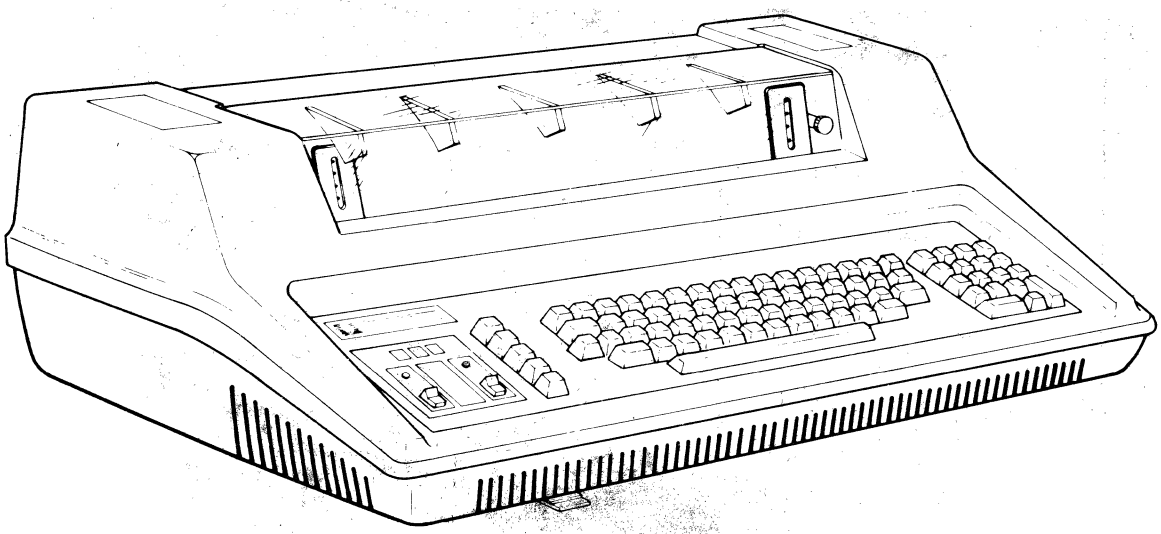
OMNI 800
electronic data terminals

Maintenance Manual



Model 820 KSR Terminal

Manual No. 999853-9701
7 DECEMBER 1978

TEXAS INSTRUMENTS
INCORPORATED

CHANGE NOTICES

Revision Letter	Date	ECN		Description
		Number	Level	

PREFACE

This manual provides detailed information for installing, operating, maintaining and replacing assemblies and subassemblies of the Texas Instruments Omni 800* Model 820 keyboard send receive (KSR) data terminal. The information is divided into the following sections:

SECTION I	**General Description:** This section contains a list of terminal specifications and features, locates the major terminal components, and identifies the various terminal versions and options.
SECTION II	**Installation:** This section provides instructions for selecting a suitable site for the terminal, installing the supplies, making cable connections, applying power, performing terminal checkout, and configuring the terminal.
SECTION III	**Operation:** This section provides a complete functional description of the terminal including the use of controls and indicators.
SECTION IV	**Theory of Operation:** This section identifies the functional components of the terminal and provides detailed discussions of the operation of each functional component.
SECTION V	**Maintenance:** This section contains preventative and corrective maintenance procedures, adjustment procedures, and removal and replacement procedures for all replaceable assemblies.
SECTION VI	**Assembly Drawings and Parts Lists:** This section contains assembly drawings and parts lists for all replaceable assemblies.
SECTION VII	**Diagrams:** This section contains logic diagrams.
APPENDIX A	**Character Set Dot Matrix**
APPENDIX B	**Character and Control Codes**
APPENDIX C	**Terminal Options and Accessories**
APPENDIX D	**Ribbon and Paper Recommendations**
APPENDIX E	**Installation Instructions For Option Kits**
APPENDIX F	**Glossary of Logic Signals**

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Concluded)

LIST OF TABLES

LIST OF ILLUSTRATIONS

SECTION I

GENERAL DESCRIPTION

1.1 INTRODUCTION

The Texas Instruments *Omni 800** Model 820 Keyboard-Send Receive (KSR) Terminal shown in Figure 1-1 consists basically of

- A *printer* which provides one original and up to five copies of data received via a *communications interface*.
- An *operator's panel* which permits entry of data on the *keyboard* for transmission to a host system or other terminals via a *communications interface*.

1.2 FEATURES AND SPECIFICATIONS

The Model 820 KSR is a compact self-contained data terminal, similar in appearance to an office typewriter, which communicates in an attended or unattended mode via appropriate transmission media. The Model 820 KSR is highly suitable for conversational, data/text entry, inquiry-response, and computer console applications.

The Model 820 KSR communicates serial, asynchronous data at rates from 110 to 9600 baud and is capable of printing at speeds up to 150 characters per second (CPS). Printing is done by means of a serial, wire-matrix impact mechanism which prints on conventional paper and features multiple copy, wide carriage, and optional forms handling capabilities. An internal buffer memory enables the Model 820 KSR to receive burst data at transmission rates which exceed its maximum printing speed.

The control electronics consists primarily of a stored-program microprocessor system which provides a high degree of flexibility with the fewest possible components. All operating parameters (e.g., communications rate, parity, etc.) can be altered from the keyboard, thereby eliminating the need for hardware strappable options and minimizing special operator controls. The modular construction of the electrical and mechanical assemblies greatly facilitates maintenance and repair.

Table 1-1 lists the specifications for the Model 820 KSR data terminal.

1.3 OPTIONS

The following features are available as options for the Model 820 KSR:

Compressed print — provides 16.5 and 10.0 characters per 25.4 mm (1 inch) horizontal pitch

Device/forms control — provides extensive terminal and format capabilities, including horizontal and vertical tabs, margin and form length control, printer ON/OFF, etc.

Numeric Keypad — an 18-key cluster, including a user-programmable ENTER key, similar to a calculator keyboard for fast number entry.

*Trademark of Texas Instruments Incorporated

Table 1-1. Model 820 KSR Specifications

POWER REQUIREMENTS

VOLTAGE: 90-130 Vac, 47-63 Hz, single phase
180-260 Vac, 47-63 Hz, single phase

POWER: 50 VA max, idle
75 VA average printing
150 VA max. executing form feed

PHYSICAL DIMENSIONS

SIZE: 660.4 mm (26.0 in.) W × 533.4 mm (21.0 in.) D × 209.5 mm (8.25 in.) H

WEIGHT: **18.6 kg (41 pounds) excluding options**

ACOUSTIC NOISE

LEVEL: Less than 60 dB (A-weighted), measured 0.9 meter (3.0 feet) directly in front under free field conditions while printing at 150 characters per second

ENVIRONMENTAL (OPERATING)

TEMPERATURE: 5° C to 40° C

RELATIVE HUMIDITY: 5 % to 90 % (no condensation)

ALTITUDE: To 3046 m (10,000 feet)

PRINTER

METHOD: Wire matrix impact

SPEED: 150 characters per second

PATTERN: 9 × 7 dot matrix

CHARACTER SET: 95 ASCII plus 33 control character graphics plus parity error symbol

CHARACTERS PER LINE: 132 max.

CHARACTER SPACING: 10 per 25.4 mm (1 in.)

LINE SPACING: 6 per 25.4 mm (1 in.)

PAPER DRIVE: 2 pinfeed tractors (4 pin)

PAPER FEED: Rear or bottom

PAPER WIDTH: 76.2 mm (3.0 in.) to 377.8 mm (14.875 in.)

PAPER TYPE: Continuous feed, fanfold, or multipart (original + 5 copies)

RIBBON: 54.8 m (60 yards) or 36.58 m(40 yards), auto reversing

LINE FEED TIME: 30 milliseconds

PAPER SLEW RATE: 190.5 mm (7.5 in.) per second

ADJUSTMENTS: Forms width, thickness, and alignment

FORM LENGTH: 279.4 mm (11 in.)

DETECTION: Paper-out, carriage jam

KEYBOARD

TYPE: Full ASCII

LAYOUT: Typewriter

ROLLOVER: N-Key

INDICATORS: Terminal and Communications status

COMMUNICATIONS

INTERFACE: EIA RS-232-C

TYPE TRANSMISSION: Asynchronous

CODE: ASCII

SPEEDS: 110, 200, 300, 600, 1200, 2400, 4800, 9600 Baud

MODES: Full duplex, half duplex, half duplex with reverse channel

PARITY: Transmit odd, even, mark, space
Check-odd, even, none

RECEIVE BUFFER: 640-characters

LINE CONTROL: Autoanswer, autodisconnect, printer ready/busy

IDENTIFICATION: 21-character answerback memory

OPTIONS

PRINTER: Compressed print (16.5 characters-perinch)

CONTROL: Device/Forms Control

KEYBOARD: 18 key numeric keypad
APL/ASCII
International keyboards

INTERFACE: dc current loop
300-baud acoustic coupler

CONFIGURATION: User-specifiable default parameter sets (up to eight) User-specifiable protected parameter sets (up to eight)

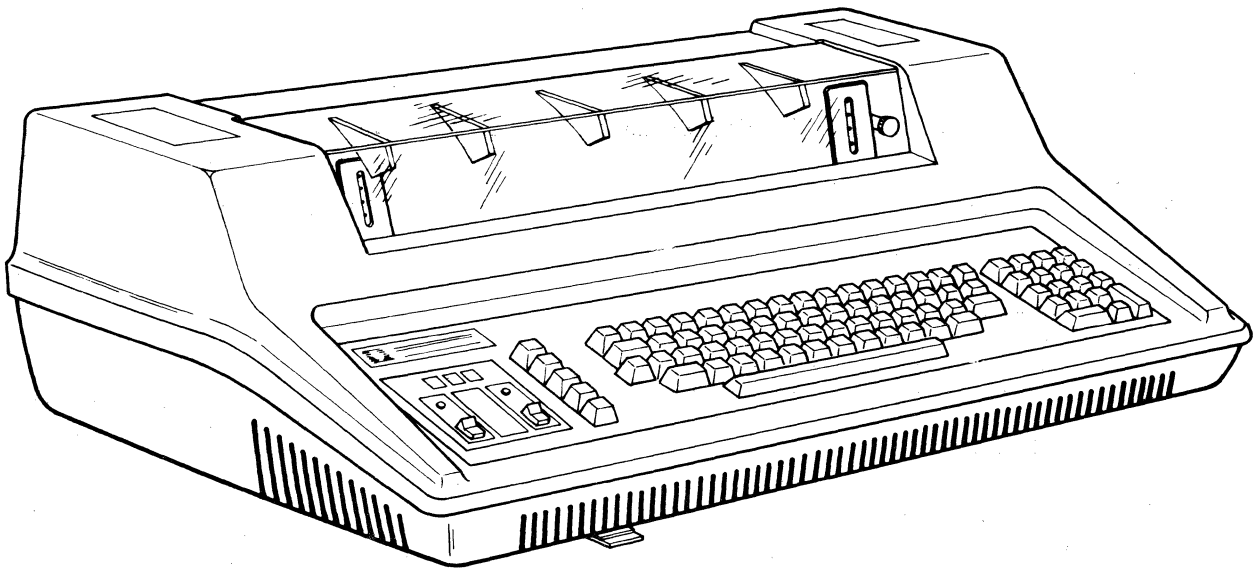


Figure 1-1. *Omni 800* **Model 820 KSR Terminal**

Alternate character sets — APL and Katakana

International keyboards — England, France, Germany, Denmark/Norway, and Sweden/Finland keyboards and character sets.

Communications Interface — dc current loop and acoustic coupler

Configuration sets — provides up to eight user-defined configuration-parameter sets to facilitate the use of the terminal with a variety of host systems.

1.4 ACCESSORIES

The following useful accessories are available for the Model 820 KSR:

- Paper basket — holds the printed output
- Terminal stand — for user convenience
- Noise enhancement kit — significantly reduces noise
- Interface cables — for console and special connections.

1.5 IDENTIFICATION

The particular configuration of the Model 820 KSR may be identified by the ***printer configuration label*** affixed inside the terminal cover. Table 1-2 defines the abbreviations used to identify the Model 820 KSR.

Table 1-2. Model 820 KSR Hardware Configuration Abbreviations

PRINTER CONFIGURATIONS

BSC	Basic Model 820 KSR
115V	115 volt operation
220V	220 volt operation
CSA	Standard EIA RS-232-C interface
PSF	Standard printer (10 characters per inch)
PCF	Compressed print option (10 and 16.5 characters per inch)
MFG	Device/Forms Control (DFC) option

KEYBOARD OPTIONS

KFS	Standard full ASCII
KFN	Standard full ASCII with numeric pad
KAS	APL/ASCII
KAN	APL/ASCII with numeric pad
KKS	Katakana/ASCII
KKN	Katakana/ASCII with numeric pad

COMMUNICATION OPTIONS

CAC	300-baud acoustic coupler
CTY	20-mA dc current loop

CONFIGURATION OPTIONS

MDP	Default configuration option
MPP	Protected configuration option

CHARACTER SET SUBOPTIONS

UKF	United Kingdom ASCII
DNF	Danish/Norwegian ASCII
SFF	Swedish/Finnish ASCII
FRF	French ASCII
GRF	German ASCII

SECTION II

INSTALLATION

2.1 INTRODUCTION

This section provides suggestions for selecting a suitable location for the terminal, installing the supplies, making power and interface connections, applying power, performing checkout procedures, and selecting the appropriate operating parameters. This discussion assumes that the Model 820 KSR has been removed from the shipping container and that all shipping fixtures are removed from the terminal.

