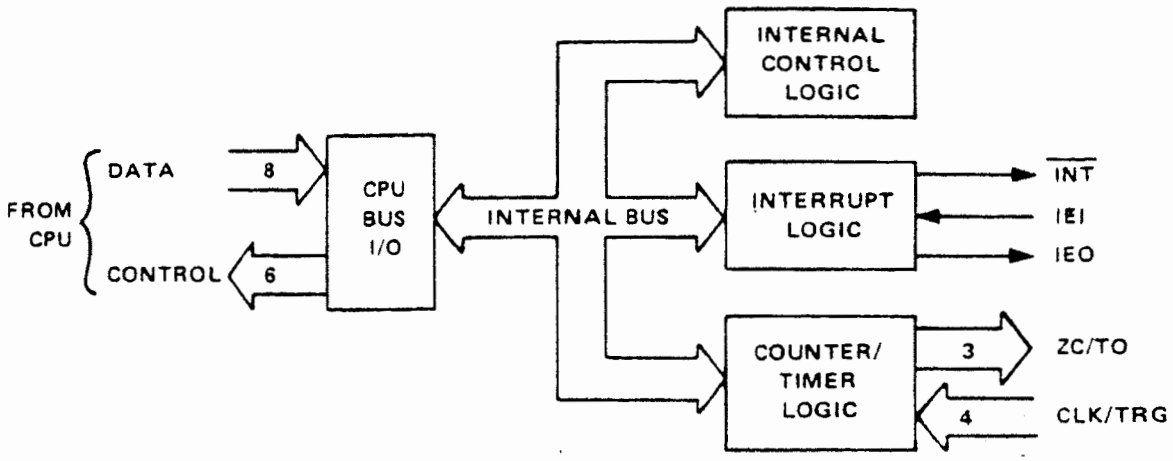


Figure 3-43. Counter/Timer Circuit (Sheet 1 of 2)

BLOCK DIAGRAM



COUNTER BLOCK DIAGRAM

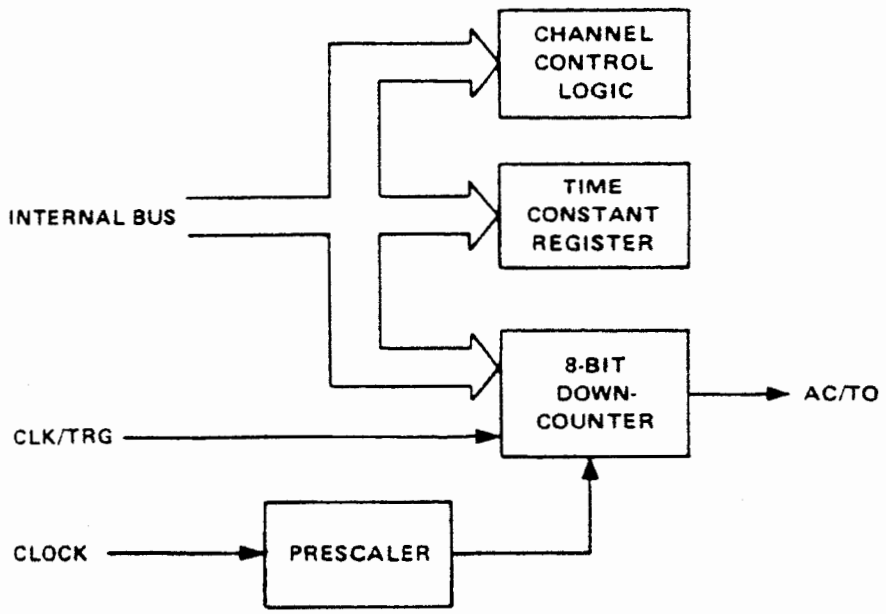
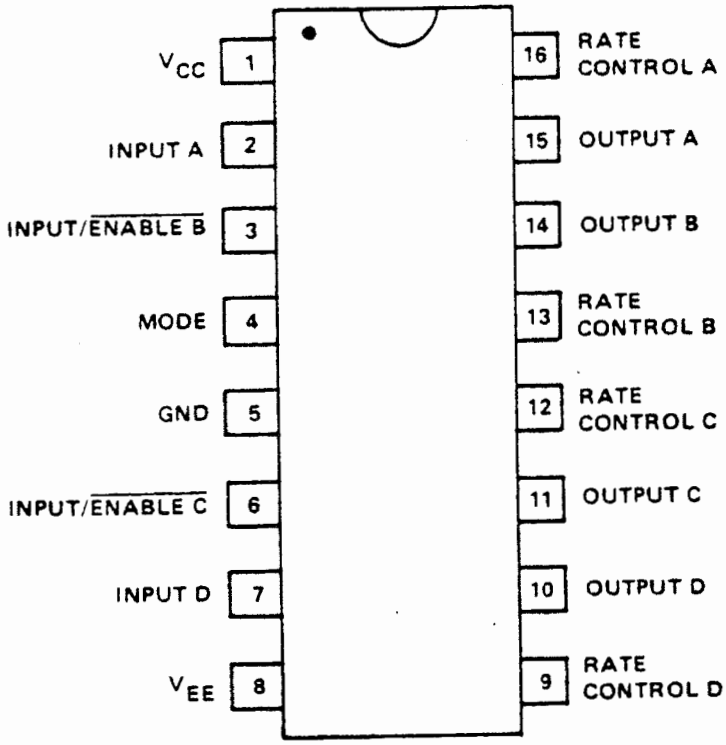


Figure 3-43. Counter/Timer Circuit (Sheet 2 of 2)

PACKAGE OUTLINE



LOGIC DIAGRAM

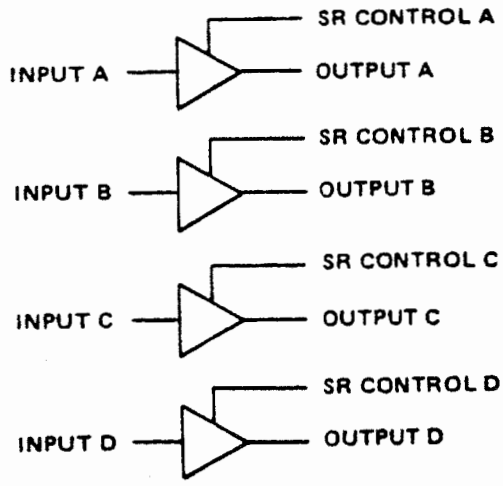
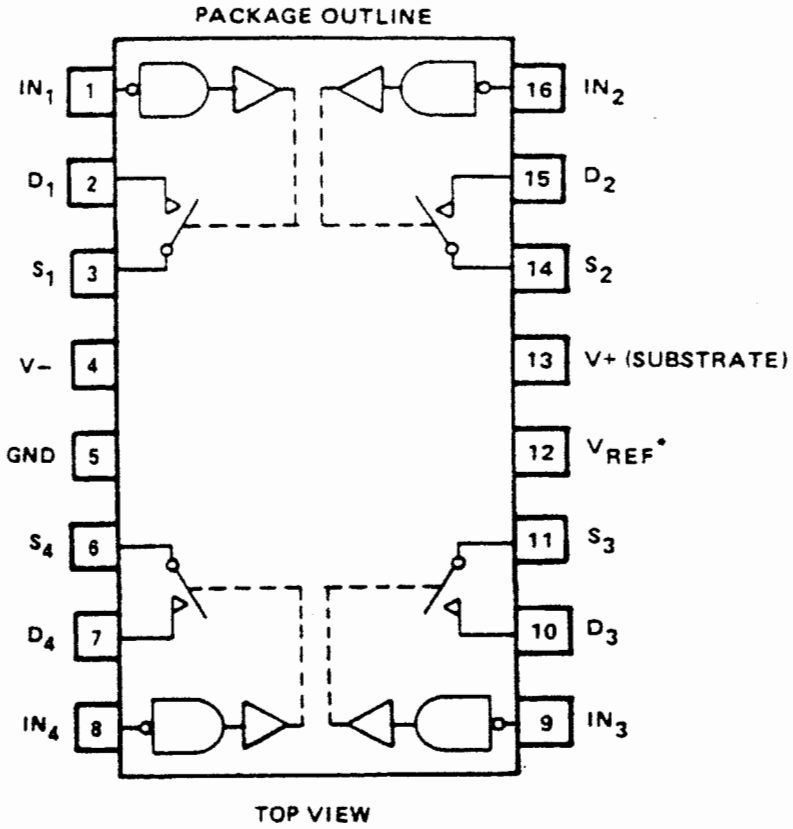


Figure 3-44. Quad Differential Line Drivers



TRUTH TABLE

LOGIC	SWITCH
0	ON
1	OFF

Figure 3-45. Quad Analog Switch

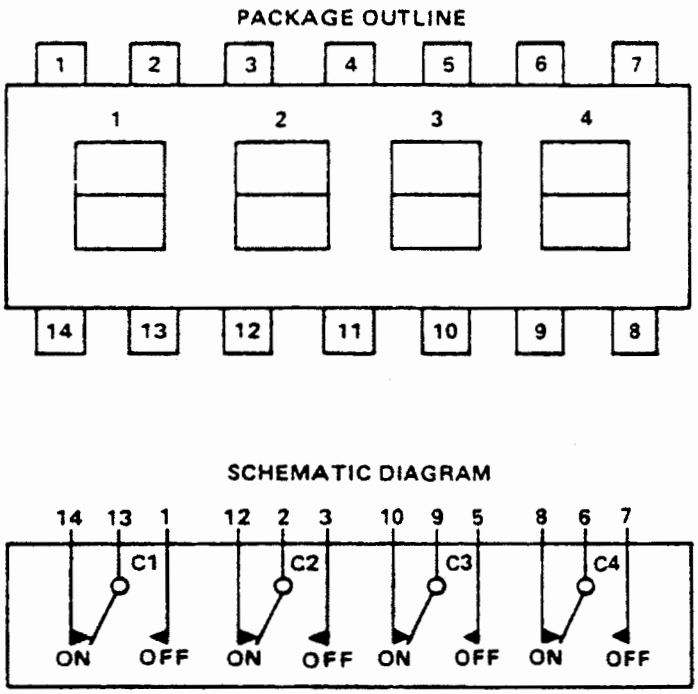
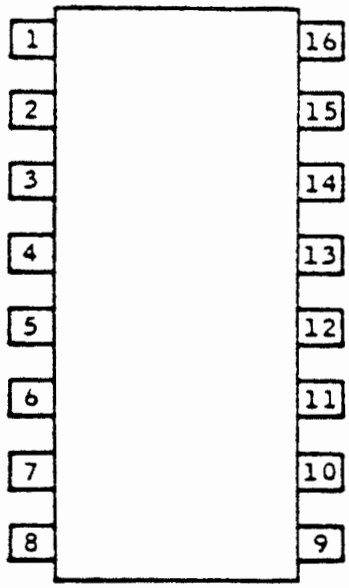


Figure 3-46. Quad Dip Switch

PACKAGE OUTLINE



SCHEMATIC DIAGRAM

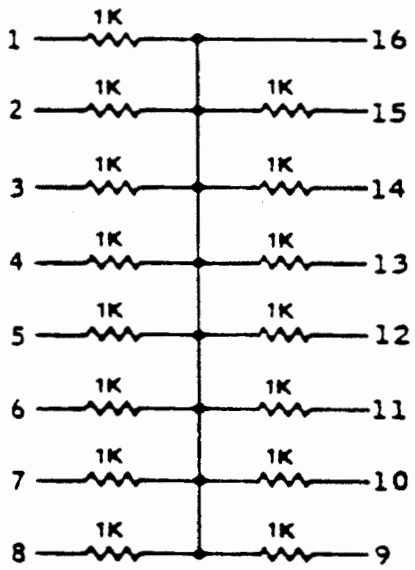
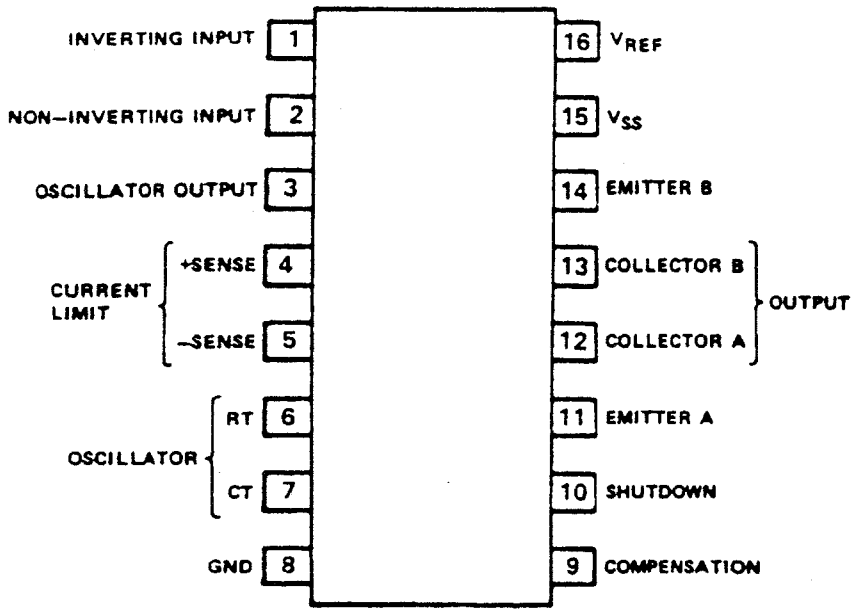


Figure 3-47. 1K Resistor Network

PACKAGE OUTLINE



BLOCK DIAGRAM

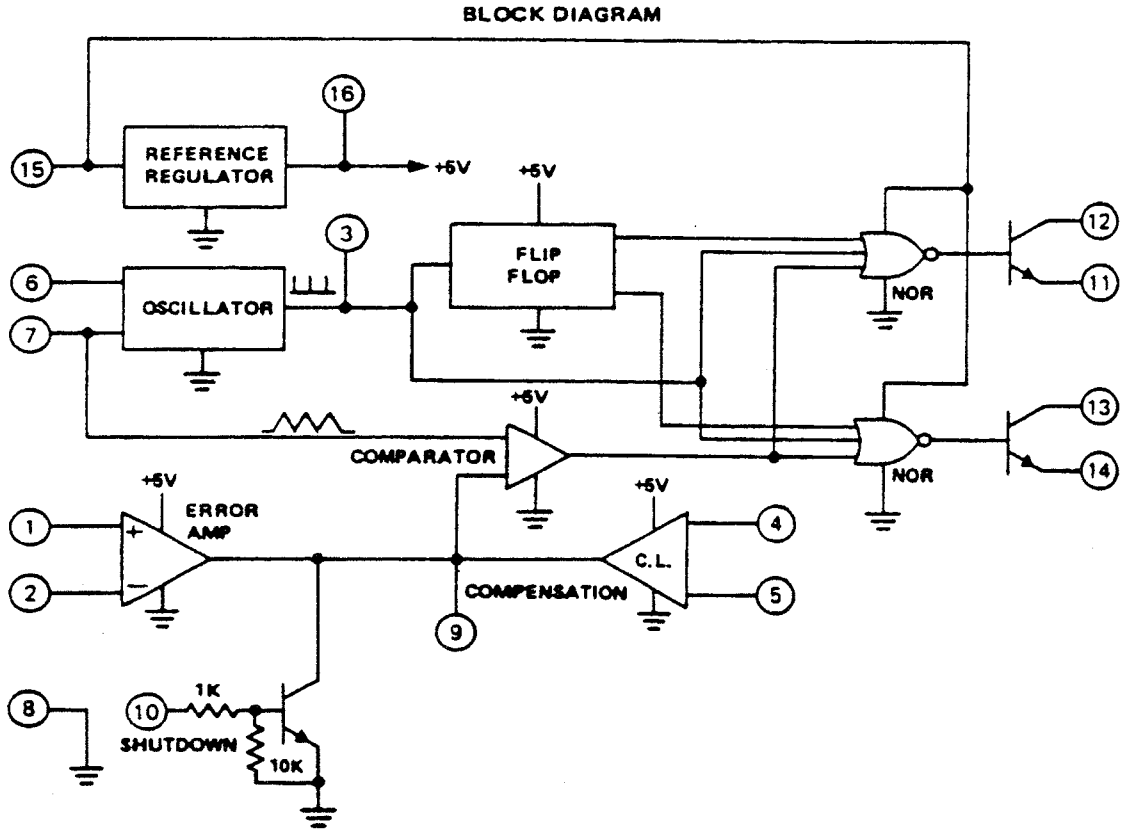


Figure 3-48. Regulating Pulse Width Modulator

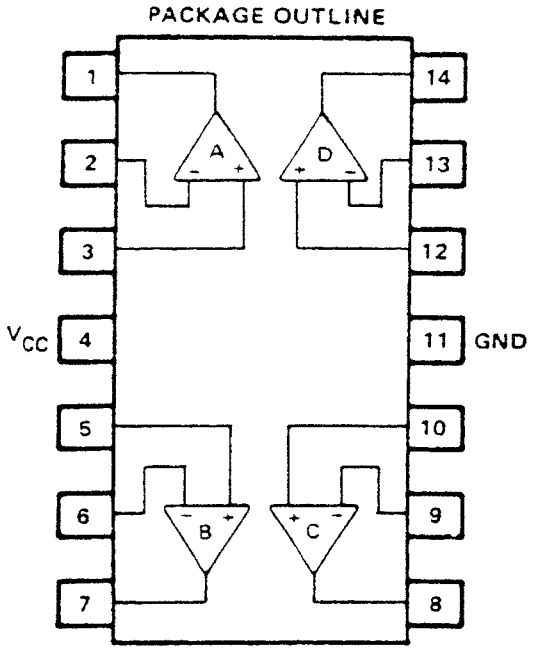


Figure 3-49. Operational Amplifier/Buffer

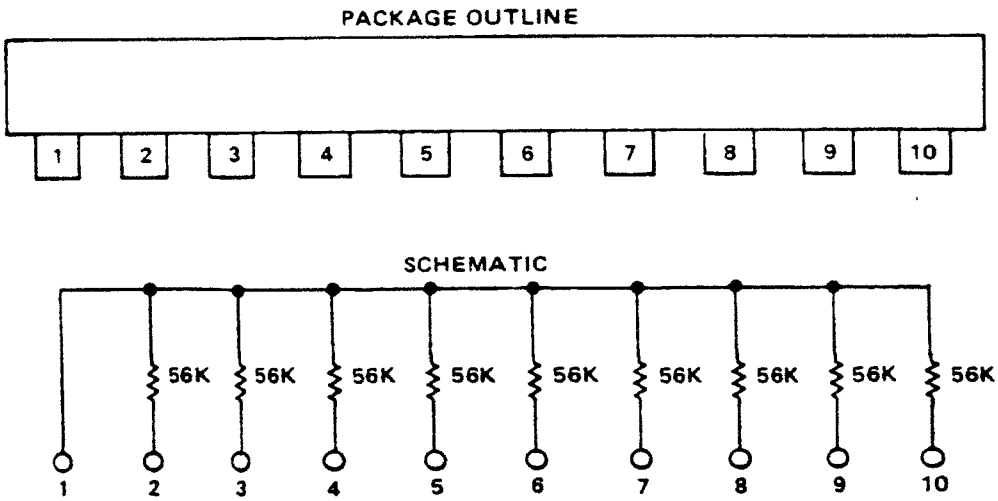
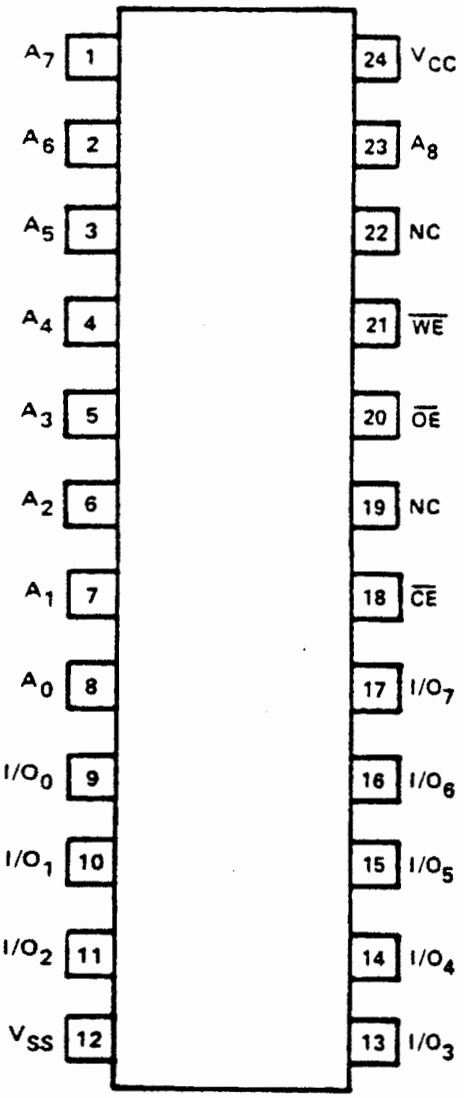


Figure 3-50. 56K Resistor Network

PACKAGE OUTLINE

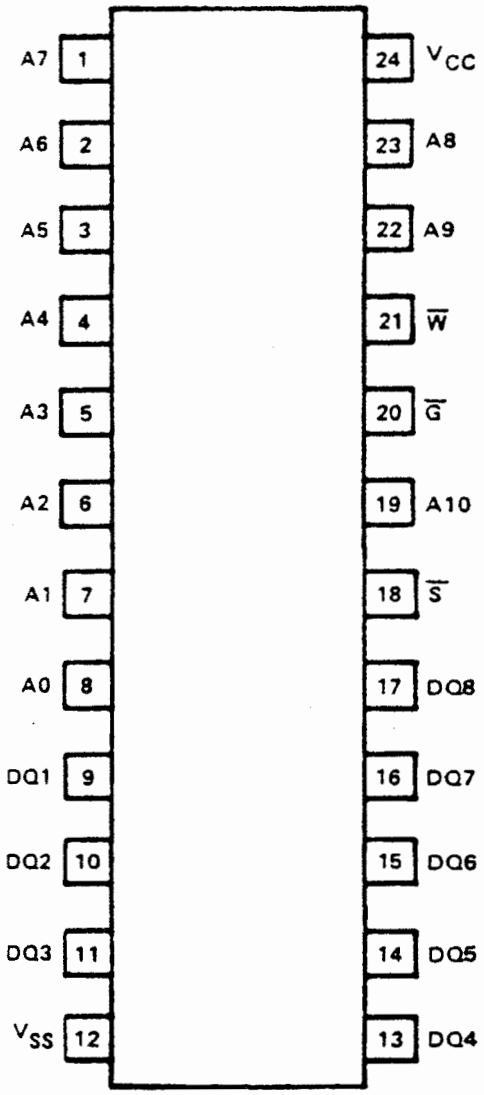


MODE SELECTION TABLE

$\overline{CE}$	$\overline{OE}$	$\overline{WE}$	MODE
H	X	X	Standby
L	L	H	Read
L	H	L	Byte Write
L	H	H	Read and Write Inhibit

Figure 3-51. Electrically Erasable PROM

PACKAGE OUTLINE



FUNCTION TABLE

W	S	G	DQ1-DQ8	MODE
L	L	X	VALID DATA	WRITE
H	L	L	DATA OUTPUT	READ
X	H	X	HI-Z	DEVICE DISABLED
H	L	H	HI-Z	OUTPUT DISABLED

H = HIGH level
L = LOW level
X = IRRELEVANT

Figure 3-52. 16K (2K X 8) Static RAM

FUNCTIONAL DESCRIPTION

THE 64K DYNAMIC RAM, AS SHOWN IN THE BLOCK DIAGRAM, CONSISTS OF ROW AND COLUMN ADDRESS BUFFERS; A TIMING AND CONTROL CIRCUIT; DATA-IN AND DATA-OUT REGISTERS; BUFFER AND I/O SELECTION CIRCUITS; AND THE MEMORY CIRCUITS. THE ADDRESS SIGNALS (A0-A7) ARE RECEIVED BY BOTH THE ROW AND COLUMN ADDRESS BUFFERS. WHEN THE ROW ADDRESS SELECT (RAS) IS ACTIVE THE ADDRESS SIGNALS ARE FED THROUGH THE ROW ADDRESS BUFFERS TO THE ROW DECODE CIRCUITS IN MEMORY. WHEN THE COLUMN ADDRESS SELECT (CAS) SIGNAL IS ACTIVE THE ADDRESS SIGNALS ARE FED THROUGH THE COLUMN ADDRESS BUFFERS TO THE COLUMN DECODERS. THE DATA INPUT (DI) IS LOADED INTO THE DATA-IN REGISTER AND WHEN THE WRITE ENABLE SIGNAL (WE) IS ACTIVE THE DATA IS LOADED INTO THE SELECTED MEMORY LOCATION VIA THE SENSE-REFRESH AMPLIFIERS. THE SENSE AMPS CONTROL CIRCUIT, USING INPUTS FROM THE TIMING AND CONTROL CIRCUIT, ENABLES THE SENSE-REFRESH AMPS. THE INPUT OF DATA OR OUTPUT OF DATA TAKES PLACE VIA THE I/O SELECTION SERVICE.

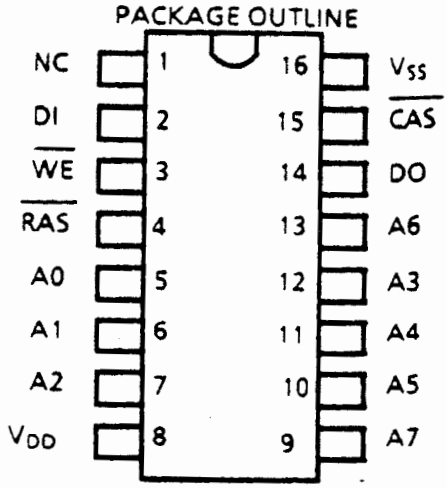


Figure 3-53. 64K X 1 Dynamic RAM (Sheet 1 of 2)

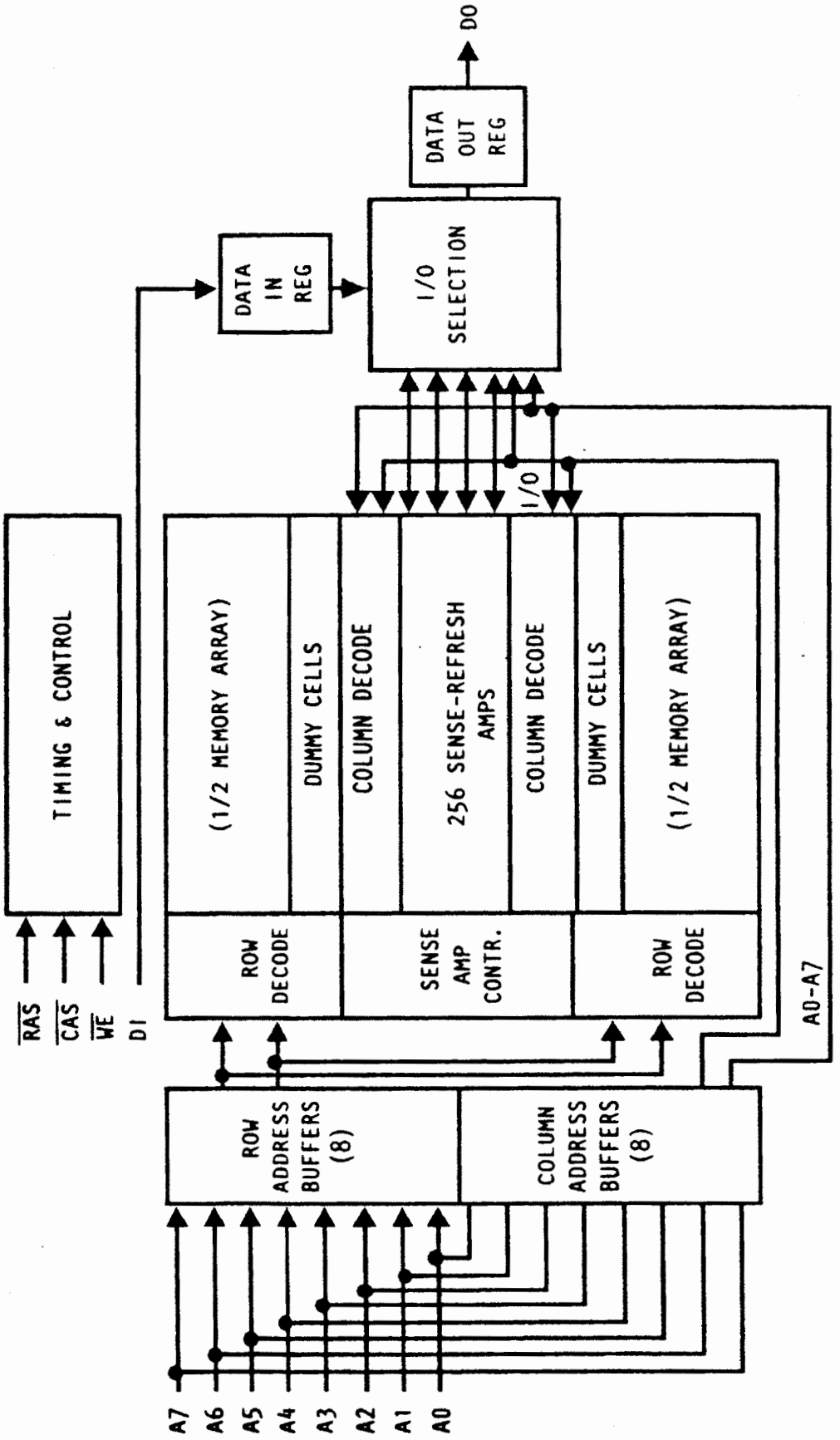
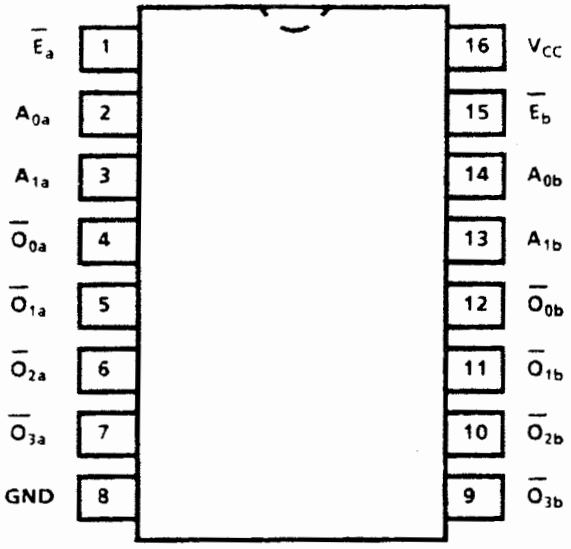
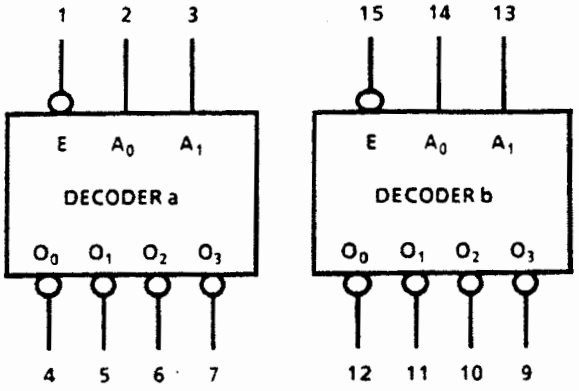


Figure 3-53. 64K X 1 Dynamic RAM (Sheet 2 of 2)

PACKAGE OUTLINE



LOGIC SYMBOL

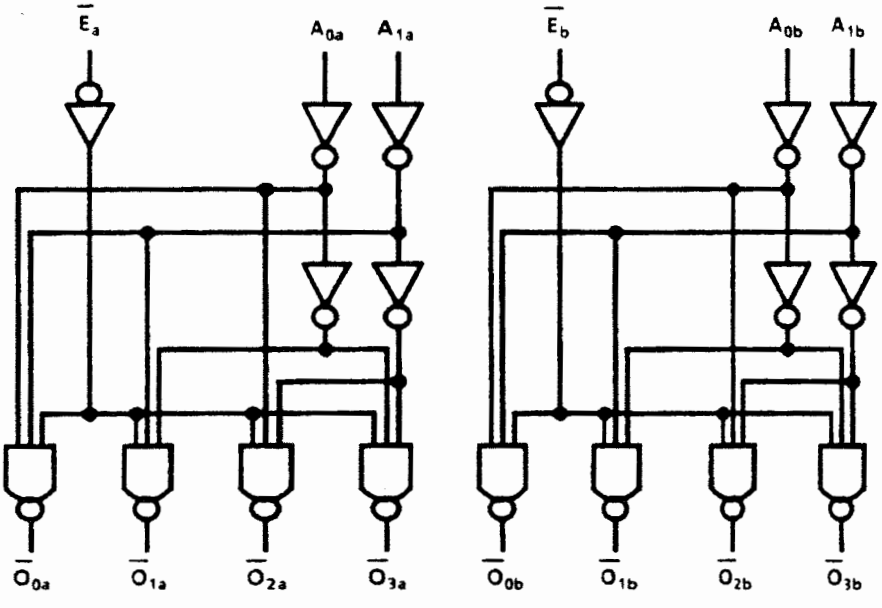


V_{CC} = Pin 16
GND = Pin 8

INPUT LOADING

PIN NAMES	DESCRIPTION	HIGH/LOW
$\overline{E}$	Address Inputs	0.5/0.25
A_0, A_1	Enable Input (Active LOW)	0.5/0.25
$\overline{O}_0 - \overline{O}_3$	Outputs (Active LOW)	10/5.0 (2.5)

LOGIC DIAGRAM



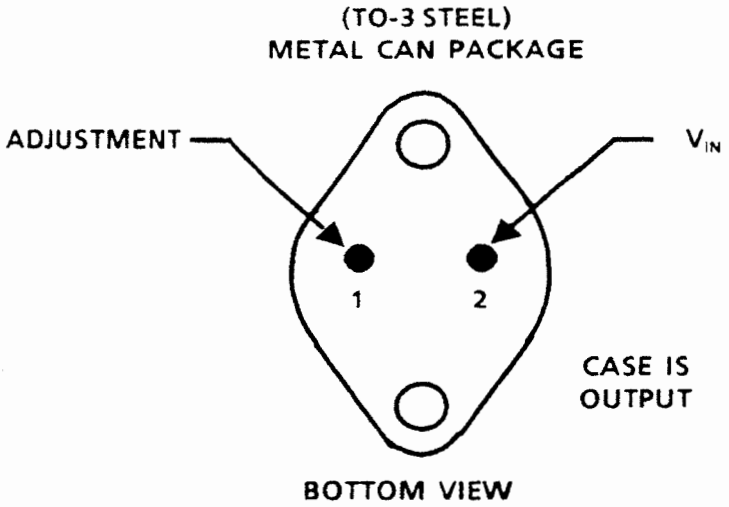
TM.88020.000.001

TRUTH TABLE

INPUTS			OUTPUTS			
$\overline{E}$	A_0	A_1	$\overline{O}_1$	$\overline{O}_2$	$\overline{O}_3$	$\overline{O}_3$
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	H	L	H	L	H	H
L	L	H	H	H	L	H
L	H	H	H	H	H	L

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial

Figure 3-54. Dual 1 of 4 Decoder/Demultiplexer



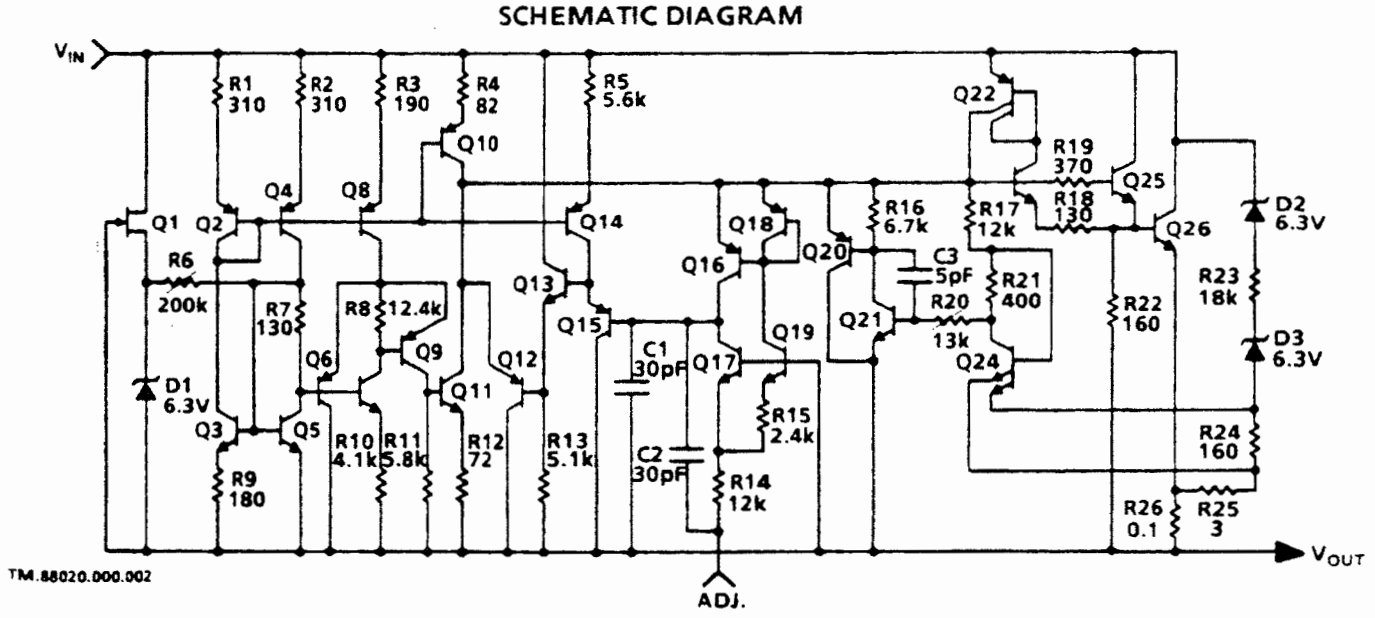
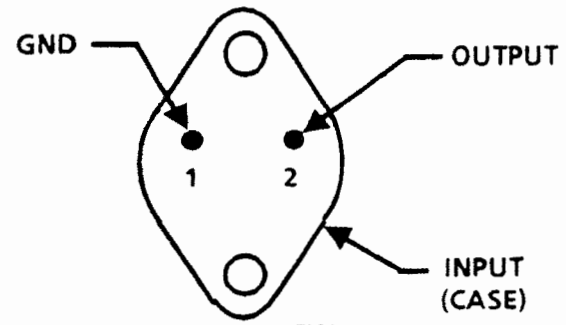


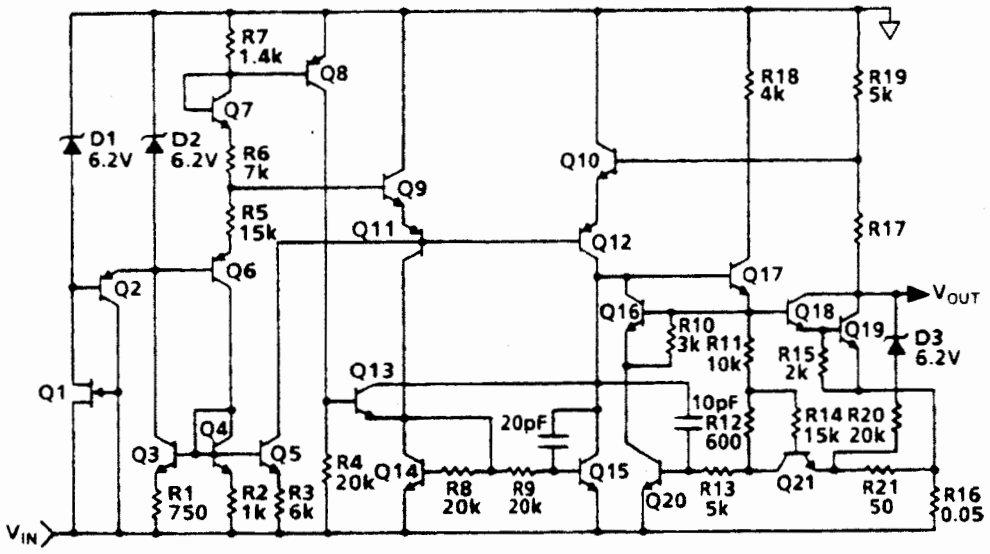
Figure 3-55. Three-Terminal Adjustable Regulator

ALUMINUM METAL CAN PACKAGE TO-3 (KC)

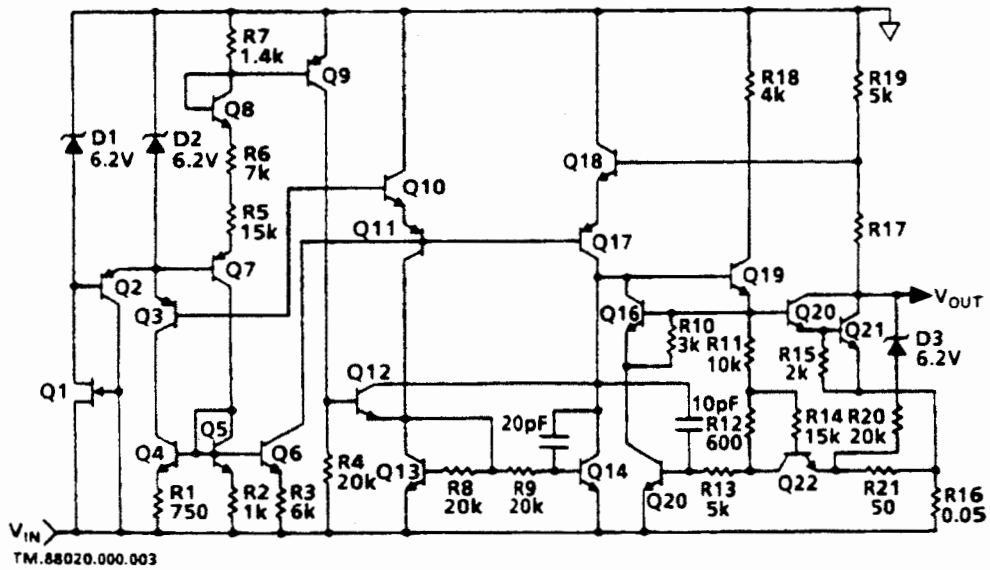


BOTTOM VIEW

SCHEMATIC DIAGRAM -5V



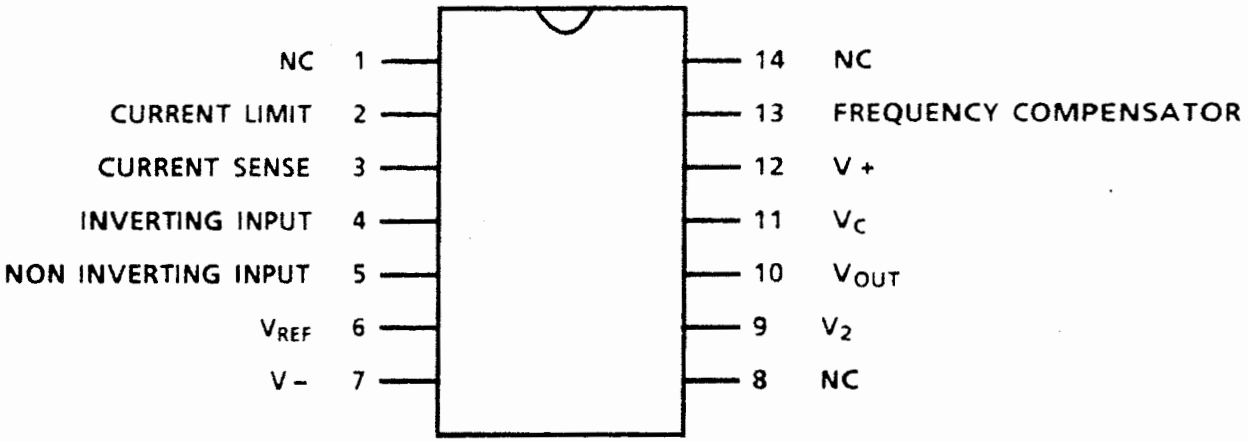
SCHEMATIC DIAGRAM -12V



TM.88020.000.003

Figure 3-56. Three-Terminal Negative Regulator

DUAL-IN-LINE PACKAGE



TOP VIEW

SCHEMATIC DIAGRAM

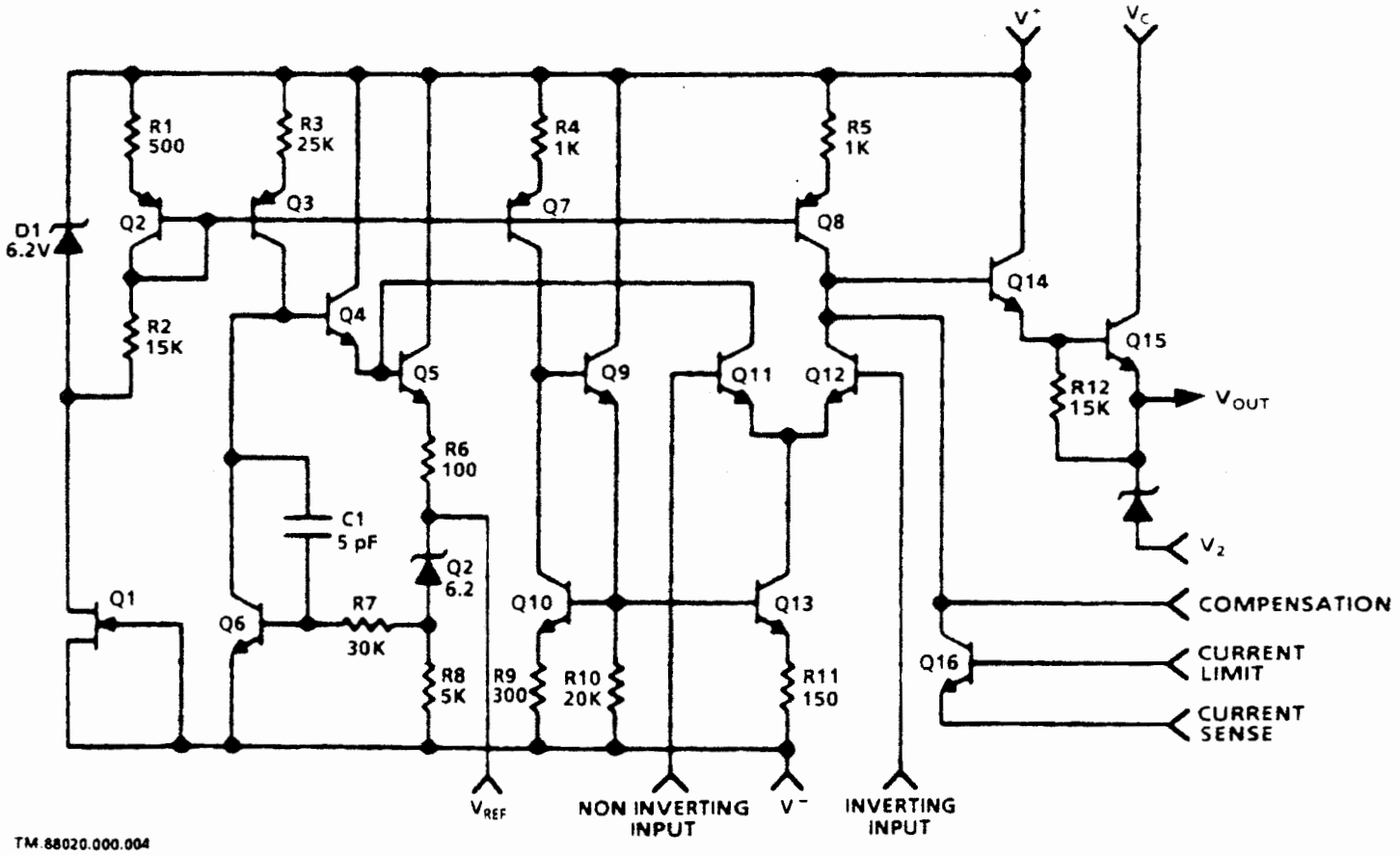
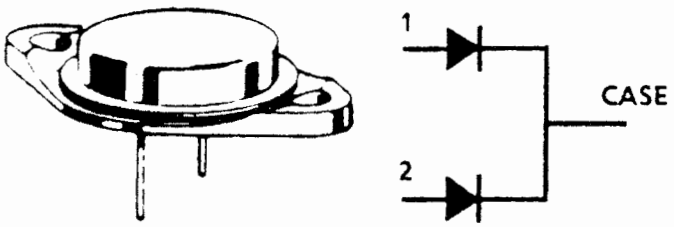


Figure 3-57. Voltage Regulator



CASE 11-03
TO-203AA METAL

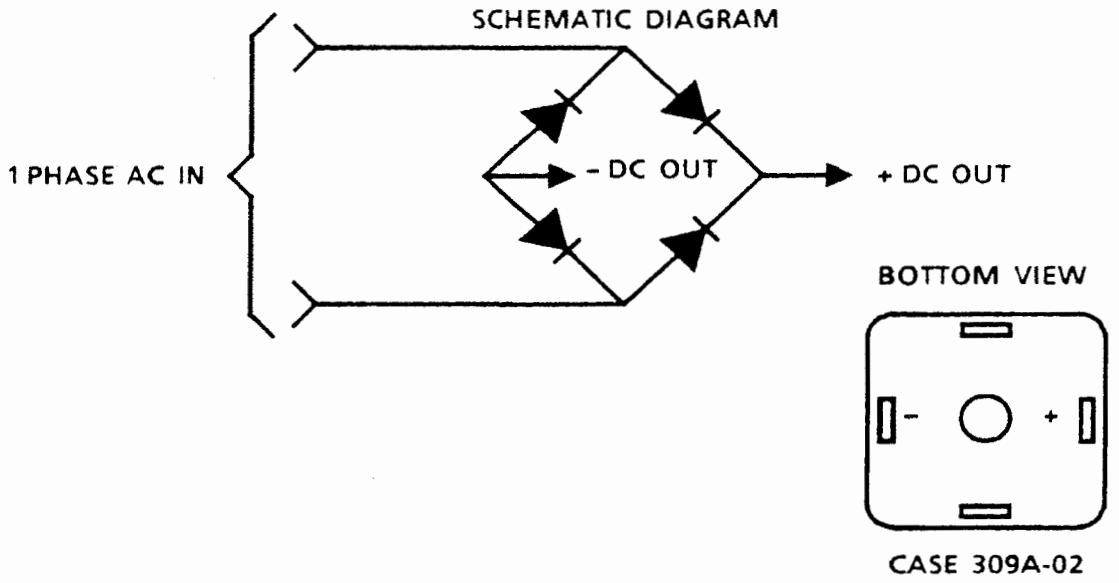
STYLE: PIN 1, ANODE 1
PIN 2, ANODE 2
CASE, COMMON CATHODE

MAXIMUM RATINGS

RATING	Symbol	SD241	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	45	Volts
Average Rectified Forward Current Per Device (Rated V_R) TC = 105°C Per Diode	I_O	30 15	Amps
Peak Repetitive Forward Current, Per Diode (Rated V_R, Square Wave, 20 kHz)	I_{FRM}	30	Amps
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfway, single phase, 60 Hz)	I_{FSM}	400	Amps
Peak Repetitive Reverse Current, Per Diode (2.0 µs, 1.0 kHz)	I_{RRM}	2.0	Amps
Operating Junction Temperature	T_J	- 65 to + 150	°C
Storage Temperature	Tstg	- 65 to + 175	°C
Peak Surge Junction Temperature (Forward Current Applied)	$T_{J(pk)}$	175	°C
Voltage Rate of Change (Rated V_R)	dv/dt	1000	V/µs

TM.88020.000.005

Figure 3-58. Schottky Barrier Power Rectifier



MAXIMUM RATINGS

Rating (Per Diode)	Symbol	Quantity	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	400	Volts
Working Peak Reverse Voltage	V_{RWM}	400	Volts
DC Blocking Voltage	V_R	400	Volts
DC Output Voltage Resistance Load Capacitive Load	 Vdc Vdc	 250 400	 Volts Volts
Sine Wave RMS Input Voltage	V_R(RMS)	280	Volts
Average Rectified Forward Current (Single phase Bridge resistive load. 60 Hz, TC = 55°C)	I_O	35	Amp
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions)	I_{FSM}	400	Amp
Operating and Storage Junction Temperature Range	T_J, T_{stg}	- 60 To + 175	°C

TM.88020.000.006

Figure 3-59. Single-Phase Full-Wave Bridge Rectifier

CHAPTER 4

SCHEDULED MAINTENANCE

4-1. INTRODUCTION.

This chapter contains preventive maintenance procedures for the Keyboard-Printer to be accomplished on a scheduled basis. Included is a scheduled maintenance action index and procedures required to inspect and clean the equipment.

NOTE

The scheduled maintenance instructions in this manual are intended to duplicate those furnished in the Planned Maintenance System (PMS). In case of conflicts, the PMS documentation takes precedence. Such conflicts should be reported immediately on the user comment sheet in accordance with the maintenance procedures for this manual.

4-2. SCHEDULED MAINTENANCE ACTION INDEX.

A list of scheduled maintenance actions is contained in table 4-1. The periodicity column gives the scheduled interval for performance of these procedures. The periodicity symbols are as follows:

INTERVAL	SYMBOL
Daily	D
Weekly	W
Monthly	M

The maintenance action column lists the maintenance action which corresponds to the periodicity symbol in column 1, and the reference column states the number of the table that contains the procedure listed in column 2.

4-3. PREVENTIVE MAINTENANCE PROCEDURES.

Procedures required to clean and inspect the Keyboard-Printer are contained in tables 4-2, 4-3, and 4-4. Lubrication of the Print Mechanism is given in table 4-4. Upon completion of preventive maintenance procedures, perform the Maintenance Turn-on Procedure listed in table 5-3.

NOTE

If yellow bond paper is used, increase maintenance actions in tables 4-3 and 4-4 to bi-weekly and bi-monthly, respectively.

WARNING

When using alcohol for cleaning, adequate ventilation must be provided. Avoid inhalation of the fumes and prolonged skin contact.

Wear protective eye gear when using pressurized air.

Table 4-1. Scheduled Maintenance Action Index

Periodicity	Maintenance action	Reference
D & W	Cleaning	Tables 4-2, 4-3
M	Air Filter Cleaning	Table 4-4
M	Lubrication	Table 4-4
D	Inspection	Table 4-2

Table 4-2. Daily Preventive Maintenance Procedures

Type maintenance	Material required	Level personnel	Procedures
Inspect Ribbon Cassette	Cassette	ET/RMSN	Inspect printout visually. If the characters are not discernible, replace ribbon cassette (figure 6-2) in accordance with table 2-8.
Inspect Paper Roll	Paper Roll	ET/RMSN	Inspect visually. If paper roll (figure 2-8) is low, replace in accordance with table 2-8.
Test Control Panel Indicators	Lamps	ET/RMSN	Turn on equipment, if indicators (figure 2-1) fail to illuminate, replace lamps in accordance with table 2-8.
Test Print Mechanism Module Lights (DS1, DS2)	Lamps	ET/RMSN	Adjust copy illumination control (COPY ILLUM). Replace faulty lamp (figure 6-2) in accordance with table 2-8.

Table 4-2. Daily Preventive Maintenance Procedures-Continued

Type maintenance	Material required	Level personnel	Procedures
Verify Configuration Panel Switch Settings	None	ET/RMSN	During turn-on procedure the printout should be used to verify the switch (figure 2-2) positions (table 2-4, steps 3 through 5). If printout is incorrect, refer to Chapter 5.
Verify Blower Operation	None	ET/RMSN	Feel for air flow from vent (figure 6-5) at right side of Keyboard-Printer, figure 6-5, view A. If there is no air flow, refer to Chapter 5.
Verify Print Function	None	ET/RMSN	Set the BITE switch (figure 2-1) to ON, printout shall conform to figure 2-4. If printout is incorrect, refer to Chapter 5. If print contrast is poor, adjust carriage shaft lever (figure 6-2).

Table 4-3. Weekly Preventive Maintenance Procedures

Type maintenance	Material required	Level personnel	Procedures
Clean Platen or Paper Roller	Alcohol type TT-I-735, Lintless Cloth or Brush	ET/RMSN	Clean platen (figure 6-7) or paper rollers (figure 6-8) with alcohol on lintless cloth or brush.
Clean Margin Sensor and Paper Low Sensor	Alcohol type TT-I-735, Lintless Cloth or Brush	ET/RMSN	Wipe clean the left margin sensor (figure 6-2) and paper low sensor (figure 6-7) with alcohol on lintless cloth or brush.

Table 4-4. Monthly Preventive Maintenance Procedures

Type maintenance	Material required	Level personnel	Procedures
Clean Print Mechanism	Vacuum Cleaner	ET/RMSN	Vacuum paper dust from the print mechanism (figure 6-2) and inside the front cover.
Clean Exterior Case	Lintless Cloth	ET/RMSN	Wipe the case (figure 1-1) with dry lintless cloth.
Clean Switches	Bristle Brush	ET/RMSN	Clean the switches (figures 2-1, 2-2) with soft bristle brush.
Clean Air Filter	Water and soap	ET/RMSN	Remove the filter (figure 6-9) and wash with hot soapy water. Blow dry with low pressure (25 PSI) air (paragraph 6-4.14).
Clean and Lubricate Carriage Shaft	Machine Oil type MIL-M-6085 and Lintless Cloth	ET/RMSN	Wipe the carriage shaft (figure 6-8) clean with a lintless cloth. Apply several drops of MIL-type light machine oil. Move carriage left and right to distribute oil on carriage shaft. Wipe excess oil off shaft with a lintless cloth.
Clean Printhead Guide Bar	Alcohol type TT-I-735, Lintless Cloth	ET/RMSN	Wipe printhead guide bar (figure 6-8) clean with alcohol on lintless cloth.

Table 4-4. Monthly Preventive Maintenance Procedures-Continued

Type maintenance	Material required	Level personnel	Procedures
Clean Printhead	Alcohol type TT-I-735, Bristle Brush, Lintless Cloth	ET/RMSN	Move printhead carriage assembly to center of unit. Remove cassette ribbon. Remove two (2) panhead screws used to secure printhead to carriage assembly. Turn printhead over on a lint-free cloth and clean and flush print needles with alcohol and a bristle brush, wipe dry, reattach printhead with hardware. Install the cassette ribbon and run BITE.

CHAPTER 5

TROUBLESHOOTING

5-1. INTRODUCTION.

This chapter provides the troubleshooting information for the Keyboard-Printer. The troubleshooting information contained in this chapter is based on the built-in automatic testing capabilities of the equipment. Organizational-level maintenance is accomplished by the technician following the maintenance turn-on procedures contained in table 5-3. Table 5-3 references the fault isolation diagram the technician should follow if a fault is identified in performance of a step. Intermediate-level maintenance is contained in table 5-4.

5-2. TROUBLESHOOTING INDEX.

The troubleshooting index is contained in table 5-1 and identifies for the technician the supporting data for troubleshooting each of the identified functions at the organizational-level.

5-3. RELAY, LAMP, AND PROTECTIVE DEVICE INDEX.

The Keyboard-Printer operates without relays. The lamp index, table 5-2, lists the reference designation, functional name, energizing voltage and troubleshooting diagram for the lamps contained in the Keyboard-Printer. A single protective device, circuit breaker CB1, is used to protect the Keyboard-Printer. It is located on the Keyboard-Printer Control Panel and labeled POWER ON/OFF. If the Keyboard-Printer draws in excess of 7 amps current, CB1 will open, removing primary power from the equipment.

5-4. MAINTENANCE TURN-ON PROCEDURE.

The maintenance turn-on procedure for the Keyboard-Printer, table 5-3, provides the technician with a step-by-step procedure for identifying failed

Table 5-1. Troubleshooting Index Teletypewriter Set AN/UGC-136BX

Functional area	Troubleshooting paragraph	Troubleshooting diagram	Functional description paragraph	Alignment/ adjust paragraph
BITE	5-5.1	FO 5-4	3-7	6-2.1, 6-3.2
Compose/edit	5-5.2	FO 5-3	3-6	None
Control	5-5.3	FO 5-5	3-8	None
Power Distribution	5-5.4	FO 5-6	3-9	None
Receive	5-5.5	FO 5-2	3-5	None
Transmit	5-5.6	FO 5-1	3-4	None

Table 5-2. Indicator Lamp Index

Reference designation	Functional name	Energizing voltage	Troubleshooting diagram (fig. no.)
1A1A1DS1/DS2	Copy Illumination	+28 Vdc	FO 5-6
1A1A2MP3DS1	PARITY	+28 Vdc	FO 5-6
1A1A2MP3DS2	PAPER LOW	+28 Vdc	FO 5-6
1A1A2MP3DS4	RCV BUSY	+28 Vdc	FO 5-6
1A1A2MP3DS5	POWER	+28 Vdc	FO 5-6
1A2A1DS1	REC UNPRT	+5 Vdc	FO 5-14
1A2A1DS2	C/E ACT	+5 Vdc	FO 5-14
1A2A1DS3	XMIT ACT	+5 Vdc	FO 5-14
1A2A1DS4	EOL	+5 Vdc	FO 5-14
1A2A1DS5	SHF LOCK	+5 Vdc	FO 5-14

functions within the equipment. If a step fails, the technician is referenced to a troubleshooting diagram or removal procedure for correcting the failure. If the problem is not corrected by the referenced material, it is beyond the level of repair authorized at the organizational-level and should be sent to a higher level repair facility.

5-5. ORGANIZATIONAL-LEVEL TROUBLESHOOTING PROCEDURES.

The maintenance philosophy for organizational-level troubleshooting is limited to module replacement. The following paragraphs provide information for organizational troubleshooting.

5-5.1 BITE Function Troubleshooting. For fault isolation of the BITE function, perform the maintenance turn-on procedure, table 5-3. Refer to troubleshooting diagrams as required.

5-5.2 Compose/Edit Function Troubleshooting. For fault isolation of the compose/edit function, perform the maintenance turn-on procedure, table 5-3. Refer to troubleshooting diagrams as required.

5-5.3 Control Function Troubleshooting. For fault isolation of the control function, perform the maintenance turn-on procedure, table 5-3. Refer to troubleshooting diagrams as required.

5-5.4 Power Distribution Function Troubleshooting. For fault isolation of the power distribution function, perform the maintenance turn-on procedure, table 5-3. Refer to troubleshooting diagrams as required.

5-5.5 Receive Function Troubleshooting. For fault isolation of the receive function, perform maintenance turn-on procedure, table 5-3. Refer to the removal procedure as required.

5-5.6 Transmit Function Troubleshooting. For fault isolation of the transmit function, perform maintenance turn-on procedure, table 5-3. Refer to removal procedure as required.

5-6. INTERMEDIATE-LEVEL TROUBLESHOOTING PROCEDURES.

These procedures are authorized for intermediate-level (or higher) activities (tender/shore facilities/depot). Repair at the intermediate-level is limited to the print mechanism A1A1, control panel (part of A1A2), and teleprinter chassis A1A2. It is assumed that these modules were found to be faulty during performance of the maintenance turn-on procedure, table 5-3. Table 5-4 references the appropriate fault isolation procedure to be used in troubleshooting the assemblies listed above. If the problem is believed to be a wiring fault, refer to the schematic diagram and detailed theory references listed in table 5-4. If problem is not corrected by using these procedures, it is beyond the level of repair authorized. Send faulty unit to depot facility for repair.

5-7. MODULE LOCATIONS.

The physical location of the modules of the Keyboard-Printer are identified in figure 6-2.

5-8. POWER SUPPLY MODULE TEST POINTS.

The test point locations of the Power Supply module (figure 5-1) can be accessed only with the cover removed. Table 5-5 provides references for test point measurements.

Table 5-3. Maintenance Turn-on Procedure

Step	Observe	Reference
	WARNING Death or injury may occur if the power cable safety ground wire is not connected to a suitable AC receptacle safety ground return. Also, an additional safety strap must be connected to ground stud (E1) at the rear of the Keyboard-Printer.	
Preliminary Procedure		
1. Set POWER switch on Keyboard-Printer Control Panel to OFF.		
2. Set PRINT ENABLE switch on Keyboard to OFF.		
3. Release two cover fasteners on front of the Keyboard-Printer cover and raise cover to latch-open position.		
4. Check Keyboard-Printer for proper installation of modules.		

Table 5-3. Maintenance Turn-on Procedure-Continued

Step	Observe	Reference
Preliminary Procedure -continued		
5. Remove all obstructions from Keyboard and Print Mechanism.		
6. Check paper supply and install new roll of paper as required.	Paper supply properly installed.	Table 2-8, steps 1 through 10.
7. Check ribbon cassette.	Ribbon cassette properly installed.	Table 2-8, steps 11 through 16.
8. Ensure configuration Control Panel switches are set to proper positions.		
9. Move Carriage Assembly left and right while observing mechanism.	Belts should be free of all obstructions and timing disk should rotate without interference.	Paragraph 6-3.1, 6-3.2.

CAUTION

Ensure carriage shaft lever is forward and properly adjusted (para 6-2.2). Firing of printhead into free air may damage printhead.

10. Close cover and secure fasteners.		
Organizational-Maintenance		
Turn-on Procedure		
11. Set POWER switch on Keyboard-Printer Control Panel to ON.	All indicators, except SHF LOCK, illuminate and an audible alarm sounds for approximately one second.	Figure FO 5-16

Table 5-3. Maintenance Turn-on Procedure-Continued

Step	Observe	Reference
Turn-on Procedure -continued		
12. Observe initialization/configuration printout.	Printout is correct and aligned to lefthand margin.	Figure FO 5-17
13. Check Keyboard-Printer for fan operation.	Air flow from vent on right side of Keyboard-Printer.	Figure FO 5-16
14. Set BITE switch to ON and hold till lamps illuminate. Release BITE switch.	Lamp test Test message prints in 35 seconds or less. Test message is centered on the hard surface of the platen and character quality is complete and acceptable.	Figure FO 5-18
NOTE Perform steps 15 and 16 only if a remote terminal (e.g. page display) is connected to port 3. Otherwise proceed to step 17.		
15. Press and hold CTRL key while pressing 4, LOC/REM key.	After approximately 35 seconds "LOCAL KEYBOARD IS ACTIVE" will be printed, if page display is not active. If page display is active, "PAGE DISPLAY BUSY" will be printed.	Figure FO 5-19
16. Reinitialize port 3 for one-line display (see table 2-4, steps 13 through 17).	Port 3 initialization data is printed.	
17. Enter compose mode by depressing EDIT key and EXIT/ENTER key.	MPN 1 appears on line display and cursor is flashing.	Replace A2 per para 6-4.1.

Table 5-3. Maintenance Turn-on Procedure-Continued

Step	Observe	Reference
Turn-on Procedure -continued		
18. Transmit a test message from the system to the Keyboard-Printer to check the receiver mode.	RCV BUSY lamp will flash as characters are being received. REC UNPRT indicator illuminates when characters are stored in memory.	Replace A1A7 per para 6-4.2.
19. Set PRINT ENABLE switch to ON.	Received test message printed.	Replace A1A8 per para 6-4.2.
	Test message printed correctly.	Replace A1A7 per para 6-4.2.
20. Transmit a test message from the Keyboard-Printer to check the transmit mode.	XMIT ACT indicator illuminated and test message is received by the system.	Replace A1A7 per para 6-4.2.

Table 5-4. Intermediate Fault Isolation

Assembly	Detailed theory	Fault isolation diagram	Schematic diagram
Chassis	Para 3-11	FO 5-21	FO 5-7
Control Panel	Para 3-8	FO 5-22	FO 5-7
Print Mechanism	Para 3-12	FO 5-20	FO 5-8

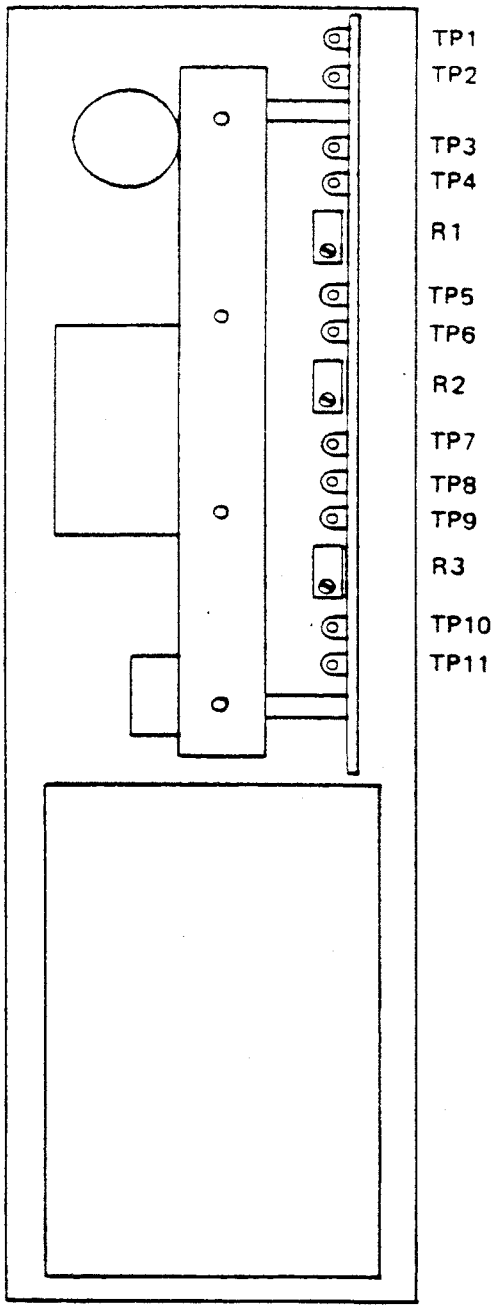


Figure 5-1. Power Supply Test Point Location

Table 5-5. Power Supply Test Point Measurements

Test point	Measurement	Adjust
1	+50, +10, -0 Vdc	None
2	+28 ±3.0 Vdc	None
3	GND	None
4	+2.5 ±.01V	R1
5	+1.01 or 1.25 Vdc	None
6	+5 ±.25 Vdc	R2
7	+5 ±.2 Vdc	None
8	-12 ±.6 Vdc	None
9	+12 ±.6 Vdc	R3
10	-5 ±.25 Vdc	None
11	+24 ±3.0 Vdc	None

CHAPTER 6

CORRECTIVE MAINTENANCE

6-1. INTRODUCTION.

This chapter contains adjustment, alignment, removal, and replacement procedures for corrective maintenance at organizational-level and intermediate-level facilities. Intermediate-level maintenance procedures shall only be performed by authorized facilities. The disassembly procedures should only be performed to the step necessary to remove the failed part. Reassembly involves reversing the disassembly procedure from the last step performed, except where noted otherwise.

6-1.1 Setscrews. The two setscrews for the idler pulley shaft (figure 6-7, View C) are secured with Loctite. Prior to removing these setscrews, apply heat to the area, then attempt to tighten setscrews to break Loctite loose before removing setscrews. Apply Loctite to these setscrews before tightening during reassembly. The single setscrew in the carriage drive pulley (figure 6-8, View B) does not require Loctite. All of these setscrews should be torqued to 3 to 5 inch-pounds when tightening.

6-1.2 Special Tools, Test Equipment, and Materials Required. Refer to table 1-3 for test equipment required but not supplied for organizational- or intermediate-level maintenance. It will be necessary for the intermediate-level maintenance personnel to manufacture extender cables and a drilling jig for the carriage motor. The following paragraphs provide the necessary information for the manufacturing process.

6-1.3 Extender Cables. To perform intermediate-level maintenance on the Print Mechanism, it may be necessary to remove it from the Keyboard-Printer that is being used as a test station. In order to perform troubleshooting on the Printer Mechanism with it out of the test station, the use of extender cables is necessary. To manufacture the three extender cables, the following materials are required.

Nomenclature	Qty	ECI Part Number	Designator
26-pin plug	1	16-01511-115	A1A1P1-1
26-pin jack	1	16-01512-003	A1A2J8
34-pin plug	2	16-01511-116	A1A1A7P1 and A1A1A6P1
34-pin jack	2	16-01512-004	A1A2J7 and A1A2J9
Flat cable	3'	31-00379-009	N/A
Flat cable	6'	31-00379-010	N/A

The procedure for manufacturing the extender cables is as follows:

a. Separate the wires in the flat cable approximately 1 inch back from the ends.

b. Remove the hold-down clamp on the back of the 26-pin plug and jack.

c. Using the insertion tool in table 1-3, insert the wires into the plug one at a time starting with the brown wire for pin number 1.

d. Using the insertion tool, insert the wires one at a time into the jack starting with the brown wire at pin number 1.

e. Replace hold-down clamps and secure in place with screws.

f. Cut 6 foot 36-wire cable into two 3 foot pieces.

g. Repeat steps a through e for both 34-pin cables.

h. Using a multimeter, check continuity of cables and repair as needed.

6-1.4 Drilling Jig. When replacing the carriage motor, it is necessary to drill the actuator shaft to install the carriage stepper motor gear. To safely and accurately drill the actuator shaft, it is necessary to use a drilling jig to hold the motor. Manufacture the drilling jig using Carriage Motor Drill Jig Manufacturing Drawing, figure FO 6-1.

Section I

ADJUSTMENTS AND ALIGNMENTS

6-2. ADJUSTMENTS.

Adjustment procedures are provided for the BITE (para 6-2.1) and for the printhead (para 6-2.2).

CAUTION

Ensure carriage shaft lever is forward and properly adjusted (para 6-2.2). Firing of printhead into free air may damage printhead.

6-2.1 BITE. When the BITE test pattern runs longer than 35 seconds, perform the following steps until the test pattern does not exceed 35 seconds. Then return to step 14 of the Maintenance Turn-on Procedure, table 5-3.

a. Clean and lubricate the entire carriage shaft per table 4-4.

b. Check BITE test pattern time. If time still exceeds 35 seconds, continue with step c.

c. Adjust the timing disc as follows:

(1) Loosen the locking screw on the center face of the timing disc assembly (figure 6-1). Do not remove.

(2) Initiate BITE test pattern.

(3) Adjust the timing by turning, CW or CCW, the timing disc adjusting screw (figure 6-1). Adjust for smooth even operation in both forward and reverse carriage travel. Tighten locking screw.

d. Recheck BITE test pattern time. If time still exceeds 35 seconds or test message is not centered on page, proceed to paragraph 6-3.2 and align the timing disc or the left margin sensor.

6-2.2 Printhead.

a. Remove Print Mechanism module (para 6-4.5).

b. Remove ribbon cassette, and position carriage assembly at center of platen.

c. Push carriage shaft lever (figure 6-8, View B) towards rear of Print Mechanism module as far as it will go.

d. Measure clearance between printhead pin tips and surface of a single-ply paper on the platen (ribbon cassette removed). Clearance should be within .011 ±.001 inch. If not, loosen three screws securing carriage assembly (figure 6-8, View B), use a 0.011-inch shim between printhead and platen (with paper) to provide required clearance, and tighten the three screws.

e. Move carriage assembly to within approximately 1 inch of right end

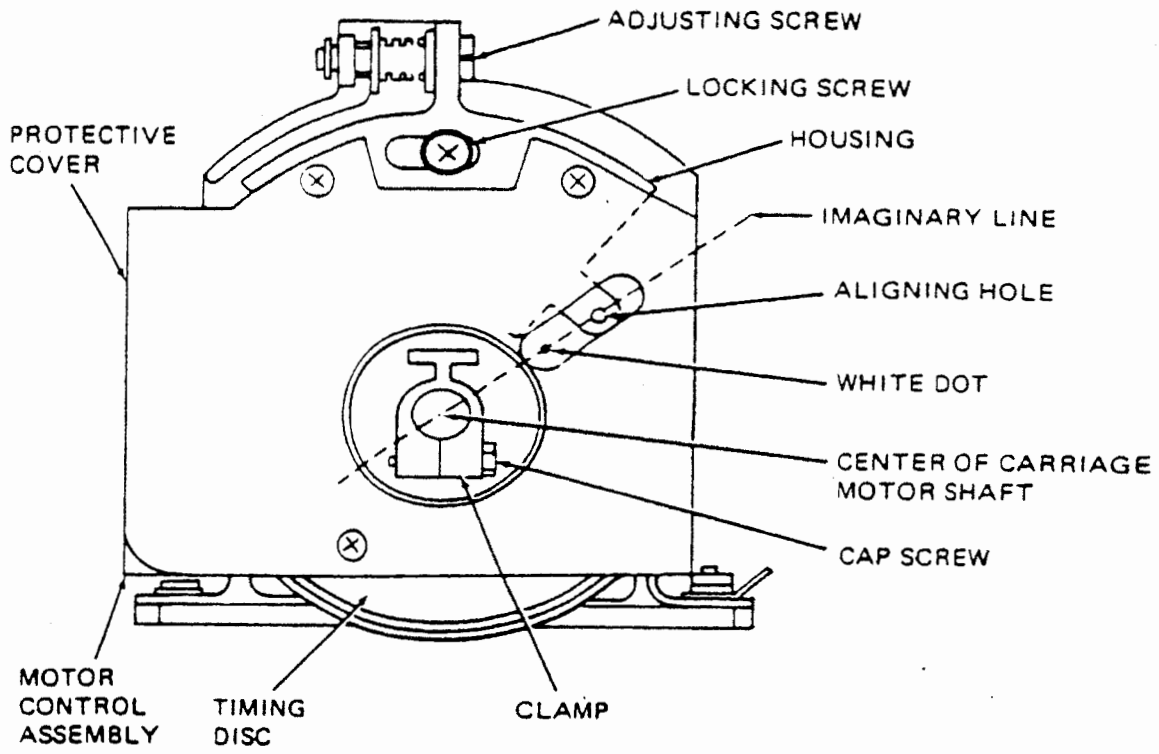


Figure 6-1. Timing Disc Alignment

of platen (avoid roller area at end of platen), and measure clearance between printhead and platen. Note this clearance.

f. Repeat step e with carriage assembly within approximately 1 inch of left end of platen.

g. The clearance at each end of the platen, as measured in steps e and f, should be within 0.002 inch of each other. This determines the parallelism of the platen and carriage shaft. If parallelism is not within tolerance, adjust carriage shaft as follows.

(1) Remove three carriage shaft retaining screws and flat washers securing carriage shaft retaining plate at left side of Print Mechanism module (figure 6-8, View B), but leave retaining plate mounted on end of carriage shaft.

(2) With printhead at left end of platen as in step f, rotate carriage shaft retaining plate (figure 6-8, View B) clockwise or counterclockwise to obtain required clearance at left end of platen (within 0.002 inch of clearance measured at right end of platen).

(3) Note that there are six screw holes in the carriage shaft retaining plate. There are only three matching holes in the chassis of the Print Mechanism module. Rotate carriage shaft retaining plate the least distance clockwise or counterclockwise to line up three of the plate holes with the three chassis holes. The parallelism of 0.002 inch should be maintained.

(4) Secure carriage shaft retaining plate with three screws and flat washers.

(5) Recheck clearance at both right end and left end of platen to ensure that clearances are 0.002 inch of each other. If not, repeat step (1) through this step as necessary to obtain required parallelism.

(6) Recheck clearance between printhead and platen (with paper). Clearance should be 0.011 ±.001-inch.

(7) Adjust the height of the printhead by loosening the eccentric nut (figure 6-8, View B) and rotating the eccentric to raise or lower the printhead so the center pin of the printhead is centered on the platen surface.

(8) Tighten the eccentric nut (figure 6-8, View B).

(9) Move carriage assembly (figure 6-2) to left brake position. Move the carriage shaft lever (figure 6-2) toward the front of the Print Mechanism until the printhead is at the maximum distance from the platen. Set the detector stop (figure 6-2) on the carriage assembly (figure 6-8, View B) for .014 ±0.002 inch clearance at the highest point of the support beam on the Print Mechanism.

(10) If available, connect the three extender cables, (see para 6-1.3) ensuring the correct cable is plugged into the proper jack in the Keyboard-Printer. If extender cables are not available, replace Print Mechanism module (para 6-4.5).

(11) After all eccentric adjustments are made, recheck the printhead pin to paper spacing for .011 ±.001 inch with the carriage shaft lever in the rearmost position. The printhead can be adjusted with the carriage shaft lever being moved toward and away from the platen to obtain acceptable print quality.

6-3. ALIGNMENTS.

Proper belt alignment is necessary for smooth carriage operation with no interference. Correct timing disc alignment is necessary for correct BITE Test Message time and centering of the BITE Test Message on the hard surface of the platen. Perform belts and timing disc alignments after replacement of the carriage assembly belt and/or the carriage motor belt. After belts and timing disc are aligned it may be necessary to reselect the printhead fire or motor clock resistors. If necessary to correct BITE operation, perform paragraphs 6-3.3 and 6-3.4.

6-3.1 Belts.

a. After replacement of either of the two belts, loosen the setscrew in the carriage drive pulley and position the carriage drive pulley (figure 6-8, View B) in the center of the carriage drive pulley shaft, so that the carriage assembly belt does not touch the carriage stepper motor gear. Maintain parallelism of carriage assembly belt to carriage shaft.

b. If necessary, rotate the carriage drive pulley shaft so that the setscrew in the carriage drive pulley will seat on the flat part of the shaft, then tighten the setscrew to a torque of 3 to 5 inch-pounds.

c. Move carriage assembly manually in both directions and observe that carriage assembly belt does not touch carriage stepper motor gear or carriage motor belt.

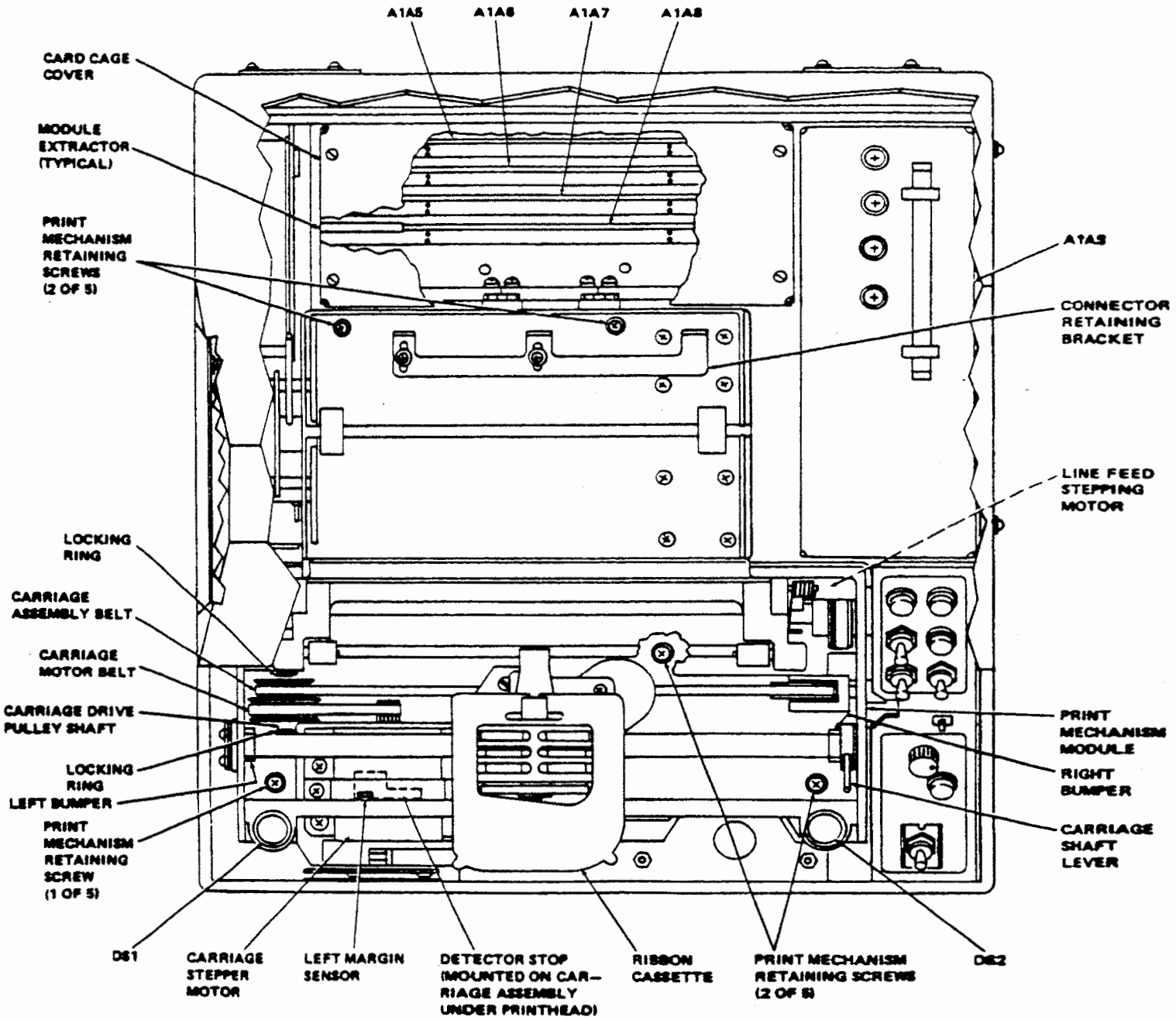


Figure 6-2. Printer, Top View

d. If interference occurs, loosen setscrew, move carriage drive pulley rearward slightly and repeat steps b and c until correct alignment of step a is achieved.

6-3.2 Timing Disc and Left Margin Sensor. Remove Print Mechanism as instructed in para 6-4.5. For timing disc alignment only, proceed from step c.

a. Loosen left margin sensor hardware (figure 6-2) and move sensor in the direction of the larger margin, which will center the test message on the page.

b. Tighten the left margin sensor hardware (figure 6-2) and then perform timing disc alignment.

c. Position carriage assembly so that left edge of the detector stop is located at left edge of left margin as shown in figure 6-2.

d. Do not move carriage assembly while checking for position of white dot on timing disc. The white dot should be positioned on an imaginary line from the center of the carriage motor shaft to the aligning hole as shown in figure 6-1.

e. If the white dot is not present, loosen the cap screw until the clamp on the carriage motor shaft is loose enough to allow the timing disc to be moved.

CAUTION

Use extreme care while turning the timing disc to avoid bending its edges.

f. Gently turn the timing disc until the white dot is present as shown in figure 6-1. Do not allow the motor shaft and carriage assembly to move from the position achieved in step c above.

g. With the white dot positioned, gently and slowly tighten the cap screw on the clamp. Ensure the clamp is positioned at the end of the carriage motor shaft.

h. Move carriage assembly left and right and check for timing disc interference with the housing.

j. If interference is detected, the timing disc must be moved slightly inward or outward to eliminate interference. Repeat steps c through j above until proper alignment and no interference results.

k. Replace Print Mechanism module (para 6-4.5).

l. Perform BITE adjustment per para 6-2.1.

6-3.3 Printhead Fire Resistor Selection. If the printhead fails to perform properly or a part is replaced on the Motor Control circuit card assembly 1A1A1A1A1A1, it may be necessary to reselect the printhead fire resistor 1A1A1A1A1A1R1. This is accomplished using the following procedure.

a. Remove Print Mechanism module (para 6-4.5).

b. Remove three Phillips head screws from protective cover and remove protective cover.

c. Connect extender cables (para 6-1.3) between card cage assembly and Print Mechanism module.

d. Remove R1 from Motor Control CCA.

e. Connect test equipment as shown in figure 6-3.

f. Set decade box to a value of 1000 ohms.

g. Initiate a BITE routine and observe the waveform displayed on the oscilloscope (figure 6-4).

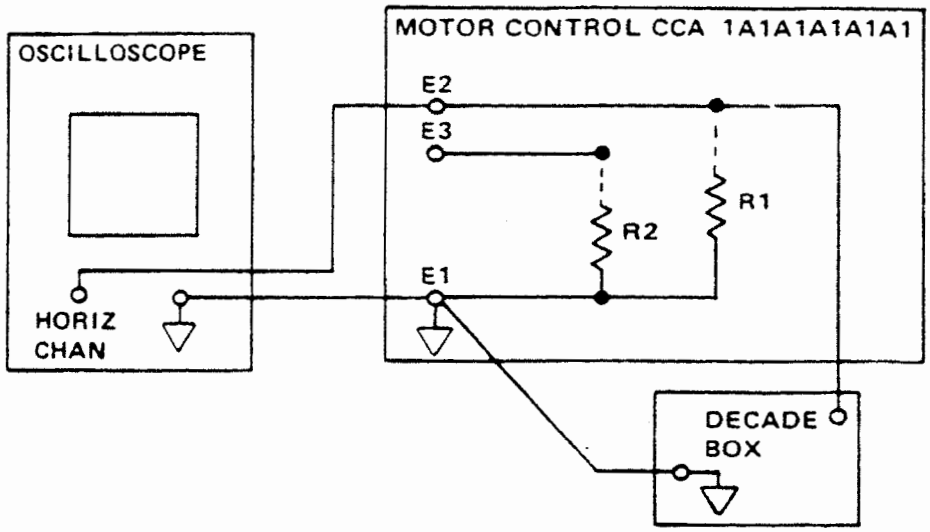


Figure 6-3. Resistor Selection Test Setup

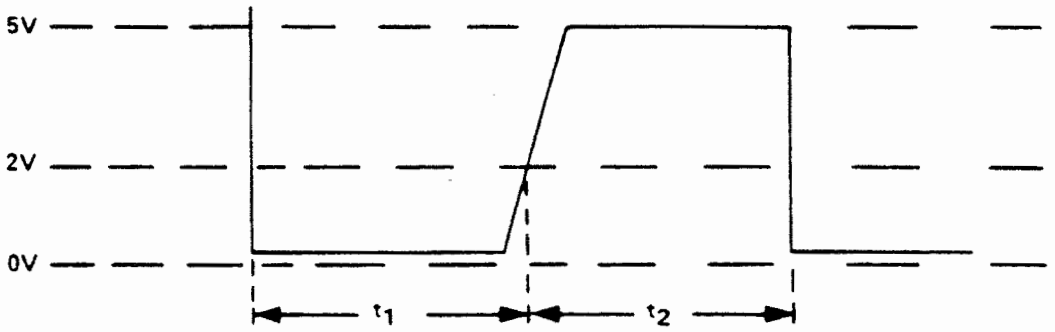


Figure 6-4. Timing Diagram

h. Adjust the decade box to the standard values shown in table 6-1 until

$$\frac{T1}{T2} = 1.5 \pm 0.2.$$

j. Select the correct resistor and nstall it on the Motor Control CCA.

k. Perform steps a through c in reverse order for replacement.

6-3.4 Motor Clock Resistor Selection. If carriage motor fails to perform properly or a part is replaced on the Motor Control circuit card assembly A1A1A1A1A1, it may be necessary to reselect the motor clock resistor A1A1A1A1A1R2. This is accomplished using the following procedure.

a. Remove Print Mechanism module (para 6-4.5).

b. Remove three Phillips head screws from protective cover and remove protective cover.

c. Connect extender cables (para 6-1.3) between card cage assembly and Print Mechanism module.

d. Remove R2 from Motor Control CCA.

e. Connect test equipment as shown in figure 6-3 except the decade box and oscilloscope should be connected to the E3 terminal.

f. Set decade box to a value of 1000 ohms.

g. Initiate the BITE routine and observe the waveform displayed on the oscilloscope (figure 6-4).

h. Adjust the decade box to the standard values shown in table 6-1 until

$$\frac{T1}{T2} = 1.5 \pm 0.2.$$

j. Select the correct resistor and install it on the Motor Control CCA.

k. Perform steps a through c in reverse order for replacement.

Table 6-1. Resistor Selection Table

Selected value	Part number
56 ohms	10-00366-054
68 ohms	10-00366-037
82 ohms	10-00366-055
100 ohms	10-00366-001
120 ohms	10-00366-065
150 ohms	10-00366-049
180 ohms	10-00366-057
220 ohms	10-00366-020
270 ohms	10-00366-046
330 ohms	10-00366-011
390 ohms	10-00366-045
470 ohms	10-00366-012
560 ohms	10-00366-167
680 ohms	10-00366-066
820 ohms	10-00366-034
1K ohms	10-00366-019
1.2K ohms	10-00366-026
1.8K ohms	10-00366-021
2.7K ohms	10-00366-002
3.9K ohms	10-00366-022
5.6K ohms	10-00366-028
8.2K ohms	10-00366-032
12K ohms	10-00366-031

Section II

REPAIR

6-4. REMOVAL AND REPLACEMENT.

Modules found defective during fault isolation shall be replaced by specific instructions provided in the following subparagraphs.

WARNING

Voltages as high as 115 volts are contained in the equipment discussed in this manual. Use standard safety precautions when the modules of this unit are removed from the case. Disconnect the power cable at J1 (figure 6-5, View B) before making any test connections, or before working inside the chassis.

6-4.1 Keyboard. The removal and replacement of the Keyboard (figure 1-1) is accomplished by performing the following steps.

a. Loosen the four retaining screws that secure the Keyboard to the front of the Printer.

b. Carefully separate the Keyboard from the Printer by pulling the Keyboard straight back with no twisting, keeping the assembly aligned until clear.

c. The Keyboard is replaced by reversing the above steps, using extreme caution in aligning the connectors.

6-4.2 Logic Modules. The four logic modules (A1A5, A1A6, A1A7, and A1A8 figure 6-2) are removed and replaced as follows:

CAUTION

The logic modules contain static sensitive devices. Care must be exercised to prevent electrostatic discharge which may damage the devices.

a. Open cover to full-open position.

b. Loosen four captive slotted screws securing card cage cover (figure 6-2) and remove cover.

CAUTION

Connector pins can be easily bent and equipment damaged if modules are not carefully removed and replaced.

When replacing A1A7 refer to table 8-2 for proper settings of the four switches.

c. Lift up the extractors (one is shown for A1A8 in figure 6-2) at each end of the module to be removed. Apply upward pressure to disengage module from the connector. Caution must be used to apply pressure straight up.

d. Lift the module straight up and out of the card cage assembly.

e. Replacement of the module is accomplished by reversing the above steps.

6-4.3 Paper. Paper is removed and replaced as described in table 2-8, steps 1 through 10, and can be accomplished with the power on.

6-4.4 Ribbon Cassette. The ribbon cassette can be removed and replaced when the Print Mechanism module is either removed or installed in the Keyboard-Printer, as described in table 2-8, steps 11 through 16.

6-4.5 Print Mechanism Module. The Print Mechanism module (figure 6-2), removal and replacement steps follow:

a. Open cover to lock-in position.

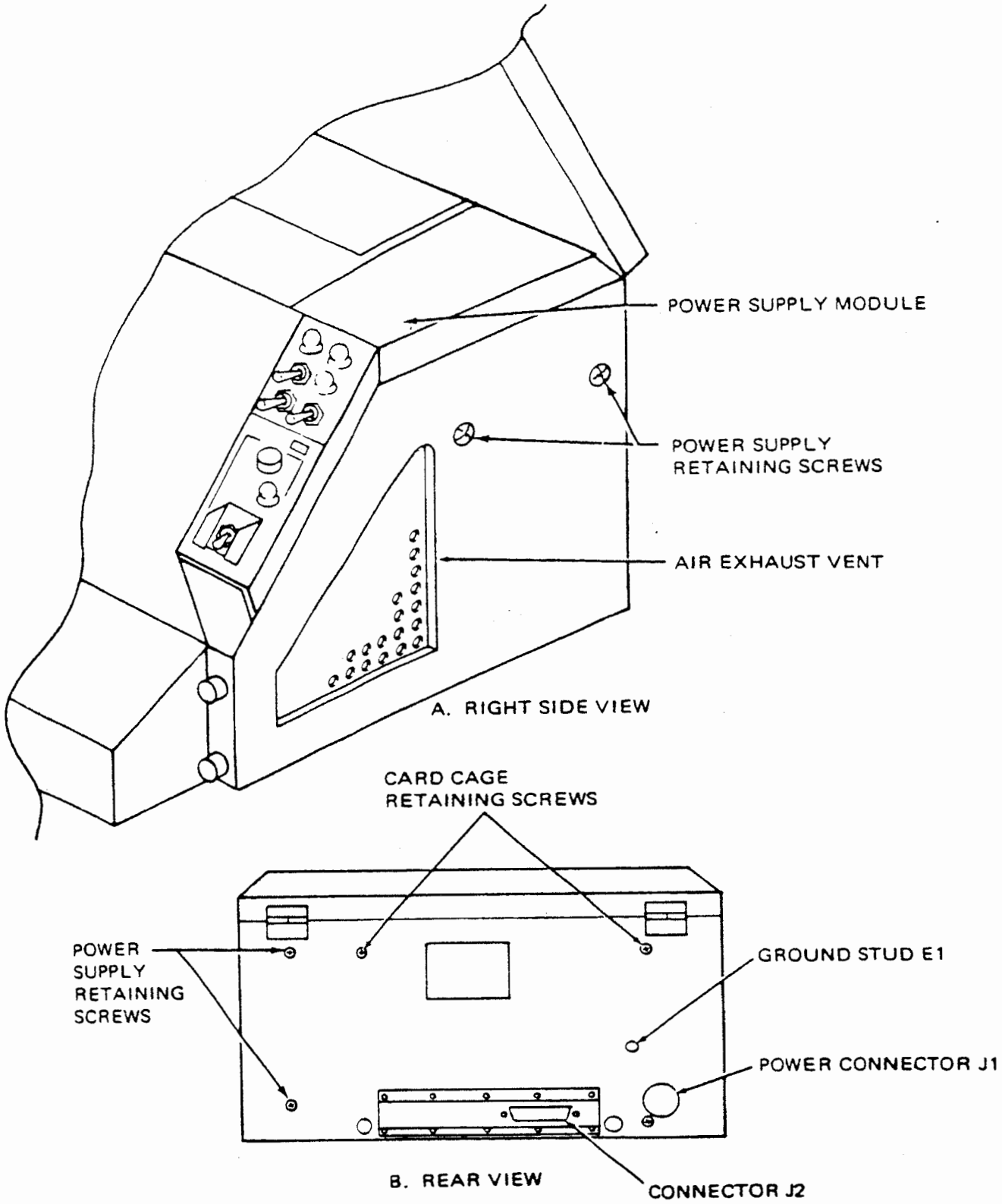


Figure 6-5. Keyboard-Printer, Side and Rear Views

CAUTION

Do not move the printhead mechanism back away from the platen when the printhead is located at the left margin. Always move the printhead horizontally to a location in center of platen before moving printhead away from platen. This procedure must be adhered to in order to avoid damage to the left margin sensing tab.

b. Carefully move printhead mechanism horizontally to the center of the platen.

c. Remove ribbon cassette, paper roll and spindle. Reference table 2-8.

d. Remove the five screws (figure 6-2) which secure the Print Mechanism module to the Keyboard-Printer.

e. Loosen two connector retaining bracket screws (figure 6-2), and slide bracket toward front of module.

f. Grasp tab on each of three connectors, and pull each connector free of its associated card cage connector.

g. Slowly lift the Print Mechanism module straight up and place it on work surface.

h. Replacement of the Print Mechanism module is accomplished by reversing the above steps.

6-4.6 Power Supply Module. Removal and replacement of the Power Supply module (A1A3, figure 6-2) shall be accomplished in accordance with the following steps:

WARNING

Voltages as high as 115 volts are contained in the equipment discussed in this manual. Use standard safety precautions when the modules of this unit are removed from the case. Disconnect the power cable at J1 (figure 6-5, View B) before making any test connections, or before working inside the chassis.

a. Open cover to full-up position.

b. Remove two panhead screws from the right side of Keyboard-Printer as shown in figure 6-5, View A.

c. Remove two panhead screws from the rear side of Keyboard-Printer (figure 6-5, View B).

CAUTION

Connector pins on the underside of the Power Supply module can be bent and damaged if care is not exercised when removing and replacing this unit.

d. Partially unseat the Power Supply module connector by grasping the rear top edge of the Power Supply module and pulling forward and upward until the Power Supply module unseats itself.

e. Carefully lift the Power Supply module using the removal strap located on top, remove it from the Keyboard-Printer, and place it on the work surface.

f. Replacement of the Power Supply module shall be accomplished by reversing the above steps, except eliminate step d.

6-4.7 Control Panels.

a. Remove Keyboard (para 6-4.1).

b. Open cover to lock-in position.

c. Remove Print Mechanism module (para 6-4.5) and set aside.

d. Disconnect connector P6 (figure 6-6) from J6 at front center of Case.

e. Remove three flathead screws on front and three flathead screws on right side that secure two Control panels, and fold out panels as far as cable slack will allow.

f. To free the two Control panels, disconnect wires from bottom of ON/OFF circuit breaker CB1 (figure 6-6) as follows:

Wire no.	CB1 terminal
W1	LINE 1
W2	LINE 2
W3	LOAD 1
W4	LOAD 2

g. Reinstall the Control panels by reversing the above steps. Use sleeving on the wires at CB1 terminals.

6-4.8 Line Feed Belt. Line feed belt removal and replacement shall be attempted only with the Print Mechanism module removed from the Keyboard-Printer. The removal and replacement steps follow:

a. Remove the Print Mechanism module (para 6-4.5).

b. Unscrew alarm bell ring (figure 6-7, View B) and remove alarm bell from its bracket on left side of paper tray.

c. Remove paper tray from Print Mechanism module by removing two screws on right side and two screws on left side of paper tray (figure 6-7, Views A and B).

d. Loosen four screws holding line feed stepping motor. Slide motor up to release tension on the line feed belt (figure 6-7, Views A and E).

e. Remove printhead guide bar retaining screws, two on each side (figure 6-7, View D).

f. Remove the platen shaft locking ring from the right end of the platen shaft (figure 6-7, View A).

g. Move the platen shaft to the left, applying pressure, which will push the left platen shaft bearing from its seat (figure 6-7, View D).

h. Slide line feed belt (figure 6-7, View E) off of platen shaft pulley and motor pulley, and pass between right end of printhead guide bar and Print Mechanism module frame. Then exit belt from frame hole at line feed stepping motor pulley (figure 6-7, View E).

j. Take new belt and insert it through frame hole at line feed stepping motor pulley (figure 6-7, View E).

k. Carefully raise the right end of the printhead guide bar and slide the belt between it and Print Mechanism module frame (figure 6-7, View E).

l. Pull belt up, loop the lower end over the line feed stepping motor pulley, and loop the upper end of the belt over the platen shaft pulley.