2.2 SPACE REQUIREMENTS

The Model 820 KSR data terminal occupies a flat surface area 660 mm (26 inches) wide by 609 mm (24 inches) deep, including cable clearance of 76 mm (3 inches). Figure 2-1 lists the outline dimensions of the Model 820 KSR, including space for adequate ventilation. Take particular care not to block the cooling fan intake and exhaust louvers located on all four sides of the terminal.

An unobstructed paper feed path must be provided behind or below the terminal for the paper supply. A method of holding the printer outut paper must also be provided if the optional paper basket accessory is not used. The terminal should not be operated in an environment where humidity, temperature, or other specifications listed in Table 1-1 may be exceeded. A sturdy table capable of adequately supporting 18.6 kilograms (41 pounds) is suitable if the optional floor mounting stand is not used. Regardless of the mounting selected, take care to ensure that the paper chute underneath the terminal does not bear any weight of the terminal and is not subjected to any pressure which could deform it.

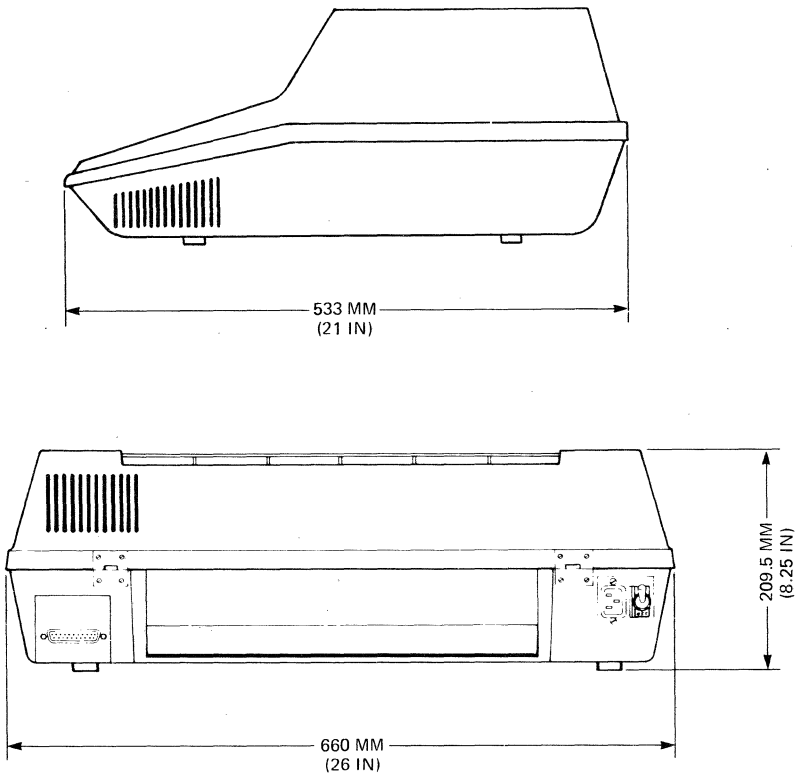


Figure 2-1. Physical Dimensions

2.3 POWER CORD CONNECTION

Note the *printer configuration label* affixed to the inside of the cover to determine the input voltage requirements and then position the terminal close to an appropriately grounded electrical outlet so that the supplied power cord can be connected. Referring to Figure 2-2, locate the *power ON/OFF switch and the power cord receptacle* at the rear of the Model 820 KSR and proceed as follows:

a. Ensure that the power ON/OFF switch is in the OFF (down) position.

b. Attach the female connector of the power cord to the terminal power cord receptacle (next to the ON/OFF switch).

c. Attach the male connector of the power cord to the electrical outlet.

WARNING

To ensure safe operation of the Model 820 KSR terminal, always use a properly grounded power source with the correct voltage, frequency, and current capacity.

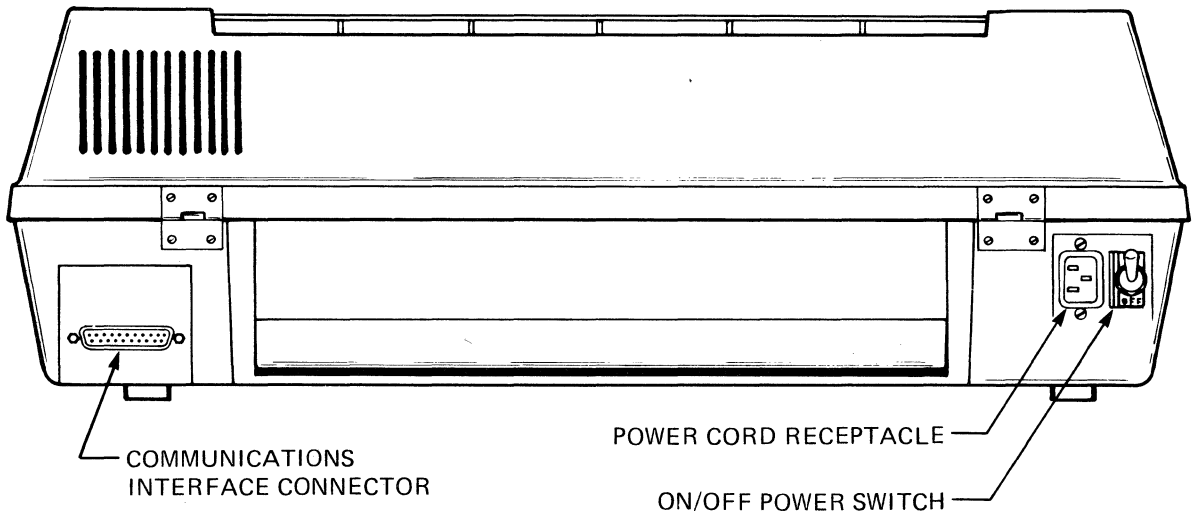


Figure 2-2. Model 820 KSR Rear Panel

2.4 PAPER LOADING

The Model 820 KSR will accommodate continuous form paper with standard sprocket holes on each side in widths from 76.2 to 377.8 mm (3.0 to 14.875 inches). Single or multipart forms meeting the specifications of TI Publication 0999860-9701, *Omni 800 Model 820 Printer Ribbon and Paper Recommendations* (Appendix D) may be used. Referring to Figure 2-3, locate the controls for *forms thickness adjustment (adjust lever)* and *forms width adjustment (flaps)* and proceed as follows:

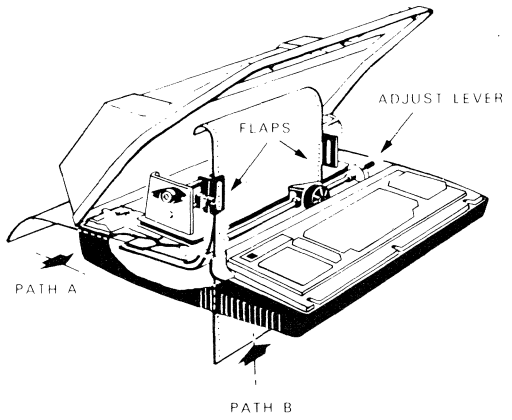


Figure 2-3. Paper Loading

a. Lift the terminal cover and open the *flaps* on both paper tractors.

b. Using the printhead *adjust lever,* move the printhead away from the platen.

c. Feed the paper into either the rear paper chute (path A) with the printing side of the paper down or the bottom paper chute (path B) with the printing side of the paper facing you until the paper appears at the platen.

d. Loosen the locking knob on the right tractor and move the tractor left or right as necessary to accommodate the paper width.

e. Place the paper in both tractors so that corresponding holes and pins engage the paper on both sides.

f. Close both tractor flaps.

g. Adjust the right tractor as necessary to remove slack in the paper and then tighten the locking knob.

h. Check that the paper supply is aligned in the paper chute and that the paper does not rub the side of the paper chute.

i. Reposition the printhead using the adjust level.

j. Close the terminal cover.

2.5 RIBBON INSTALLATION

The Model 820 KSR uses a nylon ribbon mounted on two spools as described in TI Publication 0999860-9701, *Omni 800 Model 820 Printer Ribbon and Paper Recommendations* (included in Appendix D).

CAUTION

Use of ribbons which do not meet TI specifications may seriously shorten printhead life and void the warranty.

Referring to Figure 2-4, proceed as follows:

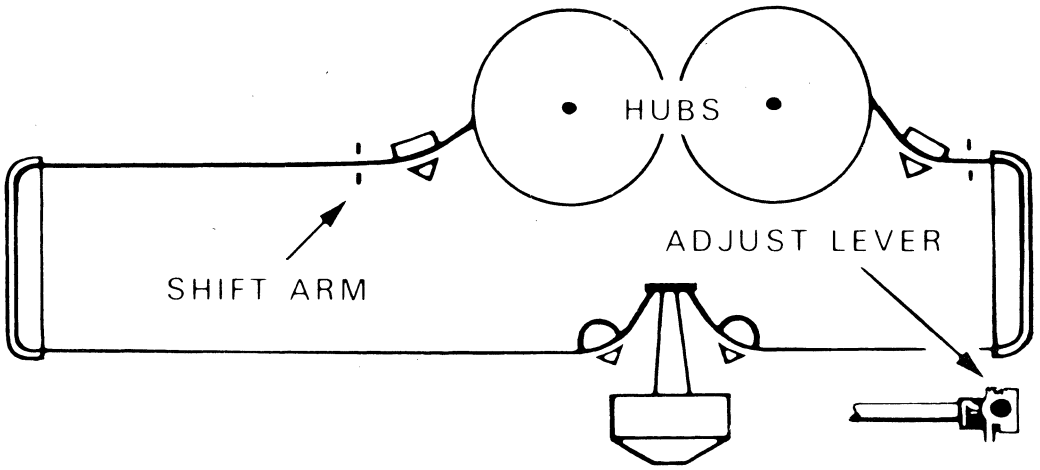


Figure 2-4. Ribbon Installation

a. Lift the terminal cover.

b. Using the printhead *adjust lever*, move the printhead away from the platen.

c. Place the full ribbon spool on either hub so that the ribbon exits from the far side.

d. Feed the ribbon along the path as shown in Figure 2-4.

e. Place the empty ribbon spool on the other hub and remove slack from the ribbon my manually rotating one of the spools in the appropriate direction.

f. Check that the empty spool *ribbon eyelet* is between the spool and the *shift arm* and that the ribbon is properly positioned between the *vertical ribbon guides* on each side of the printer.

g. Reposition the printhead using the adjust lever.

k. Close the terminal cover.

2.6 POWER-ON PROCEDURE

Referring to Figure 2-5, locate the *CONFIGURE/OPERATE switch,* the *LINE/●/LCL switch,* and the *terminal status display* and proceed as follows:

a. Set the LINE/●/LCL switch to the LCL position (lower edge depressed).

b. Lift the terminal cover and set the CONFIGURE/OPERATE switch to the OPERATE position (toward the upper edge of the keyboard). Close the terminal cover.

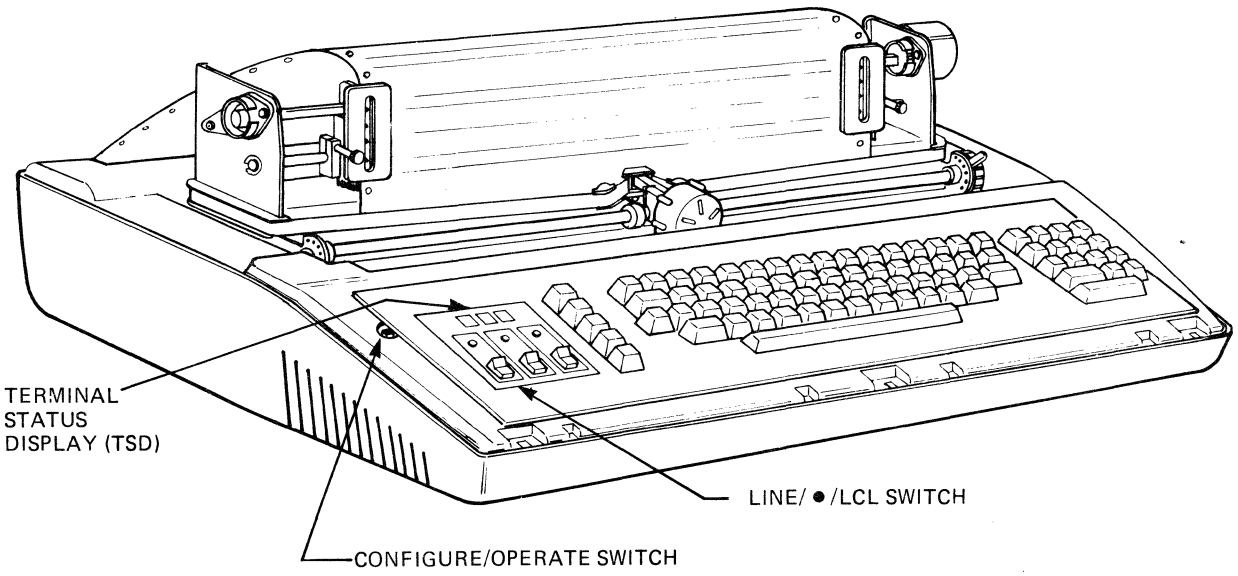


Figure 2-5. Power-on Procedure Switches

c. Set the power ON/OFF switch to the ON position (up).

d. Ascertain that the following events occur:

- The *terminal status display* (TSD) shows 888 and the LED indicators are illuminated
- The printhead aligns to the left margin
- The audible tone sounds
- The *TSD* shows 001 (or the left margin setting if the left margin is not set to column 1) and the LED indicators go off.