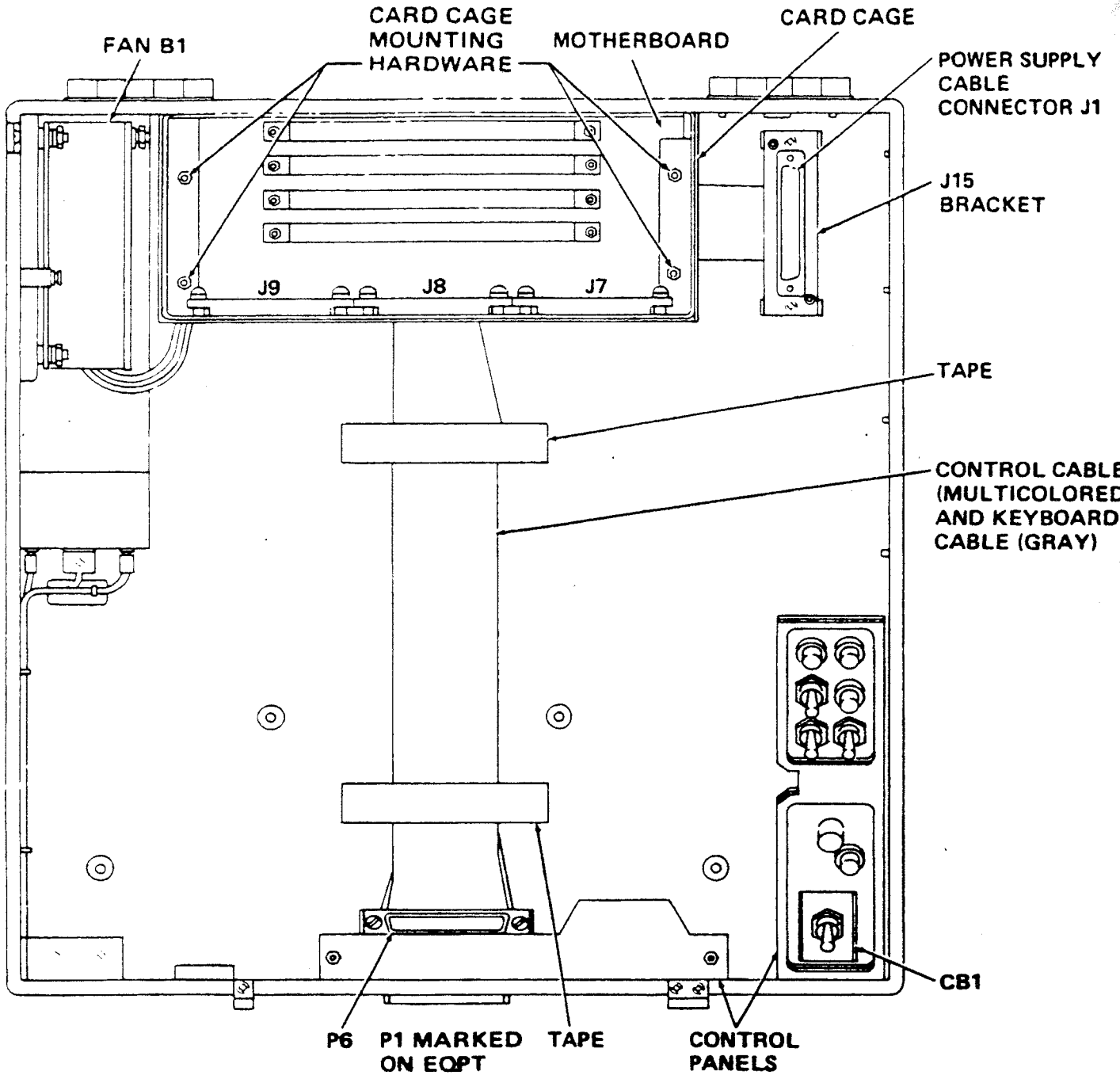


Figure 6-6. Chassis-Mounted Component Location

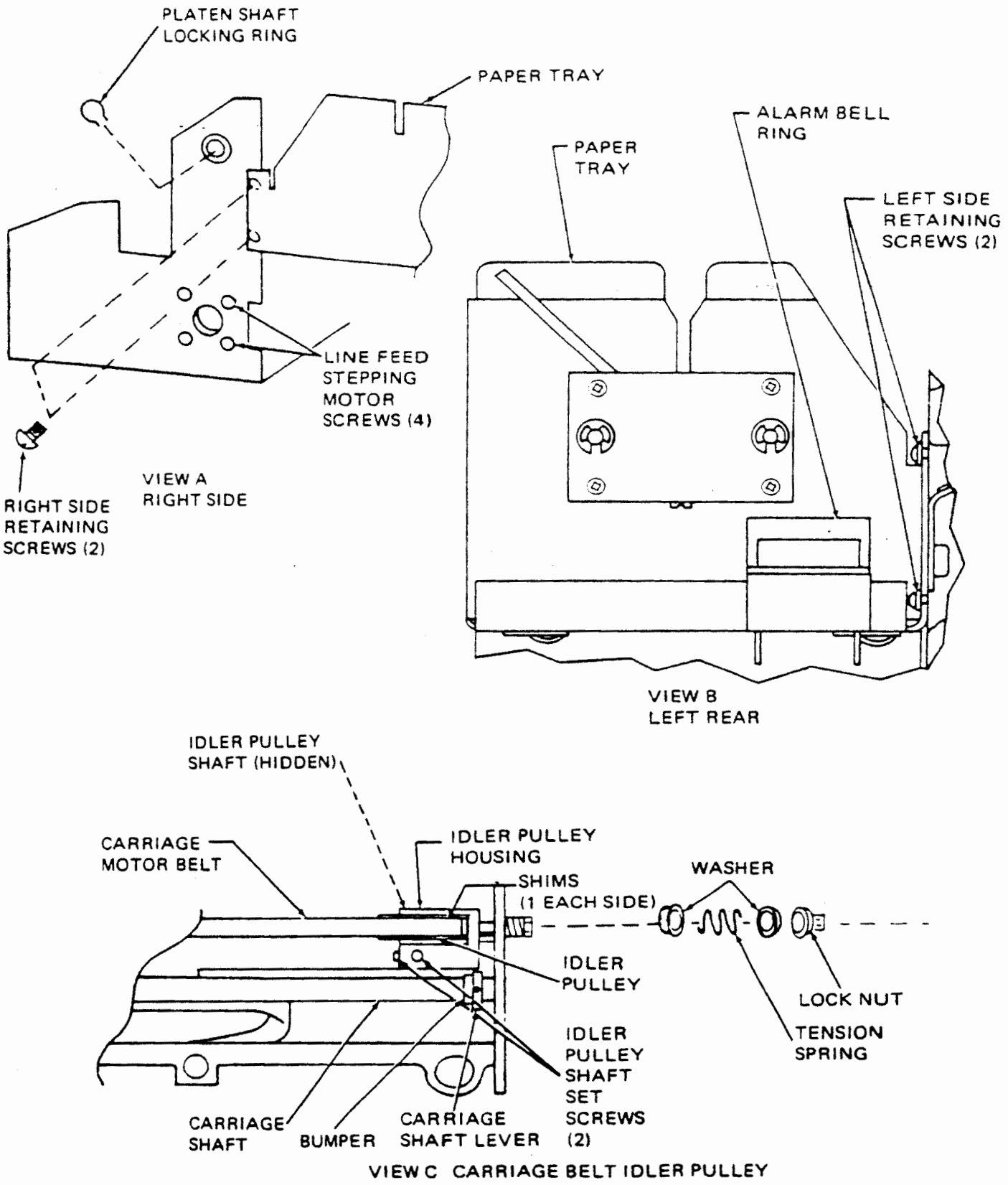


Figure 6-7. Print Mechanism Module, Carriage and Line Feed Belts (Sheet 1 of 2)

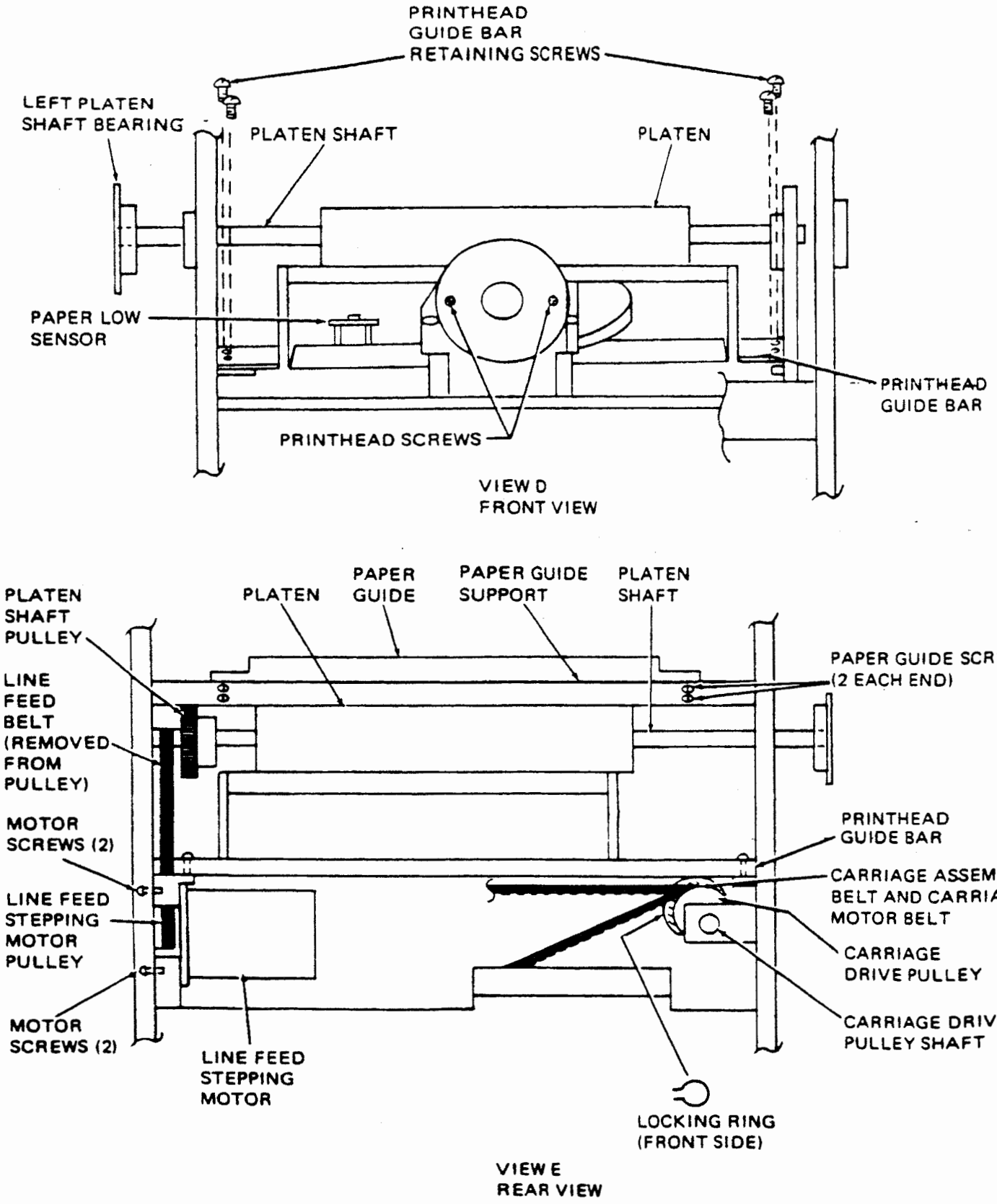


Figure 6-7. Print Mechanism Module, Carriage and Line Feed Belts (Sheet 2 of 2)

m. Reseat the platen shaft and bearing in the Print Mechanism module frame.

n. Replace the locking ring on the right end of the platen shaft (figure 6-7, View A).

p. Replace and tighten four screws which secure the printhead guide bar, two on each side (figure 6-7, View D).

q. Apply downward pressure on line feed stepping motor to tighten the belt to remove any slack and tighten the four motor screws (figure 6-7, Views A and E).

r. Rotate the platen manually to check for any binding, proper belt tension (no slack, as in previous step), and tracking on pulleys.

s. Replace the paper tray (step c above).

t. Replace the alarm bell (step b above).

u. Replace the Print Mechanism module into the Keyboard-Printer (para 6-4.5).

6-4.9 Carriage Assembly Belt. The carriage assembly belt removal and replacement shall be attempted only with the Print Mechanism module removed from the Keyboard-Printer. The removal and replacement steps follow:

a. Remove the Print Mechanism module (para 6-4.5).

CAUTION

Exercise care when removing locknut, as it is under spring pressure.

b. Release the tension on the idler pulley housing on the right side of the Print Mechanism module by removing the locknut, tension spring and two washers (figure 6-7, View C).

c. Loosen two idler pulley shaft setscrews (figure 6-7, View C), using 1/16" Allen wrench, slide shaft out of idler pulley housing, remove the four thrust washers from the idler pulley, and remove carriage assembly belt from pulley.

d. Loosen four screws holding carriage stepper motor to frame and move to left to release tension on carriage motor belt. Remove carriage motor belt from carriage stepper motor gear (figure 6-8, View B).

e. Remove two locking rings on the carriage drive pulley shaft (figure 6-2), which is located on left side of the Print Mechanism module.

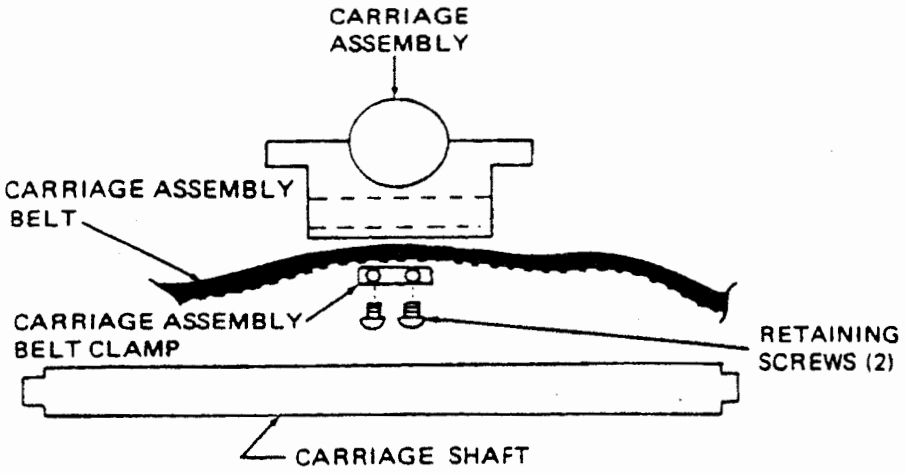
f. Loosen setscrew located on carriage drive pulley (figure 6-8, View B) and slide pulley shaft to the front of the Print Mechanism module.

g. Remove carriage motor belt and carriage assembly belt from carriage drive pulley (figure 6-8, View B).

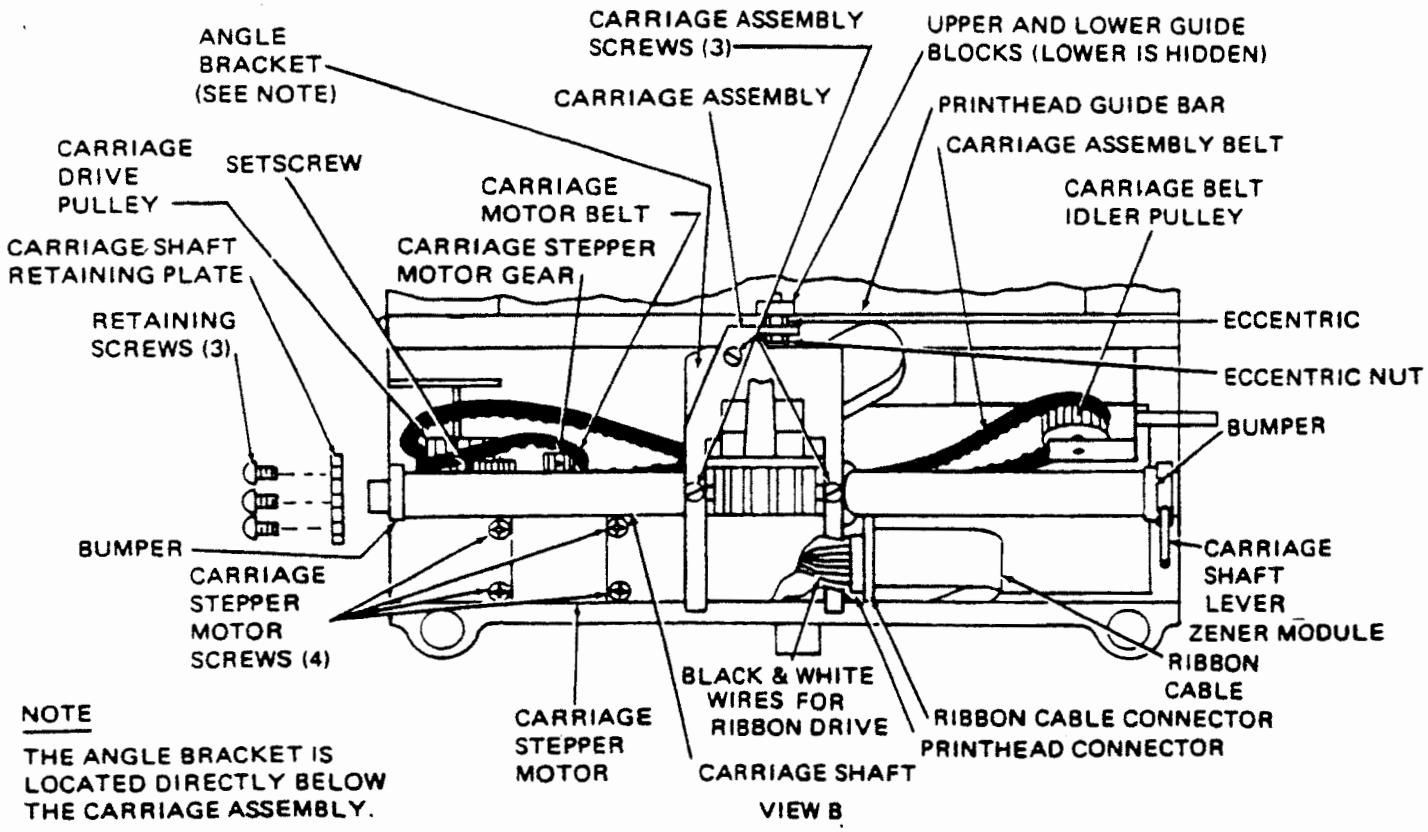
h. Refer to figure 6-8, View B, and locate angle bracket under carriage assembly. Remove two panhead screws and flat washers securing rear of angle bracket to chassis, remove one flathead screw and one panhead screw securing front of angle bracket to chassis, and remove angle bracket.

CAUTION

When performing steps j through p, exercise extreme caution so as not to damage ribbon connector or bend left margin sensor plate on carriage assembly.



VIEW A



VIEW B

Figure 6-8. Printhead Carriage Belt Mechanism

j. Remove ribbon cable connector from Zener module by removing the two retaining screws on the ribbon cable connector, using a long screwdriver through access hole on right end of frame and lay the ribbon cable connector back to the right side of the Print Mechanism module (figure 6-8, View B). Note position of upper and lower guide blocks (figure 6-8, View B), on front of carriage assembly.

NOTE

Before removing the carriage shaft retaining plate in the following step, mark one of the three used screw holes in the plate (there are six different holes) with reference to its corresponding screw hole in the frame of the Print Mechanism module. When reinstalling the plate, align the two marked holes. This is necessary for proper alignment of the carriage shaft and carriage assembly.

k. Remove three screws and the carriage shaft retaining plate located on the left side of the Print Mechanism module (figure 6-8, View B). Leave the three screws in their holes in the plate.

l. Carefully slide left bumper towards carriage assembly and then slide the carriage shaft to the left while holding the carriage assembly to the middle of the Print Mechanism module. Loosen carriage shaft lever setscrew and remove lever and curved washer. Remove right bumper from carriage shaft. Slide the carriage shaft to the left and remove left bumper from carriage shaft, then set carriage shaft aside.

m. While holding the carriage assembly, tilt rearward and carefully remove carriage assembly from the Print Mechanism module. The lower guide block is spring loaded. Be careful not to bend the left margin sensing tab.

n. While still holding carriage assembly, rotate upside down and remove the carriage assembly belt clamp by removing the two retaining screws (figure 6-8, View A).

p. Remove defective belt and replace with new belt. Lock new belt in place by replacing the carriage assembly belt clamp.

NOTE

When replacing the carriage assembly into the Print Mechanism module, push down on the lower guide block (figure 6-8, View B), which is under spring tension, and insert under the printhead guide bar. Long side of guide blocks must rest on guide bar.

q. Replace carriage assembly with new belt by reversing the above steps. While performing step d, tighten belt to remove slack. In step c, apply Loctite to the two idler pulley shaft setscrews, and torque setscrews to 3 to 5 inch-pounds. While performing step b, tighten locknut full CW and turn CCW 1/2 turn.

r. Perform belt alignment (para 6-3.1), and timing disc alignment (para 6-3.2).

6-4.10 Carriage Motor Belt. The carriage motor belt removal and replacement shall be attempted only with the Print Mechanism module removed from the Keyboard-Printer. The removal and replacement steps follow:

a. Remove the Print Mechanism module (para 6-4.5).

b. Remove two locking rings on the carriage drive pulley shaft, which is located on left side of the Print Mechanism module (figure 6-2).

c. Release the tension on carriage assembly belt by loosening the locknut on the idler pulley housing (figure 6-7, View C).

d. Loosen four screws holding carriage stepper motor to frame, and move left to release tension on the carriage motor belt. Remove carriage motor belt from carriage stepper motor gear (figure 6-8, View B).

e. Loosen the setscrew located on the carriage drive pulley, and slide shaft to front of Print Mechanism module.

f. Remove carriage assembly belt and defective carriage motor belt. Install new carriage motor belt, then carriage assembly belt.

g. Reverse above steps to restore mechanism to operating condition. While performing step d, tighten belt to remove slack. While performing step c, tighten locknut full CW and turn CCW 1/2 turn.

h. Perform belt alignment (para 6-3.1) and timing disc alignment (para 6-3.2)

j. Replace Print Mechanism module (para 6-4.5).

6-4.11 Printhead. Remove and replace the printhead as follows.

a. Open cover to lock-in position and remove ribbon cassette from printhead.

b. Move printhead to far right. Disconnect printhead connector from carriage assembly (figure 6-8, View B) by unscrewing printhead connector retaining screws located under carriage assembly.

c. Carefully cut the lacing ties to release the printhead cable from the carriage assembly frame.

d. Reference pin 1 on the printhead connector by locating the molded arrowhead on the short side of the connector. Disengage the two twisted black and white wires, using an insertion tool, from the printhead connector (figure 6-8, View B) as follows:

(1) White wire from connector position 19.

(2) Black wire from connector position 9.

e. Remove the two printhead screws and flat washers (figure 6-7, View D).

f. Remove the printhead from the carriage assembly frame, being careful with the wire cable.

g. Using a small punch, or equivalent, press retaining pin from connector retaining screw assemblies and remove both parts of the retaining screws from the connector. Retain hardware for use on replacement printhead connector.

h. Replace the defective printhead with a new one by reversing the above steps.

6-4.12 Fan. Removal and replacement of the fan is as follows.

a. Open cover to full-open position.

b. Remove Print Mechanism module (para 6-4.5).

c. Remove Power Supply module (para 6-4.6).

d. Loosen four captive slotted-head screws securing card cage cover (figure 6-2), and remove cover.

e. On each of four modules in card cage, lift up extractors at each end of module, and lift module straight up.

f. On rear of Keyboard-Printer (figure 6-5, View B), remove two panhead screws and flat washers securing card cage to rear of case.

g. In right rear corner of chassis (figure 6-6), remove two panhead screws and half-moon floating bushings securing J15 bracket. Do not remove J15 from bracket. Ensure the shims under the J15 bracket are in place before replacing the bracket.

h. Inside card cage (figure 6-6), three connectors (J7, J8, and J9) are fastened to front surface of card cage. These three connectors are part of three short cables that connect to mating connectors on the motherboard at the bottom of the card cage. Disconnect the three short cables from the motherboard connectors by pressing outward on the extractor at each side of each motherboard connector. The mating connector on the short cable will come free from its motherboard connector. (When reinstalling, it is not necessary to position the extractors). Simply mate each short cable connector with its motherboard connector, and press down on the short cable connector.

j. Inside card cage, remove card cage mounting hardware (figure 6-6), consisting of four nuts, lockwashers, and flat washers, from mounting studs.

k. Work card cage free of motherboard and set card cage aside. Motherboard is not attached to card cage.

l. Lift right side (J15 end) of motherboard up and remove spacer that fits over the two mounting studs at that end. The spacer is normally positioned between the bottom of the motherboard and the wires connected to J15.

m. Lift up front edge of motherboard as far as cable slack will allow for access to connectors on bottom.

n. On bottom of motherboard, disconnect multicolored ribbon cable connector P6 from its mating connector on motherboard, and disconnect gray-colored ribbon cable connector P5 from its mating connector on motherboard.

p. Hold motherboard to one side to obtain access to terminals on TB1 on bottom of chassis.

q. On TB1, remove screws securing W2 (red), W3 (green), and W4 (yellow) wires from fan B1 (figure 6-6) at left rear of chassis. Three sets of power supply wires will also come free.

r. Remove existing hardware securing fan B1 to side of chassis, and lift out fan. Retain hardware.

s. Place new fan in position, with wires at bottom of chassis, and secure with hardware retained in step r. Connect power supply wires and fan wires to TB1 as listed below. Only four of the six terminals of TB1 are used. (The terminal at each end of TB1 is not used.) Terminal 1 of TB1 is next to the rearmost (unused) terminal.

Fan wires	Power Supply wires	TB1 terminals
W2 (red)	W13, W14	2
W3 (green)	W12	3
W4 (yellow)	W15, W16	4

t. Install motherboard by reversing steps n, m, and l above. Gray-colored ribbon cable goes under

the cable going to J2 at the bottom rear of the chassis. When repeating step l, be sure that the spacer at J15 end of motherboard is placed on top of the wires going to J15, but under the motherboard.

u. Install card cage and its inside mounting hardware (steps k and j above), but do not tighten nuts securely. Leave nuts loose for alignment of card cage with motherboard connectors in following steps.

v. Secure card cage to rear of chassis with two panhead screws and flat washers (figure 6-5, View B) as in step f above.

w. Install Controller module A1A8 (61-40351-001) in its slot in card cage (figure 6-2), and press down to engage with motherboard connector. Close extractors to secure A1A8 in place.

x. Tighten two rear nuts inside card cage to align motherboard with card cage, then remove A1A8 and tighten two front nuts inside card cage.

y. Perform the reverse of procedures in steps h, g, and e through a.

6-4.13 Lamp Replacement. To replace lamps on the Control Panel or Print Mechanism module, refer to table 2-8, steps 17 through 19. Replacement of Keyboard lamps is not performed at this level of maintenance.

6-4.14 Air Filter. Removal and replacement of the air filter (figure 6-9) shall be accomplished by the following steps:

a. Remove the eight screws which secure the filter element to the

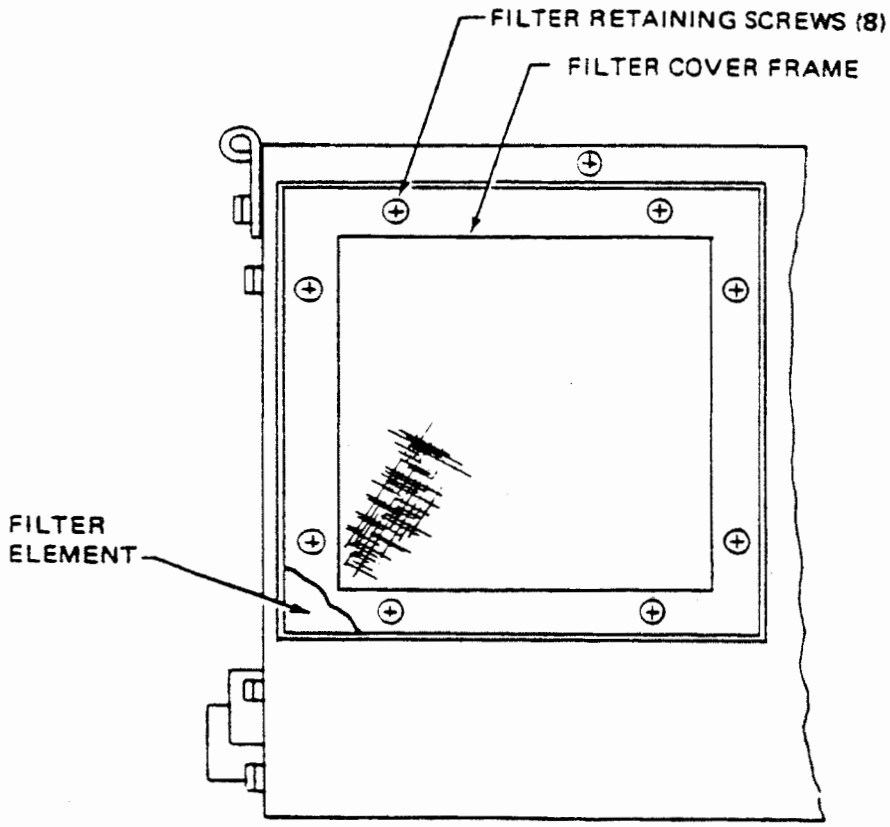


Figure 6-9. Chassis, Side View

left rear side of the Keyboard-Printer (figure 6-9).

b. Remove the air filter cover frame.

c. Remove the air filter element.

d. Replace the air filter after cleaning (table 4-4) by reversing the above steps.

6-4.15 Keyboard-Printer. Removal and replacement of the Keyboard-Printer shall be accomplished per paragraph 8-7.4.

6-4.16 Retainer Plate Assembly. The retainer plate assembly (figure 6-10), disassembly and reassembly steps follow:

a. Remove Print Mechanism module (para 6-4.5).

b. Loosen the setscrews on the right and left mounting brackets to relieve the spring tension.

c. Lift the ends of the torsion springs from the holes in the retainer plate assembly.

d. Remove the retainer rings and slide the torsion springs from the pivot pins.

e. Slide the pivot pin from the retainer plate assembly.

f. Remove the retainer plate assembly.

g. Reassemble in reverse order.

h. Connect the force gauge, listed in table 1-3, to the retainer plate assembly directly below the spring as shown in figure 6-10.

j. Insert a flathead screwdriver in the pivot pin and adjust spring tension for 1.8 to 2 lbs. and tighten setscrews.

6-4.17 Platen. The platen (figure 6-11) disassembly and reassembly steps follow:

a. Remove Print Mechanism module (para 6-4.5), and slide printhead to the left side of mechanism.

c. Loosen the setscrews (figure 6-10) on the right and left mounting brackets to relieve spring tension and slightly raise retainer plate.

d. Loosen four screws holding line feed stepping motor. Slide motor up to release tension on the line feed belt (figure 6-7, Views A and E).

e. Loosen setscrews in pulley (figure 6-11).

f. Remove locking rings from ends of platen shaft.

g. Slide platen to left and slide pulley to right, removing pulley and left bearing from platen shaft.

h. Remove right bearing from chassis.

j. Carefully slide platen to the right, while moving right end of platen towards front of mechanism, until platen is removed.

k. Reassemble in reverse order up to step d. After step d rotate platen manually to check for binding, proper belt tension (no slack) and tracking on pulleys.

l. Perform step c (in reverse) and then connect the force gauge, listed in table 1-3, to the retainer plate assembly directly below the spring, as shown in figure 6-10.

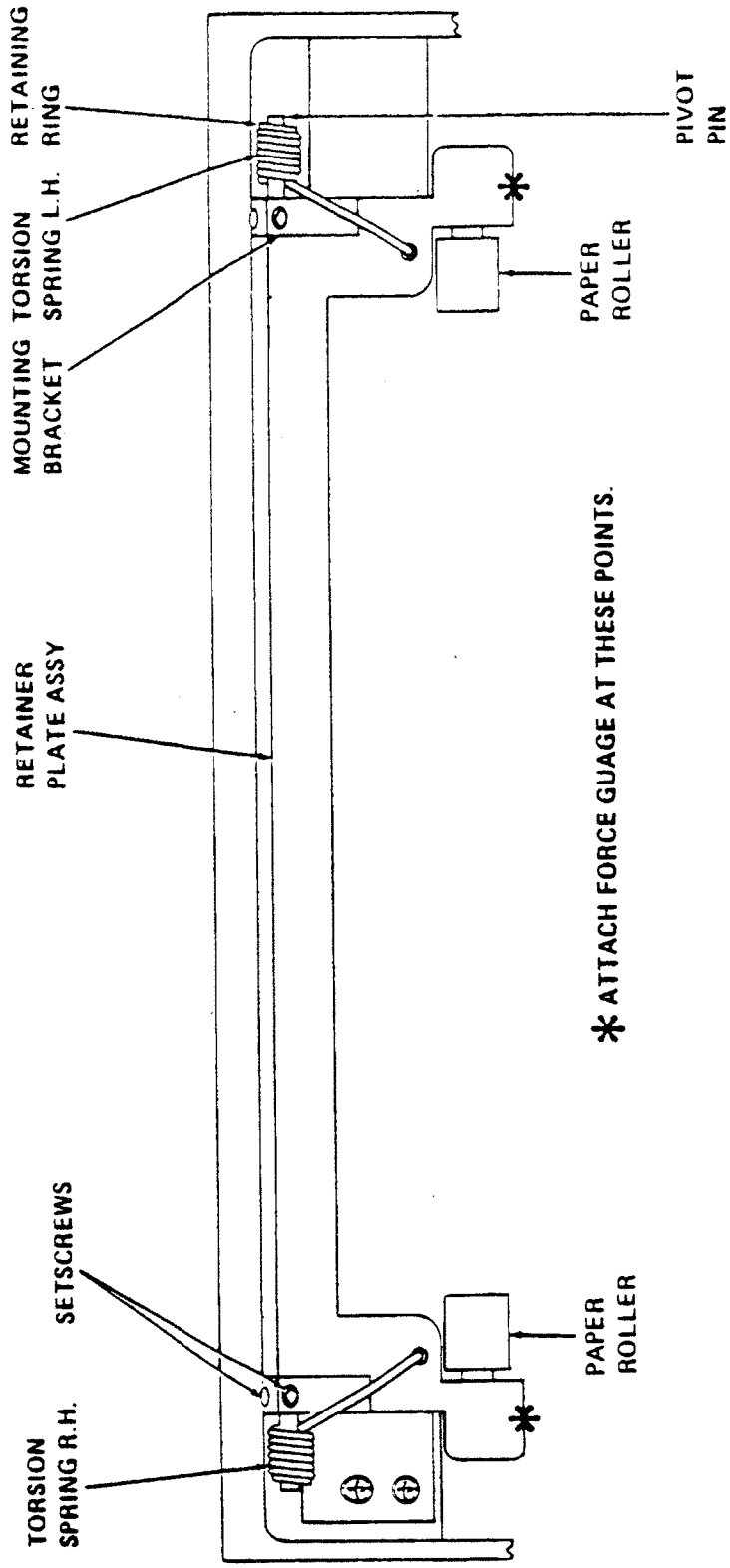


Figure 6-10. Retainer Plate Assembly

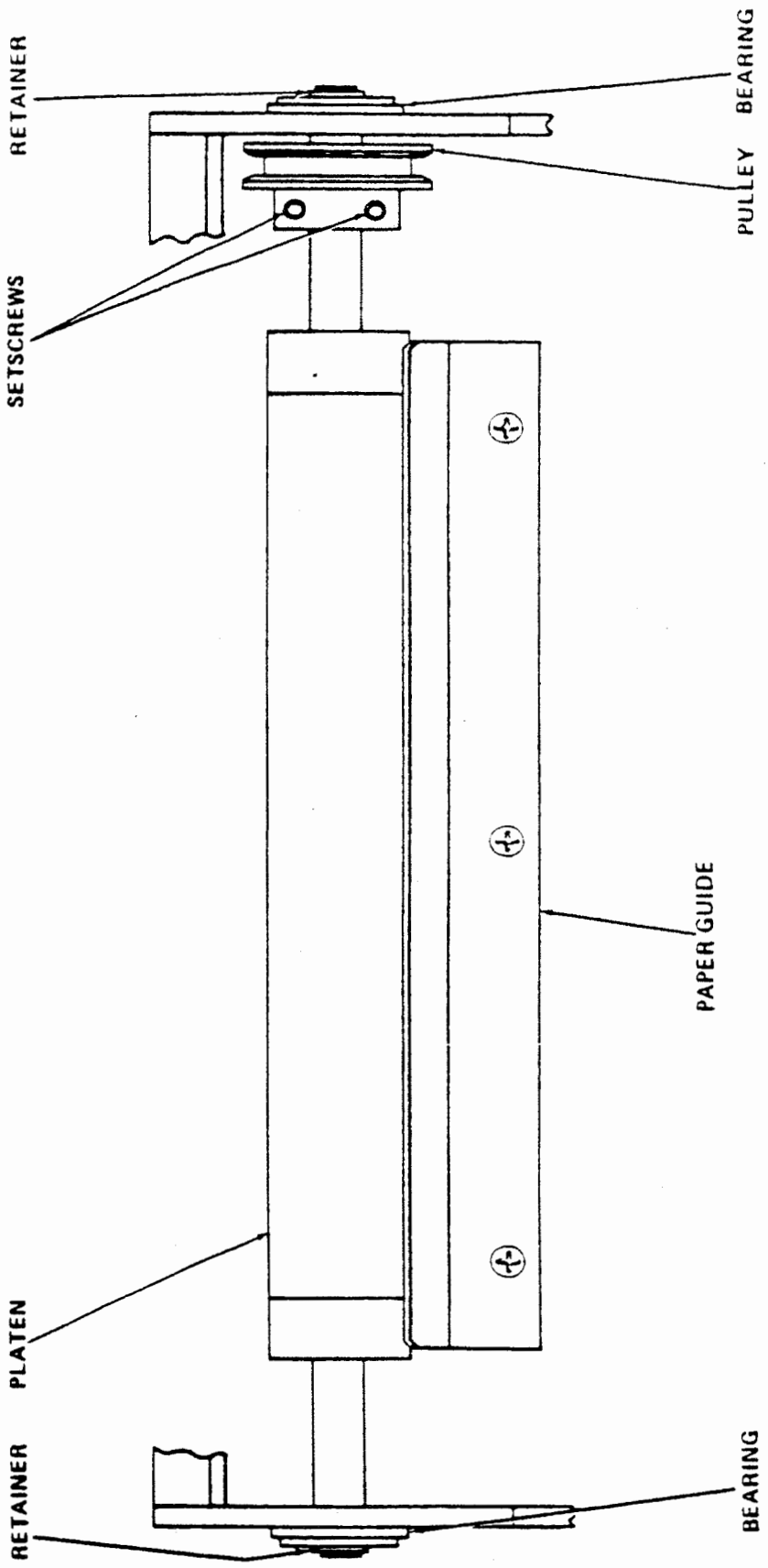


Figure 6-11. Platen

m. Insert a flathead screwdriver in the pivot pin and adjust spring tension for 1.8 to 2 lbs. and tighten screws.

n. Replace Print Mechanism module (para 6-4.5).

6-4.18 Idler Pulley Bracket. The idler pulley bracket (figure 6-12) disassembly and reassembly steps follow:

a. Remove Print Mechanism module (para 6-4.5).

b. Remove the locking nut from the idler pulley shaft while holding the idler pulley bracket.

c. Remove the two shoulder washers and spring from the shaft and slide the idler pulley bracket to the left until the shaft is clear of the Print Mechanism module.

d. Loosen the two setscrews and slide the shaft from the idler pulley bracket.

e. Separate the idler pulley bracket from the four bearing thrust washers and flanged pulley.

f. Remove the timing belt from the pulley, letting the timing belt hang from the belt retainer.

g. Remove the bearing from the flanged pulley.

h. Reassemble in reverse order to step b.

j. Perform belt alignment (para 6-3.1) and timing disc alignment (para 6-3.2).

k. Replace Print Mechanism module (para 6-4.5).

6-4.19 Carriage Drive Motor. The carriage drive motor (figure 6-13) disassembly and reassembly steps follow:

a. Remove Print Mechanism module (para 6-4.5) and position carriage assembly to the right side of the chassis.

b. Remove three Phillips head screws from protective cover and remove protective cover.

c. Remove the two nuts and lockwashers from the Motor Control assembly A1A1A1A1A1.

CAUTION

Exercise care in moving Motor Control assemblies to prevent damage to wiring.

d. Carefully fold the Motor Control assembly A1A1A1A1A1 to the left.

e. Remove the two spacers and light restrictor.

f. Remove the Phillips head screw from the adjusting plate. Remove retainer ring, plain square nut, spring and two washers from holder.

g. Loosen cap screw on clamp and remove clamp from actuator shaft.

h. Slide adjusting plate from the floating pins.

j. Slide timing disc assembly from the actuator shaft.

k. Carefully remove Motor Control assembly A1A1A1A1A2 from floating pins.

l. Carefully fold Motor Control assembly A1A1A1A1A2 to the left and remove floating pins.

m. Remove the four Phillips head screws and flat washers from the carriage stepper motor bracket (figure 6-8, View B) and carefully turn assembly (figure 6-13) until the belt can be removed from the rear pulley.

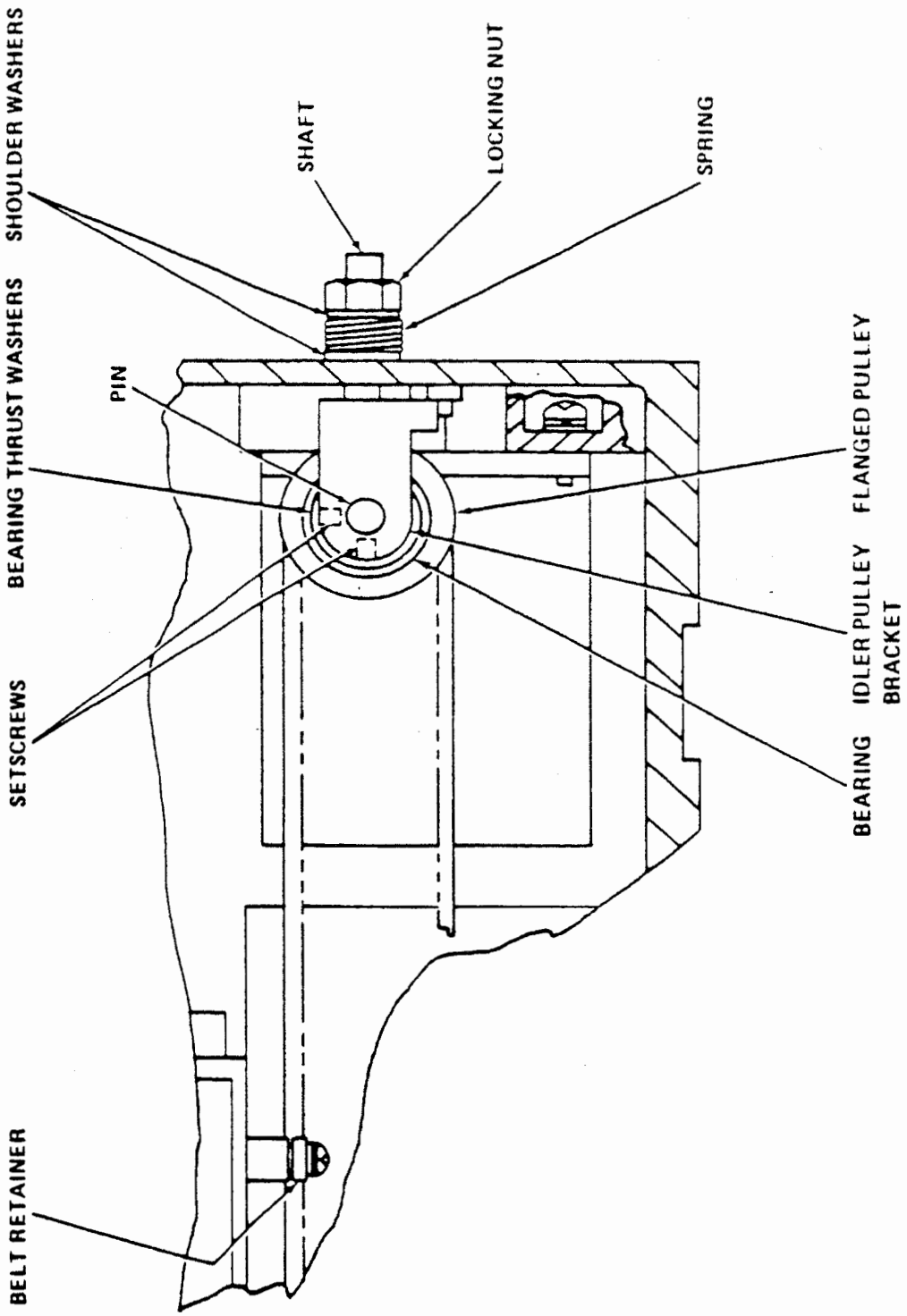


Figure 6-12. Idler Pulley Bracket

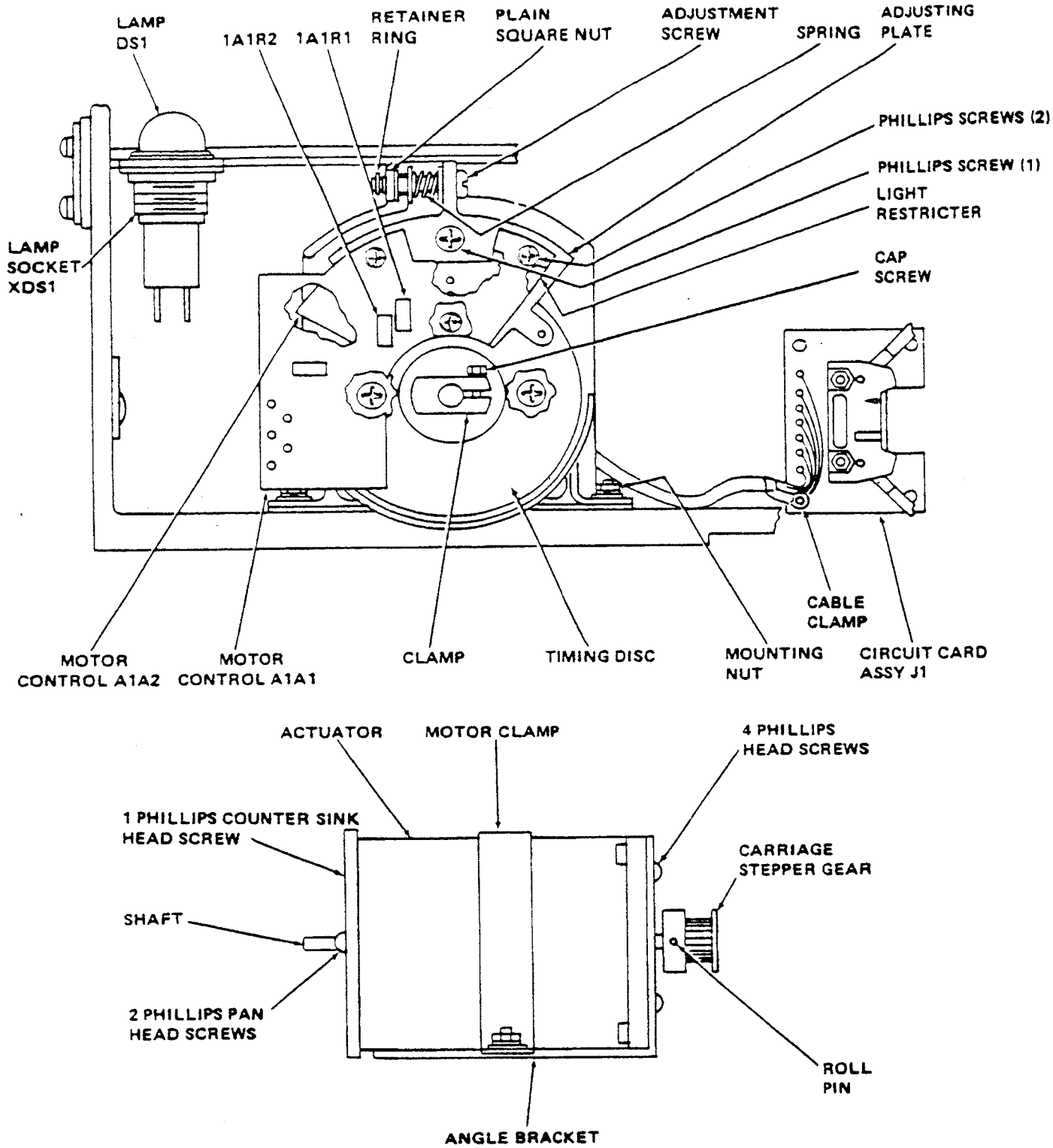


Figure 6-13. Carriage Drive Motor

n. Fold out the assembly from the mechanism.

p. Unsolder the five actuator wires from the terminals on the circuit card assembly of J1. Remove Phillips head screws and flat washer from cable clamp and discard clamp. During reassembly, replace old clamp with new clamp (A1A1A1MP26).

q. Remove roll pin from carriage stepper gear and slide gear from shaft.

r. Remove one Phillips countersink head screw and two Phillips panhead screws, lockwashers, and flat washers from the mounting plate of the actuator. Remove the mounting plate from the actuator.

s. Remove the two motor clamp nuts, screws, lockwashers and flat washers and remove the motor clamp.

t. Remove four Phillips head screws, lockwashers and flat washers. Remove the actuator from angle bracket.

u. If motor is being replaced, it will be necessary to drill the shaft for insertion of roll pin in carriage stepper gear. Refer to paragraph 6-4.21.

v. Reassemble in reverse order except for the following:

i. During step m, resolder the five wires from the new actuator to the circuit card assembly for J1 as follows; black wire to E7, yellow wire to E4, red wire to E3, orange wire to E2, and brown wire to E1.

ii. During step f., do not tighten capscrew.

iii. If Motor Control assemblies are replaced, perform printhead fire and motor clock resistor selection (paras 6-3.3 and 6-3.4) if BITE runs longer than 35 seconds and cannot be corrected through alignment.

w. Perform timing disc alignment per para 6-3.2.

x. Replace Print Mechanism module per para 6-4.5.

6-4.20 Guide Bar. The guide bar (figure 6-14) disassembly and reassembly steps follow:

a. Remove Print Mechanism module (para 6-4.5).

NOTE

Before removing the carriage shaft retaining plate in the following step, mark one of the three used screw holes in the plate (there are six different holes) with reference to its corresponding screw hole in the frame of the Print Mechanism module. When reinstalling the plate, align the two marked holes. This is necessary for proper alignment of the carriage shaft and carriage assembly.

b. Remove three Phillips screws and flat washers from bushing sleeve located on left side of Print Mechanism module. Remove bushing plate.

c. Carefully slide left bumper towards carriage assembly. Slide guide bar to the left while holding carriage assembly in middle of Print Mechanism module.

d. Loosen setscrews on collar and remove collar, curved washer, and right bumper while still holding carriage assembly.

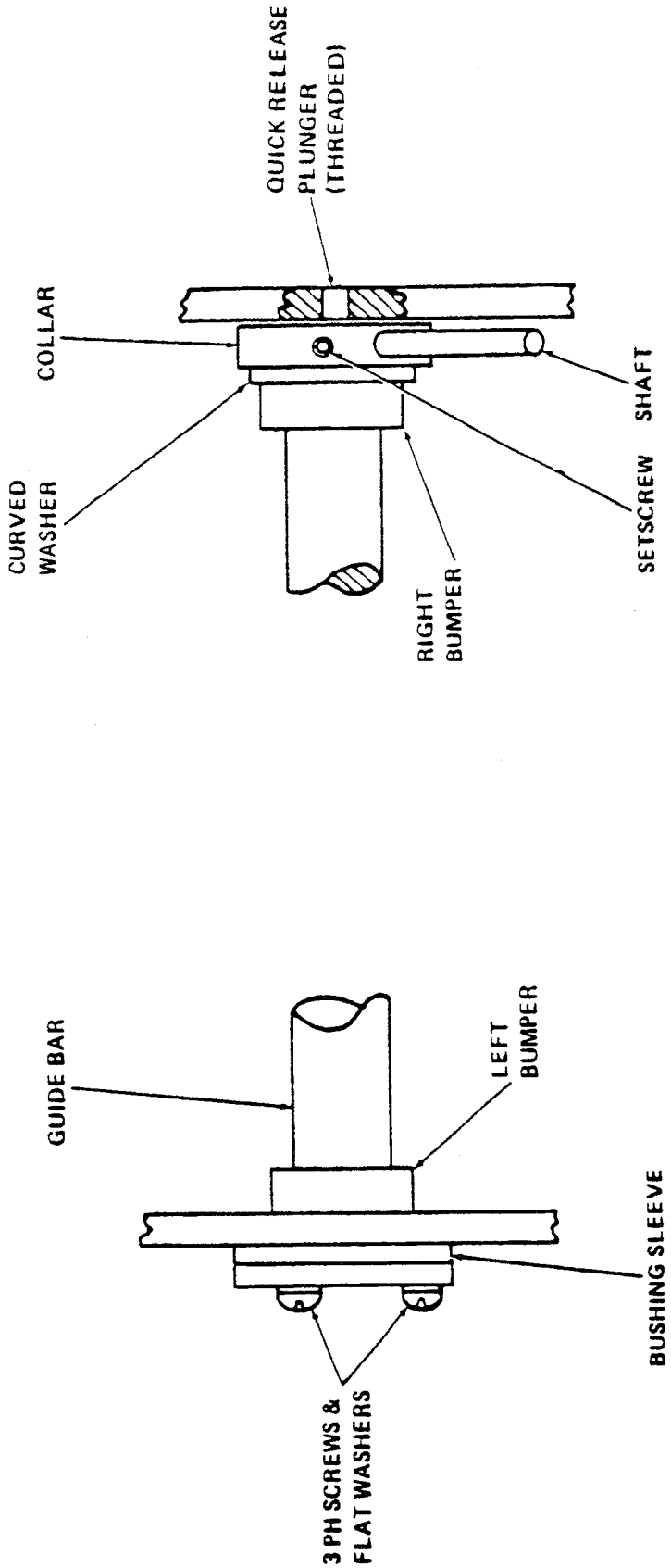


Figure 6-14. Guide Bar

e. Continue to slide guide bar to left from carriage assembly.

f. Allow carriage assembly to rest between carriage belt and front frame as guide bar is removed from Print Mechanism module, after left bumper is removed from guide bar.

NOTE

When replacing the carriage assembly into the Print Mechanism module, push down on the lower guide block (figure 6-8, View B), which is under spring tension, and insert under the printhead guide bar. Long side of guide blocks must rest on guide bar.

g. Reassemble in reverse order. Leave collar setscrew loose during step d. Tighten the collar setscrew after step b.

6-4.21 Carriage Motor Roll Pin. To replace the roll pin in the carriage motor shaft and carriage stepper gear use the following procedure.

a. Place new carriage motor in drilling jig (figure 6-15) with long shaft away from stop plate.

NOTE

For manufacturing of drilling jig refer to para 6-1.4.

b. Place a .15 inch shim between the motor body and the stop plate.

c. Slide motor firmly against shim and then slide clamp block against shaft.

d. Tighten clamp screw.

e. Tighten instant thumbscrew.

f. Place bushing plate over dowels and insert 1/16 inch drill into drilling hole in bushing plate.

g. Place drill jig in drill press and align to drill.

h. Drill hole in motor shaft.

j. Remove motor from drilling jig.

k. Slide carriage stepper gear over drilled shaft and align to hole.

l. Insert 1/16 inch roll pin and gently tap into place.

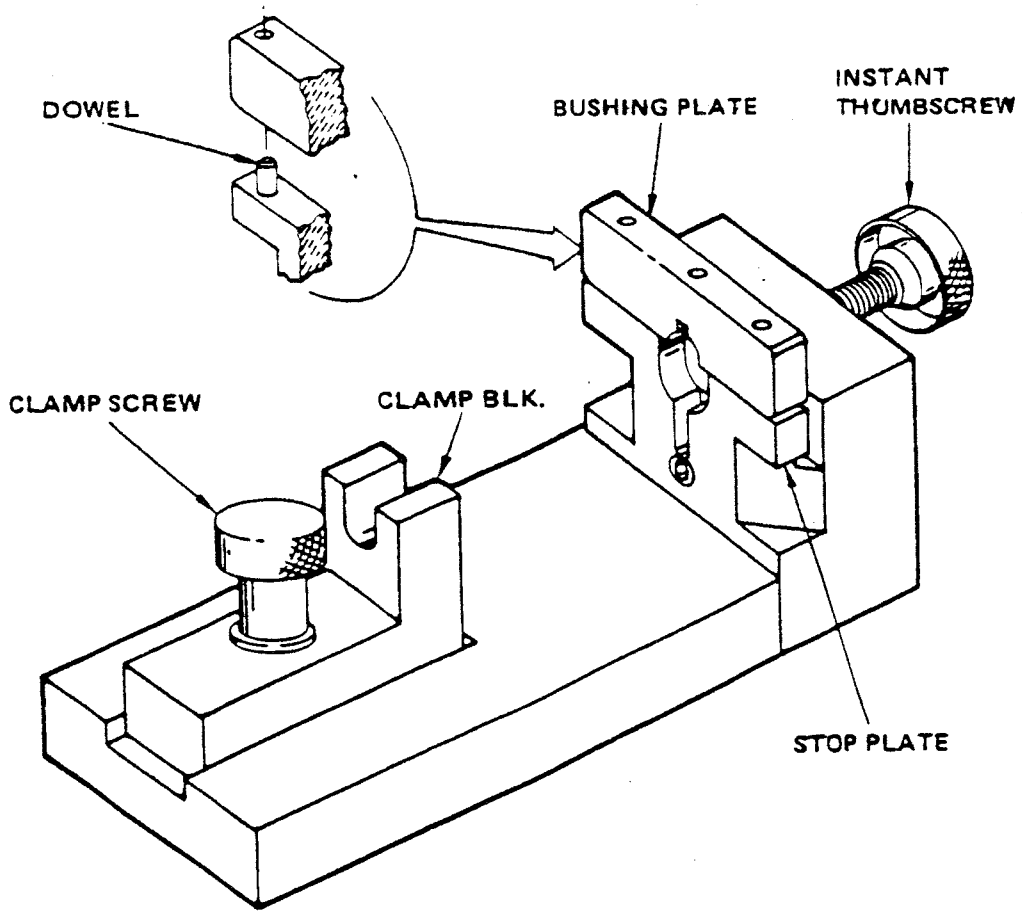


Figure 6-15. Carriage Motor Drill Jig

CHAPTER 7

PARTS LIST

7-1. INTRODUCTION.

This parts list for Teletypewriter Set AN/UGC-136BX, with reference to illustrations, lists and identifies the locations of all replaceable parts, including attaching hardware. This chapter includes the following:

a. Interchangeability.

b. List of major components.

c. Parts list.

d. List of common item descriptions.

e. List of attaching hardware.

f. List of manufacturers.

g. Parts location illustrations.

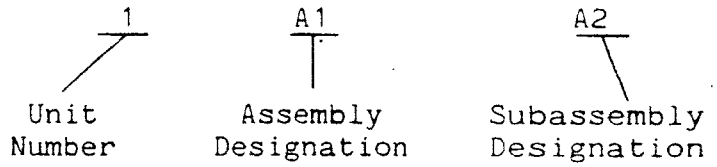
7-2. INTERCHANGEABILITY.

In general, the assemblies and parts installed at the time the end item(s) was manufactured are listed and identified in the manual. When an assembly or part (including vendor items) which is different from the original is installed during the manufacture of later items, series, or blocks, all assemblies and parts are listed (and "Usable on" coded). However, when the original assembly or part does not have continued application (no spares of the original were procured or such spares are no longer authorized for replacement), only the preferred assembly or part is listed. Also, when an assembly or part is installed during modification, and the original does not have continued application, only the preferred item is listed. Repair Parts Kits and Quick Change Units are listed when they are available for replacement.

7-3. LIST OF MAJOR COMPONENTS.

Table 7-1 is a listing of the major components included in Teletypewriter Set AN/UGC-136BX. The assemblies are listed by reference designations in numerical order. Thus, when the complete reference designation of a part is known, this table will furnish the identification of the assembly in which the part is located.

7-3.1 Column 1, Unit Number. The numbering method of assigning reference designations has been used to identify assemblies and subassemblies. An example of this numbering method is illustrated by the following:



Read as: subassembly 2, of assembly 1, in unit 1.

7-3.2 Column 2, Quantity. This column lists the quantity of units used in the teleprinter set.

7-3.3 Column 3, Name or Nomenclature. This column contains either the official name/nomenclature of the unit together with its type number, or the name/nomenclature as listed on the release production drawing.

7-3.4 Column 4, Page Number. This column lists the number of the first page of the parts listing for the stated unit.

7-4. PARTS LIST.

Table 7-2 lists all assemblies and their replaceable parts in numerical sequence by reference designation, including attaching parts. Replaceable parts for each assembly are listed alphanumerically by class of part following the assembly designation.

Table 7-2 provides the following information: (1) complete reference designation of each assembly, subassembly, and part, (2) reference to explanatory notes, (3) noun name and brief description, and (4) identification of the parts location illustration which pictorially locates the part.

7-4.1 Column 1, Reference Designation. The parts list is divided and arranged by major assemblies in numerical sequence (e.g., assembly A1 with its subassemblies, parts, etc., precedes assembly A2 with its parts). All parts attached to the assembly are listed first in alphanumerical order, followed by subassemblies with parts, also listed in alphanumerical order as follows:

Assembly	A1	Subassembly	A1A1
(Assembly Parts)	A1AT1		A1A1AT1
	A1B1		A1A1B1
	A1C1		A1A1C1
	A1CR1		A1A1CR1
	Etc.		A1A1R1

Note: MP numbers are assigned to mechanical parts subject to replacement, such as handles, slides, etc. These numbers are constructed using the item number as listed on the engineering drawing.

7-4.2 Column 2, Notes. Parts variations within each article are identified by a number symbol in the Notes column of table 7-2. The absence of a symbol in the Notes column indicates that the part is used on all articles covered by this technical manual.

7-4.3 Column 3, Name and Description. This column contains the item name, descriptive data and military part number of the item. Nonmilitary parts include physical or electrical characteristics. Identical parts that are used five times or more are referenced to the List of Common Item Descriptions (table 7-3). Following the description are the manufacturer's identification code, part number and the contractor's identification code and control drawing number. Attaching hardware, with quantity is identified by the assigned letter code from table 7-4; e.g., C(4) would be the third listed piece of attaching hardware in which four pieces are used.

7-4.4 Column 4, Figure Number. This column lists the figure number of the parts location illustration (located at the end of the chapter), which pictorially shows the physical location of the part.

7-5. LIST OF COMMON ITEM DESCRIPTIONS.

Table 7-3 contains the item number and the description of multiple use parts. The description contains the same information as in column 3 of table 7-2.

7-6. LIST OF ATTACHING HARDWARE.

Table 7-4 contains a list of attaching hardware used in five or more applications. This table provides the following information: (1) Letter Code, and (2) Name and Description.

7-6.1 Column 1, Letter Code. This column lists an alpha entry indicating the position of the attaching part in the listing.

7-6.2 Column 2, Name and Description. This column contains the item name in alphabetic sequence, descriptive data and military part number of the item.

7-7. LIST OF MANUFACTURERS.

Table 7-5 contains the name, address, and code number of all manufacturers supplying items for the equipment as referenced in the parts list. This list is in numerical sequence by code

number. Code numbers are in accordance with Cataloging Handbooks H4-1 and H4-2.

7-8. PARTS LOCATION ILLUSTRATIONS.

Parts location illustrations (figures FO 7-1 through FO 7-42), are located at the end of this chapter. Their purpose is to provide positive and rapid location of parts. Column 4 of table 7-2 references the appropriate illustration which pictorially locates the part in the equipment.

7-9. ABBREVIATIONS AND SYMBOLS.

Abbreviations and symbols used throughout this IPB are in compliance with Military Standard MIL-STD-12D. Nonstandard abbreviations are as follows:

MP	Mechanical Part

Table 7-1. Teletypewriter Set AN/UGC-136BX, List of Major Components

Unit number	Qty.	Name or nomenclature	Page number
1	1	Teletypewriter Set AN/UGC-136BX	7-6
1A1	1	Teleprinter	7-6
1A1A1	1	Teleprinter Subassembly	7-9
1A1A2	1	Chassis Assembly, Teleprinter	7-46
1A1A3	1	Power Supply	7-56
1A1A5	1	Circuit Card Assembly-Message Store	7-76
1A1A6	1	Circuit Card Assembly-Microcomputer	7-81
1A1A7	1	Circuit Card Assembly-Interface	7-87
1A1A8	1	Circuit Card Assembly-Controller	7-93
1A2	1	Keyboard Transmitter, Teletypewriter	7-100
1A2A1	1	Keyboard Transmitter Subassembly	7-101
1A2A2	1	1-Line Display Subassembly	7-104

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List

Reference designation	Notes	Name and description	Figure number (item)
1		TELETYPEWRITER SET AN/UGC-136BX: Provides pin matrix printing with programmable microprocessor electronics with full message composition editing facilities and a line display; mfr 00724, part no. 01-01344-001	FO 7-1
1MP4		PLATE, IDENTIFICATION: Mfr 00724, part no. 36-01700-001	FO 7-1 (1)
		(ATTACHING PARTS)	
		SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 1/4 in. lg, part no. MS51957-13	FO 7-1 (4)
		WASHER, FLAT: Cres, 0.125 id, 0.250 od, 0.022 in. thk, part no. MS15795-803	FO 7-1 (2)
		WASHER, LOCK: Cres, 0.121 id, 0.209 od, 0.025 in. thk, part no. MS35338-135	FO 7-1 (3)
1A1		TELEPRINTER: Provides the printing of data up to 120 characters per second and accommodates data up to 4800 baud received into the internal 64,000 character message storage; mfr 00724, part no. 03-04558-001	FO 7-1 (5) FO 7-2
1A1MP2		COVER ASSEMBLY, TELEPRINTER: Provides access to all plug-in modules, circuit cards, test points and chassis replaceable parts; mfr 00724, part no. 03-04289-001	FO 7-2
		(ATTACHING PARTS) Z(4), AK(4)	
		RING, RETAINING: External, be. cop. 0.250 dia, 0.025 in. thk; part no. MS16633-5025 (1)	
		SPACER: Cres, 2.50 lg, 0.50 wd, 0.005 in. dia holes; mfr 00724 part no. 40-00857-001 (4)	
		SPACER: Cres, 2.50 lg, 0.50 wd, 0.010 in. dia holes; mfr 00724 part no. 40-00857-002 (4)	

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		SPACER: Cres, 2.50 lg, 0.50 wd, 0.015 in. dia holes; mfr 00724, part no. 40-00857-003 (4)	
		SPACER: Cres, 2.50 lg, 0.50 wd, 0.020 in. dia holes; mfr 00724, part no. 40-00857-004 (4)	
1A1MP2MP1		CHASSIS, ELECTRICAL EQUIPMENT-TELEPRINTER, UPPER SECTION ASSEMBLY: Provides access to internal components; mfr 00724, part no. 67-05156-001	FO 7-2 (26)
1A1MP2MP2		BRACKET, ANGLE, PAPER GUIDE: 8.78 lg, 0.88 in. wd, 45 deg bend; mfr 00724, part no. 37-07338-001	FO 7-2 (16)
		(ATTACHING PARTS) E(3), AP(3), AU(3)	
1A1MP2MP3		WIRE MESH, KNITTED: EMI gasket, 1/4 wd, 3/32 in. h; mfr 07700 part no. 20-40116, 00724 dwg 48-00009-316	FO 7-2 (25)
1A1MP2MP4		PLATE, WEAR: Switch; mfr 00724, part no. 37-08053-001	FO 7-2 (27)
1A1MP2MP5		LATCH, DIAL: Cres; mfr 82240 part no. B1900-2001 mod, 00724 dwg 18-00657-001	FO 7-2 (21)
		(ATTACHING PARTS) C(2), AL(2), AV(2)	
		SCREW, MACHINE: Flathead, cross-recessed, cres, 6-32unc-2A, 5/8 in. lg, part no. MS24693-C29 (2)	
1A1MP2MP7		GASKET: 0.156 in. thk; mfr 00724, part no. 21-00445-001	FO 7-2 (23)
1A1MP2MP8		WINDOW, OBSERVATION: EMI shld; mfr 63009 part no. DT1-R-FL-2060-HC-1-SS-PA-EN-10-41-G, 00724 dwg 34-00178-001	FO 7-2 (22)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1MP2MP9		RETAINER, WINDOW: Cres, 8.72 lg, 0.25 wd, 0.136 in. dia holes; mfr 00724, part no. 37-07316-001 (ATTACHING PARTS) E(4)	FO 7-2 (17)
1A1MP2MP10		RETAINER, WINDOW: Cres, 4.10 lg, 0.25 wd, 0.136 in. dia holes; mfr 00724, part no. 37-07316-002 (ATTACHING PARTS) E(2)	FO 7-2 (19)
1A1MP2MP11		CONTACT, ELECTRICAL: Modified, 8.78 lg, 0.50 wd, 4 holes; mfr 00724, part no. 95-00312-001	FO 7-2 (18)
1A1MP2MP12		CONTACT, ELECTRICAL: Modified, 4.11 lg, 0.50 wd, 2 holes; mfr 00724, part no. 95-00312-002	FO 7-2 (20)
1A1MP2MP26		SUPPORT COVER ASSEMBLY: Cres, mfr 00724, part no. 67-04845-001 (ATTACHING PARTS) RING, RETAINING: External, be. cop. 0.250 dia, 0.025 in. thk; part no. MS16633-5025 (1)	FO 7-2 (15)
1A1MP2MP27		POST, ELECTRICAL MECHANICAL EQUIPMENT: Cres, 0.749 lg, 0.312 in. dia; mfr 00724, part no. 40-00817-002 (ATTACHING PARTS) SCREW, MACHINE: Flathead, cross-recessed, cres, 8-32unc-2A, 1/4 in. lg, part no. MS24693-C50 (1)	FO 7-2 (14)
1A1MP2MP29		PLATE, INFORMATION: Danger, 2.20 lg, 0.75 in. wd; mfr 00724, part no. 36-01648-001	FO 7-2 (24)
1A1MP7		COVER, TOP, CARD CAGE ASSEMBLY: Provides access to interior circuit card assemblies; mfr 00724, part no. 67-05158-001	FO 7-2

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1MP7MP1		COVER, TOP, CARD CAGE: 9.26 lg, 3.77 wd, 0.75 in. hgt; mfr 00724, part no. 67-05158-101	FO 7-2 (12)
1A1MP7MP2		SCREW, CAPTIVE: Sst, 6-32unc, 0.410 in. lg; mfr 17419 part no. DRSS-7900-6-A-2, 00724 dwg 23-01597-001	FO 7-2 (11)
1A1MP7MP3		RETAINER, PCB: 2.33 lg, 0.75 in. wd; mfr 00724, part no. 57-01094-001 (ATTACHING PARTS) T(4), AP(4), AU(4)	FO 7-2 (13)
1A1MP33		WASHER, LOCK: Cres, 0.263 id, 0.489 od, 0.062 in. thk; part no. MS35338-139	FO 7-2 (9)
1A1MP34		WASHER, FLAT: Cres, 0.281 id, 0.625 od, 0.065 in. thk, part no. MS15795-810	FO 7-2 (8)
1A1MP35		NUT, PLAIN, HEXAGON: Cres, 1/4-20unc-2B, 7/16 in. across flats, 3/16 in. thk; part no. MS35649-2254	FO 7-2 (10)
1A1A1		TELEPRINTER SUBASSEMBLY: Provides the paper drive and printing mechanism for the teleprinter; mfr 00724, part no. 03-04296-003 (ATTACHING PARTS) AN(3), AF(2), AM(2), AW(2) SCREW, MACHINE: Pan head, cross-recessed, cres, 10-32unf-2A, 1/2 in. lg, part no. MS51958-63 (3)	FO 7-2 (7) FO 7-3
1A1A1DS1, DS2		LAMP, INCANDESCENT: Clear, part no. MS25231-313	FO 7-3 (10)
1A1A1LS1		ALARM, UNDERVOLTAGE: 6-28 Vdc operating voltage; mfr 00724, part no. 69-00207-001	FO 7-3 (33)
1A1A1MP4		WASHER, SPRING TENSION: 0.735 od, 0.395 id, 0.016 in. thk; mfr 29964 part no. 1909, mfr 29440 part no. SU10, 00724 dwg 24-00038-024	FO 7-3 (26)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1MP7		PLATE, RETAINER: 9.75 lg, 1.75 wd, 0.06 in. thk; mfr 00724, part no. 37-07948-001 (ATTACHING PARTS) L(2), AP(2), AU(2), B(2)	FO 7-3 (42)
1A1A1MP8		BRACKET, MOUNTING: 0.71 lg, 0.25 in. wd; mfr 00724, part no. 37-07947-001 (ATTACHING PARTS) AB(2), AK(2), AV(2)	FO 7-3 (43)
1A1A1MP9		PLUNGER, QUICK RELEASE: 8-36unf, 1-1/4 lbs final end press, cc-plain; mfr 01226 part no. SSB50P, 00724 dwg 40-00585-104	FO 7-3 (39)
1A1A1MP10		BEARING, WASHER, THRUST: Cres, 0.50 od, 0.254 id, 0.005 in. thk; mfr 00724, part no. 27-00071-001	FO 7-3 (58)
1A1A1MP11		BAR, GUIDE: Cres, 12.562 lg, 0.374 in. dia; mfr 00724, part no. 37-07705-001	FO 7-3 (27)
1A1A1MP12		BRACKET, ANGLE: Al aly, 6.25 in. lg; mfr 00724, part no. 37-07767-001 (ATTACHING PARTS) Y(2), AL(2), AV(2)	FO 7-3 (20)
1A1A1MP13		SPACER, PLATE: Epoxy resin glass cloth, 1.44 lg 0.31 wd, 0.062 in. thk; mfr 00724, part no. 37-07769-001	FO 7-3 (14)
1A1A1MP14		PLATE, RETAINING, TOP PAPER, ASSEMBLY: Mfr 00724, part no. 03-04297-002	FO 7-3
1A1A1MP14-MP2		ROLLER, PINCH: Rubber exterior, 0.50 in. dia; mfr 00724, part no. 69-00486-001 (ATTACHING PARTS) RING, RETAINING: External, cres, 0.125 id 0.015 in. thk, part no. MS16633-4012 (1)	FO 7-3 (2)
1A1A1MP14-MP3		PIN, SHOULDER: 1.01 in. lg; mfr 00724, part no. 37-07968-001	FO 7-3 (18)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1MP14-MP7		WINDOW, PAPER DRIVE: Mfr 00724, part no. 57-01098-002	FO 7-3 (3)
1A1A1MP15		PLATEN, TELEPRINTER - ASSEMBLY OF: Al aly, 13.010 in. lg, mfr 00724, part no. 67-05169-001	FO 7-3 (4)
1A1A1MP16		BRACKET, IDLER PULLEY - ASSEMBLY OF: Al aly, mfr 00724, part no. 67-04887-001	FO 7-3 (67)
1A1A1MP17		BEARING, BALL, ANNULAR: Mfr 83086 part no. SFR188LLDC8K58-274, mfr 50294 part no. SSR1F-814LLRA7P58LY48, 00724 dwg 27-00068-005	FO 7-3 (49)
1A1A1MP17		BEARING, BALL, ANNULAR: Mfr 83086 part no. SFR188LLDC8K58-274, mfr 50294 part no. SSR1F-814LLRA7P58LY48, 00724 dwg 27-00068-005	FO 7-3 (59)
1A1A1MP18		BEARING, BALL, ANNULAR: Mfr 14927 part no. SFR6HHK25L01-3; mfr 83086 part no. SFR63PPDK25-7, mfr 50294 part no. SSR1F-1438ZZRA3P25L01, 00724 dwg 27-00068-002 (ATTACHING PARTS) RING, RETAINING: External, cres, 0.375 dia, 0.025 in. thk, part no. MS16624-4037 (1)	FO 7-3 (36)
1A1A1MP21		BELT, POSITIVE DRIVE: 24.0 lg, 0.25 in. wd, 120 teeth; mfr 02934 part no. 240XL025T4N10, 00724 dwg 28-00125-104	FO 7-3 (54)
1A1A1MP22		BELT, POSITIVE DRIVE: 11.20 lg, 0.25 in. wd, 140 teeth; mfr 02934 part no. MOLD80140-112MXL025A17N10, 00724 dwg 28-00165-001	FO 7-3 (35)
1A1A1MP23		BELT, POSITIVE DRIVE: 7.52 lg, 0.25 in. wd, 94 teeth; mfr 02934 part no. MOLD80094X1-4XA17N10 00724 dwg 28-00165-002	FO 7-3 (57)
1A1A1MP24		SHAFT, PULLEY BRACKET SUPPORT: Cres, 1.230 in. lg, 10-32unf 2A and 1/4-28unf-2A threaded ends; mfr 00724, part no. 29-00227-001	FO 7-3 (62)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1MP25		SHAFT: Cres, 1.25 in. lg, 6-32unc-2A threaded end; mfr 00724, part no. 29-00233-001	FO 7-3 (25)
1A1A1MP26		COLLAR, DETENT: Cres, 1.00 od, 0.375 id, 0.250 in. thk; mfr 00724, part no. 29-00234-001 (ATTACHING PARTS) AH(1)	FO 7-3 (24)
1A1A1MP27		SHAFT, DRIVE PULLEY: Cres, 1.66 lg, 0.25 in. dia stock; mfr 00724, part no. 29-00235-001 (ATTACHING PARTS) RING, RETAINING: External, cres, 0.35 dia, 0.025 in. thk; part no. MS16632-4025 (2)	FO 7-3 (50)
1A1A1MP28		CLAMP, LOOP: Plastic, 4.0 in. lg, 1/16 to 5/8 in. bundle range; mfr 59730 part no. TY33M, 00724 dwg 30-00105-002 (ATTACHING PARTS) V(1), AJ(3), AU(1), B(1)	FO 7-3 (15)
1A1A1MP29		BUSHING, SLEEVE: Al aly, 0.376 in. id; mfr 00724, part no. 30-00261-002 (ATTACHING PARTS) U(3), AJ(3)	FO 7-3 (46)
1A1A1MP30		PULLEY, FLANGED - ASSEMBLY OF: Lg pe 1.375 pd, 1.355 od, 54 T, 0.080 pitch; sm pe 1.146 pd, 1.126 od, 18 T 1/5 pitch; mfr 00724, part no. 39-00386-001 (ATTACHING PARTS) SETSCREW, SELF-LOCKING: Carbon steel, cadmium plate, 0.138-32, 0.250 in. lg; part no. NAS1081-06D7 (1)	FO 7-3 (51)
1A1A1MP31		PULLEY, FLANGED - ASSEMBLY OF: 1.375 pd, 1.355 od, 54 T 0.080 pitch; mfr 00724, part no. 39-00387-001 (ATTACHING PARTS) AH(2)	FO 7-3 (8)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1MP32		PULLEY, FLANGED: 1.146 pd, 1.126 od, 18 T, 1/5 pitch; mfr 00724, part no. 39-00388-001	FO 7-3 (60)
1A1A1MP33		SHAFT, STRAIGHT: Cres, 0.812 lg, 0.2497 in. dia stock; mfr 00724, part no. 37-07570-001	FO 7-3 (66)
1A1A1MP35		SPRING, HELICAL, COMPRESSION: 0.480 od, 1/2 in. lg; mfr 84830 part no. LC059G1SS, 00724 dwg 42-00103-001	FO 7-3 (64)
1A1A1MP38		RETAINER, BELT: 0.63 lg, 0.30 wd, 0.18 in. thk; mfr 00724, part no. 57-01057-001 (ATTACHING PARTS) AK(2), AV(2), Z(2)	FO 7-3 (53)
1A1A1MP39		HOUSING, IMPACT PRINTER MECHANISM - ASSEMBLY OF: Mfr 00724, part no. 67-05155-001	FO 7-3
1A1A1MP39-MP9		BEARING, SLEEVE, FLANGED, OIL-IMPREGNATED BRZ: 3/8 od, 1/4 id, 1/4 in. lg, mfr 70417 part no. FF312, 00724 dwg 27-00023-017	FO 7-3 (40)
1A1A1MP40		RIBBON, TELEPRINTER SUBASSEMBLY: Mfr 51809 part no. 197939, 00724 dwg 69-00402-001	FO 7-3 (30)
1A1A1MP49		KEY, POLARIZING: Mfr 53387 part no. 3435-0000, 00724 dwg 16-01513-001	FO 7-3 (22)
1A1A1MP50		PAPER ROLL ASSEMBLY: Provides support and retention for paper supply; mfr 00724, part no. 03-04298-002 (ATTACHING PARTS) Y(4), AL(4)	FO 7-3 (19) FO 7-4
1A1A1MP50-MP1		SHAFT, PAPER ROLL - ASSEMBLY OF: Mfr 00724, part no. 03-03782-001	FO 7-4
1A1A1MP50-MP1MP1		SHAFT, PAPER ROLL: 8.98 lg, 0.25 in. dia stk; mfr 00724, part no. 37-07073-001	FO 7-4 (2)
1A1A1MP50-MP1MP2		BUSHING, SLEEVE: 0.98 od, 0.25 in. id; mfr 00724, part no. 57-01014-001	FO 7-4 (3)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) F(4)	
1A1A1MP50-MP2		CHASSIS, ELECTRICAL EQUIPMENT, PAPER ROLL - ASSEMBLY OF: Mfr 00724, part no. 67-05170-001	FO 7-4 (4)
1A1A1MP50-MP3		PLATE, PAPER, TENSIONER - ASSEMBLY OF: Mfr 00724, part no. 67-04592-001	FO 7-4
		(ATTACHING PARTS)	
		RING, RETAINING: External, cres, 0.25 in. shaft dia, 0.025 in. thk; part no. MS16633-4025 (2)	
1A1A1MP50-MP3MP1		PLATE, PAPER, TENSIONER: Mfr 00724, part no. 67-04592-101	FO 7-4 (1)
1A1A1MP50-MP3MP2		POST, ELECTRICAL-MECHANICAL EQUIPMENT: 0.940 lg, 0.250 in. dia stk; mfr 00724, part no. 40-00768-001	FO 7-4 (5)
1A1A1MP50-MP4		PLATE, ASSEMBLY OF: 2.75 lg, 1.75 wd, 0.09 in. thk; mfr 00724, part no. 67-05183-001	FO 7-4 (8)
		(ATTACHING PARTS) Z(4), AV(4)	
1A1A1MP50-MP5		RETAINER, SHAFT: 0.87 in. dia; mfr 00724, part no. 37-07967-001	FO 7-4 (7)
		(ATTACHING PARTS)	
		SETSCREW, NYLON TIP: 8-32unc-2A, 15/64 lg, 5/64 in. across socket flats; mfr 00141 part no. CS11, 00724 dwg 23-01318-004 (2)	
1A1A1MP50-MP6		LEVER, SHAFT RETAINER: 2.19 lg, 0.156 in. dia stk; mfr 00724, part no. 37-07149-001	FO 7-4 (6)
1A1A1MP50-MP11		SPRING, HELICAL, COMPRESSION: MIL-S-13572 part no. MS24585-C217	FO 7-4 (10)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1MP50-MP14		MOUNT, CABLE TIEDOWN-ADHESIVE BACKED: Al, 1 lg, 1/2 in. wd; mfr 59730 part no. TC105A, 00724 dwg 30-00180-001	FO 7-4 (9)
1A1A1MP60		SETSCREW: Cres, 6-32unc-3A, 3/16 lg, 0.630 in. hex head, part no. AN565DC6H3	FO 7-3 (61)
1A1A1MP71		WASHER, LOCK: Cres, 0.148 id, 0.250 od, 0.031 in. thk; part no. MS35338-136	FO 7-3 (47.2)
1A1A1MP74		WASHER, SHOULDER: Cres, 0.500 od, 0.251 id, 0.090 in. thk; mfr 00724, part no. 24-00264-001	FO 7-3 (63)
1A1A1MP76		NUT, SELF-LOCKING, ASSEMBLED WASHER: Cres, 1/4-28unf-3B; mfr 15653 part no. HW42-4, 00724 dwg 25-00318-006	FO 7-3 (65)
1A1A1MP77		TERMINAL, LUG - CRIMP STYLE: Cop, insulated; part no. MS25036-145	FO 7-3 (47.1)
1A1A1MP83		CLAMP, LOOP: MIL-S-23190 part no. MS3367-4-9	FO 7-3 (28)
1A1A1MP84		MOUNT, CABLE TIEDOWN-ADHESIVE BACKED: Al, 1.00 lg, 0.50 in. wd; mfr 59730 part no. TC105A, 00724 dwg 30-00180-001	FO 7-3 (29)
1A1A1MP92		PIN, PIVOT: Sst, 1.150 lg, 0.225 in. od dia; mfr 00724, part no. 40-00889-002 (ATTACHING PARTS) AH(2)	FO 7-3 (23)
1A1A1MP100		SPACER, THREADED: Al aly, 6-32unc-2B X 4-40unc-28, 0.62 in. lg; mfr 00724, part no. 40-00891-001 (ATTACHING PARTS) AB(1), AK(1), AV(1)	FO 7-3 (48)
1A1A1MP101		BRACKET, ANGLE, ASSEMBLY OF: 3.00 in. lg; mfr 00724, part no. 67-05210-001 (ATTACHING PARTS) S(2), AJ(2), AU(2)	FO 7-3 (56)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1MP102		BRACKET, ANGLE: 2.90 lg, 3.25 in. wd; mfr 00724, part no. 37-08040-001 (ATTACHING PARTS) T(1), AJ(1)	FO 7-3 (52)
1A1A1MP108		BRACKET, ANGLE: 1.44 in. lg; mfr 00724, part no. 37-07803-001 (ATTACHING PARTS) AA(1), AL(2), AV(1), C(1)	FO 7-3 (16)
1A1A1MP110		KNOB: For variable resistor R2; part no. MS91528-0C1B	FO 7-3 (5)
1A1A1MP112		BAR, GUIDE: Al aly, 9.18 lg, 0.69 wd, 0.25 in. thk; mfr 00724, part no. 37-07093-001 (ATTACHING PARTS) AB(4), AK(4), AV(4)	FO 7-3 (44)
1A1A1MP113		SUPPORT, GUIDE BAR: Al aly, 11.88 lg, 1.00 in. wd; mfr 00724, part no. 37-07952-001 (ATTACHING PARTS) AB(4), AK(4)	FO 7-3 (32)
1A1A1MP116		GUIDE, PAPER: Al aly, 9.00 in. lg; mfr 00724, part no. 67-05185-001 (ATTACHING PARTS) AA(3), AK(3)	FO 7-3 (47)
1A1A1MP119		SPRING, HELICAL, TORSION: Sst 0.40 od, 2 in. lb torque at 1.00 rad; mfr 00724, part no. 42-00127-001 (ATTACHING PARTS) F(1)	FO 7-3 (1)
1A1A1MP120		SPRING, HELICAL, TORSION: Sst 0.40 od, 2 in. lb torque at 1.00 rad; mfr 00724, part no. 42-00127-002 (ATTACHING PARTS) F(1)	FO 7-3 (7)
1A1A1MP121		COLLAR-CARRIAGE STOP: Silicone, 0.500 id, 0.50 in. thk; mfr 00724, part no. 30-00280-002	FO 7-3 (68)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1MP122		COLLAR-CARRIAGE STOP: Silicone, 0.500 id, 0.27 in. thk; mfr 00724, part no. 30-00280-001	FO 7-3 (69)
1A1A1P1-1		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 26 contacts, strain relieved; mfr 53387 part no. 3399-7026, 00724 dwg 16-01511-115	FO 7-3 (21)
		TAB, PULL, CONNECTOR: Mfr 53387 part no. 3490-2, 00724 dwg 16-01513-202 (1)	
1A1A1R1		RESISTOR, FIXED, WIRE WOUND: MIL-R-39009/1 part no. RER75F51R1M	FO 7-3 (34)
		(ATTACHING PARTS) S(2), AJ(2)	
1A1A1R2		RESISTOR, VARIABLE, NON WIRE WOUND: MIL-R-94/3 part no. RV6NAYSD502A	FO 7-3 (6)
1A1A1U1		SEMICONDUCTOR DEVICE-L.E.D., OPTICAL SWITCH: Dual facing semiconductors, one LED and one silicon phototransistor; mfr 00724, part no. 20-01019-001	FO 7-3 (31)
		(ATTACHING PARTS) U(2), AJ(4), AU(2), B(2)	
1A1A1W1		CABLE ASSEMBLY, SPECIAL PURPOSE: Mfr 00724, part no. 12-02847-001	FO 7-3 (12) FO 7-5
		(ATTACHING PARTS) AQ(2)	
		JACKSCREW ASSEMBLY: Female, 6-32unc-2B X 4-40unc-2A; mfr 00779 part no. 86602-1 00724 dwg 16-01194-302 (2)	
		JACKSCREW ASSEMBLY: Male, 6-32unc-2B short turnable; mfr 00779 part no. 87185-1, 00724 dwg 16-01336-002 (2)	
1A1A1W1MP2		CONTACT: Crimp on; mfr 00779 part no. 86561-4, 00724 dwg 16-01194-203 (40)	FO 7-5

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1W1P1, P2		CONNECTOR: Housing; mfr 00779 part no. 86670-6, 00724 dwg 16-01194-102	FO 7-5
1A1A1XDS1, XDS2		LIGHT, INDICATOR: Mfr 96312 part no. 52-0410-3195-201, mfr 75915 part no. 930-404X740WN, 00724 dwg 14-00122-001	FO 7-3 (11)
1A1A1A1		MOTOR AND TIMING DISC ASSEMBLY: Provides carriage movement, and positioning; mfr 00724, part no. 03-04301-002 (ATTACHING PARTS) AN(4), V(2), I(1), L(1), AJ(3), B(1) SCREW, MACHINE: Pan head, cross-recessed, cres 10-32unf-2A, 7/16 in. lg, part no. MS51958-62 (4)	FO 7-3 (17) FO 7-6
1A1A1A1B1		ACTUATOR, ELECTRO-MECHANICAL, ROTARY: 10 vdc, four phase, 0.250 in. dia shaft; mfr 00724, part no. 15-00058-003	FO 7-3 FO 7-6 (16)
1A1A1A1MP8		SCREW, ADJUSTMENT: Cres, 8-36unf-2A, 0.908 in. lg; mfr 00724, part no. 23-01617-001	FO 7-6 (5)
1A1A1A1MP11		WASHER, FLAT: Cres, 0.188 id, 0.375 od, 0.049 in. thk; part no. MS15795-807	FO 7-6 (4)
1A1A1A1MP14		NUT, PLAIN, SQUARE: Cres, 8-36unf-2B; mfr 00724, part no. 25-00388-001	FO 7-6 (3)
1A1A1A1MP15		RING, RETAINING: External, cres, 0.125 shaft dia, 0.015 in. thk; part no. MS16633-4012	FO 7-6 (2)
1A1A1A1MP16		CLAMP, HUB-SPLIT TYPE, BALANCED: Incl 6-32 socket head cap screw; mfg 29440 part no. CG3-11, mfr 00328 part no. C90, 00724 dwg 30-00243-002	FO 7-6 (13)
1A1A1A1MP17		SPROCKET WHEEL: 0.080 in. pitch drive; mfr 59076 part no. 6A16-018DF2508, 00724 dwg 39-00399-001	FO 7-6 (15)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) PIN, SPRING: Cres, 0.625 lg, 0.062 in. dia; part no. MS171438 (1)	
1A1A1A1MP18		CLAMP, MOTOR: Cres; mfr 00724 part no. 37-07068-001 (ATTACHING PARTS) M(2), AK(2), AV(2), C(2)	FO 7-6 (17)
1A1A1A1MP20		SPRING, HELICAL, COMPRESSION: Cres, part no. MS24585-C91	FO 7-6 (1)
1A1A1A1MP21		BRACKET, ANGLE: Al aly, mfr 00724, part no. 67-04535-001 (ATTACHING PARTS) AW(4) SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 1/2 in. lg, part no. MS51957-45 (4) WASHER, FLAT: Cres, 0.169 id, 0.304 od, 0.032 in. thk, part no. NAS620C8 (4)	FO 7-6 (21)
1A1A1A1MP23		DISK, LIGHT INTERRUPTING - ASSEMBLY OF: Mfr 00724, part no. 67-04608-001	FO 7-6 (7)
1A1A1A1MP34		COVER, CONTROL BOARD: Plastic, 0.062 in. thk; mfr 00724, part no. 57-01119-001 (ATTACHING PARTS) SCREW, MACHINE: Flathead, cross-recessed, cres, 2-56unc-2A, 3/16 in. lg; part no. NAS662C2R3 (3)	FO 7-6 (18)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A1MP35		SPACER, THREADED: Plastic, 0.25 od, 0.25 in. thk, 2-56unc-2B id thread; mfr 00724, part no. 26-00398-001 (ATTACHING PARTS) SCREW, MACHINE: Flathead, cross-recessed, cres, 0.0860-56unc-2A, 3/16 in. lg; part no. NAS662C2R3 (1)	FO 7-6 (19)
1A1A1A1MP37		PLATE, MOUNTING - ASSEMBLY OF: Al aly; mfr 00724, part no. 67-04607-003 (ATTACHING PARTS) I(1), S(2), AJ(2), AU(2) SELECT VALUE FOR R1 AND R2	FO 7-6 (20)
1A1A1A1R1A, R2A		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C101JS	FO 7-6 (14)
1A1A1A1R1B, R2B		RESISTOR, (COMMON ITEM 17)	FO 7-6 (14)
1A1A1A1R1C, R2C		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C121JS	FO 7-6 (14)
1A1A1A1R1D, R2D		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C122JS	FO 7-6 (14)
1A1A1A1R1E, R2E		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C123JS	FO 7-6 (14)
1A1A1A1R1F, R2F		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C151JS	FO 7-6 (14)
1A1A1A1R1G, R2G		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C181JS	FO 7-6 (14)
1A1A1A1R1H, R2H		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C182JS	FO 7-6 (14)
1A1A1A1R1J, R2J		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C221JS	FO 7-6 (14)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A1R1K, R2K		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C271JS	FO 7-6 (14)
1A1A1A1R1L, R2L		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C272JS	FO 7-6 (14)
1A1A1A1R1M, R2M		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C331JS	FO 7-6 (14)
1A1A1A1R1N, R2N		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C391JS	FO 7-6 (14)
1A1A1A1R1P, R2P		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C392JS	FO 7-6 (14)
1A1A1A1R1Q, R2Q		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C471JS	FO 7-6 (14)
1A1A1A1R1R, R2R		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C560JS	FO 7-6 (14)
1A1A1A1R1S R2S		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C561JS	FO 7-6 (14)
1A1A1A1R1T, R2T		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C562JS	FO 7-6 (14)
1A1A1A1R1U, R2U		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C680JS	FO 7-6 (14)
1A1A1A1R1V, R2V		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C681JS	FO 7-6 (14)
1A1A1A1R1W, R2W		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C820JS	FO 7-6 (14)
1A1A1A1R1X, R2X		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C821JS	FO 7-6 (14)
1A1A1A1R1Y, R2Y		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RCR05C822JS	FO 7-6 (14)
		END OF SELECT VALUE	

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A1A1		MOTOR CONTROL - SUBASSEMBLY: Provides carriage positioning; mfr 00724, part no. 03-03790-002 (ATTACHING PARTS) AC(1), AK(1), AV(1)	FO 7-6 (6) FO 7-7
1A1A1A1A1-MP1		PLATE, ADJUSTING: Al aly; mfr 00724, part no. 37-07160-001	FO 7-7 (3)
1A1A1A1A1-MP2		PLATE, LIGHT RESTRICTING: Cres; mfr 00724, part no. 37-07161-001	FO 7-7 (4)
1A1A1A1A1-MP4		SPACER, PLATE: Al aly, 0.190 id, 0.380 od, 0.045 in. thk; mfr 00724, part no. 40-00903-001	FO 7-7 (5)
1A1A1A1A1-MP10		POST, TIMING DISK: Cres, 0.725 in. lg; mfr 00724, part no. 40-00939-001	FO 7-7 (1)
1A1A1A1A1-MP12		SHIM: Cres, 0.189 id, 0.312 od, 0.010 in. thk; mfr 00724, part no. 40-00950-001	FO 7-7 (7)
1A1A1A1A1-MP13		NUT, PLAIN, HEXAGON: Cres, 0.1640-32unjc-3B, 5/16 in.across flats; part no. NAS671C8	FO 7-7 (8)
1A1A1A1A1-A1		CIRCUIT CARD ASSEMBLY-MOTOR CONTROL: Mfr 00724, part no. 61-02525-002	FO 7-7 (6) FO 7-8
1A1A1A1A1-A1C1		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2254	FO 7-8
1A1A1A1A1-A1MP1MP3		TERMINAL, STUD, FEEDTHRU, SINGLE-DOUBLE TURRET: Mfr 71279 part no. 3653-2-05, 00724 dwg 26-00272-014 (5)	FO 7-8
1A1A1A1A1-A1MP8		BUMPER, PLASTIC: Mfr 78229 part no. ND78R, 00724 dwg 41-00247-001	FO 7-8
1A1A1A1A1-A1MP9		NUT, PLAIN, CLINCH: 2-56unc-2B; mfr 71279 part no. 350-2188-09-07, 00724 dwg 26-00020-182	FO 7-8

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A1A1-A1Q1 THRU Q3		SEMICONDUCTOR DEVICE-PHOTO-TRANSISTOR: Mfr 04713 part no. SRD190, mfr 31757 part no. MII65000-001, 00724 dwg 20-00688-001	FO 7-8
1A1A1A1A1-A1R3		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G203JS	FO 7-8
1A1A1A1A1-A1R4		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR07G181JS	FO 7-8
1A1A1A1A1-A1R6, R7		RESISTOR, (COMMON ITEM 17)	FO 7-8
1A1A1A1A1-A1R9		RESISTOR, (COMMON ITEM 17)	FO 7-8
1A1A1A1A1-A1U1		MICROCIRCUIT, ARRAY, NPN TRANSISTOR: Mfr 54590 part no. CA3045, mfr 34333 part no. SG3045J, mfr 07263 part no. UA3045DM, 00724 dwg 72-00280-207	FO 7-8
1A1A1A1A1-A2		CIRCUIT CARD ASSEMBLY-MOTOR CONTROL: Mfr 00724, part no. 61-02524-001	FO 7-7 (2) FO 7-9
1A1A1A1A1-A2CR1 THRU CR3		SEMICONDUCTOR DEVICE-PHOTO, LIGHT EMITTING: Mfr 04713 part no. SLED96, 00724 dwg 20-00682-001	FO 7-9
1A1A1A1A1-A2MP3		BUMPER, PLASTIC: Mfr 78229 part no. ND78R, 00724 dwg 41-00247-001	FO 7-9
1A1A1A1A2		CIRCUIT CARD ASSEMBLY-TERMINAL BD LINE/FEED MOTOR: Mfr 00724, part no. 61-40256-001	FO 7-6 (8)
1A1A1A1A2-MP1MP2		TERMINAL, STUD: Part no. M55155/30-5	FO 7-6 (12)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A1A2-J1		CONNECTOR, ELECTRICAL, RECEPTACLE, FLAT CABLE, RT ANGLE: Part no. M83503/20-01 (ATTACHING PARTS) D(2) SCREW, MACHINE: Flat head, cross-recessed, cres, 0.0860-56unc-2A, 7/16 in. lg, part no. NAS662C2R7 (2)	FO 7-6 (10)
1A1A1A1A2-MP9		KEY, POLARIZING: Mfr 53387 part no. 3518-0000, 00724 dwg 16-01513-101	FO 7-6 (9)
1A1A1A2		CIRCUIT CARD ASSEMBLY-PAPER DETECTOR: Mfr 00724, part no. 61-02529-001 (ATTACHING PARTS) T(2), AJ(2), AU(2)	FO 7-3 (41) FO 7-10
1A1A1A2MP1-MP2		TERMINAL, STUD, DOUBLE TURRET, SWAG TYPE: Mfr 71279 part no. ES6333-1, mfr 18310 part no. 10-232-2, mfr 88245 part no. 13252-1, mfr 05791 part no. 2465-093, mfr 86577 part no. SS-5513-1, 00724 dwg 26-00265-001 SELECT VALUE FOR R1	FO 7-10
1A1A1A2R1A		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C112GR	FO 7-10
1A1A1A2R1B		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C391GR	FO 7-10
1A1A1A2R1C		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C473GR	FO 7-10
1A1A1A2R1D		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C561GR	FO 7-10
1A1A1A2R1E		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C822GR	FO 7-10