2.7 POWER-OFF PROCEDURE

To remove power from the terminal, simply set the power ON/OFF switch to the OFF position (down). The Model 820 KSR retains operating and format parameters in a nonvolatile memory so that the terminal is ready to operate when power is again applied.

2.8 OPERATIONAL CHECKOUT AND PRINTHEAD ADJUSTMENT

Referring to Figure 2-6, locate the *CTRL, SHIFT, !/1,* and *RESET* keys on the operators panel and proceed as follows:

CAUTION

Do not operate the printer without ribbon and paper installed. Printhead damage will occur and the warranty may be voided.

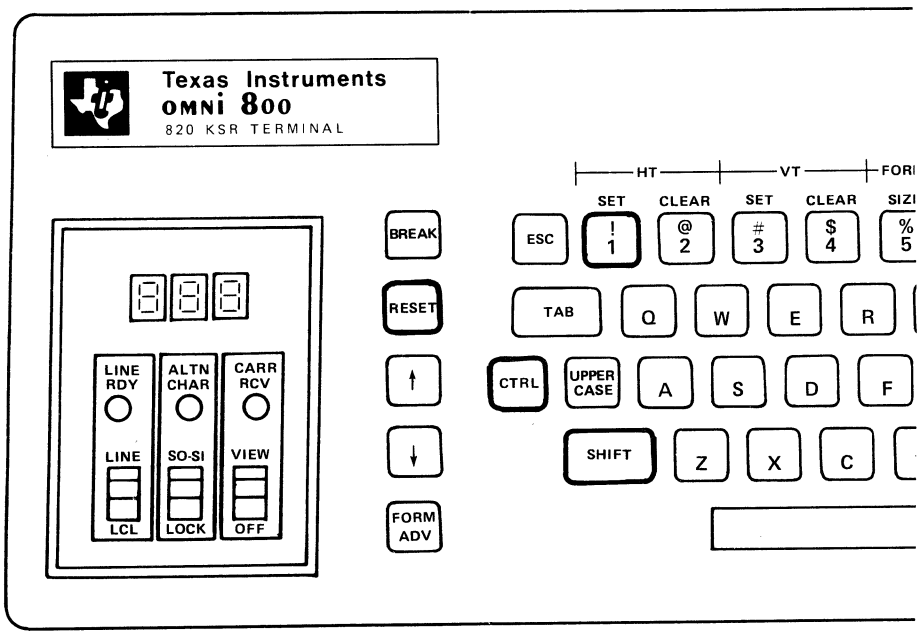


Figure 2-6. Controls for Model 820 KSR Self-Test

a. Switch the LINE/●/LCL switch to LCL.

b. Initiate the self-test by pressing and holding the CTRL and SHIFT keys and then momentarily pressing the !/1 key; then release all keys.

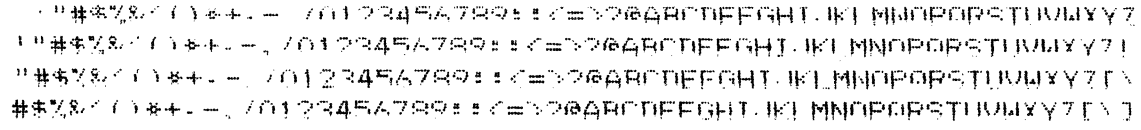
c. Observe that a repetitive, ripple pattern (called a ***barberpole***) is printed and that the TSD displays ⊐39.

d. If the printed characters are partially formed or have missing dots as shown in Figure 2-7a, the printhead is set too far from the platen: Correct this malfunction by rotating the adjust lever toward the rear of the terminal.

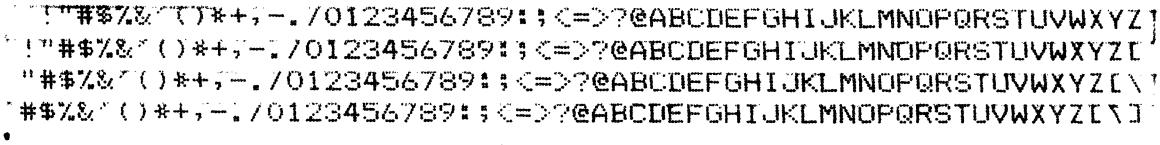
e. If the printed characters are smeared as shown in Figure 2-7b, the printhead is set too close to the platen: Correct by rotating the adjust lever toward the front of the terminal.

f. If the characters are clearly formed and not smeared as shown in Figure 2-7c, the printhead is satisfactorily adjusted.

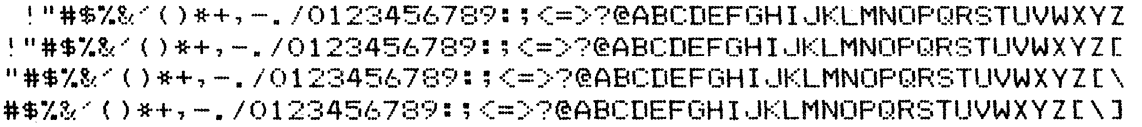
g. Terminate the self-test by momentarily pressing the RESET switch.



a. Printhead too far from platen



b. Printhead too close to platen



c. Printhead adjusted correctly

Figure 2-7. Self-Test Results

This self-test performs an operational checkout of 95 percent of the terminal electronics. If the correct test results are not observed, refer to **Section 5, Maintenance.**

Note that it may be necessary to readjust the printhead occasionally to compensate for ribbon wear.

2.9 CONFIGURATION PARAMETER SELECTION

All host system-dependent operating parameters such as communications mode, baud rate, and parity are entered from the keyboard. These operating parameters are designated by two-digit codes called *configuration codes*. The configuration codes are summarized in Table 2-1. A description of the Model 820 KSR configuration codes follows.

2.9.1 CONFIGURATION SET SELECTION (01-09). A configuration set defines all operating parameters for a particular terminal application. The definition of the configuration set parameters is

01-08 — *User-defined configuration sets* are optional features of the terminal. The user may specify up to eight complete sets of configuration parameters which are identified by the codes 01-08.

09 — *The default configuration set* has the following parameters enabled:
13 - Full-duplex
29 - Auto-select
32 - Even parity, no parity check

2.9.2 COMMUNICATIONS MODE (11-15). The communications (or duplex) mode determines the protocol used in exchanging data with the host system. Note that one (and only one) of parameters 11-15 must be enabled at all times.

11 — *Half-duplex* refers to the use of a communications channel such as that provided by a Bell System 202 data set (or equivalent) which permits exchange of data in only one direction at a time. A line-turnaround character (LTA) must be used in this mode. When the Model 820 KSR *receives* an LTA, it switches to transmit mode; when the Model 820 KSR *transmits* an LTA, it switches to receive mode.

12 — *Half-duplex with reverse channel* is a similar to half-duplex, except a low-frequency secondary channel is used to provide circuit assurance from the receiving to the transmitting station.

13 — *Full-duplex* refers to the use of a communications channel such as that provided by a Bell System 212 data set (or equivalent) which permits simultaneous, bidirectional data exchange.

14 — *Full-duplex with reverse channel ON for ready* is used for *console* operation; i.e., for applications without a modem. The Model 820 KSR switches reverse channel ON when *ready* and OFF when *busy*.

15 — *Full-duplex with reverse channel OFF for ready* is identical to parameter 14, except that operation of the reverse channel is inverted.

Table 2-1. Configuration Codes

CODE	MEANING	OPTION REQUIRED
	Predefined Configuration Selection (one only)	
01 to 08	Select corresponding predefined configuration set	YES
09	Select standard default configuration set	
	Communications Mode Selection (one only)	
11	Half duplex (for use with type 202 data set)	
12	Half duplex & reverse channel (for use with type 202 data set)	
13+	Full duplex (for type 103, 113, 212 data sets)	
14	Full duplex & reverse channel ON for ready (for use as a console)	
15	Full duplex & reverse channel OFF for ready (for use as a console)	
	Transmission Rate Selection (one only)	
21	110 baud	
22	200 baud	
23	300 baud	
24	600 baud	
25	1200 baud	
26	2400 baud	
27	4800 baud	
28	9600 baud	
29+	300/1200 baud (for use with type 212 data set with *speed-select* option)	
	Parity Selection (one only)	
31	Odd parity, no parity check	
32+	Even parity, no parity check	
33	Odd parity, indication on error	
34	Even parity, indication on error	
35	Odd parity, indication plus printed symbol on error	
36	Even parity, indication plus printed symbol on error	
37	Parity bit mark, no parity check	
38	Parity bit space, no parity check	
	Line Control Parameters (no limit)	
60	Program line turnaround characters for half duplex (202)	
61	Enable failsafe disconnect	
62	Disconnect on receipt of EOT	
63	Disconnect on receipt of DLE EOT	
64	Disconnect on paper-out or carriage jam	
	Transmission Control Parameters (no limit)	
70	Program answer-back memory (ABM)	
71	Auto-trigger ABM on connection	
72	Enable print of ABM contents (local HERE IS or code 82 set)	
	Terminal Control Parameters (no limit)	
80	Program ENTER key on numeric keypad	YES
81	Enable device & format control from the communication line	YES
82	Enable local copy of transmitted data	
83	Transmit DC3 or BREAK on printer-busy DC1 or LTA on ready	
84	Do "new line" on receipt of LF	
85	Do "new line" on receipt of CR	
86	Transmit CR LF when RETURN key is pressed	
87	Print all control characters	
88	Set compressed print (16.5 CPI) only	YES
89	Set absolute right margin at column 80	
]]	Invalid configuration code has been entered	

+ Standard default parameter configuration set

2.9.3 COMMUNICATIONS RATE. The communications (or baud) rate determines the maximum number of characters per second (CPS) that can be transmitted or received by the Model 820 KSR. The communications rate applies to both transmitted and received data. Note that one (and only one) baud rate must be enabled at all times.

21 — *110 baud* is 10 CPS

22 — *200 baud* is 20 CPS

23 — *300 baud* is 30 CPS

24 — *600 baud* is 60 CPS

25 — *1200 baud* is 120 CPS

26 — *2400 baud* is 240 CPS

27 — *4800 baud* is 480 CPS

28 — *9600 baud* is 960 CPS

29 — *Auto-select* is for use with Bell System 212 data sets (or equivalent) equipped with an automatic speed selection option. The Model 820 KSR will operate at either 300 or 1200 baud, depending on the status of the reverse channel input when the call is connected; OFF selects 300 baud, and ON selects 1200 baud.

2.9.4 PARITY (31-38) The parity selection determines how the Model 820 KSR processes the error bit of the transmitted and received data. Parity is always added to transmitted data. The parity of received data is either checked or ignored according to the selected parity parameter. If the parity of received data is checked, an error is noted in one of two ways.Note that one (and only one) parity parameter must be enabled at all times.

31 — Transmit odd parity, do not check received data

32 — Transmit even parity, do not check received data

33 — Transmit odd parity, indication on error*

34 — Transmit even parity, indication on error*

35 — Transmit odd parity, indication plus printed symbol on error†

36 — Transmit even parity, indication plus printed symbol on error†

37 — Transmit mark parity, do not check received data

38 — Transmit space parity, do not check received data

***Indicator on error** — the audible tone is sounded, and an error code is displayed.

†**Indication plus printed symbol** — the audible tone is sounded, an error code is displayed, and the erroneous character is replaced with the symbol ⋰.

2.9.5 LINE CONTROL (61-64) The line control parameters provide several *line disconnect options* for use with modem communications modes. In all cases the Model 820 KSR accomplishes the disconnect by switching off *data terminal ready* (DTR) until *data set ready* (DSR) has been off for 3 seconds. These automatic line disconnect features are usually enabled when the Model 820 KSR is to be used in an unattended environment.

Note that any number of line control parameters may be enabled at any time.

61 — *Failsafe Disconnect*, when enabled, causes the Model 820 KSR to disconnect from the transmission line when certain abnormal conditions occur. The audible tone sounds momentarily, and a *failsafe disconnect* error code is displayed to the operator. The error display will be reset the next time the DSR signal comes on or the RESET key is actuated.

Failsafe disconnect occurs under the following conditions according to the communications mode:

Full-duplex

- No carrier received within 22 seconds after DSR switched on (wrong-number timeout).
- Carrier is off for 8 seconds after having been on (loss of carrier timeout).