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A2R1F		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1501GR	FO 7-10
1A1A1A2R1G		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1502GR	FO 7-10
1A1A1A2R1H		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2001GR	FO 7-10
1A1A1A2R1J		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3001GR	FO 7-10
1A1A1A2R1K		RESISTOR, (COMMON ITEM 32)	FO 7-10
1A1A1A2R1L		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C7500GR END OF SELECT VALUE	FO 7-10
1A1A1A2U1		SEMICONDUCTOR DEVICE-LIGHT EMITTING DIODE OPTICAL SWITCH, TRANSISTOR SENSED: Mfr 00724, part no. 20-01018-001	FO 7-10
1A1A1A3		CARRIAGE ASSEMBLY: Provides printhead and ribbon motor. Determines printhead vertical positioning. Mfr 00724, part no. 03-04286-001	FO 7-3 (45) FO 7-11
1A1A1A3B1		MOTOR, DIRECT CURRENT-PERMANENT MAGNET: 12 Vdc, clockwise rotation; mfr 00724, part no. 15-00062-001 (ATTACHING PARTS) S(3), AJ(3), AU(3)	FO 7-11 (2)
1A1A1A3MP1		PRINTHEAD, PIN MATRIX: 40 to 58 Vdc, 1200 pps; mfr 00724, part no. 69-00563-001 (preferred part) 69-00472-001 acceptable alternate (ATTACHING PARTS) T(2), AJ(2) JACKSCREW ASSEMBLY: Male, turnable 0.562 in. lg, mfr 00779 part no. 87185-1, 00724 dwg 16-01336-002 (2)	FO 7-11 (3)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A3MP2		CARRIAGE, UPPER - ASSEMBLY OF: A1 aly; mfr 00724, part no. 37-07082-001 (ATTACHING PARTS) AN(3) SCREW, SHOULDER: Cres, 6-32unc-2A, 0.562 in. lg; mfr 00724, part no. 23-01600-001 (2) SCREW, SHOULDER: Cres, 6-32unc-2A, 0.438 in. lg; mfr 00724, part no. 23-01600-002 (1)	FO 7-11 (1)
1A1A1A3MP3		BRACKET, ANGLE, LOWER CARRIAGE - ASSEMBLY OF: A1 aly; mfr 00724, part no. 67-05174-001	FO 7-11 (9)
1A1A1A3MP3-MP3		PIN, STRAIGHT, HEADED-TENSION ARM: Cres, 0.557 in. lg; mfr 00724, part no. 40-00757-001	FO 7-11 (19)
1A1A1A3MP6		ARM, TENSION: Cres, 0.88 lg, 0.250 in. stk; mfr 00724, part no. 37-07062-001	FO 7-11 (20)
1A1A1A3MP7		STOP, DETECTOR: Cres, 1.56 in. lg; mfr 00724, part no. 37-07078-001 (ATTACHING PARTS) AJ(2) SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 1/8 in. lg; part no. MS51957-11 (2)	FO 7-11 (6)
1A1A1A3MP8		POST, ELECTRICAL-MECHANICAL EQUIPMENT, ECCENTRIC: Cres, 8-32unc-2A, 0.95 in. lg; mfr 00724, part no. 40-00755-001	FO 7-11 (14)
1A1A1A3MP9		POST, ELECTRICAL-MECHANICAL EQUIPMENT, PIVOT STUD: Cres, 8-32unc-2A, 0.93 in. lg; mfr 00724, part no. 40-00756-001	FO 7-11 (17)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A3MP16		WASHER, FLAT: Cres, 0.188 id, 0.375 od, 0.049 in. thk; part no. MS15795-807	FO 7-11 (13)
1A1A1A3MP18		WASHER, FLAT: Cres, 0.169 id, 0.304 od, 0.032 in. thk; part no. NAS620-8	FO 7-11 (18)
1A1A1A3MP20		WASHER, LOCK: Cres, 0.175 id, 0.293 od, 0.040 in. thk; part no. MS35338-137	FO 7-11 (12)
1A1A1A3MP21		NUT, PLAIN, HEXAGON: Cres, 8-32unc-2B, 11/32 in. across flats; part no. MS35649-284	FO 7-11 (11)
1A1A1A3MP22		BLOCK, PLASTIC: 0.50 lg, 0.375 wd, 0.156 in. thk; mfr 00724, part no. 57-01022-002	FO 7-11 (15)
1A1A1A3MP23		BEARING, BALL, ANNULAR: Mfr 96881 part no. SUPER-8-CR, 00724 dwg 27-00069-001 (ATTACHING PARTS) SETSCREW, HEXAGON, SOCKET, HEADLESS: Cres, 6-32unc-3A, 1/4 in. lg; part no. AN565DC6H4 (4) NUT, PLAIN, HEXAGON: Cres, 6-32unc-2B, 0.313 in. across flats; part no. MS25082-C1 (4)	FO 7-11 (4)
1A1A1A3MP24		RING, RETAINING, EXTERNAL: Be. cop. 0.125 dia, 0.015 in. thk; part no. MS16633-5012	FO 7-11 (16)
1A1A1A3MP25		SEAL, PLAIN, ENCASED: Sst, NPRN, 0.879 od, 0.125 in. thk; mfr 96881 part no. S500SS, 00724 dwg 28-00160-001	FO 7-11 (5)
1A1A1A3MP27		SPRING, HELICAL, EXTENSION: Cres, 3/16 od, 1/2 in. lg; mfr 84830 part no. LE022B002SS, 00724 dwg 42-00103-002	FO 7-11 (10)
1A1A1A3MP30		CONTACT, ELECTRICAL: Mfr 00779 part no. 86571-4, 00724 dwg 16-01330-001	FO 7-11 (7)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A4		MOTOR ASSEMBLY, LINE FEED: Provides a four phase 5 deg stepping motor, 17 Vdc for the line feed; mfr 00724, part no. 03-04300-001 (ATTACHING PARTS) AM(4), AW(4) SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 5/8 in. lg; part no. MS51957-46 (2) SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 3/4 in. lg; part no. MS51957-47 (2)	FO 7-3 (38) FO 7-12
1A1A1A4B1		ACTUATOR, ELECTRO-MECHANICAL, ROTARY: 17 Vdc, four phase, 5 deg step angle; mfr 00724, part no. 15-00061-002	FO 7-12 (9)
1A1A1A4MP2		PULLEY, FLANGED: Al aly, 27 T, 0.080 pitch, 0.251 in. id; mfr 00724, part no. 39-00389-001	FO 7-12 (7)
1A1A1A4MP3		CLAMP, HUB-SPLIT TYPE, BALANCED: Incl 6-32 socket head cap screw; mfg 29440 part no. CG3-13; mfr 00328 part no. C91, 00724 dwg 30-00243-003	FO 7-12 (8)
1A1A1A4MP4		MOUNTING BRACKET, CONNECTOR-LINE FEED MOTOR: Al aly; mfr 00724, part no. 37-07754-001	FO 7-12 (4)
1A1A1A4MP6		CLAMP, LOOP: Plastic, 4.0 lg, 1/16 to 5/8 in. bundle range; mfr 59730 part no. TY33M, 00724 dwg 30-00105-002 (ATTACHING PARTS) V(1), AJ(2), AU(1), B(1) TERMINAL, LUG, SOLDER TYPE, ONE LUG: Brass 0.120 dia hole, 0.020 in. thk; mfr 79963 part no. 333, 00724 dwg 26-00049-001 (1)	FO 7-12 (1)
1A1A1A4A1		CIRCUIT CARD ASSEMBLY, TERMINAL BOARD-LINE/ FEED MOTOR: Mfr 00724, part no. 61-40256-001 (ATTACHING PARTS) I(2), S(1), AJ(1), AU(1)	FO 7-12 (3)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A4A1J1		CONNECTOR, ELECTRICAL, RECEPTACLE, FLAT CABLE, RIGHT ANGLE: Part no. M83503/20-01 (ATTACHING PARTS) D(2) SCREW, MACHINE: Flathead cross-recessed, cres, 0.0860-56unc-2A, 7/16 in. lg; part no. NAS662C2R7 (2)	FO 7-12 (6)
1A1A1A4A1-MP1MP2		TERMINAL, STUD: Part no. M55155/30-5	FO 7-12 (2)
1A1A1A4A1-MP9		KEY, POLARIZING: Mfr 53387 part no. 3518-0000, 00724 dwg 16-01513-101	FO 7-12 (5)
1A1A1A5		ZENER MODULE-ASSEMBLY: Provides a balance and limit for the pin driver circuit voltage; mfr 00724, part no. 03-04292-002 (ATTACHING PARTS) AM(3) SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 1/2 in. lg; part no. MS51957-45 (5)	FO 7-3 (13) FO 7-13
1A1A1A5CR1		SEMICONDUCTOR DEVICE-DIODE: MIL-S-19500/114 part no. JAN1N2822B	FO 7-13 (6)
1A1A1A5CR2		SEMICONDUCTOR DEVICE-DIODE, VOLTAGE: MIL-S-19500/114 part no. JAN1N2810B	FO 7-13 (3)
1A1A1A5J1		CONNECTOR, PLUG, ELECTRICAL-INSULATION DISPLACEMENT: 10 contacts; mfr 53387 part no. 4610-6000, 00724 dwg 16-01512-001	FO 7-13 (15)
1A1A1A5MP1		CHASSIS, ELECTRICAL EQUIPMENT-ZENER MODULE: Mfr 00724, part no. 37-07950-001	FO 7-13 (9)
1A1A1A5MP2		COVER, ZENER MODULE - ASSEMBLY OF: Mfr 00724, part no. 67-05092-001	FO 7-13 (1)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A5MP5		HEAT SINK, ZENER MODULE - ASSEMBLY OF: Al aly, 4.31 lg, 2.19 in. wd; mfr 00724, part no. 67-05171-002	FO 7-13 (2)
1A1A1A5MP7		SPACER, SLEEVE: Brs aly, 0.125 od, 0.500 in. lg; mfr 00724, part no. 40-00038-165	FO 7-13 (14)
1A1A1A5MP8		STRAP, RUBBER-ELECTRONIC TIEDOWN: 4.0 in. lg; mfr 98159 part no. 2829-75-4, 00724 dwg 30-00260-004	FO 7-13 (11)
1A1A1A5MP9		TERMINAL, LUG-SOLDER TYPE, INTERNAL TOOTH, ONE LUG: Brz, 0.018 in. thk; mfr 78189 part no. 2102-06-00, 00724 dwg 26-00008-011	FO 7-13 (20)
1A1A1A5MP10		BUSHING, SLEEVE-FLANGED, NONMETALLIC: Plastic, 0.250 and 0.375 od, 0.156 id, 0.094 in. thk; mfr 00724, part no. 30-00086-008	FO 7-13 (18)
1A1A1A5MP11		INSULATOR, PLATE: Plastic, 0.002 in. thk; MIL-I-38527/8 part no. M38527/8-03P	FO 7-13 (4)
1A1A1A5MP12		NUT, PLAIN, HEXAGON: Cres, 0.1380-32unjc-3B, 0.250 in. across flats; part no. NAS671C6	FO 7-13 (7)
1A1A1A5MP13		SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 3/16 in. lg; part no. MS51957-12	FO 7-13 (8)
1A1A1A5MP14		SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 5/8 in. lg; part no. MS51957-31	FO 7-13 (21)
1A1A1A5MP15		SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 3/4 in. lg; part no. MS51957-19	FO 7-13 (13)
1A1A1A5MP16		WASHER, FLAT: Cres, 0.125 id, 0.250 od, 0.022 in. thk; part no. MS15795-803	FO 7-13 (12)
1A1A1A5MP17		WASHER, FLAT: Cres, 0.156 id, 0.375 od, 0.049 in. thk; part no. MS15795-806	FO 7-13 (19)
1A1A1A5MP18		WASHER, LOCK: Cres, 0.121 id, 0.209 od, 0.025 in. thk; part no. MS35338-135	FO 7-13 (16)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A5MP19		NUT, PLAIN, HEXAGON: Cres, 4-40unc-2B, 1/4 in. across flats, part no. MS35649-244	FO 7-13 (17)
1A1A1A5MP20		SCREW, MACHINE: Flat head, cross-recessed, cres, 4-40unc-2A, 1/4 in. lg, part no. MS24693-C2	FO 7-13 (10)
1A1A1A5MP30		HEAT SINK, INSULATOR SILICONE: 0.008 to 0.012 in. thk; mfr 18565 part no. 60-12-4305-1674, mfr 55285 part no. 7403-09AC-03, 00724 dwg 18-00624-103	FO 7-13 (5)
1A1A1A6		MOTOR DRIVER MODULE - ASSEMBLY OF: Provides ribbon, line feed, and carriage motor drive circuits; mfr 00724, part no. 03-04291-001 (ATTACHING PARTS) SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 3/8 in. lg; part no. MS51957-43 (8)	FO 7-3 (37) FO 7-14
1A1A1A6MP3		CHASSIS, ELECTRICAL EQUIPMENT-MOTOR DRIVER: Mfr 00724, part no. 37-07957-001	FO 7-14 (10)
1A1A1A6MP4		COVER, MOTOR DRIVER - ASSEMBLY OF: Mfr 00724, 67-05086-001 (ATTACHING PARTS) I(8), J(2)	FO 7-14 (5)
1A1A1A6MP5		SPACER, SLEEVE, HEXAGON: Al, 4-40unc-2B, 0.88 lg, 0.25 in. hex rod; mfr 00724, part no. 40-00863-001 (ATTACHING PARTS) SCREW, CAP, SOCKET HEAD: Cres, 4-40unc-3A, 3/4 lg, 3/32 in. hex head; mfr 00724, part no. 23-01513-110 (2)	FO 7-14 (6)
1A1A1A6MP22		KEY, POLARIZING: Mfr 53387 part no. 3435-0000, 00724 dwg 16-01513-001	FO 7-14 (3)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A6MP24		TAB, PULL, CONNECTOR: Mfr 53387 part no. 3490-3, 00724 dwg 16-01513-203	FO 7-14 (4)
1A1A1A6P1		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 10 contacts; mfr 53387 part no. 3473-7000, 00724 dwg 16-01511-101	FO 7-14 (9)
1A1A1A6P2		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 34 contacts; mfr 53387 part no. 3414-7034, 00724 dwg 16-01511-116	FO 7-14 (2)
1A1A1A6P3, P4		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 10 contacts; mfr 53387 part no. 3473-7010, 00724 dwg 16-01511-111	FO 7-14 (8)
1A1A1A6A1		ELECTRICAL COMPONENT ASSEMBLY NO. 1-CARRIAGE DRIVER: Mfr 00724, part no. 03-04303-001 (ATTACHING PARTS) J(1)	FO 7-14 (1) FO 7-15
1A1A1A6A1-MP1		HEAT SINK - ASSEMBLY OF: Al aly; mfr 00724, part no. 67-05121-001	FO 7-15 (3)
1A1A1A6A1-MP3		INSULATOR, ELECTRICAL: Plastic, 0.0075 in. thk; mfr 00724, part no. 67-04939-001	FO 7-15 (8)
1A1A1A6A1-MP5		INSULATOR, PLATE: Plastic, 0.002 in. thk; MIL-I-38527/8 part no. M38527-8-23P	FO 7-15 (5)
1A1A1A6A1-MP11		HEAT SINK, INSULATOR, SILICONE: 0.008 to 0.012 in. thk; MFR 55285 part no. 7403-09FR-11, 00724 dwg 18-00624-001	FO 7-15 (4)
1A1A1A6A1-MP12		BUSHING, SLEEVE-FLANGED: Plastic, 0.250 and 0.156 od, 0.125 id, 0.187 in. thk; mfr 00724, part no. 30-00262-002	FO 7-15 (6)
1A1A1A6A1-Q1 THRU Q4		TRANSISTOR-NPN, POWER DARLINGTON: 80 volt, 8 amp; mfr 04713 part no. SJ5957, 00724 dwg 20-01016-002 (ATTACHING PARTS) B(2), AU(2)	FO 7-15 (1)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A6A1-Q5		TRANSISTOR-NPN, POWER DARLINGTON: 80 volt, 8 amp; mfr 00724, part no. 20-01016-001 or 20-01016-002 (ATTACHING PARTS) B(2), AU(2)	FO 7-15 (2)
1A1A1A6A1-A1		CIRCUIT CARD ASSEMBLY, CARRIAGE DRIVER: Mfr 00724, part no. 61-40360-001	FO 7-15 (7) FO 7-16
1A1A1A6A1-A1C1		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1535	FO 7-16
1A1A1A6A1-A1C2		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1317	FO 7-16
1A1A1A6A1-A1C3		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1535	FO 7-16
1A1A1A6A1-A1C4		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1317	FO 7-16
1A1A1A6A1-A1C5		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1535	FO 7-16
1A1A1A6A1-A1C6		CAPACITOR, (COMMON ITEM 4)	FO 7-16
1A1A1A6A1-A1C7, C8		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1317	FO 7-16
1A1A1A6A1-A1C9		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1535	FO 7-16
1A1A1A6A1-A1C11		CAPACITOR, (COMMON ITEM 4)	FO 7-16
1A1A1A6A1-A1C12		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2271	FO 7-16
1A1A1A6A1-A1C13, C14		CAPACITOR, (COMMON ITEM 4)	FO 7-16

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A6A1-A1C15 THRU C18		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1299	FO 7-16
1A1A1A6A1-A1C20		CAPACITOR, (COMMON ITEM 4)	FO 7-16
1A1A1A6A1-A1CR1 THRU CR4		SEMICONDUCTOR DEVICE-DIODE, RECTIFIER, FAST RECOVERY: 200 volt, 1 amp; mfr 14099 part no. 1N4942, mfr 12969 part no. 1N4942, 00724 dwg 20-01005-001	FO 7-16
1A1A1A6A1-A1CR5		SEMICONDUCTOR DEVICE-DIODE, VOLTAGE REGULATOR: 10 volt; mfr 14433 part no. 1N758A, mfr 16068 part no. 1N758A, 00724 dwg 20-01000-001	FO 7-16
1A1A1A6A1-A1MP1		PRINTED WIRING BOARD-CARRIAGE DRIVER: Mfr 00724, part no. 52-40360-001	FO 7-16
1A1A1A6A1-A1MP1MP2		STUD, BROACHING, PWP: Ph brz, 4-40unc-2A; mfr 46384 part no. KFH-440-8, 00724 dwg 40-00895-004 (10)	FO 7-16
1A1A1A6A1-A1MP1MP4		TERMINAL, STUD, SINGLE TURRET, SWAG TYPE: 0.062 in. bd thk; mfr 71279 part no. ES6336-1, mfr 18310 part no. 10-939-2, 00724 dwg 26-00266-002 (40)	FO 7-16
1A1A1A6A1-A1MP1MP5		TERMINAL, STUD, DOUBLE TURRET, SWAG TYPE: 0.062 in. bd thk; mfr 71279 part no. ES6335-1, mfr 18310 part no. 10-941-2, 00724 dwg 26-00265-002 (2)	FO 7-16
1A1A1A6A1-A1MP22		RECEPTACLE, ELECTRONIC, COMPONENT LEAD(S), PWB: Mfr 00779 part no. 380635-1, 00724 dwg 16-01499-001 (10)	FO 7-16
1A1A1A6A1-A1MP26		INSULATOR, PLATE-TRANSISTOR: Plastic; mfr 07047 part no. 10034N, mfr 54355 part no. 717-205N, 00724 dwg 54-00159-001	FO 7-16
1A1A1A6A1-A1P1		CONNECTOR, RECEPTACLE, ELECTRICAL: 10 contacts; mfr 00779 part no. 86396-1, 00724 dwg 16-01502-001	FO 7-16

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A6A1-A1Q6		TRANSISTOR, PNP, SWITCHING: Silicon; mfr 07263 part no. 2N2907A mfr 14433 part no. 2N2907A, 00724 dwg 20-01012-001	FO 7-16
1A1A1A6A1-A1R1 THRU R4		RESISTOR, FIXED, WIRE WOUND: MIL-R-39007 part no. RWR89S1R00FR	FO 7-16
1A1A1A6A1-A1R5		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RLR05C682GR	FO 7-16
1A1A1A6A1-A1R6, R7		RESISTOR, (COMMON ITEM 26)	FO 7-16
1A1A1A6A1-A1R8		RESISTOR, (COMMON ITEM 19)	FO 7-16
1A1A1A6A1-A1R9		RESISTOR, (COMMON ITEM 27)	FO 7-16
1A1A1A6A1-A1R10, R11		RESISTOR, (COMMON ITEM 26)	FO 7-16
1A1A1A6A1-A1R12		RESISTOR, (COMMON ITEM 19)	FO 7-16
1A1A1A6A1-A1R13 THRU R15		RESISTOR, (COMMON ITEM 27)	FO 7-16
1A1A1A6A1-A1R16, R17		RESISTOR, (COMMON ITEM 26)	FO 7-16
1A1A1A6A1-A1R18		RESISTOR, (COMMON ITEM 19)	FO 7-16
1A1A1A6A1-A1R19, R20		RESISTOR, (COMMON ITEM 26)	FO 7-16
1A1A1A6A1-A1R21		RESISTOR, (COMMON ITEM 19)	FO 7-16

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A6A1-A1R22 THRU R25		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/2 part no. RCR20G561JS	FO 7-16
1A1A1A6A1-A1R26		RESISTOR, (COMMON ITEM 27)	FO 7-16
1A1A1A6A1-A1R27		RESISTOR, (COMMON ITEM 26)	FO 7-16
1A1A1A6A1-A1R28		RESISTOR, (COMMON ITEM 27)	FO 7-16
1A1A1A6A1-A1R29		RESISTOR, FIXED FILM: MIL-R-39017/5 part no. RLR05C751GR	FO 7-16
1A1A1A6A1-A1R30		RESISTOR, FIXED FILM: MIL-R-39017/5 part no. RLR05C153GR	FO 7-16
1A1A1A6A1-1A1R31 THRU R34		RESISTOR, (COMMON ITEM 27)	FO 7-16
1A1A1A6A1-A1U1		MICROCIRCUIT, (COMMON ITEM 15)	FO 7-16
1A1A1A6A1-A1U2		MICROCIRCUIT, (COMMON ITEM 8)	FO 7-16
1A1A1A6A1-A1U3		MICROCIRCUIT, (COMMON ITEM 15)	FO 7-16
1A1A1A6A2		ELECTRICAL COMPONENT ASSEMBLY NO. 2-LINE FEED: Mfr 00724, part no. 03-04304-001	FO 7-14 (7) FO 7-17
		(ATTACHING PARTS) J(1)	
1A1A1A6A2-MP1		HEAT SINK - ASSEMBLY OF: Mfr 00724, part no. 67-04938-001	FO 7-17 (8)
1A1A1A6A2-MP3		INSULATOR, ELECTRICAL: 5.00 lg, 2.31 wd, 0.0075 in. thk; mfr 00724, part no. 67-04940-001	FO 7-17 (3)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A6A2-MP5		INSULATOR, PLATE: Plastic, 0.002 in. thk; MIL-I-38527/8 part no. M38527-8-23P	FO 7-17 (6)
1A1A1A6A2-MP11		HEAT SINK, INSULATOR, SILICONE: 0.008 to 0.012 in. thk; mfr 18565 part no. 60-11-4353-1674, mfr 55285 part no. 7403-09FR-11, 00724 dwg 18-00624-001	FO 7-17 (7)
1A1A1A6A2-MP13		BUSHING, SLEEVE-FLANGED: Plastic, 0.25 and 0.125 od, 0.187 in. thk; mfr 00724, part no. 30-00262-002	FO 7-17 (5)
1A1A1A6A2-Q1		TRANSISTOR-PNP, POWER DARLINGTON: 60 volt, 8 amp; mfr 00724, part no. 20-01015-001 (ATTACHING PARTS) B(2), AU(2)	FO 7-17 (1)
1A1A1A6A2-Q2 THRU Q5		TRANSISTOR-NPN, POWER DARLINGTON: 80 volt, 8 amp; mfr 00724, part no. 20-01016-001 or 20-01016-002 (ATTACHING PARTS) B(2), AU(2)	FO 7-17 (2)
1A1A1A6A2-A1		CIRCUIT CARD ASSEMBLY-LINE FEED DRIVER: Mfr 00724, part no. 61-40361-001	FO 7-17 (4) FO 7-18
1A1A1A6A2-A1C1 THRU C3		CAPACITOR, (COMMON ITEM 4)	FO 7-18
1A1A1A6A2-A1CR1 THRU CR5		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 36)	FO 7-18
1A1A1A6A2-A1J1		CONNECTOR, HEADER: 10 CONTACTS; mfr 00779 part no. 87306-6, 00724 dwg 16-01495-003	FO 7-18
1A1A1A6A2-A1MP1MP2		STUD, BROACHING, PWP: Ph brz, 4-40unc-2A; mfr 46384 part no. KFH440-8, 00724 dwg 40-00895-004 (10)	FO 7-18

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A6A2-A1MP1MP4		TERMINAL, STUD-SINGLE TURRET, SWAGE TYPE: 0.062 in. bd thk; mfr 71279 part no. ES6336-1, mfr 18310 part no. 10-939-2, 00724 dwg 26-00266-002 (16)	FO 7-18
1A1A1A6A2-A1MP11		RECEPTACLE, ELECTRONIC, COMPONENT LEAD(S), PWB: Mfr 00779 part no. 380635-1, 00724 dwg 16-01499-001 (10)	FO 7-18
1A1A1A6A2-A1R1		RESISTOR, FIXED, WIRE WOUND: MIL-R-39007/9 part no. RWR81S1001FP	FO 7-18
1A1A1A6A2-A1R2 THRU R5		RESISTOR, FIXED, WIRE WOUND: MIL-R-39007/9 part no. RWR81S82R5FP	FO 7-18
1A1A1A6A2-A1R6 THRU R10		RESISTOR, (COMMON ITEM 27)	FO 7-18
1A1A1A6A2-A1U1 THRU U3		MICROCIRCUIT, DIGITAL: Mfr 01295 part no. SN55464JG, mfr 07263 part no. 55464RM, 00724 dwg 72-00975-001	FO 7-18
1A1A1A7		PIN DRIVER MODULE - ASSEMBLY OF: Provides output current to the print wire drive solenoids; mfr 00724, part no. 03-04290-001 (ATTACHING PARTS) AB(6), AK(6) JACKSCREW ASSEMBLY: Female, 6-32unc-2B X 4-40unc-2A; mfr 00779 part no. 86602-1, 00724 dwg 16-01194-302 (2)	FO 7-3 (55) FO 7-19
1A1A1A7C1		CAPACITOR, FIXED, ELECTROLYTIC: 1300 mf, 75 Vdc rated; mfr 14655 part no. UFT1300-75, mfr 56289 part no. 604D132F075JT6, 00724 dwg 11-00519-006	FO 7-19 (22)
1A1A1A7E1 THRU E4		TERMINAL, FEED-THRU, INSULATED: 4-40unc-2; mfr 71279 part no. 4899-1-0516, 00724 dwg 26-00359-010 (ATTACHING PARTS) S(1), AP(1), AU(1)	FO 7-19 (21)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7E6		TERMINAL, FEED-THRU, INSULATED: 4-40unc-2; mfr 71279 part no. 4899-1-0516, 00724 dwg 26-00359-010 (ATTACHING PARTS) S(1), AP(1), AU(1)	FO 7-19 (21)
1A1A1A7J1		CONNECTOR, PLUG, ELECTRICAL-INSULATION DISPLACEMENT: 10 contacts; mfr 53387 part no. 4610-6000, 00724 dwg 16-01512-001	FO 7-19 (15)
1A1A1A7J2		CONNECTOR, RECEPTACLE, ELECTRICAL: Mfr 00779 part no. 86672-5, 00724 dwg 16-01330-002	FO 7-19 (28)
1A1A1A7MP1		CHASSIS, ELECTRONIC EQUIPMENT-PIN DRIVER: Mfr 00724, part no. 37-07965-001	FO 7-19 (13)
1A1A1A7MP2		COVER, TOP, PIN DRIVER: 7.864 lg, 1.895 in. wd; mfr 00724, part no. 37-07727-001	FO 7-19 (20)
1A1A1A7MP3		COVER, BOTTOM, PIN DRIVER: 7.864 lg, 1.895 in. wd; mfr 00724, part no. 37-07966-001	FO 7-19 (9)
1A1A1A7MP5		BRACKET, MOUNTING, ASSSEMBLY OF: Al aly; mfr 00724, part no. 67-05083-001	FO 7-19
1A1A1A7MP5-MP2		RETAINER, ELECTRON TUBE: Be. cop, 1.000 id, .020 in. thk; mfr 91506 part no. 6020-6CN, 00724 dwg 18-00018-023 (ATTACHING PARTS) RIVET, UNIVERSAL HEAD: Al, 1/8 dia, 1/4 in. lg; part no. MS20470A-4-4 (2)	FO 7-19 (23)
1A1A1A7MP18		SPACER, SLEEVE: Al aly, 0.250 od, 0.130 id, 0.228 in. lg; mfr 00724, part no. 40-00038-165	FO 7-19 (16)
1A1A1A7MP19		POST, ELECTRICAL-MECHANICAL EQUIPMENT: Cres; mfr 06540 part no. 9726SS0256-7, mfr 51506 part no. 1400HSS-375-12, 00724 dwg 40-00785-105	FO 7-19 (6)
1A1A1A7MP21		SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 3/4 in. lg; part no. MS51957-19	FO 7-19 (18)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7MP22		SCREW, MACHINE: Pan head, cross-recessed, cres, 2-56unc-2A, 3/16 in. lg; part no. MS51957-2	FO 7-19 (4)
1A1A1A7MP23		SCREW, MACHINE: Pan head, cross-recessed, cres, 2-56unc-2A, 1/4 in. lg; part no. MS51957-3	FO 7-19 (1)
1A1A1A7MP24		SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 5/16 in. lg; part no. MS51957-14	FO 7-19 (10)
1A1A1A7MP25		WASHER, FLAT: Cres, 0.089 id, 0.149 od, 0.016 in. thk; part no. NAS620C2	FO 7-19 (5)
1A1A1A7MP27		WASHER, FLAT: Cres, 0.094 id, 0.250 od, 0.020 in. thk; part no. MS15795-802	FO 7-19 (3)
1A1A1A7MP28		WASHER, FLAT: Cres, 0.125 id, 0.312 od, 0.032 in. thk; part no. AN960-C4	FO 7-19 (12)
1A1A1A7MP29		WASHER, LOCK: Cres, 0.094 id, 0.172 od, 0.020 in. thk; part no. MS35338-134	FO 7-19 (2)
1A1A1A7MP30		WASHER, LOCK: Cres, 0.121 id, 0.209 od, 0.025 in. thk; part no. MS35338-135	FO 7-19 (11)
1A1A1A7MP32		NUT, PLAIN, HEXAGON: Cres, 4-40unc-2B, 1/4 in. across flats; part no. MS35649-244	FO 7-19 (14)
1A1A1A7MP33		STRAP, RUBBER-ELECTRONIC TIEDOWN: Mfr 98159 part no. 2829-75-4, 00724 dwg 30-00260-004	FO 7-19 (19)
1A1A1A7MP38		CONTACT, ELECTRICAL: Mfr 00779 part no. 86571-4, 00724 dwg 16-01330-001	FO 7-19 (29)
1A1A1A7MP48		KEY, POLARIZING: Mfr 53387 part no. 3435-0000, 00724 dwg 16-01513-001	FO 7-19 (26)
1A1A1A7MP49		KEY, POLARIZING: Mfr 53387 part no. 3518-0000, 00724 dwg 16-01513-101	FO 7-19 (17)
1A1A1A7P1		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 34 contacts; mfr 53387 part no. 3414-7034, 00724 dwg 16-01511-116	FO 7-19 (25)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7P2		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 10 contacts; mfr 53387 part no. 3473-7010, 00724 dwg 16-01511-111	FO 7-19 (27)
1A1A1A7R1		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/3 part no. RCR32G822JS	FO 7-19 (24)
1A1A1A7A1		ELECTRICAL COMPONENT ASSEMBLY-PIN DRIVER: Mfr 00724, part no. 03-04329-001	FO 7-20
1A1A1A7A1-MP1		HEAT SINK-PIN DRIVER: Mfr 00724, part no. 67-05184-001	FO 7-20 (4)
1A1A1A7A1-MP2		INSULATOR, HEAT SINK: Mfr 00724, part no. 54-00469-001	FO 7-20 (3)
1A1A1A7A1-MP7		WASHER, LOCK: Cres, 0.121 id, 0.209 od, 0.025 in. thk; part no. MS35338-135	FO 7-20 (6)
1A1A1A7A1-MP8		NUT, PLAIN, HEXAGON: Cres, 0.1120-40unjc-3B, 0.188 in. across flats; part no. NAS671C4	FO 7-20 (5)
1A1A1A7A1-MP9		INSULATOR: 0.125 id, 0.240 od, 0.092 in. thk; mfr 00724, part no. 40-00890-001	FO 7-20 (11)
1A1A1A7A1-MP10		NUT, SLEEVE: Cres, 2-56unc-2B, 3/16 across flats, 3/8 in. lg; mfr 06540 part no. 8104SS0256-7, mfr 57177 part no. 129-05SS2-56E, 00724 dwg 40-00530-025 (ATTACHING PARTS) AG(1)	FO 7-20 (1)
1A1A1A7A1-MP14		INSULATOR, PLATE: PLASTIC, 0.002 in. thk; MIL-I-38527/8 part no. M38527-8-23P	FO 7-20 (9)
1A1A1A7A1-MP15		HEAT SINK, INSULATOR SILICONE: 0.008 to 0.012 in. thk; MFR 55285 part no. 7403-09FR-11, 00724 dwg 18-00624-001	FO 7-20 (10)
1A1A1A7A1-Q2 THRU Q8		TRANSISTOR, (COMMON ITEM 41)	FO 7-20 (8)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7A1-A1		CIRCUIT CARD ASSEMBLY, PIN DRIVER: Mfr 00724, part no. 61-40362-001	FO 7-20 (2) FO 7-21
1A1A1A7A1-A1CR2 THRU CR8		SEMICONDUCTOR DEVICE, DIODE, (COMMON ITEM 36)	FO 7-21
1A1A1A7A1-A1E1 THRU E4, E20		TERMINAL, STUD-SINGLE TURRET, SWAG TYPE: Brs; mfr 71279 part no. ES6336-1, mfr 18310 part no. 10-939-2, 00724 dwg 26-00266-002	FO 7-21
1A1A1A7A1-A1MP5		STUD, BROACHING, PWB: Ph brz, 4-40unc-2A, 3/16 in. lg; mfg 46384 part no. KFH440-6, 00724 dwg 40-00895-003 (14)	FO 7-21
1A1A1A7A1-A1MP7		RECEPTACLE, ELECTRONIC, COMPONENT LEADS(S), PWB: Mfr 00779 part no. 380635-1, 00724 dwg 16-01499-001	FO 7-21
1A1A1A7A1-A1P1, P2		CONNECTOR, HEADER: 12 position; mfr 00779 part no. 87306-6, 00724 dwg 16-01495-101	FO 7-21
1A1A1A7A1-A1R2 THRU R8		RESISTOR, (COMMON ITEM 34)	FO 7-21
1A1A1A7A2		CIRCUIT CARD ASSEMBLY-PIN DRIVER LOGIC: Mfr 00724, part no. 61-40359-001	FO 7-19 (7) FO 7-22
1A1A1A7A2C1		CAPACITOR, (COMMON ITEM 4)	FO 7-22
1A1A1A7A2C2		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2271	FO 7-22
1A1A1A7A2C4		CAPACITOR, (COMMON ITEM 4)	FO 7-22
1A1A1A7A2-C7, C8		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1535	FO 7-22

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7A2C9		CAPACITOR, (COMMON ITEM 4)	FO 7-22
1A1A1A7A2-C10, C11		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-34014/1 part no. M39014/01-1535	FO 7-22
1A1A1A7A2-C12		CAPACITOR, (COMMON ITEM 4)	FO 7-22
1A1A1A7A2-C13 THRU C16		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-34014/1 part no. M39014/01-1535	FO 7-22
1A1A1A7A2-C17		CAPACITOR, (COMMON ITEM 4)	FO 7-22
1A1A1A7A2-C18 THRU C23		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1535	FO 7-22
1A1A1A7A2-C24		CAPACITOR, (COMMON ITEM 4)	FO 7-22
1A1A1A7A2-C27		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2254	FO 7-22
1A1A1A7A2-CR2 THRU CR8		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 35)	FO 7-22
1A1A1A7A2-J1, J2		CONTACT, ELECTRICAL-SOCKET CONNECTOR: Mfr 00779 part no. 85865-4, 00724 dwg 16-00983-001 (24)	FO 7-22
1A1A1A7A2R7		RESISTOR, (COMMON ITEM 33)	FO 7-22
1A1A1A7A2R8		RESISTOR, (COMMON ITEM 27)	FO 7-22
1A1A1A7A2R9		RESISTOR, (COMMON ITEM 19)	FO 7-22
1A1A1A7A2-R10, R11		RESISTOR, (COMMON ITEM 26)	FO 7-22
1A1A1A7A2-R12		RESISTOR, (COMMON ITEM 25)	FO 7-22

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7A2-R13		RESISTOR, (COMMON ITEM 33)	FO 7-22
1A1A1A7A2-R14		RESISTOR, (COMMON ITEM 19)	FO 7-22
1A1A1A7A2-R15, R16		RESISTOR, (COMMON ITEM 26)	FO 7-22
1A1A1A7A2-R17		RESISTOR, (COMMON ITEM 25)	FO 7-22
1A1A1A7A2-R18		RESISTOR, (COMMON ITEM 27)	FO 7-22
1A1A1A7A2-R19		RESISTOR, (COMMON ITEM 33)	FO 7-22
1A1A1A7A2-R20		RESISTOR, (COMMON ITEM 27)	FO 7-22
1A1A1A7A2-R21		RESISTOR, (COMMON ITEM 19)	FO 7-22
1A1A1A7A2-R22, R23		RESISTOR, (COMMON ITEM 26)	FO 7-22
1A1A1A7A2-R24		RESISTOR, (COMMON ITEM 25)	FO 7-22
1A1A1A7A2-R25		RESISTOR, (COMMON ITEM 33)	FO 7-22
1A1A1A7A2-R26		RESISTOR, (COMMON ITEM 19)	FO 7-22
1A1A1A7A2-R27, R28		RESISTOR, (COMMON ITEM 26)	FO 7-22
1A1A1A7A2-R29		RESISTOR, (COMMON ITEM 25)	FO 7-22
1A1A1A7A2-R30		RESISTOR, (COMMON ITEM 27)	FO 7-22

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7A2-R31		RESISTOR, (COMMON ITEM 25)	FO 7-22
1A1A1A7A2-R32		RESISTOR, FIXED FILM: MIL-R-39017/5 part no. RLR05C512GR	FO 7-22
1A1A1A7A2-R33		RESISTOR, (COMMON ITEM 33)	FO 7-22
1A1A1A7A2-R34		RESISTOR, (COMMON ITEM 27)	FO 7-22
1A1A1A7A2-R35		RESISTOR, (COMMON ITEM 19)	FO 7-22
1A1A1A7A2-R36, R37		RESISTOR, (COMMON ITEM 26)	FO 7-22
1A1A1A7A2-R38		RESISTOR, (COMMON ITEM 25)	FO 7-22
1A1A1A7A2-R39		RESISTOR, (COMMON ITEM 33)	FO 7-22
1A1A1A7A2-R40		RESISTOR, (COMMON ITEM 19)	FO 7-22
1A1A1A7A2-R41, R42		RESISTOR, (COMMON ITEM 26)	FO 7-22
1A1A1A7A2-R43		RESISTOR, (COMMON ITEM 25)	FO 7-22
1A1A1A7A2-R44		RESISTOR, (COMMON ITEM 27)	FO 7-22
1A1A1A7A2-R45		RESISTOR, (COMMON ITEM 33)	FO 7-22
1A1A1A7A2-R46		RESISTOR, (COMMON ITEM 27)	FO 7-22
1A1A1A7A2-R47		RESISTOR, (COMMON ITEM 19)	FO 7-22

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A1A7A2-R48, R49		RESISTOR, (COMMON ITEM 26)	FO 7-22
1A1A1A7A2-R50		RESISTOR, (COMMON ITEM 25)	FO 7-22
1A1A1A7A2-R58 THRU R64		RESISTOR, (COMMON ITEM 27)	FO 7-22
1A1A1A7A2U2		MICROCIRCUIT, LINEAR-QUAD COMPARATOR: Mfr 07263 part no. UA139DM, mfr 27014 part no. LM139D, 00724 dwg 72-00628-207	FO 7-22
1A1A1A7A2U3		MICROCIRCUIT, (COMMON ITEM 15)	FO 7-22
1A1A1A7A2U4		MICROCIRCUIT, LINEAR-QUAD COMPARATOR: Mfr 07263 part no. UA139DM, mfr 27014 part no. LM139D, 00724 dwg 72-00628-207	FO 7-22
1A1A1A7A2-U5, U6		MICROCIRCUIT, (COMMON ITEM 15)	FO 7-22
1A1A1A7A2U7		MICROCIRCUIT, LINEAR-QUAD COMPARATOR: Mfr 07263 part no. UA139DM, mfr 27014 part no. LM139D, 00724 dwg 72-00628-207	FO 7-22
1A1A1A7A2U8		MICROCIRCUIT, (COMMON ITEM 15)	FO 7-22
1A1A2		CHASSIS ASSEMBLY, TELEPRINTER: Provides the mounting for the circuit cards, power supply and printer mechanism; mfr 00724, part no. 03-04560-002	FO 7-2 (6) FO 7-23
1A1A2B1		FAN, AXIAL: 115 Vac, 1 ph, 50-60 Hz; mfr 92702 part no. BC2206F-TBA, mfr 82877 part no. 034771, 00724 dwg 59-00096-003 (ATTACHING PARTS) SCREW, MACHINE: Flat head, cross-recessed, cres, 6-32unc-2A, 5/8 in. lg; part no. MS24693-C29 (4)	FO 7-23 (1)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		INSERT, THREADED: 360 brass nut per QQ-B-626, neoprene bushing per MIL-R-6855, 0.425 head dia, 0.312 body dia, 0.499 in. lg, 6-32; mfr POP Fasteners Div part no. E-632, 00724 dwg 25-00431-003	
1A1A2FL1		FILTER, RADIO FREQUENCY INTERFERENCE-POWER, AC: Mfr 23939 part no. A-5438A, 00724 dwg 08-01142-001	FO 7-23 (13)
		(ATTACHING PARTS) X(1), AA(2), AL(2), AV(2)	
		WASHER, LOCK-FLAT, INTERNAL TOOTH: Cres, 0.150 id, 0.295 od, 0.021 in. thk; part no. MS35333-71 (1)	
1A1A2MP1		CHASSIS, ELECTRICAL EQUIPMENT-PRINTER, LOWER SECTION - ASSEMBLY OF: Mfr 00724, part no. 67-04992-001	FO 7-23
1A1A2MP1E1		STUD, SELF-CLINCHING: Cres, 1/4-20unc-2A, 3/4 in. lg; MIL-S-63540/1 part no. M63540/1-46C	FO 7-23 (17)
1A1A2MP1MP2		BUSHING, GUIDE PIN: Cres, 0.300 id, 0.560 and 0.438 od, 0.440 in. thk; mfr 00724, part no. 37-07765-001	FO 7-23 (18)
1A1A2MP5		JACKSCREW ASSEMBLY-FEMALE: Sst, 0.560 in. lg, mfr 71468 part no. D110551, 00724 dwg 16-01056-001	FO 7-23 (9)
1A1A2MP6		PLATE, SPACER: Cres, 1.00 lg, 0.12 wd, 0.06 in. thk; mfr 00724, part no. 37-08048-001	FO 7-23 (3)
1A1A2MP10		WASHER, NONMETALLIC: Silicone rbr, 0.204 id, 0.500 od, 0.060 in. thk; mfr 00724, part no. 24-00268-001	FO 7-23 (11)
1A1A2MP12		BUSHING, FLOATING: Al aly, 0.118 in. id; mfr 00724, part no. 30-00276-001	FO 7-23 (4)
1A1A2MP14		CLAMP, LOOP: MIL-S-23190 part no. MS3367-5-9	FO 7-23 (12)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2MP15		MOUNT, CABLE TIEDOWN-ADHESIVE BACKED: Al, 1 lg, 1/2 in. wd; mfr 59730 part no. TC-105A; 00724 dwg 30-00180-001	FO 7-23 (10)
1A1A2MP17		STRIKE, LATCH: Cres, 2 100 deg csk 0.152 thru 0.284 in. dia holes; mfr 00724, part no. 37-07946-001 (ATTACHING PARTS) SCREW, MACHINE: Flat head, cross-recessed, cres, 6-32unc-2A, 1/4 in. lg, part no. MS24693-C24 (2)	FO 7-23 (8)
1A1A2MP22		POST, ELECTRICAL-MECHANICAL EQUIPMENT: Cres, 5-32unc-2A male by 8-32unc-2B female, 2.231 in. lg; mfr 00724, part no. 40-00774-002	FO 7-23 (6)
1A1A2MP23		POST, ELECTRICAL-MECHANICAL EQUIPMENT: Cres, 8-32unc-2B female, 0.312 in. dia stk; mfr 00724, part no. 40-00817-001 (ATTACHING PARTS) SCREW, MACHINE: Flat head, cross-recessed, cres, 8-32unc-2A, 1/4 in. lg; part no. MS24693-C50 (1)	FO 7-23 (2)
1A1A2MP24		HINGE, BUTT: Flat back, riveted pin, cres, 2.50 lg, 1.75 in. wd; mfr 00724, part no. 41-00235-002 (ATTACHING PARTS) Y(2), AK(2)	FO 7-23 (16)
1A1A2MP28		FILTER ELEMENT, AIR CONDITIONING: Al aly, outer screen and frame, 5.00 hgt, 5.00 wd, 0.09 in. thk; mfr 00724, part no. 67-04623-002 (ATTACHING PARTS) V(8), AJ(8)	FO 7-23 (14)
1A1A2MP29		FILTER, AIR CONDITIONING-MODIFIED: Inner, 4.985 hgt, 4.985 in. wd; mfr 00724, part no. 95-00280-001	FO 7-23 (15)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2A1		CARD CAGE ASSEMBLY: Provides circuit card containment; mfr 00724, part no. 03-04559-001 (ATTACHING PARTS) AB(2), AL(2), S(10), AJ(10), U(2), T(2), AR(4), AU(2), B(2) SCREW, MACHINE: Flat head, cross-recessed, cres, 4-40unc-2A, 3/4 in. lg; part no. MS24693-C30 (2)	FO 7-23 (5) FO 7-24
1A1A2A1MP1		CHASSIS, CARD CAGE - ASSEMBLY OF: Mfr 00724, part no. 67-05159-001	FO 7-24
1A1A2A1MP1-MP2		GUIDE, PRINTED CIRCUIT BOARD: Be cop, 4.25 lg, 0.016 in. thk; mfr 52094 part no. 165-09-4-25C, 00724 dwg 18-00597-001 (ATTACHING PARTS) H(5)	FO 7-24 (5)
1A1A2A1MP1-MP3		GUIDE, PRINTED CIRCUIT BOARD: Be cop, 4.25 lg, 0.016 in. thk; mfr 52094 part no. 166-09-4-25C, 00724 dwg 18-00597-002 (ATTACHING PARTS) H(5)	FO 7-24 (7)
1A1A2A1MP1-MP4		NUT, ANCHOR-ANGLE-FLOATING: Sst, 6-32unc-3B; mfr 72962 part no. LHA27M2860-62, 00724 dwg 25-00232-002 (ATTACHING PARTS) G(2)	FO 7-24 (6)
1A1A2A1MP1-MP7		NUT, CLINCH: Brs, 4-40unc-2B, 0.250 in. lg, 0.250 od, 0.113 id; mfr 71279 part no. 350-1300-11-07, 00724 dwg 26-00020-122	FO 7-24 (13)
1A1A2A1MP1-MP8		INSULATOR, ELECTRICAL: Plastic, 8.50 lg, 6.00 wd; 0.0075 in. thk; mfr 00724, part no. 67-04936-001	FO 7-24 (4)
1A1A2A1MP2		COVER, LOWER CARD CAGE - ASSEMBLY OF: Mfr 00724, part no. 67-05082-001	FO 7-24 (10)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) C(4), AV(4), AK(4)	
1A1A2A1MP2-TB1		TERMINAL BOARD: MIL-T-55164/1 part no. 37TB4	FO 7-24 (14)
		(ATTACHING PARTS) E(2), AJ(2)	
		STUD, SELF CLINCHING: Cres, 4-40unc-2A, 1/2 in. lg; MIL-S-63540/1 part no. M63540/1-9C	
1A1A2A1MP2-MP2		SPACER: Carbon steel, external thd 6-32unc-2A, internal thd 6-32unc-2B, 0.38 od; mfr 00724, part no. 40-00854-001	FO 7-24 (15)
1A1A2A1MP3		STRAP, PLASTIC: 3.25 lg, 0.38 wd, 0.125 in. thk; mfr 00724, part no. 37-07775-001	FO 7-24 (1)
1A1A2A1MP14		JACKSCREW ASSEMBLY-FEMALE: Sst, 4-40unc thread; mfr 71468 part no. D110551, 00724 dwg 16-01056-001	FO 7-24 (2)
1A1A2A1W3		CABLE ASSEMBLY-KEYBOARD: Mfr 00724, part no. 12-02810-001	FO 7-24 (12) FO 7-25
1A1A2A1W3J5		CONNECTOR, RECEPTACLE, ELECTRICAL FILTER, RECTANGULAR: 37 contacts; mfr 12294 part no. CSK11742, mfr 08718 part no. TDC44752, 00724 dwg 16-01497-001	FO 7-25
1A1A2A1W3P5		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 40 contacts; mfr 53387 part no. 3417-6040, 00724 dwg 16-01511-017	FO 7-25
1A1A2A1W4		CABLE ASSEMBLY-CONTROLLER: Mfr 00724, part no. 12-02811-001	FO 7-24 (11) FO 7-25
1A1A2A1W4J6		CONNECTOR, PLUG, SOCKET CONTACT INSULATION DISPLACEMENT: 37 contacts; mfr 53387 part no. 3637-1000, 00724 dwg 16-01569-037	FO 7-25

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2A1W4P6		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 40 contacts; mfr 53387 part no. 3417-6040, 00724 dwg 16-01511-017	FO 7-25
1A1A2A1W5		CABLE ASSEMBLY: Mfr 00724, part no. 12-02848-001	FO 7-24 (9) FO 7-25
		(ATTACHING PARTS) U(4), AJ(4), AU(4)	
1A1A2A1W5J7		CONNECTOR, PLUG, ELECTRICAL-INSULATION DISPLACEMENT: 34 contacts; mfr 53387 part no. 4634-6000, 00724 dwg 16-01512-004	FO 7-25
1A1A2A1W5J9		CONNECTOR, PLUG, ELECTRICAL-INSULATION DISPLACEMENT: 34 contacts; mfr 53387 part no. 4634-6000, 00724 dwg 16-01512-004	FO 7-25
1A1A2A1W5P7		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-83503 part no. M83503/7-08	FO 7-25
1A1A2A1W5P9		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-83503 part no. M83503/7-08	FO 7-25
1A1A2A1W6		CABLE ASSEMBLY: Mfr 00724, part no. 12-02849-001	FO 7-24 (8) FO 7-25
		(ATTACHING PARTS) U(2), AJ(2), AU(2)	
1A1A2A1W6J8		CONNECTOR, PLUG, ELECTRICAL-INSULATION DISPLACEMENT: 26 contacts; mfr 53387 part no. 4626-6000, 00724 dwg 16-01512-003	FO 7-25
1A1A2A1W6P8		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT: 26 contacts; mfr 53387 part no. 3399-6026, 00724 dwg 16-01511-015	FO 7-25
1A1A2A1A4		CIRCUIT CARD ASSEMBLY-MASTER INTERCONNECT: Mfr 00724, part no. 61-40259-002	FO 7-24 (3) FO 7-26

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2A1A4-J1 THRU J4		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-55302 part no. M55302/92-025 (ATTACHING PARTS) AT(8), A(8) TERMINAL, LUG: Sldr, brs, 0.090 id, 0.025 in. thk; mfr 79963 part no. 349, 00724 dwg 26-00050-002 (8)	FO 7-26 (1)
1A1A2A1A4-J5, J6		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT PCB HEADER: 40 contacts; mfr 53387 part no. 3432-2003, 00724 dwg 16-01514-207	FO 7-26 (5)
1A1A2A1A4J7		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT PCB HEADER: 34 contacts; mfr 53387 part no. 3431-2303, 00724 dwg 16-01514-106	FO 7-26 (3)
1A1A2A1A4J8		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT PCB HEADER: 26 contacts; mfr 53387 part no. 3429-2303, 00724 dwg 16-01514-105	FO 7-26 (4)
1A1A2A1A4J9		CONNECTOR, RECEPTACLE, ELECTRICAL-INSULATION DISPLACEMENT PCB HEADER: 34 contacts; mfr 53387 part no. 3431-2302, 00724 dwg 16-01514-106	FO 7-26 (3)
1A1A2A1A4-MP8		TERMINAL, LUG: Sldr, brs, 0.120 id, 0.020 in. thk; mfr 79963 part no. 333, 00724 dwg 26-00049-001	FO 7-26 (11)
1A1A2A1A4-MP10		TERMINAL, LUG - CRIMP STYLE: Cop, insulated; part no. MS25036-107	FO 7-26 (7)
1A1A2A1A4-MP21		KEY, POLARIZING: Mfr 53387 part no. 3518-0000, 00724 dwg 16-01513-101	FO 7-26 (2)
1A1A2A1A4-MP22		TERMINAL STUD: Single turret, swag type, brs, solder, 1/8 in. bd thk; mfr 71279 part no. 180-7336-04-05, 00724 dwg 26-00349-004	FO 7-26 (10)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2A1A4W1		CABLE ASSEMBLY-POWER SUPPLY: Mfr 00724, part no. 12-02845-001	FO 7-26
1A1A2A1A4-W1J15		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-24308 part no. M24308/2-4 (ATTACHING PARTS) R(2)	FO 7-26 (8)
1A1A2A1A4-W1MP2		PLATE, GUIDE - ASSEMBLY OF: Sst, 3.47 lg, 1.19 wd, 0.0595 in. thk; mfr 00724, part no. 67-05205-001	FO 7-26 (9)
1A1A2A1A4-W1MP7		TERMINAL, LUG-CRIMP STYLE: Cop, insulated; part no. MS25036-107	FO 7-26 (6)
1A1A2A1A4-W2J2		CONNECTOR, RECEPTACLE, ELECTRICAL, FILTER: Rectangular, 25 contacts; mfr 12294 part no. 1255-130-0006, mfr 08718 part no. TDBJ44751-4054, 00724 dwg 16-01496-001	FO 7-26 (12)
1A1A2MP3		CONTROL ASSEMBLY: Provides control switches and indicator lights; mfr 00724, part no. 03-04570-001 (ATTACHING PARTS) AL(3) SCREW, MACHINE: Flat head, cross-recessed, cres, 6-32unc-2A, 7/16 in. lg; part no. MS24693-C27 (3) SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 3/4 in. lg; part no. MS51957-32 (3)	FO 7-23 (7) FO 7-27
1A1A2MP3CB1		CIRCUIT BREAKER: Two pole, 7 amp, long time delay; mfr 81541 part no. AP12-1-62-702 or AP12-20475-1, 00724 dwg 07-00464-001	FO 7-27 (5)
1A1A2MP3-DS1, DS2		LAMP, INCANDESCENT-TYPE 1 3/4: MIL-L-6363 part no. MS25237-387	FO 7-27 (2)
1A1A2MP3-DS4, DS5		LAMP, INCANDESCENT-TYPE 1 3/4: MIL-L-6363 part no. MS25237-387	FO 7-24 (2)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2MP3MP1		BRACKET, ANGLE-LAMP MTG: Al aly; mfr 00724, part no. 37-07949-001	FO 7-27 (4)
1A1A2MP3MP2		BRACKET, ANGLE-SWITCH: Al aly; mfr 00724, part no. 67-05288-001	FO 7-27 (8)
1A1A2MP3MP3		GUARD-CIRCUIT BREAKER: Crs, 0.032 in. thk; mfr 00724, part no. 37-07964-001	FO 7-27 (6)
1A1A2MP3-MP18		KNOB: Part no. MS91528-0F4B	FO 7-27 (14)
1A1A2MP3-MP19		KNOB: Part no. MS91528-0C1B	FO 7-27 (20)
1A1A2MP3-MP20		PLATE, IDENTIFICATION: 3.58 lg, 1.46 in. wd; mfr 00724, part no. 36-01642-001	FO 7-27 (7)
		(ATTACHING PARTS) Z(2), AS(2), AV(2)	
1A1A2MP3-MP21		PLATE, IDENTIFICATION: Mfr 00724, part no. 36-01687-001	FO 7-27 (3)
1A1A2MP3-MP23		WASHER, LOCK: Cres, 0.148 id, 0.250 od, 0.031 in. thk; part no. MS35338-136	FO 7-27 (24)
1A1A2MP3-MP25		WASHER, FLAT: Cres, 0.156 id, 0.312 od, 0.035 in. thk; part no. MS15795-805	FO 7-27 (25)
1A1A2MP3-MP27		SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 7/16 in. lg; part no. MS51957-29	FO 7-27 (23)
1A1A2MP3-MP37		JACKSCREW ASSEMBLY-MALE: Sst, 4-40unc threads; mfr 71468 part no. D110550, 00724 dwg 16-01306-001	FO 7-27 (11)
1A1A2MP3-MP38		MOUNT, CABLE TIEDOWN-ADHESIVE BACKED: Al, 1.0 lg, 0.50 in. wd; mfr 59730 part no. TC105A, 00724 dwg 30-00180-001	FO 7-27 (22)
1A1A2MP3-MP42		INSULATOR, PLATE: Plastic, 0.002 in. thk; MIL-I-38527/8 part no. M38527-8-23P	FO 7-27 (28)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2MP3-MP44		HEAT SINK, INSULATOR SILICONE: 0.008 to 0.012 in. thk; MFR 55285 part no. 7403-09FR-11, 00724 dwg 18-00624-001	FO 7-27 (27)
1A1A2MP3-MP48		CLAMP, LOOP: Adj, self-clinching, plastic, 5/8 in. max bundle dia; part no. MS3367-4-9	FO 7-27 (30)
1A1A2MP3P1		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-24308/4 part no. M24308-4-4	FO 7-27 (10)
1A1A2MP3Q1		TRANSISTOR-NPN POWER DARLINGTON: 80 volt, 8 amp; mfr 00724, part no. 20-01016-001	FO 7-27 (26)
1A1A2MP3R1		RESISTOR, VARIABLE, NON WIRE WOUND: MIL-R-9413 part no. RV6NAYSB502C	FO 7-27 (19)
1A1A2MP3S1 THRU S5		SWITCH, (COMMON ITEM 38)	FO 7-27 (12)
1A1A2MP3S7, S8		SWITCH, (COMMON ITEM 38)	FO 7-27 (12)
1A1A2MP3S9		SWITCH, TOGGLE: On-off-on, dpdt; mfg 55459 part no. A221S1YZQE, 00724 dwg 07-00281-009	FO 7-27 (13)
1A1A2MP3S10		SWITCH, ROTARY: MIL-S-3786/36 part no. M3786-36-0953 (ATTACHING PARTS) NUT, PLAIN, HEXAGON-MOUNTING: Brass, np, 1/2 in. across flats, 3/8-32nef-2B, 3/32 in. thk; mfr 73734 part no. 9002NP, 00724 dwg 25-00043-103 (1) WASHER, LOCK-INTERNAL TOOTH, NARROW RIM: Ph brz, 0.384 id, 0.500 od, 0.022 in. thk; mfr 78189 part no. 1920-02, 00724 dwg 24-00201-001 (1)	FO 7-27 (9)
1A1A2MP3S11		SWITCH, TOGGLE: On-off-on, spdt, mfg 55459 part no. A131S1YZQE, 00724 dwg 07-00281-006	FO 7-27 (15)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A2MP3S12		SWITCH, INTERLOCK: MIL-S-8805/56 part no. MS16106-4 (ATTACHING PARTS) AJ(3), AU(3) SCREW, MACHINE: Pan head, cross-recessed, cres, 4-48unf-2A, 1/4 in. lg; part no. MS51958-13 (3)	FO 7-27 (21)
1A1A2MP3S13, S14		SWITCH, TOGGLE: MIL-S-8834 part no. MS90310-271	FO 7-27 (17)
1A1A2MP3S15		SWITCH, TOGGLE: MIL-S-8834 part no. MS90311-221	FO 7-27 (18)
1A1A2MP3-XDS1, XDS2		LIGHT INDICATOR ASSEMBLY: White, translucent; MIL-L-3661 part no. LH73/2-LC27WT2	FO 7-27 (1)
1A1A2MP3-XDS4		LIGHT INDICATOR ASSEMBLY: White, translucent; MIL-L-3661 part no. LH73/2-LC27WT2	FO 7-27 (1)
1A1A2MP3-XDS5		LIGHT INDICATOR ASSEMBLY: Green, translucent; MIL-L-3661 part no. LH73/2-LC27GT2	FO 7-27 (16)
1A1A2MP3XQ1		SOCKET, PLUG-IN ELECTRONIC COMPONENTS: Mfr 06776 part no. MP66302-1T or MP66302-1G, 00724 dwg 19-00055-004.	FO 7-27 (29)
1A1A3		POWER SUPPLY - ASSEMBLY OF: Provides regulated and protected input/output isolated dc voltage to the keyboard printer and a chopped 28 vac output for fan drive; mfr 00724, part no. 03-04350-004 (ATTACHING PARTS) AK(4) SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 7/8 in. lg; part no. MS51957-33	FO 7-2 (5) FO 7-28
1A1A3MP2		COVER, BOTTOM - ASSEMBLY OF: Mfr 00724, part no. 67-05206-001 (ATTACHING PARTS) K(14)	FO 7-28 (5)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3MP3		COVER, TOP - ASSEMBLY OF: Mfr 00724, part no. 67-05207-001 (ATTACHING PARTS) T(1), AP(1), AE(4), AO(4), AW(4)	FO 7-28 (1)
1A1A3MP3MP5		HANDLE, NYLON: 4.98 in. lg; mfr 00724, part no. 57-01089-001	FO 7-28 (2)
1A1A3MP3MP7		PLATE, INSTRUCTION: Mfr 00724, part no. 36-00099-000	FO 7-28 (3)
1A1A3MP4		ENCLOSURE, POWER SUPPLY - ASSEMBLY OF: Mfr 00724, part no. 67-05208-001	FO 7-28 (6)
1A1A3MP21		PLATE, SPACER: Al aly, 0.06 in. thk; mfr 00724, part no. 37-08046-001 (ATTACHING PARTS) J(2)	FO 7-28 (7)
1A1A3A1		HEAT SINK-POWER SUPPLY - ASSEMBLY OF: Provides heat dissipation and component mounting; mfr 00724, part no. 03-04351-004 (ATTACHING PARTS) E(2), AU(2), AJ(2), K(6), I(2)	FO 7-28 (4) FO 7-29
1A1A3A1C1		CAPACITOR, FIXED, ELECTROLYTIC-ALUMINUM: 3000 mf, -10, +75 pct tol, 250 Vdcw; mfr 90201 part no. CGS302T250X4C3PH, mfr 56289 part no. 36D302F250DC2B, 00724 dwg 11-00374-018	FO 7-29
1A1A3A1C2		CAPACITOR, FIXED, ELECTROLYTIC-ALUMINUM, SINGLE ENDED, TUBULAR: 680 mf, -10, +100 pct tol, 50 Vdcw; mfr 56289 part no. 673D687H050HJ5C, 00724 dwg 11-00592-316 (ATTACHING PARTS) CLAMP, LOOP: MIL-S-23190 part no. MS3367-1-9 (2)	FO 7-29

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1C5, C6		CAPACITOR, FIXED, PLASTIC DIELECTRIC: 4.0 mf, porm 10 pct, 200 Vdcw; mfr 56289 part no. LP9A1C405K, mfr 32159 part no. 74K2405-3, 00724 dwg 11-00453-012 (ATTACHING PARTS) CLAMP, LOOP: MIL-S-23190 part no. MS3367-1-9 (1)	FO 7-29
1A1A3A1C7		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR07F183JODL	FO 7-29
1A1A3A1C21		CAPACITOR, FIXED, ELECTROLYTIC-ALUMINUM, SINGLE ENDED, TUBULAR: 680 mf, -10, +100 pct tol, 50 Vdcw; mfr 56289 part no. 673D687H050HJ5C, 00724 dwg 11-00592-316 (ATTACHING PARTS) CLAMP, LOOP: MIL-S-23190 part no. MS3367-1-9 (2)	FO 7-29
1A1A3A1C25		CAPACITOR, FIXED, ELECTROLYTIC-ALUMINUM, SINGLE ENDED, TUBULAR: 1000 mf, -10, +100 pct tol, 7.5 Vdcw; mfr 56289 part no. 672D108H7R5ET5J, 00724 dwg 11-00592-012 (ATTACHING PARTS) CLAMP, LOOP: MIL-S-23190 part no. MS3367-1-9 (1)	FO 7-29
1A1A3A1C29, C30		CAPACITOR, FIXED, METALLIZED-PAPER-PLASTIC-POLYESTER: 1.0 mf, porm 10 pct, 240 Vac; mfr 09023 part no. DMMA-BW1, 00724 dwg 11-00593-111 (ATTACHING PARTS) CLAMP, LOOP: MIL-S-23190 part no. MS3367-4-9 (1)	FO 7-29

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1CR14, CR15		SEMICONDUCTOR DEVICE, DIODE, RECTIFIER-HIGH EFFICIENCY: 150 volt, 20 amp; mfr 00724, part no. 20-01010-001	FO 7-29
1A1A3A1L1		REACTOR: Power inductor, 36 mh, porm 5; mfr 00724, part no. 09-00700-002	FO 7-29
1A1A3A1L2, L3		REACTOR: Power inductor, 170 mh, porm 25; mfr 00724, part no. 09-00700-004	FO 7-29
1A1A3A1L4		REACTOR: Power inductor, 1300 mh, porm 200; mfr 00724, part no. 09-00700-006	FO 7-29
1A1A3A1L5		REACTOR: Power inductor, 60 mh, porm 10; mfr 00724, part no. 09-00700-003	FO 7-29
1A1A3A1L6		REACTOR: Power inductor, 7 mh, porm 2; mfr 00724, part no. 09-00700-001	FO 7-29
1A1A3A1L7		CHOKE: 0.4 mh; mfr 00724, part no. 09-00701-001	FO 7-29
1A1A3A1MP1		HEAT SINK: Al aly; mfr 00724, part no. 18-00655-001	FO 7-29 (29)
1A1A3A1MP2		BRACKET: Sst, .024 in. thk; mfr 00724, part no. 37-08038-001	FO 7-29 (7)
		(ATTACHING PARTS) S(4), AU(4)	
1A1A3A1MP3		SPACER, THD: Al aly, 1.165 in. lg, 4-40unc-2B fthrd, 8-32unc-2A mthrd; mfr 00724, part no. 40-00893-001	FO 7-29 (37)
1A1A3A1MP4		INSULATOR: Silicone, 0.010 thk, 0.690 in. dia; mfr 00724, part no. 54-00470-001	FO 7-29 (2)
1A1A3A1MP5		INSULATOR: Silicone, 0.010 thk, 0.690 in. dia; mfr 00724, part no. 54-00470-002	FO 7-29 (13)
1A1A3A1MP6		INSULATOR: Silicone, 0.010 thk, 1.000 in. dia; mfr 00724, part no. 54-00470-003	FO 7-29 (8)
1A1A3A1MP7		INSULATOR: Silicone, 0.010 thk, 1.180 in. dia; mfr 00724, part no. 54-00470-004	FO 7-29 (11)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1MP9		INSULATOR: Silicone, 0.010 thk, 1.700 in. dia; mfr 00724, part no. 54-00470-006	FO 7-29 (5)
1A1A3A1MP10		INSULATOR, PLATE: Fiberglass, 0.062 in. thk; mfr 00724, part no. 54-00471-001	FO 7-29 (30)
1A1A3A1MP12		BRACKET, ANGLE - ASSEMBLY OF: Al aly, 0.090 in. thk; mfr 00724, part no. 67-05188-001	FO 7-29 (34)
		(ATTACHING PARTS) N(5)	
1A1A3A1MP13		BRACKET, ANGLE - ASSEMBLY OF: Al aly, 0.090 in. thk; mfr 00724, part no. 67-05189-001	FO 7-29 (36)
		(ATTACHING PARTS) N(4)	
1A1A3A1MP14		CLAMP: Cres, 0.031 in. thk; mfr 00724, part no. 67-05209-001	FO 7-29 (33)
		(ATTACHING PARTS) T(2), K(2), AJ(4), AU(4), B(2)	
1A1A3A1MP53		WASHER, FLAT: Cres, 0.125 id, 0.312 od, 0.032 in. thk; part no. AN960-C4	FO 7-29 (19)
1A1A3A1MP56		WASHER, LOCK: Cres, 0.121 id, 0.209 od, 0.025 in. thk; part no. MS35338-135	FO 7-29 (20)
1A1A3A1MP59		HEAT SINK, INSULATOR, SILICONE: Adhesive back, 0.009 to 0.031 in. thk; mfr 18565 part no. 60-12-4305-1674, mfr 55285 part no. 7403-09AC-03, 00724 dwg 18-00624-103	FO 7-29 (17)
1A1A3A1MP60		WASHER, SHOULDERED-NON-METALLIC: 0.112 id, 0.150 and 0.280 in. od; mfr 00724, part no. 95-00590-001	FO 7-29 (18)
1A1A3A1MP62		WASHER, SPRING: Crm, ns, 0.012 in. thk; mfr 02114 part no. 991-203-00, 00724 dwg 24-00298-001	FO 7-29 (6)
1A1A3A1MP63		CLAMP, RETAINING-POT CORE: Brs, ns, 0.543 in. hgt; mfr 72656 part no. M548, mfr 02114 part no. 991-552-00, 00724 dwg 30-00277-001	FO 7-29 (3)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) S(2), AU(2)	
1A1A3A1MP64		CLAMP, RETAINING-POT CORE: Brs, ns, 0.657 in. hgt; mfr 72656 part no. M551, mfr 02114 part no. 991-412-00, 00724 dwg 30-00277-002	FO 7-29 (14)
		(ATTACHING PARTS) S(2), AU(2)	
1A1A3A1MP65		CLAMP, RETAINING-POT CORE: Brs, ns, 0.746 in. hgt; mfr 72656 part no. M552, mfr 02114 part no. 991-417-00, 00724 dwg 30-00277-003	FO 7-29 (9)
		(ATTACHING PARTS) S(2), AU(2)	
1A1A3A1MP66		CLAMP, RETAINING-POT CORE: Brs, ns, 0.876 in. hgt; mfr 72656 part no. M553, mfr 02114 part no. 3019HCL, 00724 dwg 30-00277-004	FO 7-29 (4)
		(ATTACHING PARTS) S(2), AU(2)	
1A1A3A1MP67		TERMINAL, STUD: MIL-T-55155/20 part no. SE20XD01	FO 7-29 (31)
		(ATTACHING PARTS)	
		SCREW, MACHINE: Flat head, cross-recessed, cres, 4-40unc-2A, 3/16 in. lg; part no. MS24693-C1 (1)	
1A1A3A1MP68		TERMINAL, STUD-TAPPED HOLE BASE AND STUD: Brs, 6-32unc-2A thd; mfr 88245 part no. 784-5-5-11-2, 00724 dwg 26-00105-009	FO 7-29 (10)
1A1A3A1MP73		WASHER, LOCK: Countersunk, external tooth, spring steel, 0.123 id, 0.238 od, 0.016 in. thk; mfr 78189 part no. 1504-00, 00724 dwg 24-00176-002	FO 7-29 (12.1)
1A1A3A1MP87		PLATE, INSTRUCTION: Mfr 00724 part no. 36-00099-000	FO 7-29 (32)
1A1A3A1MP91		SCREW, MACHINE: Flat countersunk head, cross-recessed, cres, 4-40unc-2A, 5/8 in. lg; part no. MS51959-18	FO 7-29 (12.2)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1MP92		SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 7/16 in. lg; part no. MS51957-16	FO 7-29 (21)
1A1A3A1MP93		SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 3/4 in. lg; part no. MS51957-19	FO 7-29 (15)
1A1A3A1MP94		WASHER, LOCK: Cres, 0.123 id, 0.260 od, 0.019 in. thk; part no. MS35335-57	FO 7-29 (16)
1A1A3A1MP95		TERMINAL, LUG-CRIMP STYLE, COPPER, INSULATED: MIL-W-5086 part no. MS25036-103	FO 7-29 (35)
1A1A3A1MP96		TERMINAL, LUG: Mfr 00724, part no. 95-00471-001	FO 7-29 (22)
1A1A3A1MP98		WASHER, FLAT: Cres, 0.219 id, 0.500 od, 0.049 in. thk; part no. MS15795-842	FO 7-29 (25)
1A1A3A1MP99		WASHER, LOCK: Cres, 0.202 id, 0.334 od, 0.047 in. thk; part no. MS35338-138	FO 7-29 (26)
1A1A3A1-MP100		NUT, PLAIN, HEXAGON: Cres, 10-32unf-2B, 3/8 in. across flats, part no. MS35650-304	FO 7-29 (27)
1A1A3A1-MP101		INSULATOR, BUSHING: Plastic, 0.203 id, 0.260 od, 0.110 in. thk; mfr 00724, part no. 54-00113-002	FO 7-29 (24)
1A1A3A1-MP102		HEAT SINK, INSULATOR, SILICONE: Adhesive back, 0.009 to 0.013 in. thk; mfr 18565 part no. 60-12-4659-1674, mfr 55285 part no. 7403-09AC-22, 00724 dwg 18-00624-109	FO 7-29 (23)
1A1A3A1-MP103		INSULATOR: 70 lg, 0.55 wd, 0.0075 in. thk; mfr 00724, part no. 54-00474-001	FO 7-29 (12)
1A1A3A1-MP104		INSULATOR: 1.95 lg, 0.55 wd, 0.0075 in. thk; mfr 00724, part no. 54-00474-002	FO 7-29 (1)
1A1A3A1-MP105		INSULATOR: 1.50 lg, 0.30 wd, 0.0075 in. thk; mfr 00724, part no. 54-00474-003	FO 7-29 (28)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1Q1, Q2		TRANSISTOR, NPN, POWER HIGH VOLTAGE SWITCHING: 15 amp; mfr 00724, part no. 20-01017-001	FO 7-29
1A1A3A1Q3		TRANSISTOR, NPN, POWER, DARLINGTON: 80 volt, 12 amp, mfr 00724, part no. 20-01014-001	FO 7-29
1A1A3A1R1		RESISTOR, FIXED, FILM: MIL-R-39017/2 part no. RLR20C27R0GR	FO 7-29
1A1A3A1R4		RESISTOR, FIXED, WIRE WOUND: MIL-R-39009-1 part no. RER65F10R0P (ATTACHING PARTS) AT(2) SCREW, MACHINE: Pan head, cross-recessed, cres, 2-56unc-2A, 3/8 in. lg; part no. MS51957-5 (2) WASHER, FLAT: Cres, 0.089 id, 0.149 od, 0.016 in. thk; part no. NAS620C2 (2)	FO 7-29
1A1A3A1R10		RESISTOR, FIXED, WIRE WOUND-POWER, 4 TERMINAL: 0.01 ohms porm 3 pct, 25 watt; mfr 15915 part no. TMK-25, 00724 dwg 10-00514-001 (ATTACHING PARTS) T(2), AJ(2), AU(2)	FO 7-29
1A1A3A1R11, R12		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/3 part no. RCR32G473JS	FO 7-29
1A1A3A1RT2		RESISTOR, THERMAL: 50,000 ohms porm 10 pct; mfr 15801 part no. PA45D1, mfr 15454 part no. MSC503K, 00724 dwg 10-00512-001	FO 7-29
1A1A3A1RT3		RESISTOR, THERMAL-DISCONNECT: 5 ohms; mfr 15454 part no. SG200, 00724 dwg 10-00515-001	FO 7-29
1A1A3A1T1		TRANSFORMER, POWER: 115 volt input, 21.6 or 43.2 volt output porm 2 pct; mfr 08779 part no. 241-4-36, 00724 dwg 08-01133-001	FO 7-29

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) AW(2) SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 3/8 in. lg; part no. MS51957-43 (2)	
1A1A3A1T2		TRANSFORMER, POWER-DRIVER: Encapsulated, single input, triple output; mfr 00724, part no. 08-01134-001	FO 7-29
1A1A3A1T3		TRANSFORMER, POWER-CURRENT: Encapsulated, single input, single output; mfr 00724, part no. 08-01135-001	FO 7-29
1A1A3A1T4		TRANSFORMER, POWER-CONVERTER: Encapsulated, single input, six output; mfr 00724, part no. 08-01136-001	FO 7-29
1A1A3A1U1		MICROCIRCUIT, LINEAR, 3-TERMINAL ADJUSTABLE POSITIVE REGULATOR: Mfr 00724, part no. 72-00976-001	FO 7-29
1A1A3A1U2		MICROCIRCUIT, LINEAR, 3-TERMINAL NEGATIVE REGULATOR: Mfr 27014 part no. LM120K-5, mfr 34333 part no. SG120K-5, 00724 dwg 72-00977-001	FO 7-29
1A1A3A1U3		SEMICONDUCTOR DEVICE-DIODE, RECTIFIER ASSEMBLY: 400 volt, 35 amp 1 ph, full wave; mfr 00724, part no. 20-01020-001 (ATTACHING PARTS) AO(1), AW(1) SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 3/4 in. lg; part no. MS51957-47(1)	FO 7-29
1A1A3A1U4		SEMICONDUCTOR DEVICE-DIODE, RECTIFIER, DUAL: Mfr 00724, part no. 20-01021-001	FO 7-29
1A1A3A1A1		CIRCUIT CARD ASSEMBLY, AC POWER SUPPLY: Mfr 00724, part no. 61-40369-002	FO 7-29 FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) S(6), AJ(6), AU(6)	
1A1A3A1A1C1, C2		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39003/1 part no. M39003/01-2356	FO 7-30
1A1A3A1A1C3		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1298	FO 7-30
1A1A3A1A1C4		CAPACITOR, FIXED, MICA DIELECTRIC: MIL-C-39001/5 part no. CMR06F332JODL	FO 7-30
1A1A3A1A1C5		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1316	FO 7-30
1A1A3A1A1C6		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1320	FO 7-30
1A1A3A1A1C7, C8		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39003/1 part no. M39003/01-2356	FO 7-30
1A1A3A1A1C9 THRU C11		CAPACITOR, (COMMON ITEM 2)	FO 7-30
1A1A3A1A1-C12		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2254	FO 7-30
1A1A3A1A1-C13 THRU C16		CAPACITOR, (COMMON ITEM 2)	FO 7-30
1A1A3A1A1-C17		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1302	FO 7-30
1A1A3A1A1-C18		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1298	FO 7-30
1A1A3A1A1-C19, C20		CAPACITOR, (COMMON ITEM 2)	FO 7-30
1A1A3A1A1-C21		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2271	FO 7-30
1A1A3A1A1-C22		CAPACITOR, (COMMON ITEM 2)	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1-C23		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2283	FO 7-30
1A1A3A1A1-C24		CAPACITOR, (COMMON ITEM 2)	FO 7-30
1A1A3A1A1-C25		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39014/2 part no. M39014/02-1316	FO 7-30
1A1A3A1A1-C26		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1298	FO 7-30
1A1A3A1A1-C27, C28		CAPACITOR, (COMMON ITEM 2)	FO 7-30
1A1A3A1A1-CR1		SEMICONDUCTOR DEVICE-DIODE, VOLTAGE REGULATOR: 15 volt; mfr 14433 part no. 1N965B, mfr 16068 part no. 1N965B, 00724 dwg 20-01002-001	FO 7-30
1A1A3A1A1-CR2		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 35)	FO 7-30
1A1A3A1A1-CR3, CR4		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 36)	FO 7-30
1A1A3A1A1-CR5, CR6		SEMICONDUCTOR DEVICE-DIODE, RECTIFIER, FAST RECOVERY: 400 volt, 1 amp; mfr 14099 part no. 1N4944, mfr 12969 part no. 1N4944, 00724 dwg 20-01006-001	FO 7-30
1A1A3A1A1-CR7 THRU CR11		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 35)	FO 7-30
1A1A3A1A1-CR12		SEMICONDUCTOR DEVICE-DIODE: MIL-S-19500/117 part no. JAN1N975B	FO 7-30
1A1A3A1A1-CR13		SEMICONDUCTOR DEVICE-DIODE, VOLTAGE REGULATOR: 12 volt; mfr 14433 part no. 1N963B, mfr 16068 part no. 1N963B, 00724 dwg 20-01001-001	FO 7-30
1A1A3A1A1-CR14		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 35)	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1-CR15		SEMICONDUCTOR DEVICE-DIODE, VOLTAGE REGULATOR, 18 VOLT: Mfr 04713 part no. JAN1N967B, 00724 dwg 20-01024-001	FO 7-30
1A1A3A1A1-CR16		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 35)	FO 7-30
1A1A3A1A1-CR17		SEMICONDUCTOR DEVICE-DIODE, RECTIFIER, FAST RECOVERY: 200 volt, 3 amp; mfr 12969 part no. 1N5417, mfr 14099 part no. 1N5417, 00724 dwg 20-01008-001	FO 7-30
1A1A3A1A1-CR18, CR19		SEMICONDUCTOR DEVICE-DIODE, (COMMON ITEM 35)	FO 7-30
1A1A3A1A1-CR20		SEMICONDUCTOR DEVICE-DIODE, VOLTAGE REGULATOR: 15 volt; mfr 14433 part no. 1N965B, mfr 16068 part no. 1N965B, 00724 dwg 20-01002-001	FO 7-30
1A1A3A1A1J1, J2		JACK, (COMMON ITEM 5)	FO 7-30
1A1A3A1A1J3		JACK, TIP: MIL-C-39024/11 part no. M39024/11-03	FO 7-30
1A1A3A1A1J4 THRU J11		JACK, (COMMON ITEM 5)	FO 7-30
1A1A3A1A1-J12		CONNECTOR, RECEPTACLE, ELECTRICAL: 10 contacts; mfr 00779 part no. 86396-1, 00724 dwg 16-01502-001	FO 7-30
1A1A3A1A1-J13 THRU J15		CONNECTOR, RECEPTACLE, ELECTRICAL: 8 contacts; mfr 00779 part no. 1-86396-3, 00724 dwg 16-01502-010	FO 7-30
1A1A3A1A1-MP79		INSULATOR, PLATE-TRANSISTOR: 0.075 in. thk; MIL-I-38527/2 part no. M38527/02-17D	FO 7-30
1A1A3A1A1Q1		TRANSISTOR, PNP SWITCHING: Silicon; mfr 07263 part no. 2N2907A, mfr 14433 part no. 2N2907A, 00724 dwg 20-01012-001	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1Q2		TRANSISTOR, (COMMON ITEM 39)	FO 7-30
1A1A3A1A1Q3, Q4		TRANSISTOR, NPN SWITCHING: Silicone; mfr 07263 part no. 2N3725A, mfr 14433 part no. 2N3725A, 00724 dwg 20-01013-001	FO 7-30
1A1A3A1A1Q5 THRU Q14		TRANSISTOR, (COMMON ITEM 39)	FO 7-30
1A1A3A1A1R1		RESISTOR, VARIABLE, NON WIRE WOUND: MIL-R-39035/2 part no. RJR24FP102M	FO 7-30
1A1A3A1A1R2		RESISTOR, VARIABLE, NON WIRE WOUND: MIL-R-39035/2 part no. RJR24FP202M	FO 7-30
1A1A3A1A1R3		RESISTOR, VARIABLE, NON WIRE WOUND: MIL-R-39035/2 part no. RJR24FP102M	FO 7-30
1A1A3A1A1R4		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2402GR	FO 7-30
1A1A3A1A1R5		RESISTOR, (COMMON ITEM 30)	FO 7-30
1A1A3A1A1R6		RESISTOR, (COMMON ITEM 31)	FO 7-30
1A1A3A1A1R7		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2002GR	FO 7-30
1A1A3A1A1R8		RESISTOR, (COMMON ITEM 31)	FO 7-30
1A1A3A1A1R9		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2002GR	FO 7-30
1A1A3A1A1-R10 THRU R14		RESISTOR, (COMMON ITEM 31)	FO 7-30
1A1A3A1A1-R15		RESISTOR, FIXED, WIRE WOUND: MIL-R-39007/11 part no. RWR89S5620FR	FO 7-30
1A1A3A1A1-R16, R17		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C47ROGR	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1-R18		RESISTOR, FIXED, WIRE WOUND: MIL-R-39007/11 part no. RWR89S5620FR	FO 7-30
1A1A3A1A1-R19		RESISTOR, (COMMON ITEM 31)	FO 7-30
1A1A3A1A1-R20		RESISTOR, (COMMON ITEM 32)	FO 7-30
1A1A3A1A1-R21, R22		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C10ROGR	FO 7-30
1A1A3A1A1-R23		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C22ROGR	FO 7-30
1A1A3A1A1-R24		RESISTOR, (COMMON ITEM 30)	FO 7-30
1A1A3A1A1-R25 THRU R27		RESISTOR, (COMMON ITEM 31)	FO 7-30
1A1A3A1A1-R28		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2202GR	FO 7-30
1A1A3A1A1-R29		RESISTOR, (COMMON ITEM 31)	FO 7-30
1A1A3A1A1-R30		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1301GR	FO 7-30
1A1A3A1A1-R31		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3301GR	FO 7-30
1A1A3A1A1-R32		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1301GR	FO 7-30
1A1A3A1A1-R33		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1-R34		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2001GR	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1-R35		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1502GR	FO 7-30
1A1A3A1A1-R36		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3301GR	FO 7-30
1A1A3A1A1-R37		RESISTOR, (COMMON ITEM 32)	FO 7-30
1A1A3A1A1-R38		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1802GR	FO 7-30
1A1A3A1A1-R39, R40		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1302GR	FO 7-30
1A1A3A1A1-R41		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3002GR	FO 7-30
1A1A3A1A1-R42		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1601GR	FO 7-30
1A1A3A1A1-R43		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2002GR	FO 7-30
1A1A3A1A1-R44		RESISTOR, (COMMON ITEM 28)	FO 7-30
1A1A3A1A1-R45		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C7500GR	FO 7-30
1A1A3A1A1-R46		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1-R47		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3003GR	FO 7-30
1A1A3A1A1-R48, R49		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1003GR	FO 7-30
1A1A3A1A1-R50		RESISTOR, (COMMON ITEM 30)	FO 7-30
1A1A3A1A1-R51		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2703GR	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1-R52, R53		RESISTOR, (COMMON ITEM 30)	FO 7-30
1A1A3A1A1-R54		RESISTOR, (COMMON ITEM 31)	FO 7-30
1A1A3A1A1-R55		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3601GR	FO 7-30
1A1A3A1A1-R56, R57		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3001GR	FO 7-30
1A1A3A1A1-R58		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1-R59		RESISTOR, (COMMON ITEM 30)	FO 7-30
1A1A3A1A1-R60		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3902GR	FO 7-30
1A1A3A1A1-R61		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1102GR	FO 7-30
1A1A3A1A1-R62		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1-R63		RESISTOR, (COMMON ITEM 28)	FO 7-30
1A1A3A1A1-R64		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1-R65		RESISTOR, (COMMON ITEM 28)	FO 7-30
1A1A3A1A1-R66, R67		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1-R68		RESISTOR, (COMMON ITEM 32)	FO 7-30
1A1A3A1A1-R69		RESISTOR, (COMMON ITEM 30)	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1-R70		RESISTOR, (COMMON ITEM 32)	FO 7-30
1A1A3A1A1-R71		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C6201GR	FO 7-30
1A1A3A1A1-R72		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1-R73		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3302GR	FO 7-30
1A1A3A1A1-R74, R75		RESISTOR, (COMMON ITEM 28)	FO 7-30
1A1A3A1A1-R76		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2002GR	FO 7-30
1A1A3A1A1-R77		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2001GR	FO 7-30
1A1A3A1A1-R78		RESISTOR, (COMMON ITEM 28)	FO 7-30
1A1A3A1A1-R79		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2400GR	FO 7-30
1A1A3A1A1-R80		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1501GR	FO 7-30
1A1A3A1A1-R81, R82		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1202GR	FO 7-30
1A1A3A1A1-R83		RESISTOR, (COMMON ITEM 32)	FO 7-30
1A1A3A1A1-R84		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR20C4701GR	FO 7-30
1A1A3A1A1-R85		RESISTOR, (COMMON ITEM 28)	FO 7-30
1A1A3A1A1-R86		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C47ROGR	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A1-R87		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C3600GR	FO 7-30
1A1A3A1A1-R88		RESISTOR, FIXED, WIRE WOUND: MIL-R-39007/11 part no. RWR89SR464FR	FO 7-30
1A1A3A1A1-R89		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C5102GR	FO 7-30
1A1A3A1A1-R90		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C6200GR	FO 7-30
1A1A3A1A1-R91		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1501GR	FO 7-30
1A1A3A1A1-R92		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2702GR	FO 7-30
1A1A3A1A1-R93, R94		RESISTOR, (COMMON ITEM 29)	FO 7-30
1A1A3A1A1U1		MICROCIRCUIT, LINEAR-VOLTAGE REGULATOR: Mfr 04713 part no. MC1723L, mfr 27014 part no. LM723J, 00724 dwg 72-00277-207	FO 7-30
1A1A3A1A1U2		MICROCIRCUIT, DIGITAL-DUAL TYPE-D FLIP FLOP: Mfr 00724, part no. 72-00706-207	FO 7-30
1A1A3A1A1U3		MICROCIRCUIT, LINEAR-REGULATING PULSE WIDTH MODULATOR: Mfr 34333 part no. SG1524J, 00724 dwg 72-00711-207	FO 7-30
1A1A3A1A1U4		MICROCIRCUIT, LINEAR-QUAD COMPARATOR: Mfr 07263 part no. UA139DM, mfr 27014 part no. LM139D, 00724 dwg 72-00628-207	FO 7-30
1A1A3A1A1U5		MICROCIRCUIT, LINEAR-QUAD OP-AMP: Mfr 18324 part no. LM124F, mfr 27014 part no. LM124J, 00724 dwg 72-00708-207	FO 7-30
1A1A3A1A1U6		MICROCIRCUIT, LINEAR-NEGATIVE VOLTAGE REGULATOR: Mfr 27014 part no. LM120H12, mfr 34333 part no. SG120T12, 00724 dwg 72-00735-215	FO 7-30

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A2		CIRCUIT CARD ASSEMBLY-INTERCONNECT BOARD: Mfr 00724, part no. 61-40370-004 (ATTACHING PARTS) Z(5), AS(5), AV(5)	FO 7-29 FO 7-31
1A1A3A1A2C3, C4		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2257	FO 7-31
1A1A3A1A2C8		CAPACITOR, FIXED: Mfr 00724, part no. 95-00218-004	FO 7-31
1A1A3A1A2C9		CAPACITOR, FIXED: Mfr 00724, part no. 95-00218-001	FO 7-31
1A1A3A1A2-C10, C11		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1310	FO 7-31
1A1A3A1A2-C12		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2283	FO 7-31
1A1A3A1A2-C13 THRU C15		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1310	FO 7-31
1A1A3A1A2-C16		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2283	FO 7-31
1A1A3A1A2-C17, C18		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1310	FO 7-31
1A1A3A1A2-C19		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2471	FO 7-31
1A1A3A1A2-C20		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1310	FO 7-31
1A1A3A1A2-C22 THRU C24		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1310	FO 7-31
1A1A3A1A2-C26		CAPACITOR, FIXED: Mfr 00724, part no. 95-00218-003	FO 7-31

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A2-C27, C28		CAPACITOR, FIXED, CERAMIC, DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1310	FO 7-31
1A1A3A1A2-CR2 THRU CR5		SEMICONDUCTOR DEVICE-DIODE, RECTIFIER, FAST RECOVERY: 200 volt, 1 amp; mfr 14099 part no. 1N4942, mfr 12969 part no. 1N4942, 00724 dwg 20-01005-001	FO 7-31
1A1A3A1A2-CR6, CR7		SEMICONDUCTOR DEVICE-DIODE, RECTIFIER, FAST RECOVERY: 600 volt, 1 amp; mfr 14099 part no. 1N4946, mfr 12969 part no. 1N4946, 00724 dwg 20-01007-001	FO 7-31
1A1A3A1A2-CR8, CR9		SEMICONDUCTOR, DEVICE-DIODE, RECTIFIER, HIGH EFFICIENCY: 150 volt, 6 amp; mfr 01281 part no. 1N5811, mfr 12969 part no. 1N5811 00724 dwg 20-01009-001	FO 7-31
1A1A3A1A2-CR10, CR11		SEMICONDUCTOR, DEVICE-DIODE, RECTIFIER, FAST RECOVERY: 200 volt, 3 amp; mfr 12969 part no. 1N5417, mfr 14099 part no. 1N5417, 00724 dwg 20-01008-001	FO 7-31
1A1A3A1A2-CR12, CR13		SEMICONDUCTOR, DEVICE-DIODE, RECTIFIER: 300 volt, 5 amp; mfr 00724, part no. 20-01027-001	FO 7-31
1A1A3A1A2-MP20		TERMINAL, STUD: MIL-T-55155/12 part no. SE12XC04 (101)	FO 7-31
1A1A3A1A2-MP33		NUT, CLINCH: Brass, 0.344 lg, 0.138 id, 0.250 od, 4-40nc-2B; mfr 00724, part no. 26-00381-001 (7)	FO 7-31
1A1A3A1A2-MP37		INSULATOR, STRIP: Plastic, 2.86 lg, 0.18 wd, 0.01 in. thk; mfr 00724, part no. 57-01104-001	FO 7-31
1A1A3A1A2P1		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-24308/24 part no. M24308/24-28 (ATTACHING PARTS) U(2), AJ(2), AU(2), B(2)	FO 7-31
1A1A3A1A2-P12		CONNECTOR, HEADER: 10 contacts; mfr 00779 part no. 87306-6, 00724 dwg 16-01495-003	FO 7-31

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A3A1A2-P13		CONNECTOR, HEADER: 6 contacts; mfr 00779 part no. 87306-4, 00724 dwg 16-01495-001	FO 7-31
1A1A3A1A2-P14, P15		CONNECTOR, HEADER: 8 contacts; mfr 00779 part no. 87306-5, 00724 dwg 16-01495-002	FO 7-31
1A1A3A1A2R2, R3		RESISTOR, FIXED, FILM-INSULATED: MIL-R-39017/1 part no. RLR07C47ROGR	FO 7-31
1A1A3A1A2R5		RESISTOR, FIXED, FILM-INSULATED: MIL-R-39017/1 part no. RLR07C1203GR	FO 7-31
1A1A3A1A2R6		RESISTOR, FIXED, WIRE WOUND: MIL-R-39007/11 part no. RNR89S1001FR	FO 7-31
1A1A3A1A2R7, R8		RESISTOR, FIXED, CARBON: MIL-R-39008/5 part no. RCR42G100JS	FO 7-31
1A1A3A1A2R9		RESISTOR, FIXED, WIRE WOUND: 0.01 ohm porm 0.01 pct, 3 watt; mfr 11502 part no. 4LPW3-0-01 mfr 15915 part no. TSKM-0-01 or TSKM-5-0-01, 00724 dwg 10-00483-001	FO 7-31
1A1A3A1A2-R13		RESISTOR, FIXED, FILM-INSULATED: MIL-R-39017/1 part no. RWR81S46R4FP	FO 7-31
1A1A3A1A2-RT1		RESISTOR, THERMAL-DISC: 5 ohms; mfr 15454 part no. SG200, 00724 dwg 10-00515-001	FO 7-31
1A1A5		CIRCUIT CARD ASSEMBLY-MESSAGE STORE-64K: Mfr 00724, part no. 61-40414-001	FO 7-2 (1) FO 7-32
1A1A5C1 THRU C24		CAPACITOR, (COMMON ITEM 2)	FO 7-32
1A1A5C25		CAPACITOR, (COMMON ITEM 1)	FO 7-32
1A1A5C26 THRU C30		CAPACITOR, (COMMON ITEM 2)	FO 7-32
1A1A5C39 THRU C41		CAPACITOR, (COMMON ITEM 2)	FO 7-32

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A5C42		CAPACITOR, FIXED CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1299	FO 7-32
1A1A5C43 THRU C50		CAPACITOR, (COMMON ITEM 2)	FO 7-32
1A1A5C51		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1314	FO 7-32
1A1A5C53		CAPACITOR, (COMMON ITEM 1)	FO 7-32
1A1A5J1 THRU J7		JACK, TIP: Yellow; mfr 91506 part no. 8046-1G2, 00724 dwg 16-00612-002	FO 7-32
1A1A5J8		JACK, TIP: Black; mfr 91506 part no. 8046-1G6, 00724 dwg 16-00612-006	FO 7-32
1A1A5MP17		EJECTOR, PRINTED WIRING BOARD: Handle, sst, 3/32 in. thk; mfr 94222 part no. 90-0-6635-11, 00724 dwg 18-00483-004 (2) (ATTACHING PARTS) RIVET-EJECTOR HANDLE: Sst; mfr 94222 part no. 90-0-5971-24, 00724 dwg 18-00483-005 (1)	FO 7-32
1A1A5P1		CONNECTOR, PLUG, ELECTRICAL: MIL-C-55302/8 part no. M55302/89-08 (ATTACHING PARTS) D(2), P(2), AI(2)	FO 7-32
1A1A5R1 THRU R4		RESISTOR, (COMMON ITEM 17)	FO 7-32
1A1A5R5 THRU R12		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G470JS	FO 7-32
1A1A5R13		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G101JS	FO 7-32
1A1A5R15, R16		RESISTOR, (COMMON ITEM 17)	FO 7-32

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A5R18 R19		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G470JS	FO 7-32
1A1A5R20 THRU R22		RESISTOR, (COMMON ITEM 17)	FO 7-32
1A1A5R23		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G222JS	FO 7-32
1A1A5R24		RESISTOR, (COMMON ITEM 23)	FO 7-32
1A1A5R25		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G152JS	FO 7-32
1A1A5R26		RESISTOR, (COMMON ITEM 17)	FO 7-32
1A1A5U1		MICROCIRCUIT, DIGITAL, 512 X 8 BIT EEPROM: Mfr 60395 part no. X2804AD1-35, 00724 dwg 72-01022-001	FO 7-32
1A1A5U2		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00518-001	FO 7-32
1A1A5U3		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00519-001	FO 7-32
1A1A5U4		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00520-001	FO 7-32
1A1A5U5		MICROCIRCUIT, (COMMON ITEM 6)	FO 7-32
1A1A5U6		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00521-001	FO 7-32
1A1A5U7		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00569-001	FO 7-32
1A1A5U9, U10		MICROCIRCUIT, DIGITAL-2048 X 8 BIT STATIC RAM: Mfr 34335 part no. AM9128-20DC, mfr 55576 part no. SYD2128-4, 00724 dwg 72-01017-001	FO 7-32

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A5U11		MICROCIRCUIT, DIGITAL-OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS: Mfr 01295 part no. SN54LS245J, mfr 04713 part no. SN54LS245J, 00724 dwg 72-00836-207	FO 7-32
1A1A5U12		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-32
1A1A5U13, U14		MICROCIRCUIT, (COMMON ITEM 7)	FO 7-32
1A1A5U15		MICROCIRCUIT, DIGITAL-OCTAL BUFFER/LINE DRIVER: Mfr 01295 part no. SN54LS240J, mfr 07263 part no. 54LS240DM, 00724 dwg 72-01018-207	FO 7-32
1A1A5U16		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-32
1A1A5U17		MICROCIRCUIT, DIGITAL-QUAD TWO INPUT AND GATE: Mfr 01295 part no. SN54S08J00, mfr 07263 part no. 54S08DM, 00724 dwg 72-01019-207	FO 7-32
1A1A5U18		MICROCIRCUIT, DIGITAL-TTL, GATE, QUAD 2-INPUT, POSITIVE NAND: Mfr 01295 part no. SN54S00J, mfr 18324 part no. S54S00F, mfr 07260 part no. 54S00DM, 00724 dwg 72-00315-207	FO 7-32
1A1A5U19 THRU U26		MICROCIRCUIT, DIGITAL - 64K BIT, DYNAMIC RAM: Mfr 01295 part no. TMS4164-20JDL, mfr 34649 part no. D2164A-20, 00724 dwg 72-01015-001	FO 7-32
1A1A5U27		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-32
1A1A5U28		MICROCIRCUIT, DIGITAL-OCTAL D-TYPE FLIP-FLOP: Mfr 01295 part no. SN54LS374J, mfr 34335 part no. AM54LS374DMB, 00724 dwg 72-00954-207	FO 7-32
1A1A5U29		MICROCIRCUIT, DIGITAL-OCTAL BUFFER/LINE DRIVER: Mfr 01295 part no. SN54LS240J, mfr 07263 part no. 54LS240DM, 00724 dwg 72-01018-207	FO 7-32

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A5U30		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-32
1A1A5U31		MICROCIRCUIT, DIGITAL-OCTAL BUFFER/LINE DRIVER: Mfr 01295 part no. SN54LS240J, mfr 07263 part no. 54LS240DM, 00724 dwg 72-01018-207	FO 7-32
1A1A5U32, U33		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-32
1A1A5U34		MICROCIRCUIT, DIGITAL-QUAD TWO INPUT AND GATE: Mfr 01295 part no. SN54S08J00, mfr 07263 part no. 54S08DM, 00724 dwg 72-01019-207	FO 7-32
1A1A5U35		MICROCIRCUIT, DIGITAL-TTL, GATE, QUAD 2-INPUT, POSITIVE NAND: Mfr 01295 part no. SN54S00J, mfr 18324 part no. S54S00F, mfr 07260 part no. 54S00DM, 00724 dwg 72-00315-207	FO 7-32
1A1A5U44		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-32
1A1A5U45		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-32
1A1A5U46		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY TTL, NOR GATES, MONOLITHIC SILICON: Mfr 01295 part no. SN54LS02J, mfr 18324 part no. S54LS02F, 00724 dwg 72-00965-001	FO 7-32
1A1A5U47		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY TTL, NAND GATE: Mfr 01295 part no. SN54LS10J, mfr 18324 S54LS10F, 00724 dwg 72-00967-001	FO 7-32
1A1A5U48		MICROCIRCUIT, (COMMON ITEM 11)	FO 7-32
1A1A5U49		MICROCIRCUIT, (COMMON ITEM 13)	FO 7-32
1A1A5U50		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-32

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A5U51		MICROCIRCUIT, DIGITAL, LOW POWER, SCHOTTKY TTL, NOR GATES, MONOLITHIC SILICON: Mfr 01295 part no. SN54LS02J, mfr 18324 part no. S54LS02F, 00724 dwg 72-00965-001	FO 7-32
1A1A5U52		MICROCIRCUIT, DIGITAL-TTL, GATE, QUAD 2-INPUT, POSITIVE NAND: Mfr 01295 part no. SN54S00J, mfr 18324 part no. S54S00F, mfr 07260 part no. 54S00DM, 00724 dwg 72-00315-207	FO 7-32
1A1A5U53		MICROCIRCUIT, DIGITAL-8-BIT SHIFT REGISTER: Mfr 01295 part no. SN54LS164J, mfr 18324 part no. 54LS164F, 00724 dwg 72-00649-207	FO 7-32
1A1A5U54		MICROCIRCUIT, DIGITAL-D-TYPE POSITIVE EDGE TRIGGERED FLIP-FLOP: Mfr 01295 part no. SN54S74J00, mfr 07263 part no. 54S74DM, 00724 dwg 72-01021-207	FO 7-32
1A1A5U55		MICROCIRCUIT, DIGITAL-TTL, GATE, QUAD 2-INPUT, POSITIVE NAND: Mfr 01295 part no. SN54S00J, mfr 18324 part no. S54S00F, mfr 07260 part no. 54S00DM, 00724 dwg 72-00315-207	FO 7-32
1A1A5U56		MICROCIRCUIT: MIL-M-38510/341 part no. JM38510/34101BCX	FO 7-32
1A1A5U57		MICROCIRCUIT, DIGITAL-TTL, GATE, QUAD 2-INPUT, POSITIVE NAND: Mfr 01295 part no. SN54S00J, mfr 18324 part no. S54S00F, mfr 07260 part no. 54S00DM, 00724 dwg 72-00315-207	FO 7-32
1A1A5XU2 THRU XU4		SOCKET, PLUG-IN: MIL-S-83734/8 part no. M83734/8-031	FO 7-32
1A1A5XU6 THRU XU8		SOCKET, PLUG-IN: MIL-S-83734/8 part no. M83734/8-031	FO 7-32
1A1A5Y1		CRYSTAL UNIT, QUARTZ: 16.5888 MHz porm 0.005 pct; mfr 00724, part no. 13-00084-001	FO 7-32
1A1A6		CIRCUIT CARD ASSEMBLY-MICROCOMPUTER: Mfr 00724, part no. 61-03032-001	FO 7-2 (2) FO 7-33

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A6C1, C2		CAPACITOR, (COMMON ITEM 4) SELECT VALUE FOR C3	FO 7-33
1A1A6C3A		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C1R0D0DM	FO 7-33
1A1A6C3B		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C5R0D0DM	FO 7-33
1A1A6C3C		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C6R0D0DM	FO 7-33
1A1A6C3D		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C7R0D0DM	FO 7-33
1A1A6C3E		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C8R0D0DM	FO 7-33
1A1A6C3F		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C100D0DM	FO 7-33
1A1A6C3G		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C120J0DM	FO 7-33
1A1A6C3H		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C150J0DM	FO 7-33
1A1A6C3J		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C180J0DM	FO 7-33
1A1A6C3K		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04E220J0DM	FO 7-33
1A1A6C3L		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04E270J0DM	FO 7-33
1A1A6C3M		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04E330J0DM	FO 7-33
1A1A6C3N		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C010D0DL	FO 7-33
1A1A6C3P		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C050D0DL	FO 7-33
1A1A6C3Q		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C060D0DL	FO 7-33

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A6C3R		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C070DODL	FO 7-33
1A1A6C3S		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C080DODL	FO 7-33
1A1A6C3T		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C100DODL	FO 7-33
1A1A6C3U		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C120JODL	FO 7-33
1A1A6C3V		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C150JODL	FO 7-33
1A1A6C3W		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04C180JODL	FO 7-33
1A1A6C3X		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04E220JODL	FO 7-33
1A1A6C3Y		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04E270JODL	FO 7-33
1A1A6C3Z		CAPACITOR, FIXED, MICA: MIL-C-39001/5 part no. CMR04E330JODL	FO 7-33
		END OF SELECT VALUE	
1A1A6C4		CAPACITOR, (COMMON ITEM 1)	FO 7-33
1A1A6C5 THRU C10		CAPACITOR, (COMMON ITEM 4)	FO 7-33
1A1A6C11		CAPACITOR, (COMMON ITEM 1)	FO 7-33
1A1A6C12		CAPACITOR, (COMMON ITEM 4)	FO 7-33
1A1A6C13		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2295	FO 7-33
1A1A6C14, C15		CAPACITOR, (COMMON ITEM 4)	FO 7-33

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A6C16		CAPACITOR, (COMMON ITEM 1)	FO 7-33
1A1A6C17 THRU C19		CAPACITOR, (COMMON ITEM 4)	FO 7-33
1A1A6C20		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1538	FO 7-33
1A1A6J1 THRU J14		JACK, TIP: Yellow; mfr 91506 part no. 8046-1G2, 00724 dwg 16-00612-002	FO 7-33
1A1A6J15		JACK, TIP: Black; mfr 91506 part no. 8046-1G6, 00724 dwg 16-00612-006	FO 7-33
1A1A6MP15		EJECTOR, PRINTED WIRING BOARD: Handle, sst, 3/32 in. thk; mfr 94222 part no. 90-0-6635-11, 00724 dwg 18-00483-004 (2) (ATTACHING PARTS) RIVET-EJECTOR HANDLE: Sst; mfr 94222 part no. 90-0-5971-24, 00724 dwg 18-00483-005 (1)	FO 7-33
1A1A6P1		CONNECTOR, PLUG, ELECTRICAL: MIL-C-55302 part no. M55302/89-08 (ATTACHING PARTS) P(2), AI(2), D(2)	FO 7-33
1A1A6R1 THRU R5		RESISTOR, (COMMON ITEM 17)	FO 7-33
1A1A6R6		RESISTOR, (COMMON ITEM 20)	FO 7-33
1A1A6R7		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G390JS	FO 7-33
1A1A6R8 THRU R15		RESISTOR, (COMMON ITEM 17)	FO 7-33
1A1A6R16 THRU R18		RESISTOR, (COMMON ITEM 22)	FO 7-33
1A1A6R19		RESISTOR, (COMMON ITEM 17)	FO 7-33

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A6R20 THRU R25		RESISTOR, (COMMON ITEM 22)	FO 7-33
1A1A6R26 THRU R29		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G152JS	FO 7-33
1A1A6R30		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G390JS	FO 7-33
1A1A6R31 THRU R44		RESISTOR, (COMMON ITEM 22)	FO 7-33
1A1A6U1		MICROCIRCUIT, DIGITAL-SYSTEM CONTROLLER DATA BUS DRIVER: Mfr 34649 part no. MD8228 or MD3228, mfr 01295 part no. SN54S428J, 00724 dwg 72-00621-207	FO 7-33
1A1A6U2		MICROCIRCUIT, DIGITAL-CLOCK GENERATOR/DRIVER: Mfr 34335 part no. AM8224DC, mfr 34649 part no. D8224, 00724 dwg 72-00620-207	FO 7-33
1A1A6U3		MICROCIRCUIT, DIGITAL-8-BIT MICROPROCESSOR: Mfr 34649 part no. 1D8080A, mfr 34335 part no. AM9080AD1, 00724 dwg 72-00617-207	FO 7-33
1A1A6U4		MICROCIRCUIT, DIGITAL: Mfr 00724, part no. 95-00512-001	FO 7-33
1A1A6U5 THRU U8		MICROCIRCUIT, (COMMON ITEM 9)	FO 7-33
1A1A6U9		MICROCIRCUIT, (COMMON ITEM 13)	FO 7-33
1A1A6U10		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-33
1A1A6U11		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, WAND GATE: Mfr 01295 part no. SN54LS10J, mfr 18324 part no. S54LS10F, 00724 dwg 72-00967-001	FO 7-33
1A1A6U12 THRU U14		MICROCIRCUIT, (COMMON ITEM 9)	FO 7-33

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A6U15		MICROCIRCUIT, (COMMON ITEM 14)	FO 7-33
1A1A6U16, U17		MICROCIRCUIT, DIGITAL, 1024 X 4 STATIC R/W RANDOM ACCESS MEMORY: Mfr 00724, part no. 72-00978-001	FO 7-33
1A1A6U18 THRU U21		MICROCIRCUIT, (COMMON ITEM 7)	FO 7-33
1A1A6U22		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-33
1A1A6U23, U24		MICROCIRCUIT, DIGITAL-QUAD 2-LINE TO 1-LINE DATA SELECTOR/MULTIPLEXER: Mfr 07263 part no. 54LS257DM, mfr 49956 part no. 54LS257J, 00724 dwg 72-00610-207	FO 7-33
1A1A6U25, U26		MICROCIRCUIT, (COMMON ITEM 10)	FO 7-33
1A1A6U27, U28		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-33
1A1A6U29, U30		MICROCIRCUIT, (COMMON ITEM 10)	FO 7-33
1A1A6U31		MICROCIRCUIT, (COMMON ITEM 6)	FO 7-33
1A1A6U32		RESISTOR, FIXED, FILM-NETWORK: MIL-R-83401/2 part no. M8340102M1001GB	FO 7-33
1A1A6U33		MICROCIRCUIT, (COMMON ITEM 9)	FO 7-33
1A1A6U34		MICROCIRCUIT, (COMMON ITEM 6)	FO 7-33
1A1A6U35		MICROCIRCUIT, (COMMON ITEM 10)	FO 7-33
1A1A6U36		MICROCIRCUIT, (COMMON ITEM 6)	FO 7-33
1A1A6U37		MICROCIRCUIT, DIGITAL, CASCADABLE OCTAL PRIORITY ENCODER: Mfr 01295 part no. SN54LS148J, mfr 18324 part no. S54LS148F, 00724 dwg 72-00983-001	FO 7-33