Half-duplex

- Carrier is off for 22 seconds after DSR comes on unless the ABM autotrigger feature is enabled.
- Carrier is off for 8 seconds after a line turnaround character is transmitted.
- Clear to send (CTS) fails to switch on within 8 seconds after request to send (RTS) comes on.

Half-duplex with reverse channel

- Carrier is off for 22 seconds after circuit DSR comes on.
- Carrier is off for 8 seconds after a line turnaround character is transmitted.
- Carrier is off for 8 seconds after having been on, unless carrier turnoff was preceded by a transmitted "**break**" by the Model 820 KSR or receipt of a line turnaround character.
- CTS fails to come on within 8 seconds after RTS comes on (CTS timeout).

In all cases, the *failsafe* code is not displayed if DSR switches off before the specified timeout elapses, or if disconnect is preceded by receipt of the configured disconnect character or character sequence.

62 — *Disconnect on receipt of EOT* causes the Model 820 KSR to perform a line disconnect when the control character *EOT* is received.

63 — *Disconnect on receipt of DLE EOT* causes the Model 820 KSR to perform a line disconnect when the control character sequence *DLE EOT* is received.

64 — *Disconnect on paper-out or carriage jam (*when enabled) causes the Model 820 KSR to perform a line disconnect when the terminal detects either fault condition. If parameter 64 is disabled, a *busy* signal is issued when either condition occurs. The *busy* signal depends upon the communications mode:

- *Full-duplex* - timed break pulse (256-ms spacing signal) transmitted
- *Half-duplex* - no response possible; request to send will be held off following receipt of next line turnaround character
- *Half-duplex with reverse channel* - reverse channel is turned off

Enablng or disabling of parameter 64 has no effect upon the *busy* signal provided on the reverse channel when operating in one of the *console* modes (parameters 14 and 15); conversely, parameter 64 is unaffected by parameters 14 and 15.

2.9.6 TRANSMISSION CONTROL (71-72). The transmission control parameters provide automatic control of the *answer-back memory* (ABM). Note that any number of the transmission control parameters may be enabled at any time.

71 — *Auto-trigger ABM on connection* causes the programmed ABM message to be transmitted at the following times according to the enabled modem communications mode:

- *Full-duplex* - 1.28 seconds after both DSR and CTS switch on. RTS is switched on when DSR comes on. CTS ordinarily switches on simultaneously with the carrier.
- *Half-duplex* - similar to full duplex except that the carrier is tested when DSR comes on. If the carrier is off for 220 milliseconds, indicating that no carrier is being received, RTS is switched on and the ABM message is transmitted 1.28 seconds after CTS comes on. If the carrier is on within 220 milliseconds after DSR comes on, the Model 820 KSR remains in receive mode until the first line turnaround. The ABM message is then transmitted at the same 1.28-second delay after CTS switches on.
- *Half duplex with reverse channel* - identical to half duplex except that reverse channel must be received before the ABM message is transmitted.

NOTE

In both *half duplex* and *half duplex with reverse channel* the ABM should be programmed to include a line turnaround character as the last character of the message if it is intended that the Model 820 KSR is to revert automatically to receive mode after the ABM is transmitted.

72 — *Enable print of ABM* causes the contents of the ABM to be printed when the ABM message is transmitted and local copy is enabled, or when the *HERE IS* key is actuated and the terminal is off line.

2.9.7 TERMINAL CONTROL (81-89). The terminal control parameters enable use of certain special features of the Model 820 KSR. Note that any number of the terminal control parameters may be enabled at any time.

81 — *Enable device and format control from the communications line* permits use of the Device/Forms Control (DFC) option by the host system; when parameter 81 is disabled, recognition of the *ESC* sequences from the host system is inhibited.

82 — *Enable local copy of transmitted data* causes all transmitted characters, except *ENQ* and *ESC*, to be copied to the Model 820 KSR. Local copy may be enabled for any communications mode.

83 — *Transmit DC3 or BREAK on printer busy and DC1 or LTA when ready,* when enabled, causes transmission of a *busy* signal when the *receive FIFO* is within 64 characters of being full and a transmission of a *ready* signal when the receive FIFO is within 128 characters of being empty. The *busy/ready* response is determined by the communications mode as follows:

- *Full-duplex and console:*
  Busy - DC3 transmitted
  Ready - DC1 transmitted

- *Half-duplex:*
  No response possible

- *Half-duplex with reverse channel:*
  Reverse channel off at *busy*; if the carrier is still being received and no line turnaround character has been received at *ready*, reverse channel is switched on and operation continues. If the carrier has switched off before *ready*, RTS is switched on; at *ready* or when reverse channel comes on (whichever comes later), the first programmed line turnaround is transmitted, and RTS is switched off.

The status of configuration parameter 83 has no effect on the *ready/busy* signal provided on the reverse channel in the transmission modes selected by parameters 14 and 15. Similarly, parameters 14 and 15 have no effect upon the operation of parameter 83.

84 — *Do new line on receipt of LF* causes the terminal to respond to the receipt of the LF character by performing a carriage return *and* a line feed.

85 — *Do new line on receipt of CR* causes the terminal to respond to the receipt of the CR character by performing a carriage return *and* line feed.

86 — *Transmit CR LF when RETURN is entered* causes the terminal to transmit the CR and LF character sequence when CR is transmitted.

NOTE

Simultaneous enabling of parameter 84 or parameter 85 with parameter 86 will cause double line feeds on data transmitted with local copy enabled.

87 — *Print all control characters* causes all control characters to be printed (using the character font shown in Appendix A) to enable analysis of incoming data streams. The control functions normally associated with these characters, including printer control functions, will not be performed.

88 — *Set compress print only* provides a means of locking the printer in compressed print mode to prevent inadvertent changes of horizontal pitch which could result in printing beyond the right edge of the form.

NOTE

The optional compressed print feature must be installed to use this parameter; use of the compressed print parameter without the option will cause erroneous operation.

89 — *Set absolute right margin at column 80* prevents inadvertent printing beyond the right edge of the form when the Model 820 KSR is used in a network of 80-column format terminals.

2.9.8 PROGRAMMABLE PARAMETERS (ABM, LTA, ENTER). In addition to the previously described operating parameters, the Model 820 KSR offers three programmable parameters - the *answer-back memory* (ABM), the *line turnaround characters* (LTA), and the *ENTER key* (if the optional numeric keypad is installed). All three parameters may be programmed from the keyboard as required.

- *Answer-Back Memory* - The ABM is a unique terminal identifier which may be programmed from one to 21 characters long. Any combination of the 128 ASCII characters may be programmed in the ABM message.

- *Line Turnaround Characters* - The LTA characters provide control of the communications line when either half-duplex (parameter 11) or half-duplex with reverse channel (parameter 12) is used. At least one and no more than three of the 128 ASCII characters must be programmed when either of the half-duplex communications modes are selected.

- *ENTER Key* - The ENTER key on the optional numeric keypad may be programmed to generate a 1 , 2 , or 3 character sequence when the ENTER key is actuated. Any combination of the 128 ASCII characters may be used.

2.9.9 CONFIGURATION REPORT. A printed configuration report may be obtained as follows:

a. Ensure that the LINE/•/LCL switch is in the LCL position and that the CONFIGURE/OPERATE switch is in the OPERATE position.

b. Initiate the configuration report by pressing and holding the CTRL and SHIFT keys and then momentarily pressing the @/2 key; then release all keys.

c. Observe that a report of the form

NN;NN; . . . NNT

is printed. The terms *NN* correspond to the two-digit configuration codes which are currently active; i.e., the ***enabled*** parameters. The term *T* corresponds to the programmed line turnaround characters.

NOTE

The codes 60, 70, and 80 are never reported and the LTA, ABM, and ENTER key contents are not included in this report.

2.10 CONFIGURATION PARAMETER ENTRY

The selected configuration parameters are entered via the keyboard of the Model 820 KSR. This procedure, called ***configuring the terminal,*** is outlined in the following paragraphs in the recommended sequence.

2.10.1 INITIATE CONFIGURATION. To initiate configuration, proceed as follows:

a. Set the LINE/•/LCL switch to the LCL position (lower edge depressed).

b. Lift the terminal cover and set the CONFIGURE/OPERATE switch to the CONFIGURE position (toward the front of the terminal).

c. Close the terminal cover.

d. Observe the terminal status display: The left digit is the symbol ⊏ , indicating that the terminal is in the ***configure mode***; the center and right digits represent the configuration code corresponding to the first enabled configuration parameter.

2.10.2 REVIEW CURRENT CONFIGURATION. The current configuration (i.e., all enabled parameters) can be *reviewed* by using the TAB key. Each time the TAB key is pressed and released, the Model 820 KSR will display the next enabled configuration parameter (the ***next parameter*** is the one with the next higher configuration code or the lowest configuration code if none higher are enabled). Use of the TAB key in no way affects the current configuration.

2.10.3 ENABLE MUTUALLY EXCLUSIVE PARAMETERS. *Mutually exclusive parameters* are those which *must* be specified. The mutually exclusive parameters are

- Communications mode *codes* 11-15
- Communications rate *codes* 21-29
- Parity *codes* 31-38

To enable a new mutually exclusive parameter proceed as follows:

a. Type the two-digit code corresponding to the parameter to be enabled (see Table 2-1 for a list of configuration parameter codes, or refer to the *Operator Reference Cards*).

b. Momentarily press the RETURN key.

c. Listen for a short audible tone and ascertain that the code for the new parameter is displayed, signifying that the old parameter has been *replaced* with the new.

2.10.4 ENABLE ON/OFF PARAMETERS. The ON/OFF parameters are those which modify the operation of the terminal and are not required. Any number of the ON/OFF parameters may be enabled (or switched ON). The ON/OFF parameters are:

- The line control options, *codes* 61-64
- The transmission control (ABM) options, *codes* 71 and 72
- The terminal control options, *codes* 81-89.

To enable a new ON/OFF parameter proceed as follows:

a. Type the two-digit code corresponding to the parameter to be enabled.

b. Momentarily press the RETURN key.

c. Listen for a short audible tone and ascertain that the code for the new parameter is displayed, signifying that the new parameter is enabled. Note that no other parameter is affected.

2.10.5 DISABLE ON/OFF PARAMETERS. Any ON/OFF parameter that is currently enabled may be disabled (or switched OFF). To disable an ON/OFF parameter proceed as follows:

a. Type the two-digit code corresponding to the parameter to be disabled *or* press the TAB key until the code is displayed.

b. Momentarily press the DEL (delete) key.

c. Listen for a short audible tone and ascertain that the code for the next enabled parameter is displayed, signifying that the old parameter is disabled.

2.10.6 PROGRAM THE ABM, LTA, AND ENTER KEY. The programmable parameters are entered from the keyboard while in the CONFIGURE mode. To program the LTA, ABM, or ENTER key proceed as follows:

a. Type the code corresponding to the programmable parameter as follows:

60 - line turnaround (LTA) characters
70 - answer-back memory (ABM)
80 - ENTER key (optional numeric keypad must be installed).

b. Momentarily press the RETURN key.

c. Observe that the left digit of the TSD displays '-', signifying that the terminal is in the *programming mode*, and that the other two digits display '01', signifying that the first character of the programming sequence may now be entered.

d. Type any of the 128 ASCII characters. For each entry the count in the middle and right digits will increment by one, signifying that the entry has been accepted. The maximum number of characters which may be entered is three for the LTA, 21 for the ABM, and three for the ENTER key.

e. Terminate the programming sequence by (1) entering the maximum number of characters or (2) pressing the HERE IS key.

f. Listen for a short audible tone and ascertain that the left digit displays '-' and the other two digits display the code for the next enabled parameter, signifying that the programming sequence has been successfully completed.

NOTE

The key sequence **60** (or **70** or **80**), **RETURN, HERE IS** may be used to erase the corresponding programmable parameter.

2.10.7 CONFIGURATION ERRORS. Typing errors may be made during the configuration process. If an invalid code is entered via the keyboard, the terminal will emit a long audible tone and display the code '---'. To recover from this condition, type the correct code (or press the TAB key) and continue the configuration procedure. Note that no parameters are changed when a configuration error occurs.

2.10.8 TERMINATE CONFIGURATION. Before terminating the configuration mode, it is advisable to review the current configuration by pressing the TAB key to verify that the correct parameters are enabled. To terminate the configuration mode proceed as follows:

a. Lift the terminal cover.

b. Set the CONFIGURE/OPERATE switch in the OPERATE position (toward the rear of the terminal).

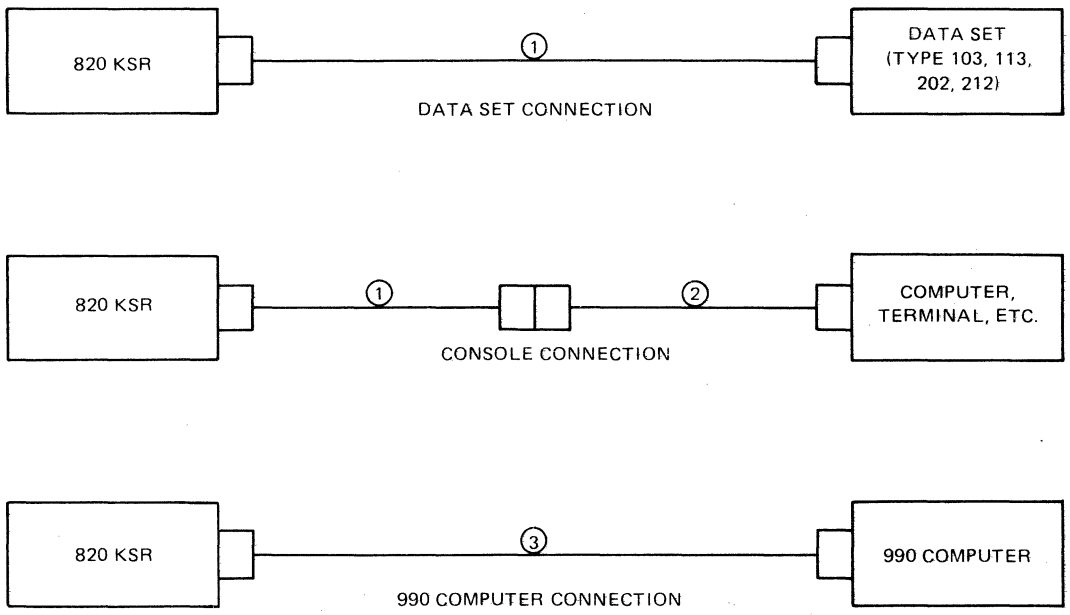
c. Close the cover.

d. Observe that the TSD displays the column number signifying that the terminal has calculated a checksum for the current configuration parametes and has stored the parameters and checksum in nonvolatile memory.

2.11 COMMUNICATIONS INTERFACE CABLE CONNECTION

The Model 820 KSR is shipped with a 1.8 meter (6 foot) communications interface cable (TI part number 0993205-0001) suitable for direct connection to Bell System type 103, 113, 202, and 212 data sets. To install the cable between the terminal and the data set, simply plug the cable into the appropriate receptacles and tighten the mounting screws.

Refer to Figure 2-8 for other communications interface cable connections.



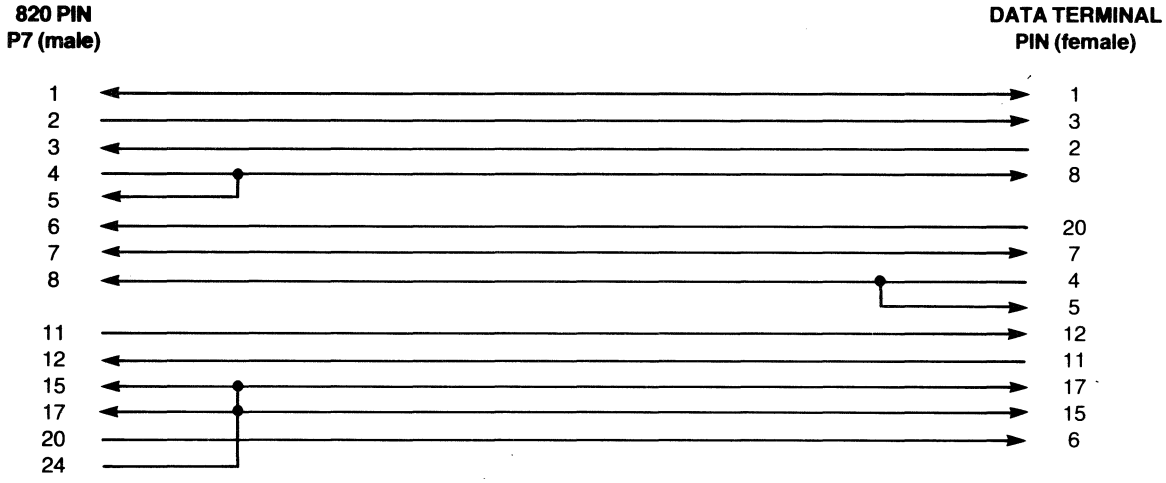
ITEM NO.	TI PART NUMBER	DESCRIPTION	LENGTH METERS	LENGTH FEET
1	0993205-0001	103/113/202/212 DATA SET CABLE(STANDARD)	1.8	6.0
2	0993210-0001	DATA TERMINAL CABLE	1.8	6.0
3	2262093-0001	990 TTY/EIA TO 820 CABLE	9.0	30.0
ALSO AVAILABLE	0993211-0001	EIA EXTENSION CABLE (25 WIRES)*	1.8	6.0

*MAY BE USED IN ANY CONNECTION

Figure 2-8. Communications Interface Cable Connections

Table 2-2. 113A/103, 202/212 Data Set Cable (TI Part No. 993205-0001)

820 Pin P6 - P7 (Male)	Data Set Pin (Male)	RS-232-C Circuit	Function
1	1	AA	Protective Ground
2	2	BA	Transmitted Data
3	3	BB	Received Data
4	4	CA	Request to Send
5	5	CB	Clear to Send
6	6	CC	Data Set Ready
7	7	AB	Signal Ground
8	8	CF	Received Line Signal Detector
11	11	SCA	Secondary Request to Send (Reverse Channel Transmit)
12	12	SCF	Secondary Received Line Signal Detector (Reverse Channel Receive)
20	20	CD	Data Terminal Ready
22	22	CE	Ring Indicator



REFERENCE:	PIN	EIA RS-232-C CIRCUIT	FUNCTION
(EITHER END)	1	AA	Protective Ground
	2	BA	Transmitted Data
	3	BB	Received Data
	4	CA	Request to Send
	5	CB	Clear to Send
	6	CC	Data Set Ready
	7	AB	Signal Ground
	8	CF	Data Carrier Detect
	11	SCA	Reverse Channel Transmit
	12	SCF	Reverse Channel Receive
	15	DB	Transmission Signal Element Timing
	17	DD	Receive Signal Element Timing
	20	CD	Data Terminal Ready
	24	AUXLIO	Auxiliary Input/Output Control

Figure 2-9. Data Terminal Cable (TI Part No. 0993210-0001)

SECTION III

OPERATION

3.1 INTRODUCTION

This section provides a complete functional description of the Model 820 KSR, including the use of all controls and indicators. Figure 3-1 shows the location of the major functional components of the terminal, including the *operator panel*, the *printer*, the *communications interface*, and the *operator reference cards*. Also discussed in this section is the operation of the various terminal *options*.

3.2 OPERATOR'S PANEL

The operator's panel, shown in Figure 3-2, may be considered as four sections: the *control panel*, the *typewriter keyboard*, the optional *numeric keypad*, and the *CONFIGURE/OPERATE switch*. The operation of each section of the operator's panel is described in the following paragraphs.

3.2.1 CONTROL PANEL. The control panel provides various switches to permit the operator to control th communications interface and the operation of the printer. Various indicators provide operating status information to the operator.

3.2.1.1 LINE/•/LCL Switch. This three-position rocker switch controls the communications interface as follows:

LINE — When the switch is set to LINE, the terminal is in the *LINE* mode (or on-line) and data may be interchanged with other devices in the system. Data received from the host system via the communications interface is printed, and data entered on the Model 820 KSR keyboard by the operator is transmitted to the host system via the communications interface.

•(standby) — When the switch is in the center position, the terminal is in the *STANDBY* mode and no data may be interchanged with the host system. Data received from the host system via the communications interface is ignored. Data entered on the Model 820 KSR keyboard by the operator is printed but not transmitted. When in the *STANDBY* mode, the Model 820 KSR will maintain connection to the host system (similar to a telephone on "hold").

LCL (local) — When the switch is set to LCL, the terminal is in the *LOCAL* mode and no data may be interchanged with the host system. Operation in the *LOCAL* mode is identical to the STANDBY mode, except that connection to the host system is not maintained.

3.2.1.2 VIEW/OFF Switch (Last Character Visibility). This two-position rocker switch controls the *last character visibility* feature of the Model 820 KSR. When set to the VIEW position, the printhead will move to the right to make visible the last character printed. A pointer on the left side of the printhead indicates the position where the next character will be printed. While the switch is in the VIEW position, the receipt of any printable character will cause the printhead to return to its previous position to print that character; after the character is printed, the printhead will again move to the right if no more characters are received within 1 second.

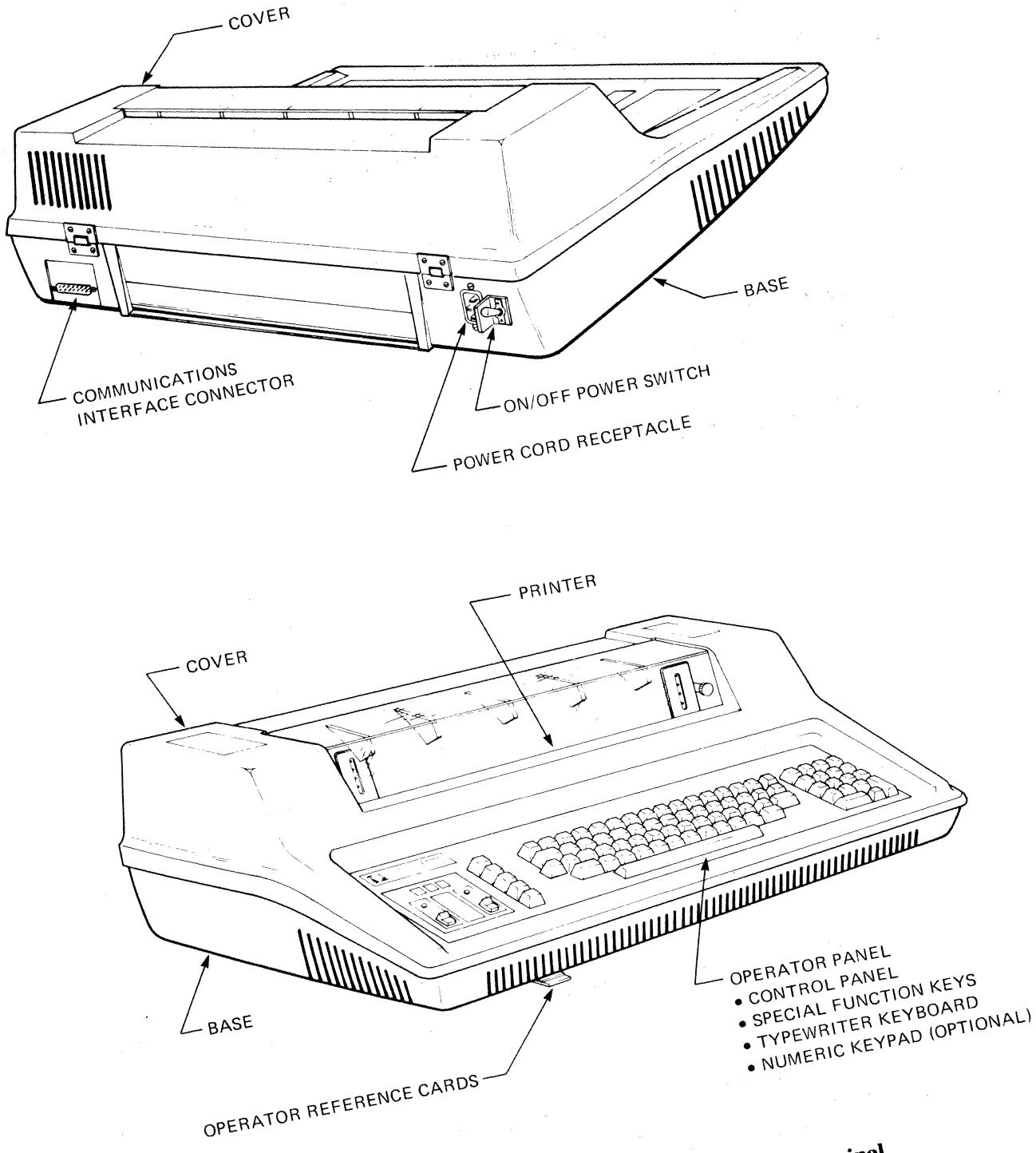


Figure 3-1. OMNI 800 Model 820 KSR Data Terminal

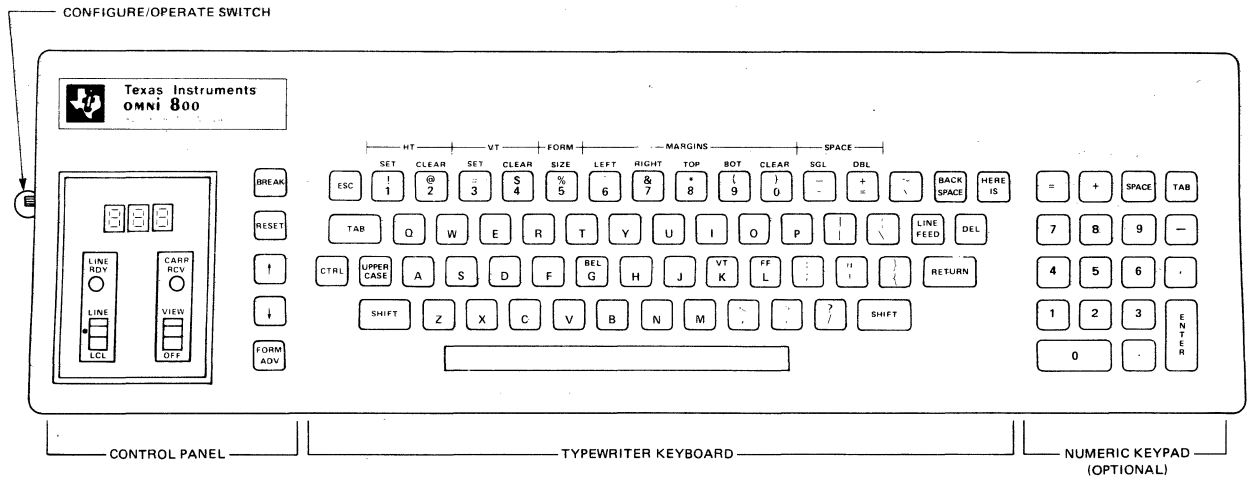


Figure 3-2. The Operators Panel

When the switch is placed in the OFF position, the printhead will return to its previous position to print the next character and will not move to the right to permit visibility of the last character.