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A6XU3		SOCKET, PLUG-IN: MIL-S-83734/10 part no. M83734/10-013	FO 7-33
1A1A6XU4		SOCKET, PLUG-IN: MIL-S-83734/8 part no. M83734/8-031	FO 7-33
1A1A6Y1		CRYSTAL UNIT, QUARTZ: 16.5888 MHz porm 0.005 pct; mfr 00724, part no. 13-00084-001	FO 7-33
1A1A7		CIRCUIT CARD ASSEMBLY, INTERFACE, MULTIPORT: Mfr 00724, part no. 61-40377-001	FO 7-2 (3) FO 7-34
1A1A7C1 THRU C9		CAPACITOR, (COMMON ITEM 2)	FO 7-34
1A1A7C11		CAPACITOR, (COMMON ITEM 2)	FO 7-34
1A1A7C12		CAPACITOR, (COMMON ITEM 1)	FO 7-34
1A1A7C13 THRU C22		CAPACITOR, (COMMON ITEM 2)	FO 7-34
1A1A7C23		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1523	FO 7-34
1A1A7C24, C25		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1308	FO 7-34
1A1A7C26		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1523	FO 7-34
1A1A7C27, C28		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1320	FO 7-34
1A1A7C29, C30		CAPACITOR, (COMMON ITEM 2)	FO 7-34
1A1A7C31, C32		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1523	FO 7-34
1A1A7C33		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1305	

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A7C34		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1308	FO 7-34
1A1A7C35		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1314	FO 7-34
1A1A7C36		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/1 part no. M39014/01-1320	FO 7-34
1A1A7C37, C38		CAPACITOR, (COMMON ITEM 2)	FO 7-34
1A1A7C39		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1298	FO 7-34
1A1A7C41		CAPACITOR, (COMMON ITEM 2).	FO 7-34
1A1A7C43, C44		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1298	FO 7-34
1A1A7C47		CAPACITOR, (COMMON ITEM 2)	FO 7-34
1A1A7C51		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2286	FO 7-34
1A1A7C53		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no.. M39014/02-1298	FO 7-34
1A1A7J1 THRU J11		JACK, TIP: Yellow; mfr 91506 part no. 8046-1G2, 00724 dwg 16-00612-002	FO 7-34
1A1A7J12		JACK, TIP: Black; mfr 91506 part no. 8046-1G6, 00724 dwg 16-00612-006	FO 7-34
1A1A7MP44		EJECTOR, PRINTED WIRING BOARD: Handle, sst, 3/32 in. thk; mfr 94222 part no. 90-0-6635-11, 00724 dwg 18-00483-004 (2) (ATTACHING PARTS) RIVET-EJECTOR HANDLE: Sst; mfr 94222 part no. 90-0-5971-24, 00724 dwg 18-00483-005 (1)	FO 7-34

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A7MP47		INSULATOR, PLATE-TRANSISTOR: Mfr 07047 part no. 10034N, mfr 54355 part no. 717-205N, 00724 dwg 54-00159-001	FO 7-34
1A1A7P1		CONNECTOR, PLUG, ELECTRICAL: MIL-C-55302 part no. M55302/89-08 (ATTACHING PARTS) P(2), AI(2), D(2)	FO 7-34
1A1A7Q7		TRANSISTOR, (COMMON ITEM 39)	FO 7-34
1A1A7R3 THRU R13		RESISTOR, (COMMON ITEM 17)	FO 7-34
1A1A7R14 THRU R16		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G103JS	FO 7-34
1A1A7R17		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G272JS	FO 7-34
1A1A7R18		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G102JS	FO 7-34
1A1A7R19		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G103JS	FO 7-34
1A1A7R20		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G102JS	FO 7-34
1A1A7R21		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G472JS	FO 7-34
1A1A7R27, R28		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G102JS	FO 7-34
1A1A7R29		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G271JS	FO 7-34
1A1A7R30		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G680JS	FO 7-34
1A1A7R31		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G102JS	FO 7-34

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A7U1		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00513-001	FO 7-34
1A1A7U2		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00514-001	FO 7-34
1A1A7U3		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00515-001	FO 7-34
1A1A7U4		MICROCIRCUIT, DIGITAL-PROGRAMMABLE INTERVAL TIMER: Mfr 34649 part no. D8253, 00724 dwg 72-01028-001	FO 7-34
1A1A7U5 THRU U7		MICROCIRCUIT, DIGITAL, PROGRAMMABLE COMMUNICATION INTERFACE: Mfr 34649 part no. MD8251A, mfr 34335 part no. MD8251A, 00724 dwg 72-00939-207	FO 7-34
1A1A7U8, U9		MICROCIRCUIT, DIGITAL, OCTAL D-TYPE FLIP-FLOP: Mfr 01295 part no. SN54LS374J, mfr 34335 part no. AM54LS374DM, 00724 dwg 72-00954-207	FO 7-34
1A1A7U10		SWITCH, PUSH-MINIATURE: 4 station; mfr 81073 part no. 76RSC04S, 00724 dwg 07-00469-001	FO 7-34
1A1A7U11		MICROCIRCUIT, DIGITAL-TRIPLE 3-INPUT, AND GATE: Mfr 01295 part no. SN54LS11J, mfr 04713 part no. SN54LS11J, 00724 dwg 72-01075-207	FO 7-34
1A1A7U12, U13		MICROCIRCUIT, DIGITAL, DEMULTIPLEXER: Mfr 01295 part no. SN54LS138J, mfr 07263 part no. 54LS138DM, 00724 dwg 72-00604-207	FO 7-34
1A1A7U14, U15		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-34
1A1A7U16		SWITCH, PUSH-MINIATURE: 4 station; mfr 81073 part no. 76RSC04S, 00724 dwg 07-00469-001	FO 7-34

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A7U17		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, EXCLUSIVE OR GATE: Mfr 01295 part no. SN54LS86J, mfr 18324 part no. S54LS86F, 00724 dwg 72-00971-001	FO 7-34
1A1A7U18		MICROCIRCUIT, DIGITAL-TRIPLE, 3-INPUT NOR GATE: Mfr 01295 part no. SN54LS27J, mfr 04713 part no. SN54LS27J, 00724 dwg 72-01073-207	FO 7-34
1A1A7U19		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, EXCLUSIVE OR GATE: Mfr 01295 part no. SN54LS86J, mfr 18324 part no. S54LS86F, 00724 dwg 72-00971-001	FO 7-34
1A1A7U20, U21		SWITCH, PUSH-MINIATURE: 4 station; mfr 81073 part no. 76RSC04S, 00724 dwg 07-00469-001	FO 7-34
1A1A7U22		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, DATA SELECTOR/MULTIPLEXER: Mfr 01295 part no. SN54LS151J, mfr 18324 S54LS151F, 00724 dwg 72-00972-001	FO 7-34
1A1A7U23		MICROCIRCUIT, DIGITAL, DUAL TYPE-D FLIP-FLOP: Mfr 00724, part no. 72-00706-207	FO 7-34
1A1A7U24		MICROCIRCUIT, DIGITAL-QUAD 2-INPUT OR GATE: Mfr 01295 part no. SN54LSJ, mfr 34148 part no. 54LS32DM, 00724 dwg 72-01074-207	FO 7-34
1A1A7U25		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, NAND GATE: Mfr 01295 part no. SN54LS10J, mfr 18324 part no. S54LS10F, 00724 dwg, 72-00967-001	FO 7-34
1A1A7U26, U27		MICROCIRCUIT, DIGITAL-DUAL, DIFFERENTIAL PARTY LINE/QUAD, SINGLE ENDED LINE DRIVER: Mfr 34335 part no. AM26LS30DM, mfr 27014 part no. DS1691J, 00724 dwg 72-01025-207	FO 7-34
1A1A7U28		MICROCIRCUIT, DIGITAL-COUNTER: Mfr 01295 part no. SN54LS161J, mfr 07263 part no. 54LS161DM, 00724 dwg 72-00608-207	FO 7-34

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A7U29, U30		MICROCIRCUIT, DIGITAL-QUAD DIFFERENTIAL LINE RECEIVERS: Mfr 34335 part no. AM26LS32DM, mfg 27014 part no. DS26LS32MJ, 00724 dwg 72-01042-207	FO 7-34
1A1A7U31		MICROCIRCUIT, DIGITAL, DUAL TYPE-D FLIP-FLOP: Mfr 00724, part no. 72-00706-207	FO 7-34
1A1A7U32		MICROCIRCUIT, DIGITAL-QUAD 2-INPUT OR GATE: Mfr 01295 part no. SN54LSJ, mfr 34148 part no. 54LS32DM, 00724 dwg 72-01074-207	FO 7-34
1A1A7U33		MICROCIRCUIT, DIGITAL, OCTAL BUS TRANSCEIVERS W/3 STATE OUTPUTS: Mfr 01295 part no. SN54LS245J, mfr 04713 part no. SN54LS245J, 00724 dwg 72-00836-207	FO 7-34
1A1A7U34, U35		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-34
1A1A7U36		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, HEX SCHMITT-TRIGGER: Mfr 01295 part no. SN54LS14J, mfr 18324 part no. S54LS14F, 00724 dwg 72-00968-001	FO 7-34
1A1A7U37		MICROCIRCUIT, DIGITAL, DUAL PERIPHERAL POSITIVE NOR DRIVERS: Mfr 01295 part no. SN55464JG, mfr 07263 part no. 55464RM, 00724 dwg 72-00975-001	FO 7-34
1A1A7U38		MICROCIRCUIT, LINEAR-CMOS, QUAD, SPST ANALOG SWITCH: Mfr 17856 part no. DG201ABK, 00724 dwg 72-01024-001	FO 7-34
1A1A7U39		MICROCIRCUIT, DIGITAL-COUNTER: Mfr 01295 part no. SN54LS161J, mfr 07263 54LS161DM, 00724 dwg 72-00608-207	FO 7-34
1A1A7U42, U43		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-34

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A7U44		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-563G, mfr 32997 part no. 4310R-101-563G, 00724 dwg 10-00501-045	FO 7-34
1A1A7XU1 THRU XU3		SOCKET, PLUG-IN: MIL-S-83734/8 part no. M83734/8-031	FO 7-34
1A1A8		CIRCUIT CARD ASSEMBLY-CONTROLLER: Mfr 00724, part no. 61-40226-001	FO 7-2 (4) FO 7-35
1A1A8C1		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1290	FO 7-35
1A1A8C2		CAPACITOR, (COMMON ITEM 2)	FO 7-35
1A1A8C3		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1314	FO 7-35
1A1A8C4 THRU C10		CAPACITOR, (COMMON ITEM 2)	FO 7-35
1A1A8C12 THRU C16		CAPACITOR, (COMMON ITEM 2)	FO 7-35
1A1A8C17		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1292	FO 7-35
1A1A8C18 THRU C25		CAPACITOR, (COMMON ITEM 2)	FO 7-35
1A1A8C26		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1292	FO 7-35
1A1A8C27		CAPACITOR, (COMMON ITEM 2)	FO 7-35
1A1A8C28 THRU C30		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1292	FO 7-35
1A1A8C31		CAPACITOR, (COMMON ITEM 2)	FO 7-35
1A1A8C33		CAPACITOR, (COMMON ITEM 1)	FO 7-35

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A8C34		CAPACITOR, FIXED ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2295	FO 7-35
1A1A8J3 THRU J19		JACK, TIP: Yellow; mfr 91506 part no. 8046-1G2, 00724 dwg 16-00612-002	FO 7-35
1A1A8J21 THRU J26		JACK, TIP: Yellow; mfr 91506 part no. 8046-1G2, 00724 dwg 16-00612-002	FO 7-35
1A1A8J27		JACK, TIP: Black; mfr 91506 part no. 8046-1G6, 00724 dwg 16-00612-006	FO 7-35
1A1A8MP36		EJECTOR, PRINTED WIRING BOARD: Handle, sst, 3/32 in. thk; mfr 94222 part no. 90-0-6635-11, 00724 dwg 18-00483-004 (2) (ATTACHING PARTS) RIVET-EJECTOR HANDLE: Sst; mfr 94222 part no. 90-0-5971-24, 00724 dwg 18-00483-005 (1)	FO 7-35
1A1A8MP40		INSULATOR, PLATE-TRANSISTOR: Plastic; mfr 07047 part no. 10034N, mfr 54355 part no. 717-205N, 00724 dwg 54-00159-001	FO 7-35
1A1A8P1		CONNECTOR, PLUG, ELECTRICAL: MIL-C-55302 part no. M55302/89-08 (ATTACHING PARTS) D(2), P(2), AI(2)	FO 7-35
1A1A8Q1		TRANSISTOR, PNP SWITCHING: Mfr 07263 part no. 2N2907A, mfr 14433 part no. 2N2907A, 00724 dwg 20-01012-001	FO 7-35
1A1A8R1		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G122JS	FO 7-35
1A1A8R2,		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G272JS	FO 7-35
1A1A8R3		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G122JS	FO 7-35

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A8R4		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C22ROGR	FO 7-35
1A1A8R5		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G221JS	FO 7-35
1A1A8R6 THRU R29		RESISTOR, (COMMON ITEM 17)	FO 7-35
1A1A8R31		RESISTOR, (COMMON ITEM 17)	FO 7-35
1A1A8R32		RESISTOR, (COMMON ITEM 18)	FO 7-35
1A1A8R33		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G222JS	FO 7-35
1A1A8R34		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G473JS	FO 7-35
1A1A8R35, R36		RESISTOR, (COMMON ITEM 18)	FO 7-35
1A1A8R37		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G104JS	FO 7-35
1A1A8R38		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G222JS	FO 7-35
1A1A8R39, R40		RESISTOR, (COMMON ITEM 18)	FO 7-35
1A1A8R41		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G393JS	FO 7-35
1A1A8R42		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G154JS	FO 7-35
1A1A8R43, R44		RESISTOR, (COMMON ITEM 18)	FO 7-35
1A1A8R45		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G473JS	FO 7-35
1A1A8R46		RESISTOR, (COMMON ITEM 18)	FO 7-35

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A8R47 THRU R49		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G222JS	FO 7-35
1A1A8R50		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RLR05C2401GR	FO 7-35
1A1A8R51		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G473JS	FO 7-35
1A1A8R52 THRU R55		RESISTOR, (COMMON ITEM 18)	FO 7-35
1A1A8R59		RESISTOR, (COMMON ITEM 17)	FO 7-35
1A1A8R60		RESISTOR, THERMAL: Mfr 15801 part no. PA45D1, mfr 15454 part no. MSC503K, 00724 dwg 10-00512-001	FO 7-35
1A1A8R61		RESISTOR, (COMMON ITEM 31)	FO 7-35
1A1A8R62, R63		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C6801GR	FO 7-35
1A1A8R64		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C8202GR	FO 7-35
1A1A8R65		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C6801GR	FO 7-35
1A1A8R66		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/3 part no. RCR32G121JS	FO 7-35
1A1A8R67		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/2 part no. RCR20G271JS	FO 7-35
1A1A8R68		RESISTOR, (COMMON ITEM 26)	FO 7-35
1A1A8R69		RESISTOR, (COMMON ITEM 18)	FO 7-35
1A1A8R70		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G330JS	FO 7-35
1A1A8R71		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G680JS	FO 7-35

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A8R72, R73		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G392JS	FO 7-35
1A1A8R74		RESISTOR, (COMMON ITEM 17)	FO 7-35
1A1A8R76		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G562JS	FO 7-35
1A1A8R77		RESISTOR, (COMMON ITEM 22)	FO 7-35
1A1A8U1		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-35
1A1A8U2		MICROCIRCUIT, (COMMON ITEM 11)	FO 7-35
1A1A8U3		MICROCIRCUIT, DIGITAL-QUAD 2-INPUT AND GATE: Mfr 01295 part no. SN54LS08J, mfr 34148 part no. 54LS08DM, 00724 dwg 72-01072-207	FO 7-35
1A1A8U4		MICROCIRCUIT, (COMMON ITEM 11)	FO 7-35
1A1A8U5		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-35
1A1A8U6		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, NOR GATES: Mfr 01295 part no. SN54LS02J, mfr 18324 part no. S54LS02F, 00724 dwg 72-00965-001	FO 7-35
1A1A8U7		MICROCIRCUIT, (COMMON ITEM 13)	FO 7-35
1A1A8U8		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, NAND GATE: Mfr 01295 part no. SN54LS10J, mfr 18324 part no. S54LS10F, 00724 dwg 72-00967-001	FO 7-35
1A1A8U9		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, NOR GATES: Mfr 01295 PART NO. SN54LS02J, mfr 18324 part no. S54LS02F, 00724 dwg 72-00965-001	FO 7-35
1A1A8U10		MICROCIRCUIT, DIGITAL-PARALLEL INPUT/OUTPUT CONTROLLER: Mfr 56708 part no. Z8420ADE or Z8420ACE, 00724 dwg 72-01030-001	FO 7-35
1A1A8U11		MICROCIRCUIT, DIGITAL, COUNTER/TIMER CIRCUIT: Mfr 56708 part no. Z8430ADE or Z8430ACE, 00724 dwg 72-01031-001	FO 7-35

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A8U12		MICROCIRCUIT, DIGITAL: Mfr 00724, part no. 95-00516-001	FO 7-35
1A1A8U13		MICROCIRCUIT, (COMMON ITEM 6)	FO 7-35
1A1A8U14, U15		MICROCIRCUIT, DIGITAL-1024 X 4, STATIC RANDOM ACCESS MEMORY: Mfr 55576 part no. SYD2114A-5, mfr 34649 part no. D2114A-5, 00724 dwg 72-01016-001	FO 7-35
1A1A8U16		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM 00724 dwg 72-01020-207	FO 7-35
1A1A8U17		MICROCIRCUIT, DIGITAL, CENTRAL PROCESSING UNIT: Mfr 56708 part no. Z8400ADE or Z8400ACE, 00724 dwg 72-01029-001	FO 7-35
1A1A8U18		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM 00724 dwg 72-01020-207	FO 7-35
1A1A8U20		MICROCIRCUIT, DIGITAL: Mfr 00724 part no. 95-00517-001	FO 7-35
1A1A8U21, U22		MICROCIRCUIT, (COMMON ITEM 8)	FO 7-35
1A1A8U23		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-35
1A1A8U24		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-35
1A1A8U25		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 part no. 72-01020-207	FO 7-35

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A1A8U26, U27		MICROCIRCUIT, DIGITAL-OCTAL D-TYPE FLIP-FLOP: Mfr 01295 part no. SN54LS374J, mfr 34335 part no. AM54LS374DM, 00724 dwg 72-00954-207	FO 7-35
1A1A8U30		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-35
1A1A8U31		MICROCIRCUIT, (COMMON ITEM 6)	FO 7-35
1A1A8U32		MICROCIRCUIT, (COMMON ITEM 11)	FO 7-35
1A1A8U33		MICROCIRCUIT, DIGITAL-OCTAL BUFFER/LINE DRIVER: Mfr 01295 part no. SN54LS240J, mfr 07263 part no. 54LS240DM, 00724 dwg 72-01018-207	FO 7-35
1A1A8U34, U35		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-35
1A1A8U36, U37		MICROCIRCUIT, (COMMON ITEM 15)	FO 7-35
1A1A8U38		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, EXCLUSIVE OR GATE: Mfr 01295 part no. SN54LS86J, mfr 18324 part no. S54LS86F, 00724 dwg 72-00971-001	FO 7-35
1A1A8U39		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-35
1A1A8U40, U41		MICROCIRCUIT, (COMMON ITEM 11)	FO 7-35
1A1A8U43		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: Mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-35
1A1A8XU12		SOCKET, PLUG-IN: MIL-S-83734/8 part no. M83734/8-031	FO 7-35
1A1A8XU17		SOCKET, PLUG-IN: MIL-S-83734/10 part no. M83734/10-013	FO 7-35
1A1A8Y1		CRYSTAL UNIT, QUARTZ: 3.579545 MHz; mfr 00724, part no. 13-00094-001	FO 7-35

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2		KEYBOARD, TRANSMITTER, TELETYPEWRITER: Provides controls, a 1-line display, and indicators required for normal operation of the printer, message memory, line communications facilities, and manipulation of the compose and edit capabilities; mfr 00724, part no. 03-04394-001	FO 7-1 (6) FO 7-36
1A2MP2		CASE, KEYBOARD - ASSEMBLY OF: Al aly, mfr 00724, part no. 67-05268-001 (ATTACHING PARTS) SCREW, MACHINE: Flat head, cross-recessed, 6-32unc-2A, 3/8 in. lg; mfr 00724, part no. 23-01147-256 (5)	FO 7-36 (5)
1A2MP2MP11		SCREW, CAPTIVE: 8-32unc-2A; mfr 08524 part no. FRB7500-8B2, 00724 dwg 23-01604-001	FO 7-36 (2)
1A2MP5		PLATE, IDENTIFICATION: Al aly, 3.0 lg, 1.0 wd, 0.032 in. thk; mfr 00724, part no. 36-01683-001 (ATTACHING PARTS) T(2), AQ(2), AU(2)	FO 7-36 (4)
1A2MP15		SPACER, CONNECTOR 1-LINE DISPLAY: Al aly, .468 in. lg; mfr 00724, part no. 40-00932-001 (ATTACHING PARTS) I(2)	FO 7-36 (6)
1A2W4		CABLE ASSEMBLY - 1-LINE DISPLAY: Mfr 00724, part no. 12-02897-001 (ATTACHING PARTS) B(2), K(2), R(2), AQ(4), AU(4)	FO 7-36 (1) FO 7-37
1A2W4J1		CONNECTOR, PLUG-SOCKET CONTACT, INSULATION DISPLACEMENT: Mfr 53387 part no. 3637-1000, 00724 dwg 16-01569-037	FO 7-37 (2)
1A2W4J2		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-83503/7 part no. M83503/7-09	FO 7-37 (1)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2W4P1		CONNECTOR, RECEPTACLE, ELECTRICAL: Mfr 53387 part no. 3636-1000, 00724 dwg 16-01568-037	FO 7-37 (3)
1A2A1		KEYBOARD TRANSMITTER, SUBASSEMBLY: Mfr 00724, part no. 03-04450-001	FO 7-36 (3) FO 7-38
		(ATTACHING PARTS)	
		SCREW, MACHINE: Flat head cross-recessed, 6-32unc-2A, 3/8 in. lg; mfr 00724, part no. 23-01147-256 (10)	
1A2A1DS1 THRU DS5		LIGHT, INDICATOR - ENCAP. 6-V: MIL-L-3661/40 part no. LHC82/2WT2	FO 7-38 (1)
1A2A1MP4		COVER, KEYBOARD, 1-LINE DISPLAY: Al aly, 14.62 lg; mfr 00724, part no. 67-05269-001	FO 7-38 (4)
1A2A1MP5		SPACER, 1-LINE DISPLAY: Al aly, 0.335 in. lg; mfr 00724, part no. 40-00922-001	FO 7-38 (5)
1A2A1MP6		SPACER, 1-LINE DISPLAY: Cres, 14.00 lg, 0.70 wd, 0.020 in. thk; mfr 00724, part no. 40-00921-001	FO 7-38 (13)
1A2A1MP7		SPACER, 1-LINE DISPLAY: Cres, 6.68 lg, 0.40 wd, 0.020 in. thk; mfr 00724, part no. 40-00920-001	FO 7-38 (10)
1A2A1MP8		SPACER, 1-LINE DISPLAY: Cres, 6.68 lg, 0.40 wd, 0.020 in. thk; mfr 00724, part no. 40-00919-001	FO 7-38 (12)
1A2A1MP10		RETAINER, WINDOW, 1-LINE DISPLAY: Be cop, 6.68 lg, 0.010 in. thk; mfr 00724, part no. 28-00169-001	FO 7-38 (11)
		(ATTACHING PARTS) AT(3), AI(3)	
		NUT, PLAIN, HEXAGON: Cres, 2-56unc-2B, 3/16 in. across flats; part no. MS35649-224 (3)	
1A2A1MP11		RETAINER, WINDOW, 1-LINE DISPLAY: Be cop, 6.68 lg, 0.010 in. thk; mfr 00724, part no. 28-00170-001	FO 7-38 (9)

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) AT(3), AI(3)	
		NUT, PLAIN, HEXAGON: Cres, 2-56unc-2B, 3/16 in. across flats; part no. MS35649-224 (3)	
1A2A1MP12		RETAINER, WINDOW, 1-LINE DISPLAY: Be cop, 14.00 lg, 0.010 in. thk; mfr 00724, part no. 28-00171-001	FO 7-38 (14)
		(ATTACHING PARTS) AT(5), AI(5)	
		NUT, PLAIN, HEXAGON: Cres, 2-56unc-2B, 3/16 in. across flats; part no. MS35649-224 (5)	
1A2A1MP13		SPACER, SLEEVE: Al aly, 0.150 id, 0.250 od, 0.210 in. lg; mfr 00724, part no. 40-00038-179	FO 7-38 (8)
1A2A1MP14		WINDOW, OBSERVATION, 1-LINE DISPLAY: Mfr 00724, part no. 34-00181-001	FO 7-38 (15)
1A2A1MP15		ELECTRICAL SHIELD-WIRE WOVEN SCREEN: Mfr 00724, part no. 18-00704-001	FO 7-38 (16)
1A2A1R1		RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RLR05C470GR	FO 7-38 (17)
1A2A1S1		SWITCH, TOGGLE: Spdt, on-none-on; mfr 55459 part no. A123S1YZQE, 00724 dwg 07-00281-003	FO 7-38 (3)
1A2A1S2		SWITCH, PUSH: MIL-S-8805/96 part no. M8805/96-010	FO 7-38 (2)
		(ATTACHING PARTS)	
		WASHER, LOCK-INTERNAL TOOTH, NARROW RIM: SST, 0.261 id, 0.402 od, 0.025 in. thk; mfr 78189 part no. 1714-10, 00724 dwg 24-00201-003 (1)	
1A2A1A1		KEYBOARD, DATA ENTRY-ASSEMBLY: Mfr 00724, part no. 69-00489-001	FO 7-38 (7)
		(ATTACHING PARTS) AB(5), AS(5), AV(5)	
1A2A1A2		CIRCUIT CARD ASSEMBLY - KEYBOARD LOGIC: Mfr 00724, part no. 61-40387-001	FO 7-38 (6) FO 7-39

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) AD(6), AS(6), AV(6)	
1A2A1A2C1		CAPACITOR, FIXED CERAMIC: MIL-C-39014/01 part no. M39014/01-1281	FO 7-39
1A2A1A2C2		CAPACITOR, (COMMON ITEM 2)	FO 7-39
1A2A1A2C3		CAPACITOR, FIXED, CERAMIC: MIL-C-39014/01 part no. M39014/01-1281	FO 7-39
1A2A1A2C4		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/01 part no. M39003/01-2254	FO 7-39
1A2A1A2C5 THRU C7		CAPACITOR, (COMMON ITEM 2)	FO 7-39
1A2A1A2C8		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/01 part no. M39003/01-2286	FO 7-39
1A2A1A2J1, J2		CONNECTOR, RECEPTACLE, ELECTRICAL: 20 contacts; mfr 00779 part no. 87141-2, 00724 dwg 16-01502-012	FO 7-39
1A2A1A2MP29		KEY, HEADER: Mfr 53387 part no. 3518-0000, 00724 dwg 16-01513-101	FO 7-39
1A2A1A2P1		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-83503/20 part no. M83503/20-20	FO 7-39
		(ATTACHING PARTS) AI(2), AT(2), P(2)	
		NUT, PLAIN HEXAGON: Cres, 2-56unc-2B, 3/16 in. across flats; part no. MS35649-224 (2)	
1A2A1A2R1 THRU R5		RESISTOR, FIXED COMPOSITION: MIL-R-39008/1 part no. RCR07G471JS	FO 7-39
1A2A1A2R6		RESISTOR, FIXED COMPOSITION: MIL-R-39008/1 part no. RCR07G101JS	FO 7-39
1A2A1A2R7		RESISTOR, (COMMON ITEM 17)	FO 7-39
1A2A1A2TP1		JACK, TIP: Yellow; mfr 91506 part no. 8046-1G2, 00724 dwg 16-00612-002	FO 7-39

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2A1A2TP2		JACK, TIP: Black; mfr 91506 part no. 8046-1G6, 00724 dwg 16-00612-006	FO 7-39
1A2A1A2U1		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: 10.0K ohm; mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-39
1A2A1A2U2 THRU U4		MICROCIRCUIT, (COMMON ITEM 15)	FO 7-39
1A2A1A2U5		MICROCIRCUIT, DIGITAL: Mfr 00724, part no. 95-00540-001	FO 7-39
1A2A1A2U6		RESISTOR, NETWORK, FIXED, FILM-10 PIN SIP: 10.0K ohm; mfr 56845 part no. MSP10A01-103G, mfr 32997 part no. 4310R-101-103G, 00724 dwg 10-00501-036	FO 7-39
1A2A1A2U7		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00, mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-39
1A2A1A2U8		MICROCIRCUIT, DIGITAL-OCTAL D-TYPE FLIP-FLOP: Mfr 01295 part no. SN54LS374J, mfr 34335 part no. AM54LS374DM, 00724 dwg 72-00954-207	FO 7-39
1A2A1A2U9		MICROCIRCUIT, (COMMON ITEM 14)	FO 7-39
1A2A1A2U10		MICROCIRCUIT, DIGITAL-OCTAL BUFFERS AND LINE DRIVERS, THREE STATE OUTPUTS: Mfr 01295 part no. SN54LS244J00 mfr 07263 part no. 54LS244DM, 00724 dwg 72-01020-207	FO 7-39
1A2A1A2XU5		SOCKET, PLUG-IN: MIL-S-83734/10 part no. M83734/10-013	FO 7-39
1A2A1A2Y1		CRYSTAL UNIT, QUARTZ SELECTION: MIL-C-3098/42 part no. CR-64/U	FO 7-39
1A2A2		1-LINE DISPLAY SUBASSEMBLY: Mfr 00724, part no. 03-04571-001	FO 7-36 (7) FO 7-40

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
		(ATTACHING PARTS) Y(3), AK(3), AV(3)	
1A2A2MP3		HEAT SINK, 1-LINE DISPLAY: Al aly; mfr 00724, part no. 18-00694-001	FO 7-40 (8)
1A2A2MP4		POST, HEX, THREADED: 4-40unc-2B, 0.660 in. lg; mfr 00724, part no. 40-00943-001	FO 7-40 (5)
1A2A2MP14		INSULATOR: 0.125 id, 0.240 od, 0.92, in. thk; mfr 00724, part no. 40-00890-001	FO 7-40 (10)
1A2A2MP15		HEAT SINK, INSULATOR, SILICON: 0.008 to 0.012 in. thk; MIL-I-38527/8 part no. M38527/08-099R	FO 7-40 (11)
1A2A2MP16		INSULATOR, PLATE: MIL-I-38527/8 part no. M38527/8-23P	FO 7-40 (12)
1A2A2MP17		SHIELD ASSEMBLY: Al aly, 14.06 lg, 0.032 in. thk; mfr 00724, part no. 67-05353-001	FO 7-40 (9)
		(ATTACHING PARTS) J(4)	
1A2A2MP18		COVER, SHIELD: Al aly, 0.031 in. thk; mfr 00724, part no. 37-08352-001	FO 7-40 (3)
		(ATTACHING PARTS) R(13), AJ(13), AU(13)	
1A2A2MP19		SPACER: Cres; mfr 00724, part no. 40-00929-001	FO 7-40 (1)
		(ATTACHING PARTS) AJ(1), AU(1)	
1A2A2MP21		BRACKET ASSEMBLY - 1-LINE DISPLAY: Al aly, 0.062 in. thk; mfr 00724, part no. 67-05355-001	FO 7-40 (4)
		(ATTACHING PARTS) J(2)	
1A2A2Q6 THRU Q10		TRANSISTOR-PNP, POWER DARLINGTON: 60 volt, 8 amp; mfr 04713 part no. 2N6298, mfr 07256 part no. 2N6298, 00724 dwg 20-01015-001	FO 7-40 (7)
		(ATTACHING PARTS) AJ(2), AU(2), B(2)	

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2A2A1		CIRCUIT CARD ASSEMBLY-DISPLAY LOGIC: Mfr 00724, part no. 61-40378-001	FO 7-40 (2) FO 7-41
1A2A2A1C1 THRU C3		CAPACITOR, FIXED, ELECTROLYTIC-ALUMINUM, SINGLE ENDED, TUBULAR: 1000 mf, -10, +100 pct tol, 7.5 Vdcw; mfr 56289 part no. 672D108H7R5ET5J, 00724 dwg 11-00592-012	FO 7-41
1A2A2A1C4		CAPACITOR, (COMMON ITEM 1)	FO 7-41
1A2A2A1C5 THRU C9		CAPACITOR, (COMMON ITEM 2)	FO 7-41
1A2A2A1C10, C11		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1281	FO 7-41
1A2A2A1C12		CAPACITOR, (COMMON ITEM 2)	FO 7-41
1A2A2A1C13		CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2254	FO 7-41
1A2A2A1C14 THRU C17		CAPACITOR, (COMMON ITEM 2)	FO 7-41
1A2A2A1C18, C19		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1305	FO 7-41
1A2A2A1C20		CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1314	FO 7-41
1A2A2A1E1, 8, 9, 15, 21, 22, 24, 26, 28, 30		TERMINAL STUD: Red leaded brass, 0.060 dia, 0.125 lg; mfr 71279 part no. 180-7336-03-05, 00724 dwg 26-00349-001 (10)	FO 7-41
1A2A2A1MP15		RECEPTACLE, ELECTRONIC, COMPONENT LEAD: Gold and nickel plated copper, 0.048 dia, 0.254 lg; mfr 00779 part no. 380635-1, 00724 dwg 16-01499-001 (10)	FO 7-41
1A2A2A1MP35		SPACER: Cres; mfr 00724, part no. 40-00929-001 (2)	FO 7-41

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2A2A1MP40		STUD, BROACHING, PWP: Phosphor bronze, 4-40unc-2A, 3/16 dia, 0.500 in. lg; mfr 46384 part no. KFH-440-8, 00724 dwg 40-00895-004 (10)	FO 7-41
1A2A2A1MP41		INSULATOR, PLATE-TRANSISTOR: Plastic; mfr 07047 part no. 10034N, mfr 54355 part no. 717-205N, 00724 dwg 54-00159-001 (7)	FO 7-41
1A2A2A1MP43		PLATE, CONNECTOR 1-LINE DISPLAY: Al aly, 0.0250 in. thk; mfr 00724, part no. 37-08351-001 (2) (ATTACHING PARTS) AJ(1), AU(1)	FO 7-41
1A2A2A1P1		CONNECTOR, RECEPTACLE, ELECTRICAL, RECTANGULAR, RIGHT ANGLE-PCB MOUNT: Mfr 71468 part no. DCM37PG-A156-K75, mfr 71785 part no. DCM37PK-A156, 00724 dwg 16-01151-025 (ATTACHING PARTS) S(2), AJ(1), AU(1)	FO 7-41
1A2A2A1Q1 THRU Q5		TRANSISTOR, (COMMON ITEM 39)	FO 7-41
1A2A2A1Q11, Q12		TRANSISTOR, (COMMON ITEM 39)	FO 7-41
1A2A2A1R1		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G331JS	FO 7-41
1A2A2A1R2, R3		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G681JS	FO 7-41
1A2A2A1R4		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G331JS	FO 7-41
1A2A2A1R5		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G681JS	FO 7-41
1A2A2A1R6		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G331JS	FO 7-41
1A2A2A1R7		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C15R0GR	FO 7-41

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2A2A1R8		RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C2001GR	FO 7-41
1A2A2A1R9 THRU R11		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G102JS	FO 7-41
1A2A2A1R12		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G101JS	FO 7-41
1A2A2A1R13		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G331JS	FO 7-41
1A2A2A1R14		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G681JS	FO 7-41
1A2A2A1R15		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G331JS	FO 7-41
1A2A2A1R16		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/1 part no. RCR07G681JS	FO 7-41
1A2A2A1R17		RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G100JS	FO 7-41
1A2A2A1U1		MICROCIRCUIT, DIGITAL-QUAD DIFFERENTIAL LINE RECEIVERS: Mfr 34335 part no. AM26LS32DM, mfr 27014 part no. DS26LS32MJ, 00724 dwg 72-01042-207	FO 7-41
1A2A2A1U2		MICROCIRCUIT, (COMMON ITEM 7)	FO 7-41
1A2A2A1U3		MICROCIRCUIT, DIGITAL-OCTAL BUFFER/LINE DRIVER: Mfr 01295 part no. SN54LS240J, mfr 07263 part no. 54LS240DM, 00724 dwg 72-01018-207	FO 7-41
1A2A2A1U4		MICROCIRCUIT, DIGITAL: Mfr 00724, part no. 95-00538-001	FO 7-41
1A2A2A1U5, U6		MICROCIRCUIT, DIGITAL-1024 X 4 STATIC RANDOM ACCESS MEMORY: Mfr 55576 part no. SYD2114A-5, mfr 34649 part no. D2114A-5, 00724 dwg 72-01016-001	FO 7-41

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2A2A1U7		MICROCIRCUIT, DIGITAL-OCTAL D-TYPE FLIP-FLOP: Mfr 01295 part no. SN54LS374J, mfr 34335 part no. AM54LS374DM, 00724 dwg 72-00954-207	FO 7-41
1A2A2A1U8		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-41
1A2A2A1U9		MICROCIRCUIT, DIGITAL: Mfr 00724, part no. 95-00539-001	FO 7-41
1A2A2A1U10		MICROCIRCUIT, DIGITAL, PROGRAMMABLE COMMUNICATION INTERFACE: Mfr 34649 part no. MD8251A, mfr 34335 part no. MD8251A, 00724 dwg 72-00939-207	FO 7-41
1A2A2A1U11		MICROCIRCUIT, DIGITAL-8-BIT PARALLEL IN/SERIAL OUT SHIFT REGISTER: Mfr 01295 part no. SN54LS165J, 00724 dwg 72-00638-207	FO 7-41
1A2A2A1U12		MICROCIRCUIT, (COMMON ITEM 12)	FO 7-41
1A2A2A1U13		MICROCIRCUIT, (COMMON ITEM 7)	FO 7-41
1A2A2A1U14		MICROCIRCUIT, (COMMON ITEM 11)	FO 7-41
1A2A2A1U15		MICROCIRCUIT, (COMMON ITEM 13)	FO 7-41
1A2A2A1U16		MICROCIRCUIT, DIGITAL, LOW-POWER, SCHOTTKY, TTL, NOR GATES: Mfr 01295 part no. SN54LS02J, mfr 18324 part no. S54LS02F, 00724 dwg 72-00965-001	FO 7-41
1A2A2A1XU9		SOCKET, PLUG-IN: MIL-S-83734/10 part no. M83734/10-013	FO 7-41
1A2A2A1Y1		CRYSTAL UNIT, QUARTZ: 5.529600 MHz, MIL-C-3098/42 part no. CR-64/U	FO 7-41
1A2A2A2		CIRCUIT CARD ASSEMBLY-DISPLAY BOARD: Mfr 00724, part no. 61-03049-001	FO 7-40 (6) FO 7-42
		(ATTACHING PARTS) J(11)	
1A2A2A2C1 THRU C7		CAPACITOR, (COMMON ITEM 2)	FO 7-42

Table 7-2. Teletypewriter Set AN/UGC-136BX, Parts List-Continued

Reference designation	Notes	Name and description	Figure number (item)
1A2A2A2MP7		TERMINAL STUD, SINGLE TURRET TYPE: Brass, 0.047 dia, 0.205 lg; mfr 71279 part no. ES-6334-1, mfr 18310 part no. 10-121-2, 00724 dwg 26-00266-001	FO 7-42
1A2A2A2MP8		GASKET, THERMALLY CONDUCTIVE: 14.00 lg, 0.190 in. wd; mfr 00724, part no. 21-00447-001	FO 7-42
1A2A2A2MP10		WASHER, NON-METALLIC: Plastic, 7/64 id, 7/32 od, 1/16 in. thk; mfr 00724, part no. 24-00042-067 (7)	FO 7-42
1A2A2A2MP15		PANEL, MOUNTING, 1-LINE DISPLAY: Al aly, 0.09 in. thk; mfr 00724, part no. 67-05354-001	FO 7-42
1A2A2A2U1 THRU U20		SEMICONDUCTOR DEVICE-OPTOELECTRONIC DISPLAY, ALPHANUMERIC: Mfr 28480 part no. HDSP-2000, 00724 dwg 20-01032-001	FO 7-42

Table 7-3. List of Common Item Descriptions

Item number	Description
1	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-39003/1 part no. M39003/01-2257
2	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/2 part no. M39014/02-1310
3	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1513
4	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-39014/1 part no. M39014/01-1553
5	JACK, TIP: MIL-C-39024/11 part no. M39024/11-08
6	MICROCIRCUIT, DIGITAL, DEMULTIPLEXER: Mfr 07263 part no. 54LS138DM, mfr 01295 part no. SN54LS138J, 00724 dwg 72-00604-207
7	MICROCIRCUIT, DIGITAL, COUNTER: Mfr 07263 part no. 54LS161DM, mfr 01295 part no. SN54LS161J, 00724 dwg 72-00608-207
8	MICROCIRCUIT LINEAR - QUAD, COMPARATOR: Mfr 07263 part no. UA139DM, mfr 27014 part no. LM139D, 00724 dwg 72-00628-207
9	MICROCIRCUIT, DIGITAL - HEX 3-STATE BUFFER: Mfr 07263 part no. 54LS367DM, mfr 01295 part no. SN54LS367J, 00724 dwg 72-00637-207
10	MICROCIRCUIT, DIGITAL, HEX D-TYPE FLIP-FLOP: Mfr 18324 part no. S54LS174F, mfr 01295 part no. SN54LS174J, 00724 dwg 72-00705-207
11	MICROCIRCUIT, DIGITAL - DUAL TYPE-D FLIP-FLOP: Mfr 00724, part no. 72-00706-207
12	MICROCIRCUIT, DIGITAL, NAND GATES: Mfr 01295 part no. SN54LS00J, mfr 18324 part no. S54LS00F, 00724 dwg 72-00964-001
13	MICROCIRCUIT, DIGITAL, HEX INVERTER: Mfr 01295 part no. SN54LS04J, mfr 18324 part no. S54LS04F, 00724 dwg 72-00966-001
14	MICROCIRCUIT, DIGITAL HEX SCHMITT-TRIGGER: Mfr 01295 part no. SN54LS14J, mfr 18324 part no. S54LS14F, 00724 dwg 72-00968-001
15	MICROCIRCUIT, DIGITAL, DUAL PERIPHERAL POSITIVE NOR DRIVERS: Mfr 01295 part no. SN55464JG, mfr 07263 part no. 55464RM, 00724 dwg 72-00975-001

Table 7-3. List of Common Item Descriptions-Continued

Item number	Description
16	MICROCIRCUIT, DIGITAL, RANDOM ACCESS MEMORY: Mfr 00724, part no. 72-00982-001
17	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G102JS
18	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G103JS
19	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G105JS
20	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G123JS
21	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G202JS
22	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G332JS
23	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G471JS
24	RESISTOR, FIXED, COMPOSITION: MIL-R-39008/4 part no. RCR05G563JS
25	RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RLR05C102GR
26	RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RLR05C103GR
27	RESISTOR, FIXED, FILM: MIL-R-39017/5 part no. RLR05C472GR
28	RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1000GR
29	RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1001GR
30	RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C1002GR
31	RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C4701GR
32	RESISTOR, FIXED, FILM: MIL-R-39017/1 part no. RLR07C5101GR
33	RESISTOR, FIXED, WIREWOUND: MIL-R-39007/9 part no. RWR81S3010FP
34	RESISTOR, FIXED, WIREWOUND: MIL-R-39007 part no. RWR89SR562FR
35	SEMICONDUCTOR DEVICE, DIODE: 75 volt; mfr 01295 part no. 1N4148, mfr 14433 part no. 1N4148, 00724 dwg 20-01003-001
36	SEMICONDUCTOR DEVICE, DIODE: 200 volt, 1 amp; mfr 14099 part no. 1N4942, mfr 12969 part no. 1N4942, 00724 dwg 20-01005-001

Table 7-3. List of Common Item Descriptions-Continued

Item number	Description
37	SOCKET, PLUG-IN, ELECTRICAL COMPONENT: MIL-S-83734/8 part no. M83734/8-013
38	SWITCH, TOGGLE: SPDT, 5 amp, 125 Vac/24 Vdc; mfr 55459 part no. A123S1YZQE, 00724 dwg 07-00281-003
39	TRANSISTOR: Mfr 01295 part no. 2N2222A, mfr 14433 part no. 2N2222A, 00724 dwg 20-01011-001
40	TRANSISTOR: Mfr 04713 part no. 2N6301, mfr 07256 part no. 2N6301, 00724 dwg 20-01016-001
41	TRANSISTOR: Mfr 04713 part no. SJ5957, 00724 dwg 20-01016-002

Table 7-4. List of Attaching Hardware

Letter code	Description
A	CLAMP, LOOP: Adj, self-clinching, plastic, 5/8 in. max bundle dia; part no. MS3367-4-9
B	NUT, PLAIN, HEXAGON: Cres, 4-40unc-2B, 1/4 in. across flats; part no. MS35649-244
C	NUT, PLAIN, HEXAGON: Cres, 6-32unc-2B, 5/16 in. across flats; part no. MS35649-264
D	NUT, PLAIN, HEXAGON: Cres, 0.0860-56unjc-3B, 0.156 in. across flats; part no. NAS671C2
E	NUT, PLAIN, HEXAGON: Cres, 0.1120-40unjc-3B, 0.188 in. across flats; part no. NAS671C4
F	RING, RETAINING: External, cres, 0.250 in. dia, 0.025 in. thk; part no. MS16624-4025
G	RIVET, SOLID, CRES: AL, 1/16 in. dia, 3/16 in. lg; part no. MS20427F2-3
H	RIVET, SOLID, CRES: 3/32 in. dia, 3/16 in. lg; part no. MS16535-89
I	SCREW, MACHINE: Flat head, cross-recessed, cres, 4-40unc-2A, 1/4 in. lg; part no. MS24693-C2
J	SCREW, MACHINE: Flat head, cross-recessed, cres, 4-40unc-2A, 5/16 in. lg; part no. MS24693-C3
K	SCREW, MACHINE: Flat head, cross-recessed, cres, 4-40unc-2A, 3/8 in. lg; part no. MS24693-C4
L	SCREW, MACHINE: Flat head, cross-recessed, cres, 4-40unc-2A, 1/2 in. lg; part no. MS24693-C6
M	SCREW, MACHINE: Flat head, cross-recessed, cres, 6-32unc-2A, 3/8 in. lg; part no. MS24693-C26
N	SCREW, MACHINE: Flat head, cross-recessed, cres, 8-32unc-2A, 1/4 in. lg; part no. MS24693-C46
O	SCREW, MACHINE: Pan head, cross-recessed, cres, 2-56unc-2A, 1/4 in. lg; part no. MS51957-3
P	SCREW, MACHINE: Pan head, cross-recessed, cres, 2-56unc-2A, 1/2 in. lg; part no. MS51957-7

Table 7-4. List of Attaching Hardware-Continued

Letter code	Description
Q	SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 3/16 in. lg; part no. MS51957-12
R	SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 1/4 in. lg; part no. MS51957-13
S	SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 5/16 in. lg; part no. MS51957-14
T	SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 3/8 in. lg; part no. MS51957-15
U	SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 7/16 in. lg; part no. MS51957-16
V	SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 5/8 in. lg; part no. MS51957-18
W	SCREW, MACHINE: Pan head, cross-recessed, cres, 4-40unc-2A, 3/4 in. lg; part no. MS51957-19
X	SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 1/4 in. lg; part no. MS51957-26
Y	SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 5/16 in. lg; part no. MS51957-27
Z	SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 3/8 in. lg; part no. MS51957-28
AA	SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 7/16 in. lg; part no. MS51957-29
AB	SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 1/2 in. lg; part no. MS51957-30
AC	SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 5/8 in. lg; part no. MS51957-31
AD	SCREW, MACHINE: Pan head, cross-recessed, cres, 6-32unc-2A, 1 in. lg; part no. MS51957-34
AE	SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 5/16 in. lg; part no. MS51957-42

Table 7-4. List of Attaching Hardware-Continued

Letter code	Description
AF	SCREW, MACHINE: Pan head, cross-recessed, cres, 8-32unc-2A, 7/16 in. lg; part no. MS51957-44
AG	SCREW, MACHINE: Flat head, cross-recessed, cres, 0.0860-56unc-2A, 5/8 in. lg; part no. NAS662C2R10
AH	SETSCREW, SELF-LOCKING: Carbon steel, cadmium plate, .1380-32, 0.250 in. lg; part no. NAS1081-06D3
AI	WASHER, FLAT: Cres, 0.094 id, 0.250 od, 0.020 in. thk; part no. MS15795-802
AJ	WASHER, FLAT: Cres, 0.125 id, 0.250 od, 0.022 in. thk; part no. MS15795-803
AK	WASHER, FLAT: Cres, 0.156 id, 0.312 od, 0.035 in. thk; part no. MS15795-805
AL	WASHER, FLAT: Cres, 0.156 id, 0.375 od, 0.049 in. thk; part no. MS15795-806
AM	WASHER, FLAT: Cres, 0.188 id, 0.375 od, 0.049 in. thk; part no. MS15795-807
AN	WASHER, FLAT: Cres, 0.219 id, 0.438 od, 0.049 in. thk; part no. MS15795-808
AO	WASHER, FLAT: Cres, 0.188 id, 0.438 od, 0.049 in. thk; part no. MS15795-841
AP	WASHER, FLAT: Cres, 0.125 id, 0.312 od, 0.032 in. thk; part no. AN960C4
AQ	WASHER, FLAT: Cres, 0.115 id, 0.209 od, 0.032 in. thk; part no. NAS620C4
AR	WASHER, FLAT: Cres, 0.115 id, 0.209 od, 0.016 in. thk; part no. NAS620C4L
AS	WASHER, FLAT: Cres, 0.143 id, 0.267 od, 0.032 in. thk; part no. NAS620C6
AT	WASHER, LOCK: Cres, 0.094 id, 0.172 od, 0.020 in. thk; part no. MS35338-134

Table 7-4. List of Attaching Hardware-Continued

Item number	Description
AU	WASHER, LOCK: Cres, 0.121 id, 0.209 od, 0.025 in. thk; part no. MS35338-135
AV	WASHER, LOCK: Cres, 0.148 id, 0.250 od, 0.031 in. thk; part no. MS35338-136
AW	WASHER, LOCK: Cres, 0.175 id, 0.293 od, 0.040 in. thk; part no. MS35338-137

Table 7-5. List of Manufacturers

Code number	Manufacturers name and address
00141	Pic Design Corp P O Box 1004 Benson Rd Middlebury, CT 06762
00328	Designatronics, Inc Sterling Instrument Division 55 S Denton Ave New Hyde Park, NY 11040-4901
00724	E-Systems Inc, ECI Div P O Box 12248 1501 72nd St N St Petersburg, FL 33733
00779	Amp, Inc 2800 Fulling Mill P O Box 3608 Harrisburg, PA 17105
01226	Barry Wright Corp Vlier Engineering Div 2333 Valley St Burbank, CA 91505-1336
01281	TRW Electronics and Defense Sector RF Devices 14520 Aviation Blvd Lawndale, CA 90260-1121
01295	Texas Instruments, Inc Semiconductor Group P O Box 655012 13500 N Central Expressway Dallas, TX 75265
02114	Amperex Electronic Corp Ferroxcube Div 5083 Kings Hwy Saugerties, NY 12477
02934	Uniroyal, Inc Fiber and Textile Div Administrative Center Winnsboro, SC 29180
04713	Motorola, Inc Semiconductor Products Sector 5005 East McDowell Road Phoenix, AZ 85008-4229
05791	Lyn-Tron, Inc 3150 Damon Way Burbank, CA 91505-1015
06540	Mite Corp, Amatom Electronic Hardware Div 446 Blake St New Haven, CT 06515-1238
06776	Robinson Nugent, Inc P O Box 1208 800 E 8th St New Albany, IN 47150-3264
07047	Ross Milton Co 511 Second Street Pike Southampton, PA 18966-3804
07256	Silicon Transistor Corp Sub of BBF, Inc Katrina Rd Chelmsford, MA 01824
07260	Monarch Tools, Inc Lynwood, CA
07263	Fairchild Semiconductor Corp North American Sales Sub of Schlumberger Ltd MS118 10400 Ridgeview CT Cupertino, CA 95014
07700	Technical Wire Products, Inc DBA Tecknit, Inc 129 Dermody St Cranford, NJ 07016-3217