NOTE

The pointer affixed to the printhead is accurate *only* when the printhead has moved to the right to allow last character visibility.

3.2.1.3 LINE RDY and CARR RCV Indicators. These two light-emitting-diode (LED) indicators provide operating status information for the communications interface. The LINE RDY (line ready) indicator shows the status of the data set ready (DSR) interface signal and the transmit circuitry; the CARR RCV (carrier received) indicator shows the status of the data carrier detect (DCD) interface signal. Table 3-1 defines the operation of these two indicators.

3.2.1.4 Terminal Status Display (TSD). This three-digit numeric display provides several operating indications, including *next character position, current line number, status,* and *configuration and programming modes*.

- *Next Character Position* - The TSD normally displays the next character position; that is, if a character was just printed in column 67, the TSD will display 068 . When indicating the next character position, the display will always show a number between 001 and 133.

- *Current Line Number* - If the device/forms control option is installed in your Model 820 KSR, the TSD can be converted from a next-character-position indicator to a current-line-number indicator. When used as a current-line-number indicator, the left digit of the TSD will be blank and the other two digits will contain a line number between 01 and 84.

- *Status* - The TSD functions as a status indicator when an error condition or a special operating condition exists. When operating as a status indicator, the TSD will flash on and off, the left digit will contain the symbol ⊐7, and the other two digits will display one of the status codes listed in Table 3-2.

Table 3-1. LINE RDY and CARR RCV Indicators

COMMUNICATION MODE	CARR RCV INDICATOR		LINE RDY INDICATOR		
	ON	OFF	FLASHING	ON	OFF
Half Duplex	Ready to Receive	Receive not ready; transmit available	In standby or transmit requested but not ready	Comm line ready	Comm line not connected
Full Duplex		Receive not ready; no carrier	In standby or data set failure		

Table 3-2. Status Codes

TYPE	CODE	DEFINITION	ACTION REQUIRED
I		Memory Failure	
	00	RAM memory	Equipment problem: Cycle power. If condition repeats, call for service.
	01	ROM memory I	
	02	ROM memory II	
	03	Nonvolatile memory	
II		Operator Correctable	
	10	Leaving configure mode with half-duplex set, but no LTA specified	Go to CONFIGURE mode and specify LTA character or set full-duplex operation.
	11	Carriage jam	Clear jam and reset
	12	Paper-out	Load paper and reset
III		Abnormal Communications	
	20	Clear-to-send timeout	Reset*
	21	Loss-of-carrier timeout	Reset*
	22	Wrong number timeout	Reset*
	23	Receive Buffer overflow	Reset†
	24	Parity error	Reset/Change Parity†
	25	Transmit buffer overflow	Reset†
	29††	Invalid EXC sequence from communications line	†
IV		Special Operating Mode	
	30	Keyboard locked	From line or reset
	31	Printer off	From line or reset
	39	Test in progress	Reset
V	⊐7 ⊐7	Operator Error Invalid ESC sequence from keyboard	Reset and type valid command sequence

*Automatically reset when data-set-ready comes on (repetition could indicate data set failure); associated with failsafe disconnect parame
†Automatically reset when status report transmitted per request from line: See DFC Option.
††This code is not displayed, but it is transmitted as part of the status report: See DFC Option.

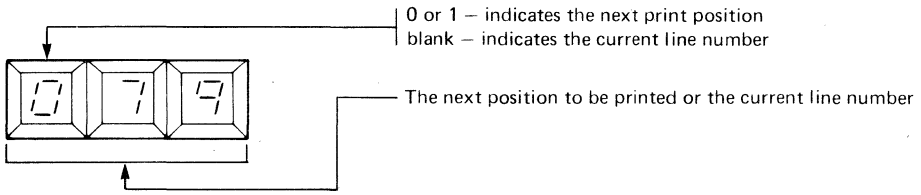
The status codes are prioritized in ascending numeric order; that is, code 00 is assigned the highest priority and 39, the lowest. When multiple status codes are active, the highest priority code (i.e., the lowest number) will be displayed until it is cleared by pressing RESET; then the next highest code will be displayed.

- *Configuration and Programming Modes*. Use of the TSD, in conjunction with the configuration and programming modes, is explained in paragraph 2.10. In summary, a ⊏ displayed in the left digit indicates the configuration mode, and a ⊔ displayed in the left digit indicates the programming mode.

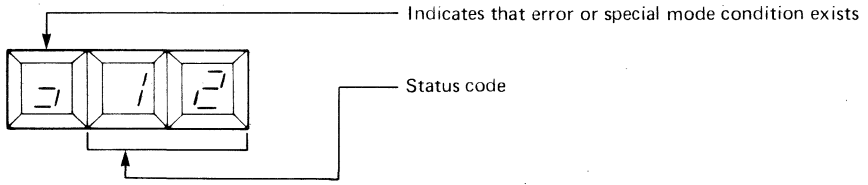
Table 3-3 summarizes the TSD functions.

Table 3-3. Interpreting Terminal Status Display (TSD) Functions

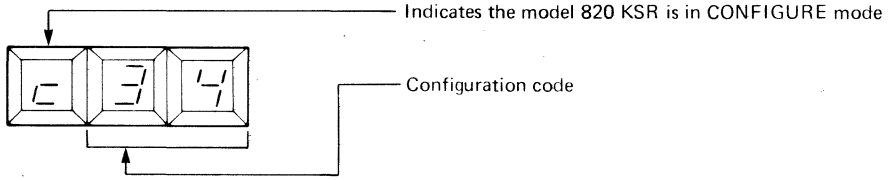
a. Print Column/Current Line Indicator



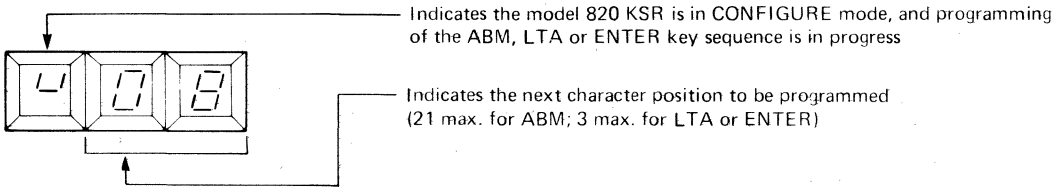
b. Status (Display Flashing)



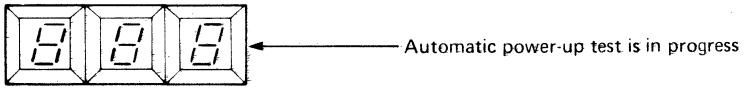
c. Configure Mode



d. Program Answer-Back Memory (ABM), Line Turnaround (LTA) Character(s), or ENTER Key Sequence



e. Indicator Test



3.2.1.5 Special Function Keys. The five momentary pushbuttons located on the control panel provide additional control of the printer and the communications interface.

- *BREAK*. The BREAK pushbutton enables the operator to signal the host system that an abnormal condition exists. When the BREAK key is pressed, the terminal generates a ***break*** signal for 256 milliseconds or until the key is released, whichever is longer. When the terminal is transmitting, the ***break*** signal is a SPACE condition on the transmitted data line; when the terminal is configured for half-duplex with reverse channel (parameter 12) and is receiving, the ***break*** signal is the reverse channel in the OFF condition.

- *RESET*. The RESET pushbutton enables the operator to acknowledge and clear errors detected by the terminal and to return the terminal to normal operation after a self-test has been initiated (see Section V of this manual for self-test instructions).

- ↑ and ↓. These pushbuttons permit the operator to make fine adjustments to the vertical paper registration. The ↑ key advances the paper in 0.5 mm (1/48 inch) steps; the ↓ key performs the reverse function.

- *FORM ADV*. This pushbutton permits the operator to advance the paper without generating or receiving a printer control code. If FORM ADV is pressed and released, the paper will advance one line and the printhead will remain in its present position. If FORM ADV is pressed and held (for longer than 0.25 second), the paper will advance to the top of the next form and the printhead will perform a carriage return.

3.2.2 TYPEWRITER KEYBOARD. The typewriter keyboard is capable of generating all 128 ASCII characters defined in Appendix B to this manual. The keyboard features n-key rollover interlocking to prevent erroneous code generation when two or more keys are pressed simultaneously. All keys on the keyboard except SHIFT, UPPER CASE, CTRL, and HERE IS generate a single character code when pressed.

3.2.2.1 Code Generating Keys. All code generating keys except ESC, TAB, DEL, and RETURN feature automatic-character-repeat operation that is, when a key is pressed for longer than 0.6 second, the associated character is generated at a 10 character per second rate until the key is released.

The code generated for a particular key is dependent upon the position of the four qualifier keys, SHIFT (2 keys), UPPER CASE, and CTRL, as follows:

- SHIFT - When this key is depressed while another key is pressed, uppercase alphabet characters A-Z are generated, and the top function marked on two-function keys is generated (e.g., SHIFT and !/1 generates !).

- UPPER CASE - When this alternate action switch is locked down, uppercase alphabet characters A-Z are generated. This switch affects only the alphabet keys.

- CTRL - When this key is depressed while another key is pressed, ASCII control characters are generated. Appendix A describes the control characters generated and their action.

3.2.2.2 HERE IS Key. When pressed, the HERE IS key causes the Model 820 KSR to transmit the answer-back memory (ABM) message if the ABM is programmed; HERE IS is ignored if the ABM is not programmed. Note that if the LINE/•/LCL switch is in the LCL position and parameter 72 is enabled, the ABM will be printed. Control characters in the ABM will be printed in the font shown in Appendix A.

3.2.3 NUMERIC KEYPAD OPTION. The numberic keypad option provides an additional 18-key cluster for use in high-volume number entry applications. The user-programmable ENTER key can generate a 1, 2, or 3-character sequence when pressed (see paragraph 2.10.6).

3.2.4 CONFIGURE/OPERATE SWITCH. This two-position slide switch is located on the left side of the operator panel under the terminal cover. When in the CONFIGURE position, the terminal operating parameters may be changed; when in the OPERATE position, the terminal functions normally. The correct position of this switch is shown in Figure 3-3.

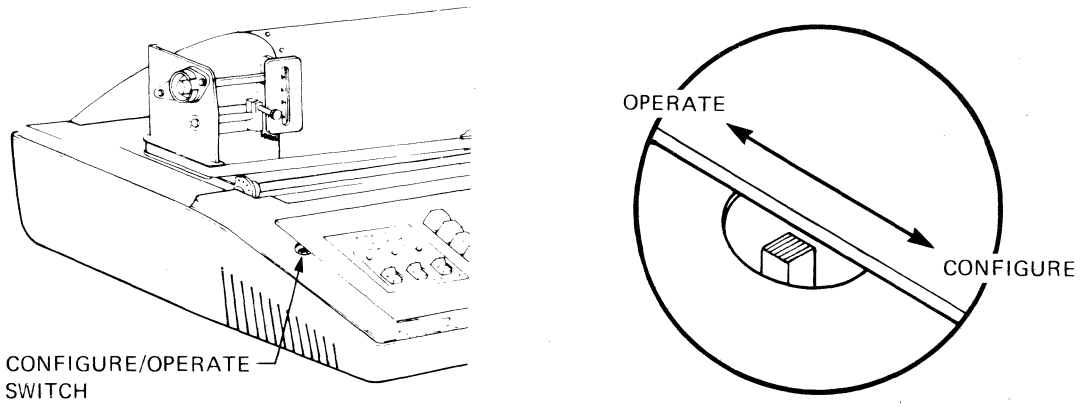


Figure 3-3. CONFIGURE/OPERATE Switch

NOTE

Before the CONFIGURE/OPERATE switch is set to the CONFIGURE position, the LINE/•/LCL switch must be set to the LCL position. If this condition is violated, the terminal will pulse the audible tone on and off until the above switch settings are made.

3.2.5 AUDIBLE TONE. The Model 820 KSR has an audible tone generator which produces a 3200 Hz (±500 Hz) signal at a sound pressure of 55 ±10 dB measured approximately 610 mm (2.0 feet) directly in front of the terminal. The operation of the audible tone is summarized in Table 3-4.

3.3 PRINTER

The printer is a serial, wire-matrix, impact mechanism which prints on conventional continuous-forms paper.

3.3.1 CHARACTER SET AND FONT. The 94 graphic symbols defined by ASCII plus a unique parity error symbol are printed in a nine-wide by seven-high matrix font as shown in Appendix A. When the 33 control characters are to be printed rather than acted upon (i.e., parameter 87 enabled), they are printed in the control symbol font shown in Appendix A.

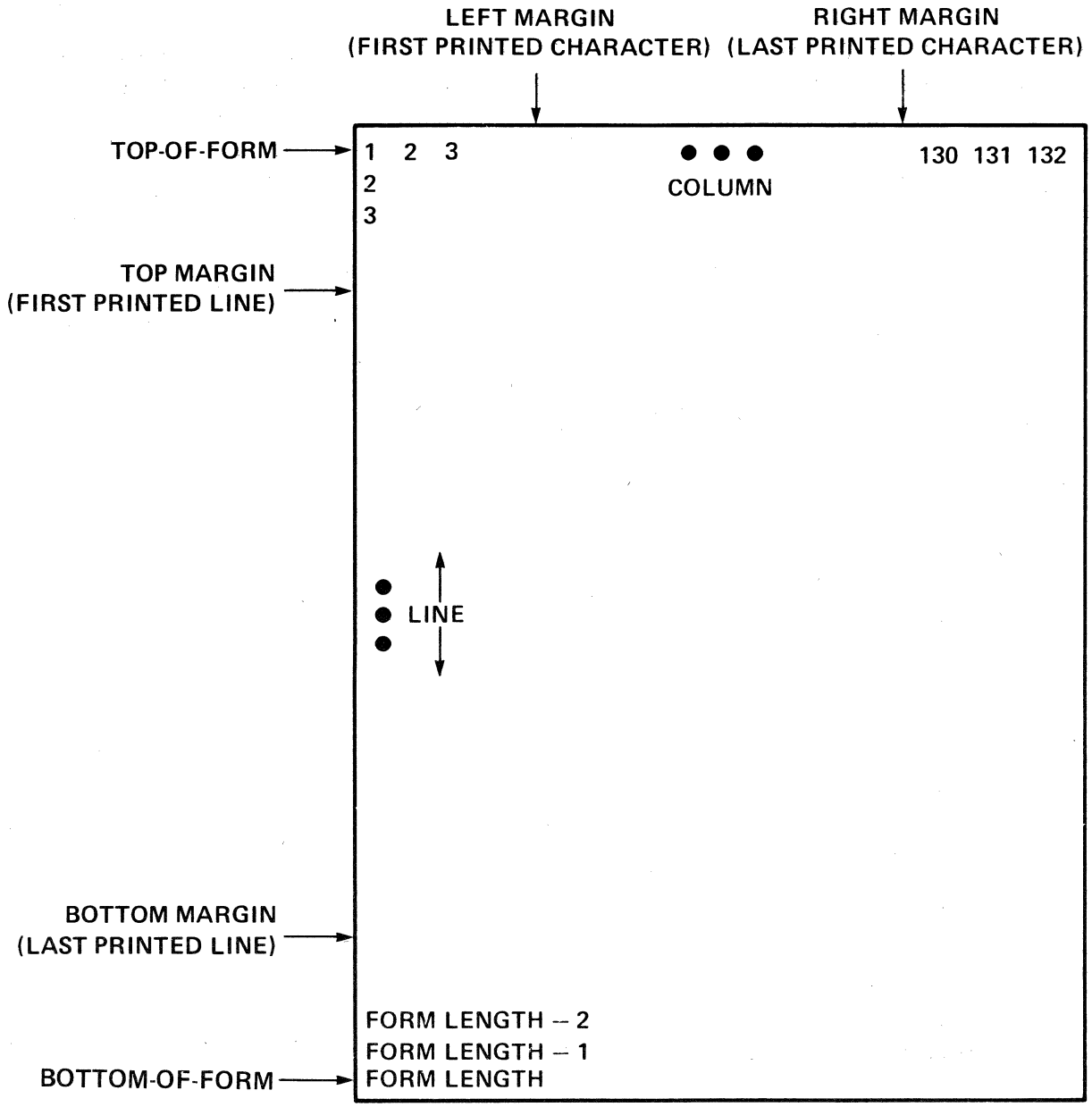
3.3.2 FORMAT PARAMETERS. To facilitate setting up the Model 820 KSR as a *forms printer*, the following *format parameters* are defined:

Form Length - The number of lines on a page based on 4.23 mm line spacing (6 lines per inch)
Top-of form - The first line on a page
Bottom-of-form - The last line on a page
Top margin - The first line which may be printed on a page
Bottom margin - The last line which may be printed on a page
Left margin - The first print position on a line
Right margin - The last print position on a line.

These format parameters are shown graphically in Figure 3-4.

Table 3-4. Audible Tone Operation

SIGNAL	EXPLANATION
Short Tone (80 milliseconds)	1. 8 character positions from right margin when typing OR 2. ASCII BEL character has been received OR 3. A configuration command has been accepted OR 4. Power-up test has been completed successfully
Repeated Short Tones	Invalid attempt to initiate or terminate CONFIGURE mode operation
Long Tone (1 second)	A new status code has been activated or an invalid configuration parameter entered.



TOP OF FORM = LINE 1
1 ⩽ FORM LENGTH ⩽ 84
1 ⩽ TOP MARGIN ⩽ BOTTOM MARGIN ⩽ FORM LENGTH
1 ⩽ LEFT MARGIN ⩽ RIGHT MARGIN ⩽ 132

DEFAULT VALUES (NO DFC OPTION)
BOTTOM MARGIN = FORM LENGTH = 66
TOP MARGIN = TOP OF FORM = 1
LEFT MARGIN = 1
RIGHT MARGIN = 132 (OR 80, IF CONFIGURED)

Figure 3-4. Format Parameters

3.3.3 END-OF-LINE ALARM. The audible tone sounds momentarily when the printhead reaches the eighth print position before the right margin. The tone functions only on keyboard-entered data and is silenced on received data.

3.3.4 PRINTER OPERATION. The printer is controlled by the data received either from the communications interface or from the keyboard. Two types of data may be received: *printable characters* and *control characters*.

3.3.4.1 Printable Characters. The receipt of printable characters causes those characters to be printed in the sequence received. Up to 132 characters can be printed on a single line.

3.3.4.2 Automatic New Line. After a character is printed in the column position defined as the *right margin,* the terminal will automatically print the next character in the column position defined as the *left margin* of the *next line*. This feature is called *automatic new line*.

3.3.4.3 Control Characters. There are 33 control characters defined by ASCII. Although the Model 820 KSR is capable of generating and transmitting all 33 control characters, it responds only to those listed below:

BS Backspace - moves the printhead one character space to the left. BS is ignored if the printhead is at the left margin.

CR Carriage return - causes the next printable character to be printed in the character position defined as the left margin. CR also advances the paper one line space if the appropriate *new line* feature is configured (parameter 85 enabled). CR also will cause CR and LF to be transmitted if the appropriate feature is configured (parameter 86 enabled).

FF Form feed - positions the printhead to the top-left margin of the next page.

LF Line feed - advanced paper one line space. If LF advances paper beyond the bottom margin, the paper will advance to next top margin. LF also will cause a carriage return if the appropriate *new line* feature is configured (parameter 84 enabled).

BEL Bell - sounds the audible tone generator for 80 milliseconds.

HT Horizontal tab - if the Device/Forms Control (DFC) option is installed, HT advances the printhead to the next tab stop. With no tabs set between the present print position and the right margin, a horizontal tab is treated as a carriage return/line feed so that the next printable character will appear at the left margin of the next line. HT is ignored if the DFC option is not installed.

S0 Shift out - selects an alternate character set, such as APL, for printing. S0 is ignored if an alternate character set option is not installed.

DC1 Device control 1 - is transmitted by the terminal to indicate *buffer ready* if parameter 83 is enabled.

DC3 Device control 3 - is transmitted automatically to indicate *buffer full* if parameter 83 is enabled. DC3 is ignored when received.

ENQ Enquiry - receipt activates the answer-back memory (ABM) if an ABM is programmed. In half-duplex operation transmission of ENQ or receipt of ENQ followed by loss of carrier initiates a line turnaround if, and only if, the ABM is programmed.

EOT End-of-transmission - used as a disconnect character if parameter 62 or 63 is enabled; otherwise EOT is ignored.

DLE Data link escape - receipt of DLE followed by EOT initiates disconnect if parameter 63 is enabled; otherwise DLE is ignored.

ESC Escape - identifies the subsequent character or character sequence as a terminal command if the DFC option is installed. ESC is ignored if the DFC option is not installed.

3.3.5 SETTING THE TOP-OF-FORM. The top-of-form is established as follows:

a. Press and hold the FORM ADV key for longer than 1/4 second to advance the paper and initialize the line count to one.

b. Use the ↑ and ↓ keys as required to position the paper so that line one (the top-of-form) can be printed. (Do not use the LINE FEED key because the line count will be incorrect.)

NOTE

It may be easier to open the tractor flaps and move the paper to the approximate position required before using the ↑ and ↓ keys.

3.3.6 PAPER-OUT CONDITION. When the paper supply is exhausted, the terminal will cease printing, sound the audible tone, and display an error code. The remainder of the form currently being printed may be completed by pressing the RESET switch once for each line to be printed (if this is done, the error condition display will remain on). When the current form is completed, it may be ejected by depressing the FORM ADV switch (for longer 1/4 second) and a new box of forms installed. Pressing the RESET pushbutton after loading new paper will clear the error condition.

3.3.7 MECHANISM FAILURE DETECTION. The control electronics constantly monitors a tachometer signal from the carriage drive motor and determines the response of the carriage to positioning commands. If a high friction condition or obstruction is detected, printing will be inhibited, the audible tone will sound, and a *mechanism failure* code will be displayed by the TSD.

If the terminal has been configured to issue a BREAK signal or to disconnect when a paper-out conditions occurs, the same action will be taken when a mechanism failure occurs.

3.3.8 DATA BUFFERING AND PRINTER THROUGHPUT. All data to be printed by the Model 820 KSR is passed through a first-in-first-out buffer memory (FIFO) which has a maximum capacity of 640 characters. The Model 820 KSR monitors the number of characters stored in the FIFO and selects an appropriate print mode accordingly.

When only one or two characters are stored in the FIFO, as would occur during keyboard entry, the printer functions incrementally, printing one character at a time. Operation is unidirectional; that is, characters are printed from left to right with a carriage return and line feed at the end of each line.

If the number of characters stored in the FIFO increases, as would occur when receiving continuous data from a 300-baud line, the printer switches to a continutous unidirectional mode. No fill characters are required after carriage return, line feed, or tab commands since the print speed is adequate to prevent overflowing the FIFO at data rates up to 300 baud.

If the number of stored characters increases to the point where more than one line is waiting in the FIFO to be printed, the printer switches to a high speed bidirectional mode. In this mode data is printed one line at a time. At the end of each line, the printhead is positioned to print the next line either forward or backward, whichever direction will require the lesser time.

In the bidirectional mode the printer will "keep up" with a continuous 1200-baud data stream without FIFO overflow, provided the average line length is 29 characters or longer. Maximum throughput for full 132-column lines is 60 lines per minute.

The terminal may be configured (parameter 83 enabled) to transmit a ***busy*** signal when there is a danger of buffer overflow, followed by a ***ready*** signal when the printer overtakes the incoming data. ***Busy*** is transmitted when fewer than 64 vacant character spaces remain in the buffer, and ***ready*** is transmitted when fewer than 128 characters remain in the buffer. If buffer overflow occurs, the audible tone will sound, and an error code will be displayed.

Busy and *ready* signals depend upon the communications mode, as explained in Section II.

3.4 COMMUNICATIONS INTERFACE

The communications interface provides the method by which the Model 820 KSR interchanges data with the host system.

3.4.1 INTERFACE SIGNALS. The communications interface signals conform to the electrical requirements of EIA Standard RS-232-C and C.C.I.T.T. Standard V24. Table 3-5 lists the signals provided at the Model 820 KSR communications interface. A functional description of each interface signal is given in the following paragraphs.

- *Protective Ground (AA)* - This lead is connected to the terminal frame and earth ground conductor of the power cord.

- *Signal Ground (AB)* - Tied to the dc ground of the terminal power supply, this lead establishes the common ground reference for all interface signals.

- *Transmitted Data (BA)* - This lead conveys signals from the terminal data transmitter output to the data set transmitter circuitry. It is held to a MARKING condition when no data or break signals are being transmitted.

- *Received Data (BB)* - This lead conveys signals from the external data set receiver to the terminal data receiver input.

Table 3-5. Interface Signals

CONNECTOR PIN NUMBER	EIA	C.C.I.T.T.	EIA NAME
1	AA	101	Protective Ground
2	BA	103	Transmitted Data
3	BB	104	Received Data
4	CA	105	Request to Send
5	CB	106	Clear to Send
6	CC	107	Data Set Ready
7	AB	102	Signal Ground
8	CF	109	Received Line Signal Detector
11	SCA	118	Secondary Request to Send
12	SCF	119	Secondary Received Line Signal Detector
20	CD	108	Data Terminal Ready
22	CE	125	Ring Indicator

Request to Send (CA) - This line is used by the terminal to control the transmitter carrier of the data set. ***Request to send*** is held on at all times when the terminal is configured for full-duplex operation and circuit CC (***data set ready***) is on. For half-duplex operation ***request to send*** is controlled by the configured line turnaround character and reverse channel options as well as the ***paper-out*** response and buffer response options.