Table 7-5. List of Manufacturers-Continued

Code number	Manufacturers name and address
08524	Deutsch Fastener Corp (See 97928) El Segundo, CA
08718	ITT Cannon Electric Phoenix Div 2801 Air Lane Phoenix, AZ 85034-2715
08779	Insilco Corp Signal Transformer Co Div 500 Bayview Ave Inwood, NY 11696-1702
09023	Cornell-Dubilier Electronics (See 93790) Fuquay-Varina, NC
11502	International Resistive Co, Inc P O Box 1860 Greenway Rd Boone, NC 28607-1860
12294	Murata Erie North American, Inc Div 5 Fraser Ave Trenton, Ont, CAN K8V 5S1
12969	Unitrode Corp 5 Forbes Road Lexington, MA 02173-7305
14099	Semtech Corp 652 Mitchell Road Newbury Park, CA 91320-2211
14433	ITT Semiconductors Div 3301 Electronics Way P O Box 3049 West Palm Beach, FL 33402
14655	Cornell-Dubilier Electronics One Interchange Plaza Wayne, NJ 07470
14927	Pacamor Bearings Inc Kubar Division 3oo Jordan Rd Troy, NY 12180-8346
15454	Ametek Inc, Rodan Div 2905 Blue Star St Anaheim, CA 92806-2510
15653	Kaynar Microdot Aerospace Fastening Systems P O Box 3001 800 S College Blvd Fullerton, CA 92634-3001
15801	Kidde, Inc Fenwal Electronics Div 450 Fortune Blvd Milford, MA 01757
15915	Tepro of Florida, Inc P O Box 1260 2608 Enterprise Road Clearwater, FL 34617
16068	International Diode Corp 229 Cleveland Ave Harrison, NJ 07029-1307
17419	The Deutsch Co 7001 West Imperial Highway Los Angeles, CA 90045-6313
17856	Siliconix Inc 2201 Laurelwood Rd Santa Clara, CA 95054-1516
18310	Concord Electronics Corp 30 GT Jones St New York, NY 10012-1115
18324	Signetics Corp Military Products Div 4130 S Market Court Sacramento, CA 95834-1222

Table 7-5. List of Manufacturers-Continued

Code number	Manufacturers name and address
18565	Chomerics, Inc 77 Dragon Court Woburn, MA 01801-1039
23939	The Captor Corp 5040 South Country Road 25A Tipp City, OH 45371-2808
27014	National Semiconductor Corp 2900 Semiconductor Dr Santa Clara, CA 95051-0606
28480	Hewlett-Packard Co Corporate Headquarters 3000 Hanover St Palo Alto, CA 94304-1112
29440	Winfred M Berg, Inc 499 Ocean Ave East Rockaway, NY 11518-1226
29964	Allied Devices Corp P O Drawer E 2365 Milburn Ave Baldwin, NY 11510-3321
31757	Micropac Industries, Inc 905 E Walnut St Garland, TX 75040-6611
32159	West-Cap Arizona Sub of SFE Technologies 2201 E Elvira Rd Tucson, AZ 85706-7026
32997	Bourns, Inc Trimpot Div 1200 Columbia Ave Riverside, CA 92507-2114
34148	Fairchild Camera and Instrument Corp Sub of Schlumberger Ltd Mountain View, CA (See 07263)
34333	Silicon General, Inc 11651 Monarch St Garden Grove, CA 92641-1816
34335	Advanced Micro Devices 901 Thompson Pl Sunnyvale, CA 94086-4518
34649	INTEL Corp ST4-2 3065 Bowers Ave Santa Clara, CA 95051
46384	Penn Engineering and Mfg Corp P O Box 1000 Old Easton Rd Danboro, PA 18916
49956	Raytheon Co Executive Offices 141 Spring St Lexington, MA 02173-7801
50294	New Hampshire Ball Bearings, Inc P O Box 2515 9730 Independence Ave Chatsworth, CA 91311-4323
51506	Accurate Screw Machine Co 19 Baltimore St Nutley, NJ 07110-1303
51809	NCR Corp Systemedia Division 9095 Washington Church Rd Miamisburg, OH 45342-4428
52094	Calmark Corp 4915 Walnut Grove Ave San Gabriel, CA 91776-2021

Table 7-5. List of Manufacturers-Continued

Code number	Manufacturers name and address
53387	Minnesota Mining and Mfg Co Electronic Products Div 3M Center St Paul, MN 55101-1428
54355	Accessories for Electronics, Inc 800 Merrick Rd Baldwin, NY 11510-3593
54590	RCA Corp Distribution and Special Products Bldg 206-2 Cherry Hill Offices Cherry Hill, NJ 08002
55285	The Bergquist Co, Inc 5300 Edina Industrial Blvd Minneapolis, MN 55435-3707
55459	Eaton Corp Aerospace and Commercial Controls Div JBT Products 300 8th Ave Arab, AL 35016
55576	Synertek 3001 Stender Way Santa Clara, CA 95054
56289	Sprague Electric Co World Headquarters 267 Lowell Road Hudson, NH 03051
56708	Zilog, Inc 1315 Dell Ave Campbell, CA 95008-6609
56845	Dale Electronics, Inc 2300 Riverside Blvd P O Box 74 Norfolk, NE 68701-2242
57177	Promptus Electronic Hardware, Inc 520 Homestead Ave Mount Vernon, NY 10550-4620
59076	Designatronics Inc Stock Drive Products Div 55 S Denton Ave New Hyde Park, NY 11040-4901
59730	Thomas and Betts Corp Highway 218 S Iowa City, IA 52240
60395	Xicor Inc 851 Buckeye Ct Milpitas, CA 95035-7408
63009	Dontech, Inc P O Box 889 601-606 Airport Industrial Blvd Doylestown, PA 18901-1004
70417	Chrysler Corp, Amplex Div 6565 E Eight Mile Rd Warren, MI 48091-2949
71279	Interconnection Products, Inc 2601 S Garnsey St Santa Ana, CA 92707
71468	International Telephone and Telegraph Corp ITT Cannon Div 666 E Dyer Road Santa Ana, CA 92702
71785	Labinal Components and Systems, Inc 1521 Morse Ave Elk Grove Village, IL 60007-5723

Table 7-5. List of Manufacturers-Continued

Code number	Manufacturers name and address
72656	The Titan Corp Indiana General Ferrite Component Products Div Crows Mill Rd Keasby, NJ 08832
72962	Harvard Industries, Inc Elastic Stop Nut Div 2330 Vauxhall Road Union, NJ 07083-5038
73734	Federal Screw Products, Inc 3917 N Kedzie Ave Chicago, IL 60618-3415
75915	Littelfuse Tracor, Inc Sub of Tracor, Inc 800 E Northwest Hwy Des Plaines, IL 60016-3049
78189	Illinois Tool Works, Inc Shakeproof Division St Charles Road Elgin, IL 60120
78229	FL Industries, Inc American Electric Construction Materials Group P O Box 1548 1207 Columbus Ave Pittsburgh, PA 15230-1204
79963	Zierick Mfg Co Radio Circle Mount Kisco, NY 10549
80205	National Aerospace Standards Committee Aerospace Industries Assoc of America, Inc 1725 DeSales St NW Washington, DC 20036
81073	Grayhill, Inc P O Box 10373 561 Hillgrove Ave La Grange, IL 60525-5914
81349	Military Specifications Promulgated by Military Departments/Agencies Under Authority of Defense Standardization Manual 4120 3-M
81541	Airpax Corp Cambridge Div A North American Philips Co P O Box 520 Woods Rd Cambridge, MD 21613
82240	Simmons Fastener Corp 1765 N Broadway St PO Box 1985 Albany, NY 12201
82877	Rotron, Inc Custom Div 7 Hasbrouck Lane Woodstock, NY 12498-1807
83086	New Hampshire Ball Bearings, Inc RT 202 Peterborough, NH 03458
84830	Lee Spring Co, Inc 1462 62nd St Brooklyn, NY 11219-5413
86577	Precision Metal Products Co P O Box 6026 Centennial Dr Peabody, MA 01960

Table 7-5. List of Manufacturers-Continued

Code number	Manufacturers name and address
88044	Aeronautical Standards Group Dept of Navy and Air Force
88245	Winchester Electronics Litton Systems-USECO Div 13536 Saticoy St Van Nuys, CA 91409
90201	Mallory Capacitor Co Sub of Emhart Industries, Inc P O Box 372 4760 Kentucky Ave Indianapolis, IN 46206
91506	Augat, Inc P O Box 799 33 Perry Ave Attleboro, MA 02703-2417
92702	IMC Magnetics Corp Eastern Division 570 Main St Westbury, NY 11591
93790	Cornell-Dubilier Electronics P O Box B-967 1605 E Rodney French Blvd New Bedford, MA 02741-9990
94222	Southco, Inc 210 N Brinton Lake Rd Concordville, PA 19331
96312	Dialight Corp Brooklyn Div 203 Harrison PL Brooklyn, NY 11237-1587
96881	Thomson Industries, Inc Shore Rd at Channel Dr Port Washington, NY 11050
96906	Military Standards Promulgated by Military Departments Under Authority of Defense Standardization Manual 4120 3-M
97928	Deutsch Fastener Corp 3969 Paramount Blvd Lakewood, CA 90712-4193
98159	Rubber Teck, Inc P O Box 389 19115 Hamilton Ave Gardena, CA 90247
NONE	POP Fasteners Div Emhart Fastener Group Shelton, CT 06484

CHAPTER 8

INSTALLATION

8-1. INTRODUCTION.

The Keyboard-Printer is designed to operate within a communications network. These instructions are applicable to installing the Keyboard-Printer at any site where a communications network exists.

8-2. TOOLS AND MATERIALS.

There are no special tools required to install the Keyboard-Printer.

8-3. UNPACKING.

The Keyboard-Printer is packed in a Triplewall RSC carton, 1000 lb. test, with two inches of 1.6 density polyurethane foam cushioning for all surfaces (figure 8-1). The Keyboard-Printer is wrapped in Grade A wrapping paper prior to being placed into the carton. In addition, the printhead and carriage assembly are blocked on both sides with two pieces of polyurethane foam to prevent damage during shipment. Unpack the equipment as follows:

WARNING

The carton weights 91 lbs. complete. To prevent injury to personnel or damage to equipment, two persons are required for lifting and carrying.

NOTE

Exercise care in removing packing and crating materials. Some of these materials can be stored and reused for reshipment of equipment.

a. Cut sealing tape on top of carton and open.

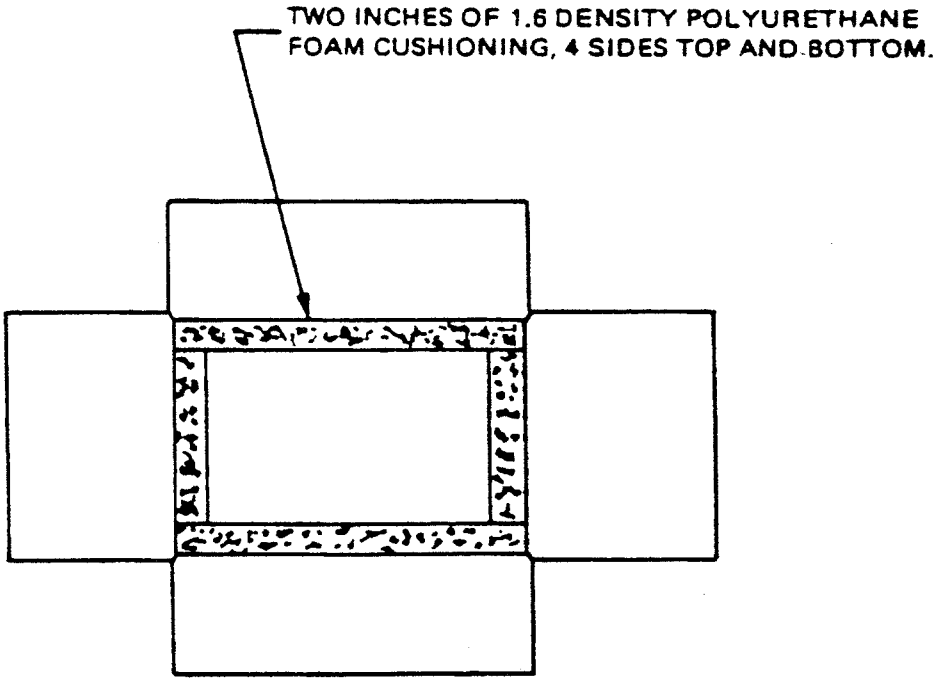


Figure 8-1. Keyboard-Printer, Packing Carton

b. Remove top layer of foam and four side cushions.

c. Lift Keyboard-Printer out of carton.

d. Retain shipping material for repacking and shipment.

8-4. REPACKING.

To repack the equipment, use the following procedure:

a. Wrap the Keyboard-Printer in Grade A wrapping paper.

b. Place Keyboard-Printer in shipping carton.

c. Place four side cushions between Keyboard-Printer and carton sides.

d. Place top layer of foam in carton.

e. Close carton and seal with shipping tape.

8-5. INSPECTION.

Visually inspect the Keyboard-Printer to determine if any physical damage was sustained during shipment. Also, check the following:

a. Check the equipment against the packing slip to see if all items were received.

b. Inspect connectors for bent or damaged pins.

c. Verify that control panel components are not broken.

d. Check that all hardware is tight and all screws are in place.

8-6. POWER REQUIREMENTS.

The Keyboard-Printer requires a source of 115 Vac, 60 Hz, single-phase power.

8-7. INSTALLATION INSTRUCTIONS.

WARNING

The Keyboard-Printer weighs approximately 68 pounds. To avoid injury to personnel, two persons are required for lifting, carrying and installing the Keyboard-Printer.

8-7.1 Preparation of Foundation. To install the Keyboard-Printer, perform the following:

a. Place the Keyboard-Printer on a sliding drawer in a standard 19-inch rack. See figure 8-2.

b. Attach Keyboard-Printer using 1/4-28 bolts of sufficient length to secure the front of the Keyboard-Printer to the drawer. The bolts should contain 1/4-inch flat washers and be inserted through the Keyboard-Printer (figure 8-2) into the two holes located on the bottom of the drawer. Fasten using 1/4-28 nuts.

c. Ensure Keyboard-Printer POWER switch is OFF.

8-7.2 Interconnections. Perform the following to interconnect the Keyboard-Printer:

WARNING

Death or injury may occur if the power cable safety ground wire is not connected to a suitable AC receptacle safety ground return. Also, an additional safety ground strap must be connected to E1 ground stud at the rear of the Keyboard-Printer.

a. Verify the power source as 115 Vac, 60 Hz before connecting

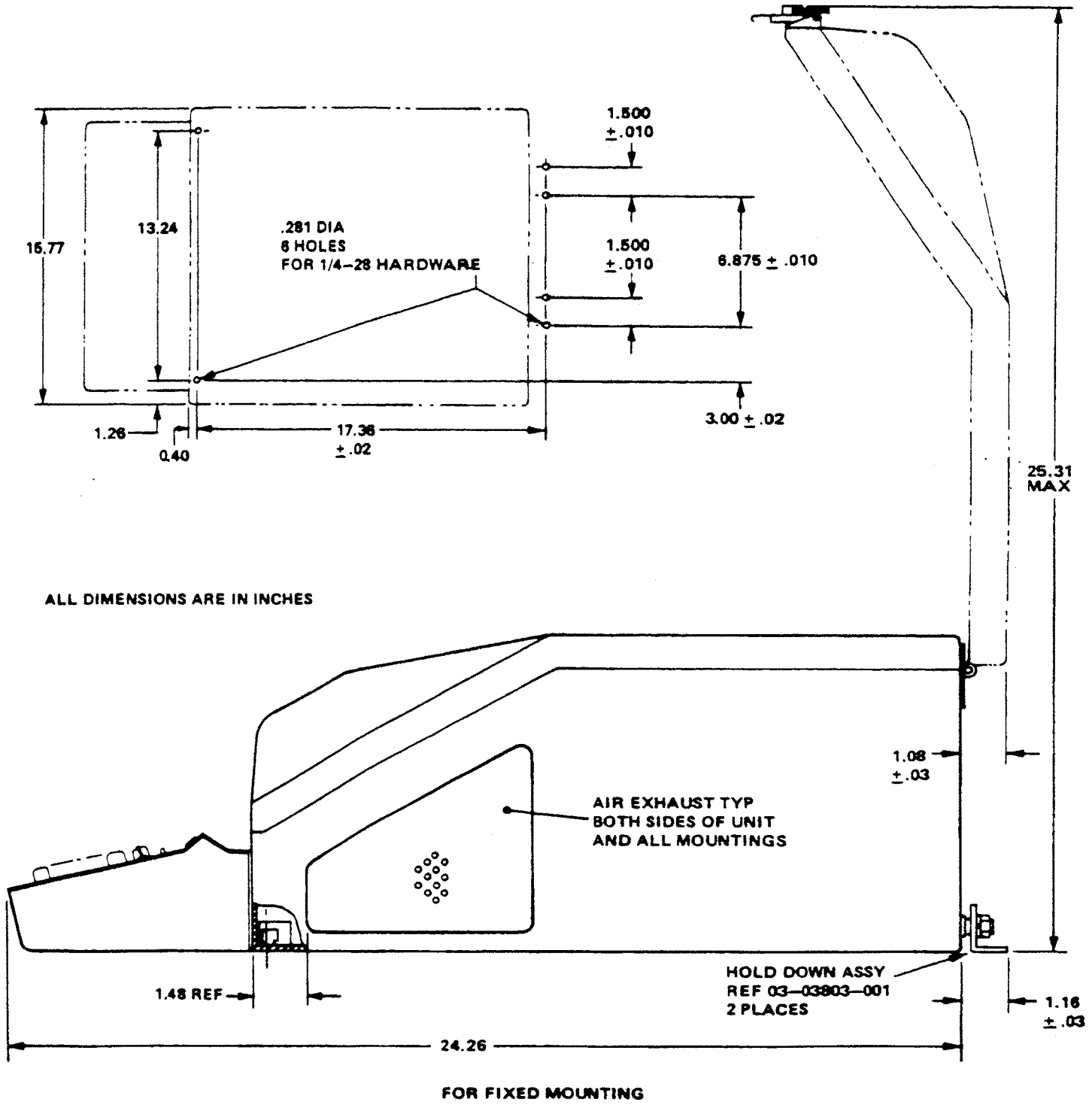


Figure 8-2. Keyboard-Printer, Installation Drawing

the power cable to connector J1 (figure 6-5).

b. Connect the signal cable to connector J2 (figure 6-5).

c. Connect safety ground return line to E1 ground stud (figure 6-5).

d. Fill out the Installation Standard Summary sheet.

8-7.3 Servicing. The Keyboard-Printer does not require servicing prior to initial operation.

8-7.4 Removal. Perform above interconnections and physical location steps in reverse order to remove the Keyboard-Printer.

8-8. INSTALLATION CHECKOUT.

Perform the following procedures prior to operating the Keyboard-Printer.

8-8.1 Installation Inspection and Preenergizing Procedures. Perform the following:

a. Ensure Keyboard-Printer is properly grounded and input power and control signal connectors are properly connected (see table 8-1).

b. Ensure mounting hardware is installed and secure.

c. Check configuration control panel (table 2-4, step 1-4), for proper switch settings.

d. Remove logic module A1A7 (para 6-4.2). Refer to table 8-2 and figure 8-3, to set the four switches for the proper system configuration. Replace logic module A1A7.

e. Ensure Installation Summary Sheet is complete.

f. Install paper and ribbon cartridge per table 2-8.

8-8.2 Initial Turn-on and Preliminary Test. Perform steps 1 through 14 of table 5-3.

8-8.3 Installation Verification Test. Perform steps 15 through 20 of table 5-3.

Table 8-1. Rear Panel Connectors and Signal Interface Information

Connector	Function
J1 Power Connector (five-pin, male receptacle connector)	Connects Keyboard-Printer to AC power source.
Pin / Signal	
A / 115 VAC	
B / 115 RTN	
C / GND (chassis)	
D / Not used	
E / Not used	
J2 Signal Connector (25-pin, male receptacle connector)	Through signal cable, provides signal interface or input/output signals between Keyboard-Printer and other equipment.
Pin / Signal	
1 / RXD1	Receive Data Port 1
2 / TXD1	Transmit Data Port 1
3 / TXINH1C	Transmit Inhibit Port 1
4 / RTS/RCVINH1C	Receive Inhibit Port 1
5 / BELLV28	External Bell
6 / RBRS1	Remote Baud Rate Select 1
7 / RBRS2	Remote Baud Rate Select 2
8 / RBRSS	Remote Baud Rate Select Status
9 / STCS-1	Transmit Switch
10 / STCS-1	Transmit Switch
11 / STC-2	Transmit Switch
12 / STC-1	Transmit Switch
13 / RXD2	Receive Data Port 2
14 / TXD2	Transmit Data Port 2
15 / TXINH2C	Transmit Inhibit Port 2
16 / RTS/RCVINH2C	Receive Inhibit Port 2
17 / RXD3	Receive Data Port 3
18 / TXD3	Transmit Data Port 3
19 / TXINH3C	Transmit Inhibit Port 3
20 / RTS/RCVINH3C	Receive Inhibit Port 3
21 / EXT CLK1	External Clock 1
22 / CLOCK OUT	Clock Out
23 / EXT CLK2	External Clock 2
24 / IORTN	I/O Return
25 / CHASSIS GND	Chassis Ground

Table 8-2. System Configuration Switch Settings

Switch	On	Off
U10-A	Syn/Asynchronous-normal	Isosynchronous
U10-B	Iso/Asynchronous-normal	Synchronous
U10-C	N/A	N/A
U10-D	N/A	N/A
U16-A	CTS	DSR3-normal
U16-B	RTS3	DTR3-normal
U16-C	CTC	DSR2-normal
U16-D	RTS3	DTR2-normal
U20-A	4800 Baud Clk filter	2400 Baud Clk filter-normal
U20-B	CTS1	DSR1-normal
U20-C	RTS1	DTR1-normal
U20-D	Keyline	BELLV28-normal
U21-A	RCV CLK int-normal	RCV CLK EXT 1
U21-B	TX CLK int-normal	TX CLK EXT 1 or 2*
U21-C	TX CLK-EXT CLK2-normal	TX CLK EXT 1
U21-D	RXD2-normal	RXD2 disconnected

*See U21C

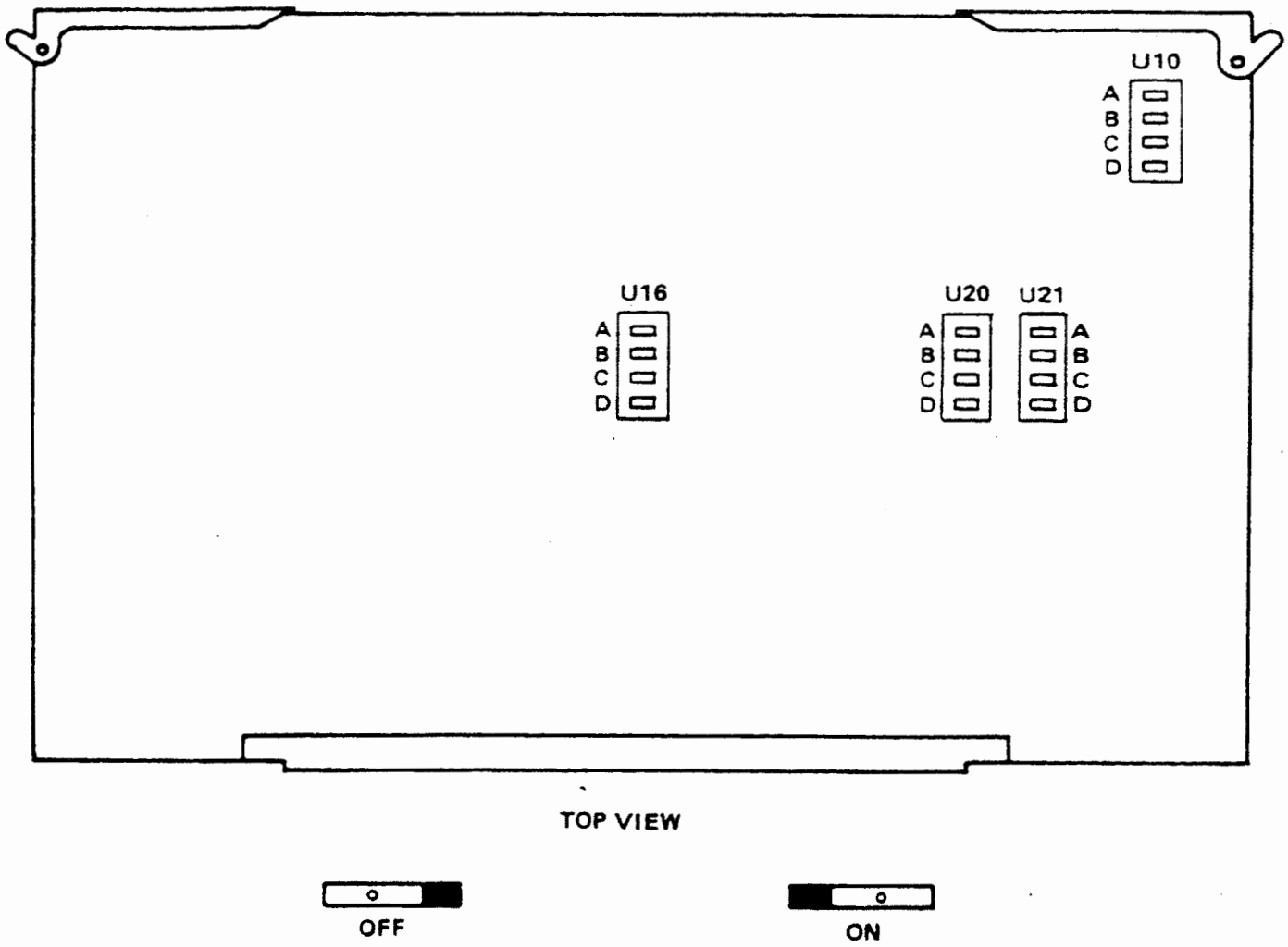


Figure 8-3. System Configuration Switch Locations

TELETYPEWRITER SET

AN/UGC-136BX

INSTALLATION STANDARDS SUMMARY

Input Voltage 115 Vac

Input Frequency 60 Hz

1 phase

Date _____

Serial Number _____

of Model _____

Installed in (ship or station)

_____

Record on this summary sheet the test indications which have been obtained during the installation verification test.

Table 5-3

Step No.	Ref Std
1	_____ Check
2	_____ Check
3	_____ Check
4	_____ Check
5	_____ Check
6	_____ Check
7	_____ Check
8	_____ Check
9	_____ Check
10	_____ Check
11	_____ Check
12	_____ Check
13	_____ Check
14	_____ Check
15	_____ Check
16	_____ Check
17	_____ Check
18	_____ Check
19	_____ Check
20	_____ Check

APPENDIX A

A-1. INTRODUCTION.

This appendix provides additional information concerning the configuration status message. This information consists of an example of a typical configuration message and detailed definition of the information provided by each line.

A-2. CONFIGURATION/STATUS MESSAGE.

The configuration status message (figure A-1) provides the configuration of the equipment, and the operational status at the time of power-on sequence. The following paragraphs provide descriptions of the information provided in each line of the message.

A-3. LINE 1.

Line 1 will contain the word "READY" at the completion of the power-on sequence if the equipment is operable. If the equipment is not operable, the word "READY" will not be printed and the maintenance technician should refer to chapter 5 to correct the fault.

A-4. LINE 2.

This line contains the total blocks of memory that are available for message storage. This is determined during the power-on sequence by examining the

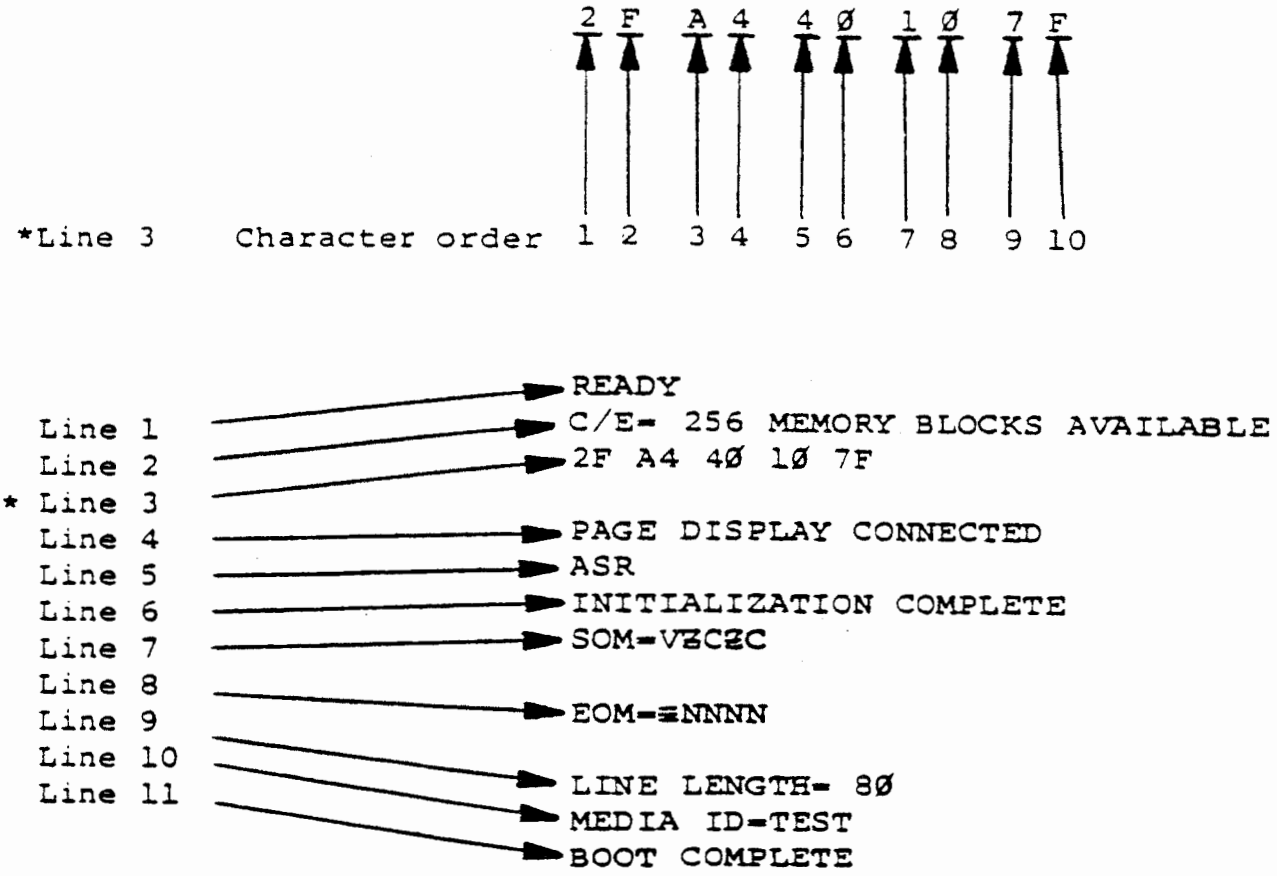


Figure A-1. Configuration/Status Message Printout

memory for defects and totaling the amount of memory that is operable.

A-5. **LINE 3.**

This line contains five pairs of hexadecimal coded characters. Each character represents the hexadecimal character for a four place binary code. The binary codes represent from one to four conditions that existed during the power-up sequence. Tables A-1 through A-10 are a breakdown of each character by order number (see figure A-1).

A-6. **LINE 4.**

When a page display is used in conjunction with the Keyboard-Printer it is normally connected to port 3. During the power-on sequence, the Keyboard-Printer will determine if the page display is connected. If so, it will be printed on line 4. If it is not connected, this line will be blank.

A-7. **LINE 5.**

This line provides the configuration of the Keyboard-Printer. The Keyboard-Printer can operate in four different configurations, as listed in table A-11. One of the four possible configuration codes will be printed on this line.

A-8. **LINE 6.**

After each port has been searched and the operating status determined, the operable ports are initialized. Upon completion of the initialization process, "INITIALIZATION COMPLETE" is printed.

A-9. **LINE 7.**

Line 7 identifies the start-of-message (SOM) code contained in memory. The SOM, end-of-message (EOM), line 8, and line length, line 9, are contained in a nonvolatile memory and are operator controlled functions. The operator enters the code or length into the equipment using the operating procedures provided in table 2-4. During the power-on sequence, the information is read and printed. To change the codes or line length, the operator must again perform the procedures in table 2-4.

A-10. **LINE 8.**

This line contains the end-of-message (EOM) contained in memory.

A-11. **LINE 9.**

This line contains the line length (69 to 80 characters) contained in memory.

A-12. **LINE 10.**

Line 10 contains the identification title for the disk when using a bulk storage device. The Keyboard-Printer will read this disk and then print "MEDIA ID = (name of disk)".

A-13. **LINE 11.**

This line will inform the operator when the bulk storage device is connected and operative, and the boot operation is completed, bringing the bulk storage device on-line. This operation will take place during the power-on sequence. If the bulk storage device is not connected or inoperative lines 10 and 11 are blank.

Table A-1. Character Order No. 1

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	XMIT PRINT = ON ECHO = ON DATA = INVRT XMIT RDY = ON
1	0	0	0	1	XMIT PRINT = OFF ECHO = ON DATA = INVRT XMIT RDY = ON
2	0	0	1	0	XMIT PRINT = ON ECHO = OFF DATA = INVRT XMIT RDY = ON
3	0	0	1	1	XMIT PRINT = OFF ECHO = OFF DATA = INVRT XMIT RDY = ON
4	0	1	0	0	XMIT PRINT = ON ECHO = ON DATA = NORM XMIT RDY = ON
5	0	1	0	1	XMIT PRINT = OFF ECHO = ON DATA = NORM XMIT RDY = ON
6	0	1	1	0	XMIT PRINT = ON ECHO = OFF DATA = NORM XMIT RDY = ON
7	0	1	1	1	XMIT PRINT = OFF ECHO = OFF DATA = NORM XMIT RDY = ON
8	1	0	0	0	XMIT PRINT = ON ECHO = ON DATA = INVRT XMIT RDY = OFF

Table A-1. Character Order No. 1-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	XMIT PRINT = OFF ECHO = ON DATA = INVRT XMIT RDY = OFF
A	1	0	1	0	XMIT PRINT = ON ECHO = OFF DATA = INVRT XMIT RDY = OFF
B	1	0	1	1	XMIT PRINT = OFF ECHO = OFF DATA = INVRT XMIT RDY = OFF
C	1	1	0	0	XMIT PRINT = ON ECHO = ON DATA = NORM XMIT RDY = OFF
D	1	1	0	1	XMIT PRINT = ON ECHO = ON DATA = NORM XMIT RDY = OFF
E	1	1	1	0	XMIT PRINT = ON ECHO = OFF DATA = NORM XMIT RDY = OFF
F	1	1	1	1	XMIT PRINT = OFF ECHO = OFF DATA = NORM XMIT RDY = OFF

Table A-2. Character Order No. 2

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = ON
1	0	0	0	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = ON
2	0	0	1	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = ON
3	0	0	1	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = ON
4	0	1	0	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = ON
5	0	1	0	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = ON
6	0	1	1	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = ON
7	0	1	1	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = ON
8	1	0	0	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = OFF

Table A-2. Character Order No. 2-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = OFF
A	1	0	1	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = OFF
B	1	0	1	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = ON AUTO PRINT = OFF
C	1	1	0	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = OFF
D	1	1	0	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = OFF
E	1	1	1	0	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = OFF
F	1	1	1	1	REMOTE BAUD SEL 1 = }* REMOTE BAUD SEL 2 = BREAK = OFF AUTO PRINT = OFF

*Remote Baud Sel 1 and 2 are used together as a binary code for remotely selecting baud rates. The following is the binary codes and their baud rates:

2^1	2^0	Baud Rate
0	0	50
0	1	75
1	0	1200
1	1	2400

Table A-3. Character Order No. 3

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = EVEN ITA CODE SWITCH = 5 STOP BITS SWITCH = MULT
1	0	0	0	1	PARITY ENABLE = NONE PARITY SENSE = EVEN ITA CODE SWITCH = 5 STOP BITS SWITCH = MULT
2	0	0	1	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = ODD ITA CODE SWITCH = 5 STOP BITS SWITCH = MULT
3	0	0	1	1	PARITY ENABLE = NONE PARITY SENSE = ODD ITA CODE SWITCH = 5 STOP BITS SWITCH = MULT
4	0	1	0	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = EVEN ITA CODE SWITCH = 2 STOP BITS SWITCH = MULT
5	0	1	0	1	PARITY ENABLE = NONE PARITY SENSE = EVEN ITA CODE SWITCH = 2 STOP BITS SWITCH = MULT
6	0	1	1	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = ODD ITA CODE SWITCH = 2 STOP BITS SWITCH = MULT
7	0	1	1	1	PARITY ENABLE = NONE PARITY SENSE = ODD ITA CODE SWITCH = 2 STOP BITS SWITCH = MULT
8	1	0	0	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = EVEN ITA CODE SWITCH = 5 STOP BITS SWITCH = SGL

Table A-3. Character Order No. 3-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	PARITY ENABLE = NONE PARITY SENSE = EVEN ITA CODE SWITCH = 5 STOP BITS SWITCH = SGL
A	1	0	1	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = ODD ITA CODE SWITCH = 5 STOP BITS SWITCH = SGL
B	1	0	1	1	PARITY ENABLE = NONE PARITY SENSE = ODD ITA CODE SWITCH = 5 STOP BITS SWITCH = SGL
C	1	1	0	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = EVEN ITA CODE SWITCH = 2 STOP BITS SWITCH = SGL
D	1	1	0	1	PARITY ENABLE = NONE PARITY SENSE = EVEN ITA CODE SWITCH = 2 STOP BITS SWITCH = SGL
E	1	1	1	0	PARITY ENABLE = ODD/EVEN PARITY SENSE = ODD ITA CODE SWITCH = 2 STOP BITS SWITCH = SGL
F	1	1	1	1	PARITY ENABLE = NONE PARITY SENSE = ODD ITA CODE SWITCH = 2 STOP BITS SWITCH = SGL

Table A-4. Character Order No. 4

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Baud rate switch position
0	0	0	0	0	TEST 2
1	0	0	0	1	TEST 1
2	0	0	1	0	REMOTE
3	0	0	1	1	BLANK
4	0	1	0	0	4800
5	0	1	0	1	2400
6	0	1	1	0	1200
7	0	1	1	1	600
8	1	0	0	0	300
9	1	0	0	1	200
A	1	0	1	0	150
B	1	0	1	1	110
C	1	1	0	0	100
D	1	1	0	1	75
E	1	1	1	0	50
F	1	1	1	1	45.5

Table A-5. Character Order No. 5

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	TXRDY2 = NOT READY TXRDY3 = NOT READY ASYNC = SYNCHRONOUS ISOSYNC = ASYNCHRONOUS
1	0	0	0	1	TXRDY2 = READY TXRDY3 = NOT READY ASYNC = SYNCHRONOUS ISOSYNC = ASYNCHRONOUS
2	0	0	1	0	TXRDY2 = NOT READY TXRDY3 = READY ASYNC = SYNCHRONOUS ISOSYNC = ASYNCHRONOUS
3	0	0	1	1	TXRDY2 = READY TXRDY3 = READY ASYNC = SYNCHRONOUS ISOSYNC = ASYNCHRONOUS
4	0	1	0	0	TXRDY2 = NOT READY TXRDY3 = NOT READY ASYNC = ASYNCHRONOUS ISOSYNC = ASYNCHRONOUS
5	0	1	0	1	TXRDY2 = READY TXRDY3 = NOT READY ASYNC = ASYNCHRONOUS ISOSYNC = ASYNCHRONOUS
6	0	1	1	0	TXRDY2 = NOT READY TXRDY3 = READY ASYNC = ASYNCHRONOUS ISOSYNC = ASYNCHRONOUS
7	0	1	1	1	TXRDY2 = READY TXRDY3 = READY ASYNC = ASYNCHRONOUS ISOSYNC = ASYNCHRONOUS
8	1	0	0	0	TXRDY2 = NOT READY TXRDY3 = NOT READY ASYNC = SYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS

Table A-5. Character Order No. 5-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	TXRDY2 = READY TXRDY3 = NOT READY ASYNC = SYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS
A	1	0	1	0	TXRDY2 = NOT READY TXRDY3 = READY ASYNC = SYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS
B	1	0	1	1	TXRDY2 = READY TXRDY3 = READY ASYNC = SYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS
C	1	1	0	0	TXRDY2 = NOT READY TXRDY3 = NOT READY ASYNC = ASYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS
D	1	1	0	1	TXRDY2 = READY TXRDY3 = NOT READY ASYNC = ASYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS
E	1	1	1	0	TXRDY2 = NOT READY TXRDY3 = READY ASYNC = ASYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS
F	1	1	1	1	TXRDY2 = READY TXRDY3 = READY ASYNC = ASYNCHRONOUS ISOSYNC = ISOSYNCHRONOUS

Table A-6. Character Order No. 6

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	RXRDY1 = NOT READY RXRDY2 = NOT READY RXRDY3 = NOT READY TXRDY1 = NOT READY
1	0	0	0	1	RXRDY1 = READY RXRDY2 = NOT READY RXRDY3 = NOT READY TXRDY1 = NOT READY
2	0	0	1	0	RXRDY1 = NOT READY RXRDY2 = READY RXRDY3 = NOT READY TXRDY1 = NOT READY
3	0	0	1	1	RXRDY1 = READY RXRDY2 = READY RXRDY3 = NOT READY TXRDY1 = NOT READY
4	0	1	0	0	RXRDY1 = NOT READY RXRDY2 = NOT READY RXRDY3 = READY TXRDY1 = NOT READY
5	0	1	0	1	RXRDY1 = READY RXRDY2 = NOT READY RXRDY3 = READY TXRDY1 = NOT READY
6	0	1	1	0	RXRDY1 = NOT READY RXRDY2 = READY RXRDY3 = READY TXRDY1 = NOT READY
7	0	1	1	1	RXRDY1 = READY RXRDY2 = READY RXRDY3 = READY TXRDY1 = NOT READY
8	1	0	0	0	RXRDY1 = NOT READY RXRDY2 = NOT READY RXRDY3 = NOT READY TXRDY1 = READY

Table A-6. Character Order No. 6-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	RXRDY1 = READY RXRDY2 = NOT READY RXRDY3 = NOT READY TXRDY1 = READY
A	1	0	1	0	RXRDY1 = NOT READY RXRDY2 = READY RXRDY3 = NOT READY TXRDY1 = READY
B	1	0	1	1	RXRDY1 = READY RXRDY2 = READY RXRDY3 = NOT READY TXRDY1 = READY
C	1	1	0	0	RXRDY1 = NOT READY RXRDY2 = NOT READY RXRDY3 = READY TXRDY1 = READY
D	1	1	0	1	RXRDY1 = READY RXRDY2 = NOT READY RXRDY3 = READY TXRDY1 = READY
E	1	1	1	0	RXRDY1 = NOT READY RXRDY2 = READY RXRDY3 = READY TXRDY1 = READY
F	1	1	1	1	RXRDY1 = READY RXRDY2 = READY RXRDY3 = READY TXRDY1 = READY

Table A-7. Character Order No. 7

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	COVER UP = NO NOT USED MOTOR INT = NO OVERTEMP = NO
1	0	0	0	1	COVER UP = YES NOT USED MOTOR INT = NO OVERTEMP = NO
2	0	0	1	0	COVER UP = NO NOT USED MOTOR INT = NO OVERTEMP = NO
3	0	0	1	1	COVER UP = YES NOT USED MOTOR INT = NO OVERTEMP = NO
4	0	1	0	0	COVER UP = NO NOT USED MOTOR INT = YES OVERTEMP = NO
5	0	1	0	1	COVER UP = YES NOT USED MOTOR INT = YES OVERTEMP = NO
6	0	1	1	0	COVER UP = NO NOT USED MOTOR INT = YES OVERTEMP = NO
7	0	1	1	1	COVER UP = YES NOT USED MOTOR INT = YES OVERTEMP = NO
8	1	0	0	0	COVER UP = NO NOT USED MOTOR INT = NO OVERTEMP = YES

Table A-7. Character Order No. 7-continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	COVER UP = YES NOT USED MOTOR INT = NO OVERTEMP = YES
A	1	0	1	0	COVER UP = NO NOT USED MOTOR INT = NO OVERTEMP = YES
B	1	0	1	1	COVER UP = YES NOT USED MOTOR INT = NO OVERTEMP = YES
C	1	1	0	0	COVER UP = NO NOT USED MOTOR INT = YES OVERTEMP = YES
D	1	1	0	1	COVER UP = YES NOT USED MOTOR INT = YES OVERTEMP = YES
E	1	1	1	0	COVER UP = NO NOT USED MOTOR INT = YES OVERTEMP = YES
F	1	1	1	1	COVER UP = YES NOT USED MOTOR INT = YES OVERTEMP = YES

Table A-8. Character Order No. 8

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	LIMITER = OFF SEC STEP = NO SYNC = NO LEFT BRAKE = NO
1	0	0	0	1	LIMITER = ON SEC STEP = NO SYNC = NO LEFT BRAKE = NO
2	0	0	1	0	LIMITER = OFF SEC STEP = YES SYNC = NO LEFT BRAKE = NO
3	0	0	1	1	LIMITER = ON SEC STEP = YES SYNC = NO LEFT BRAKE = NO
4	0	1	0	0	LIMITER = OFF SEC STEP = NO SYNC = YES LEFT BRAKE = NO
5	0	1	0	1	LIMITER = ON SEC STEP = NO SYNC = YES LEFT BRAKE = NO
6	0	1	1	0	LIMITER = OFF SEC STEP = YES SYNC = YES LEFT BRAKE = NO
7	0	1	1	1	LIMITER = ON SEC STEP = YES SYNC = YES LEFT BRAKE = NO
8	1	0	0	0	LIMITER = OFF SEC STEP = NO SYNC = NO LEFT BRAKE = YES

Table A-8. Character Order No. 8-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	LIMITER = ON SEC STEP = NO SYNC = NO LEFT BRAKE = YES
A	1	0	1	0	LIMITER = OFF SEC STEP = YES SYNC = NO LEFT BRAKE = YES
B	1	0	1	1	LIMITER = ON SEC STEP = YES SYNC = NO LEFT BRAKE = YES
C	1	1	0	0	LIMITER = OFF SEC STEP = NO SYNC = YES LEFT BRAKE = YES
D	1	1	0	1	LIMITER = ON SEC STEP = NO SYNC = YES LEFT BRAKE = YES
E	1	1	1	0	LIMITER = OFF SEC STEP = YES SYNC = YES LEFT BRAKE = YES
F	1	1	1	1	LIMITER = ON SEC STEP = YES SYNC = YES LEFT BRAKE = YES

Table A-9. Character Order No. 9

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	LINE SPACE = 2 RESET = RESET ENGLISH = NO PAPER LOW = OK
1	0	0	0	1	LINE SPACE = 1 RESET = RESET ENGLISH = NO PAPER LOW = OK
2	0	0	1	0	LINE SPACE = 2 RESET = NOT RESET ENGLISH = NO PAPER LOW = OK
3	0	0	1	1	LINE SPACE = 1 RESET = NOT RESET ENGLISH = NO PAPER LOW = OK
4	0	1	0	0	LINE SPACE = 2 RESET = RESET ENGLISH = YES PAPER LOW = OK
5	0	1	0	1	LINE SPACE = 1 RESET = RESET ENGLISH = YES PAPER LOW = OK
6	0	1	1	0	LINE SPACE = 2 RESET = NOT RESET ENGLISH = YES PAPER LOW = OK
7	0	1	1	1	LINE SPACE = 1 RESET = NOT RESET ENGLISH = YES PAPER LOW = OK
8	1	0	0	0	LINE SPACE = 2 RESET = RESET ENGLISH = NO PAPER LOW = LOW

Table A-9. Character Order No. 9-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	LINE SPACE = 1 RESET = RESET ENGLISH = NO PAPER LOW = LOW
A	1	0	1	0	LINE SPACE = 2 RESET = NOT RESET ENGLISH = NO PAPER LOW = LOW
B	1	0	1	1	LINE SPACE = 1 RESET = NOT RESET ENGLISH = NO PAPER LOW = LOW
C	1	1	0	0	LINE SPACE = 2 RESET = RESET ENGLISH = YES PAPER LOW = LOW
D	1	1	0	1	LINE SPACE = 1 RESET = RESET ENGLISH = YES PAPER LOW = LOW
E	1	1	1	0	LINE SPACE = 2 RESET = NOT RESET ENGLISH = YES PAPER LOW = LOW
F	1	1	1	1	LINE SPACE = 1 RESET = NOT RESET ENGLISH = YES PAPER LOW = LOW

Table A-10. Character Order No. 10

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
0	0	0	0	0	LOCAL LF = LINE FEED LOCAL CR = CAR RTN BITE = ACTIVE PRINT ENABLE = OFF
1	0	0	0	1	LOCAL LF = NO LINE FEED LOCAL CR = CAR RTN BITE = ACTIVE PRINT ENABLE = OFF
2	0	0	1	0	LOCAL LF = LINE FEED LOCAL CR = NO CAR RTN BITE = ACTIVE PRINT ENABLE = OFF
3	0	0	1	1	LOCAL LF = NO LINE FEED LOCAL CR = NO CAR RTN BITE = ACTIVE PRINT ENABLE = OFF
4	0	1	0	0	LOCAL LF = LINE FEED LOCAL CR = CAR RTN BITE = INACTIVE PRINT ENABLE = OFF
5	0	1	0	1	LOCAL LF = NO LINE FEED LOCAL CR = CAR RTN BITE = INACTIVE PRINT ENABLE = OFF
6	0	1	1	0	LOCAL LF = LINE FEED LOCAL CR = NO CAR RTN BITE = INACTIVE PRINT ENABLE = OFF
7	0	1	1	1	LOCAL LF = NO LINE FEED LOCAL CR = NO CAR RTN BITE = INACTIVE PRINT ENABLE = OFF
8	1	0	0	0	LOCAL LF = LINE FEED LOCAL CR = CAR RTN BITE = ACTIVE PRINT ENABLE = ON

Table A-10. Character Order No. 10-Continued

Hexidecimal code	Binary code 2^3	2^2	2^1	2^0	Conditions present
9	1	0	0	1	LOCAL LF = NO LINE FEED LOCAL CR = CAR RTN BITE = ACTIVE PRINT ENABLE = ON
A	1	0	1	0	LOCAL LF = LINE FEED LOCAL CR = NO CAR RTN BITE = ACTIVE PRINT ENABLE = ON
B	1	0	1	1	LOCAL LF = NO LINE FEED LOCAL CR = NO CAR RTN BITE = ACTIVE PRINT ENABLE = ON
C	1	1	0	0	LOCAL LF = LINE FEED LOCAL CR = CAR RTN BITE = INACTIVE PRINT ENABLE = ON
D	1	1	0	1	LOCAL LF = NO LINE FEED LOCAL CR = CAR RTN BITE = INACTIVE PRINT ENABLE = ON
E	1	1	1	0	LOCAL LF = LINE FEED LOCAL CR = NO CAR RTN BITE = INACTIVE PRINT ENABLE = ON
F	1	1	1	1	LOCAL LF = NO LINE FEED LOCAL CR = NO CAR RTN BITE = INACTIVE PRINT ENABLE = ON

Table A-11. Keyboard-Printer Configuration Code

Code	Configuration
KSR	Keyboard Send/Receive - The keyboard send/receive configuration consists of the Printer and either a Page Display or keyboard connected. This configuration will also work with both a Page Display and keyboard connected as long as only one is active (local/remote) at a time.
ASR	Automatic Send/Receive - The automatic send/receive configuration is the same as the KSR with the addition of a Bulk Storage Device.
RCV ONLY MODEL 1	Receive Only Model One - The receive only model one configuration is a stand alone Printer without a Page Display or keyboard connected.
RCV ONLY MODEL 2	Receive Only Model Two - The receive only model two configuration is the same as the receive only model one with the addition of a Bulk Storage Device.

GLOSSARY

AC	alternating current
ACT	active
ASCII	American Standard Code for Information Interchange
ASR	automatic send/receive
ASSY	assembly
AUTO	automatic
BITE	built-in test equipment
BRK	break
BSN	bulk storage number
CB	circuit breaker
CCW	counterclockwise
C/E	compose/edit
CKT	circuit
CLK	clock
CPU	central processing unit
CR	carriage return
CTRL	control
CW	clockwise
D	daily
DC	direct current
DEL	delete
DLTE	delete
DIR	directory
DVM	digital voltmeter
EOL	end-of-line
EOM	end-of-message
FMT	format
INVT	invert
I/O	input/output
INSRT	insert
ITA-2	International Telegraph Alphabet Number Two
ITA-5	International Telegraph Alphabet Number Five
LED	light emitting diode
LF	line feed
KB	keyboard
M	monthly
MP	mechanical part
MPN	message processing number
MSG	message
MULT	multiple
NORM	normal
PIO	parallel input/output
PRNT	print
PWR	power
RDY	ready
REC	receive
RFI	radio frequency interference
RO	receive only
RPT	repeat
RETN	return
SGL	single
SHF	shift
SP	space
ST	store
TRM	terminal
TTL	transistor-transistor logic
TX	transmit
UNLD	unload
UNPRT	unprinted
USART	universal synchronous/asynchronous receive/transmit
W	weekly
XMT	transmit

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