- *Clear to Send (CB)* - This line is switched on by the data set to indicate to the terminal that the data set is ready to transmit. The terminal will not attempt to transfer data across the interface when ***clear to send*** is off.

- *Data Set Ready (CC)* - This line is switched on by the data set to indicate that a connection has been established. The terminal will not attempt to receive or transmit data across the interface when ***data set ready*** is off.

- *Data Terminal Ready (CD)* - This line is switched on by the data terminal to indicate that it is ready to receive a call. Operation depends upon the position of the LINE/•/LCL switch, the configured *paper-out* response, and the configured disconnect features.

- *Ring Indicator (CE)* - This line is switched on by the data set to indicate that a ringing signal is being received on the communications line. This signal is not used by the Model 820 KSR terminal.

- *Received Line Signal Detector (CF)* - This line, also called ***data carrier detect,*** is switched on by the data set to indicate that it has received a valid carrier signal from the remote data set. The terminal will not accept data from the interface if this signal is off. The CF Line (and no other) is regarded as on when open (floating) to permit operation with data sets such as the Bell System 113 series, which do not provide circuit CF.

- *Secondary Request to Send (SCA)* - This line, also called *transmitted reverse channel,* is held on by the terminal to switch on the reverse channel transmitter of a Bell System 202-compatible data set equipped with a reverse channel option. The transmitted reverse channel indicates that the terminal is ready to receive data when operating in the half-duplex with reverse channel communication mode (parameter 12). The SCA signal is switched off at line turnaround or when a *break* signal is transmitted in response to BREAK key actuation or the configured paper-out or buffer response features.

  This output is also used as a terminal *ready/busy* indication for full-duplex mode in console applications (parameter 14 or 15).

- *Secondary Received Line Signal Detector (SCF)* - This signal, also called *received reverse channel*, has a dual function, depending on the external data set. It is held on by Bell System 202-series data sets to indicate receipt of a valid reverse channel carrier from a remote data set. When the terminal is configured for the reverse channel feature, it will not transmit data until reverse channel is received. The terminal will treat a loss of reverse channel which exceeds 112 milliseconds as a *break* signal and will perform a line turnaround from transmit to receive mode.

  Bell System 212-compatible data sets use the SCF signal as a baud rate indicator, holding the signal ON for 1200 baud operation and OFF for 300 baud. The terminal may be configured to adjust transmit and receive data rates automatically in response to this signal (parameter 29).

3.4.2 INTERFACE SIGNAL LEVELS. When it is ON, a control line carries a positive voltage between +3 and +25 volts. When the line potential changes to a negative voltage between −3 and −25 volts, the line is considered to be OFF. The digital data exchanged between the Model 820 KSR and an external data set consists of a series of logic ONE and ZERO signals. A logic ONE, called a *MARK,* is indicated by a negative voltage between −3 and −25 volts. A logic ZERO, called a *SPACE*, is indicated by a positive voltage between +3 and +25 volts.

In summary, a positive voltage on a *control line* is an ON condition; but a positive voltage on a *data line* represents a SPACE or logic ZERO. A *negative* voltage on a control line is an OFF condition, but on a data line a negative voltage represents a MARK or logic ONE.

3.4.3 LOCAL MODE. When the LINE/•/LCL switch is in the LCL position, the Model 820 KSR terminal is in the *local mode*. In the local mode the terminal operates as follows:

1. No data is exchanged with the host system.

2. The interface signal *data terminal ready* is switched OFF.

3. Data entered on the keyboard is echoed to the printer.

3.4.4 STANDBY MODE. When the LINE/•/LCL switch is in the center position (•), the terminal is in the *standby mode*. In the standby mode the terminal operates as follows:

1. No data is exchanged with the host system.

2. The interface signal *data terminal ready* is maintained in its current state; that is, if the signal is ON it will remain ON, if it is OFF it will remain OFF.

3. Data entered on the keyboard is echoed to the printer.

NOTE

The terminal does not signal the host system when the terminal is placed in standby mode.

3.4.5 LINE MODE. When the LINE/•/LCL switch is in the LINE position, the terminal is in the *line mode* or *on-line*. In the line mode the terminal operates as follows:

1. Data is exchanged with the host system in accord with the configured communications mode as explained in the following paragraphs.

2. The interface signal *data terminal ready* is switched ON.

3. Data entered on the keyboard is transmitted if a call is in progress.

3.4.5.1 Full-Duplex Operation. In full-duplex mode the transmit and receive circuits are independent. The terminal operator initiates communications mode operation by setting the LINE/•/LCL switch to the LINE position, which switches on the *data terminal ready* (DTR) line. The DTR line must be ON before the external data set may switch the *data set ready* (DSR) line ON. When ready to exchange data with a remote device, the external data set will switch on the DSR line. If the terminal does not detect a DSR signal, it will wait (the keyboard is disabled while the terminal is waiting) until DSR switches ON.

The Model 820 KSR terminal switches on the *request to send* (RTS) line as soon as it detects that the DSR line has been switched on by the external data set. At the same time the Model 820 KSR causes the LINE RDY indicator on the operator control panel to start flashing.

To begin the actual data exchange two signals are now required: *data carrier detect* (also called *received line signal detector*) and *clear to send*. The receive circuit requires the *data carrier detect* (DCD) signal to be ON to begin operation, and the transmit circuit requires the *clear to send* (CTS) line to be ON. Although the receive and transmit sequences occur simultaneously, each sequence is described separately in the following discussion.

Transmit Sequence. The Model 820 KSR terminal must receive a *clear to send* (CTS) signal from the external data set before it can transmit data. After CTS switches ON, the LINE RDY indicator on the operator control panel will stop flashing and glow steadily. The terminal then can transmit data entered from the keyboard to the external data set via the *transmitted data* (TD) line. Each character then is transmitted as it is received from the keyboard. The data on the TD line enters the data set where it is modulated for tranmsission over the telephone line. Transmission of data may continue as long as characters are entered from the keyboard or until either the CTS or DSR signal is lost.

If the CTS line goes OFF, the LINE RDY indicator on the control panel will begin flashing and any character being tranmsitted will be completed, but no new characters will be transmitted until CTS switches back ON. Any characters entered via the keyboard while CTS is off are stored in a 32-character first-in-first-out (FIFO) buffer. The characters in the FIFO buffer will be transmitted when CTS switches back ON. After 32 characters are entered into the buffer with CTS OFF, an alarm will sound when entry of the 33rd character is attempted. An error code 25 will be displayed on the terminal status display (TSD) of the control panel, and the last character entered will be lost.

If DSR goes off, indicating that the call has been disconnected, the terminal LINE RDY indicator will extinguish and any characters remaining in the transmit FIFO buffer will be lost. The Model 820 KSR will respond to the loss of DSR by switching off RTS and DTR. DTR will remain off until DSR has been off for 3 seconds; DTR will then be switched on to prepare the data set for the next call.

Receive Sequence. The *data carrier detect* (DCD) line from the external data set must be ON for the terminal to receive data on the *received data* (RD) line. When DCD is detected by the terminal, the CARR RCV indicator on the control panel will light. If the DCD line switches off, the CARR RCV indicator will extinguish and the terminal will stop receiving data until DCD comes ON again.

3.4.5.2 Half-Duplex (Without Reverse Channel) Operation. When the Model 820 KSR is operating in the half-duplex mode, data communications can take place in only one direction at a time. That is, when the Model 820 KSR terminal is transmitting in half-duplex mode, the remote unit must be in *receive* mode. Likewise, when the Model 820 KSR terminal has completed transmission and is ready to receive data from the remote unit, a method is required to inform the remote unit to terminate receiving and begin transmitting.

The control of a remote receiving device by the transmitting unit is referred to a *line control*. Line control in a half-duplex system is accomplished by the use of a *line turnaround character*. When the Model 820 KSR receives a turnaround character, it switches from the receive mode and begins to transmit data to the remote terminal. In a half-duplex system it is the responsibility of the transmitting unit to provide a turnaround character upon completion of transmission. The *receiving* unit has no control of the communications lines until it receives a turnaround character and becomes the *transmitting* unit.

The Model 820 KSR can be configured to recognize any of three different turnaround characters at any given time. Any of the 128 ASCII characters may be assigned as a turnaround character. If an answer-back memory (ABM) message has been programmed, the control character ENQ is also treated as a turnaround character.

The operator initiates communications mode operation by setting the terminal LINE/•/LCL switch to the LINE position. This causes the *data terminal ready* (DTR) line to switch on, informing the external data set that the Model 820 KSR is ready to exchange data. When the data set switches on the *data set ready* (DSR) line, indicating the establishment of a call, the Model 820 KSR begins to monitor the *data carrier detect* (DCD) line to determine if it should switch to the receive mode. If the operator enters a keyboard character before DCD is received, the Model 820 KSR will switch to the transmit mode.

If the external data set switches the DCD line ON, indicating a carrier present on the communications line, the Model 820 KSR will switch to the receive mode, the CARR RCV indicator will illuminate, and the LINE RDY indicator will remain lit.

The Model 820 KSR will remain in the receive mode until it receives a turnaround character on the *received data* line or the call is disconnected. It is not the responsibility of the external data set to detect the line turnaround character. The data set will send the character to the Model 820 KSR along with all other characters on the data line. The Model 820 KSR is responsible for recognizing the turnaround character and for acting upon it.

When the Model 820 KSR detects a *line turnaround character*, the receive circuits are disabled, the CARR RCV indicator extinguishes, and the RTS line is switched on. The LINE RDY indicator on the control panel will begin to flash until the external data set switches on the CTS line. After the CTS line is switched on, the LINE RDY indicator will glow steadily.

The terminal will remain in the transmit mode until a line turnaround character is transmitted. It is the responsibility of the transmitting party to ensure that the last character of a message is a line turnaround character.

3.4.5.3 Half-Duplex with Reverse Channel Operation. Half-duplex-with-reverse-channel operation is similar to half-duplex, except a low-frequency secondary channel, (commonly referred to as the *reverse channel*) is added. In a half-duplex system the transmitting unit controls the unit that is receiving. In a half-duplex with-reverse-channel system, the receiving unit can also cause a line turnaround by use of the reverse channel.

Additional control lines are used in half-duplex-with reverse-channel communications. The two reverse channel lines are *secondary received line signal detector* (circuit SCF) and *secondary request to send* (circuit SCA). When the Model 820 KSR switches on the *reverse channel SCA* line, it is received by the remote unit as a *reverse channel SCF* signal. Likewise, when the remote unit switches on the *reverse channel SCA* line, it is received by the Model 820 KSR as a reverse channel SCF signal.

No officially recognized standard exists to specify use of the reverse channel. The Model 820 KSR terminal sequence of events for reverse channel operation is described below.

Initiation of half-duplex data communications with reverse channel is identical to the half-duplex described in paragraph 3.4.5.2. When the LINE/•/LCL switch is set to LINE, the Model 820 KSR switches on the DTR line and waits for a DSR signal from the external data set. When the Model 820 KSR detects the DSR from the data set, the Model 820 KSR enters an idle state until the necessary parameters are detected to enable the Model 820 KSR to switch into either the *transmit* or *receive* mode.

Transmit Sequence. Pressing of the code-generating keys on the terminal keyboard before the DCD line switches ON will cause the Model 820 KSR terminal to enter the transmit mode. The terminal will switch on RTS and wait for CTS and reverse channel SCF to switch on. Any data entered from the keyboard before CTS and reverse channel SCF switches on is stored in the 32-character FIFO transmit buffer of the Model 820 KSR. After RTS, CTS, and reverse channel SCF come ON, the LINE RDY indicator will light and the terminal is ready to transmit data via the transmitted data (TD) line.

When transmitting, the Model 820 KSR checks the reverse channel SCF before it sends each character. If reverse channel SCF switches off, the Model 820 KSR will hold the transmitted data line at a MARK state

and start a time-out. If the reverse channel SCF line returns to an ON condition within 112 milliseconds, the Model 820 KSR will resume transmission of the characters stored in its transmit FIFO buffer. If reverse channel SCF remains off for longer than 112 milliseconds (indicating that the receiving unit has initiated a line turnaround), the terminal will switch to the receive mode: The Model 820 KSR terminal will switch off the RTS line, and any characters remaining in the transmit FIFO buffer will be lost.

Receive Sequence. When the Model 820 KSR terminal switches to the receive mode, it switches on the *reverse channel transmit SCA* (secondary request to send) line. When the external data set switches on the DCD line, the Model 820 KSR begins to accept data until it receives a line turnaround character. The terminal operator may intentionally initiate a line turnaround by pressing the BREAK key.

When the BREAK key is pressed, the terminal will respond by switching off the *reverse channel SCA* line. The terminal will continue to accept data from the received data (RD) line until the DCD line switches off. The terminal will also monitor the *reverse channel receive SCF* (secondary received line signal) line following a turnaround from receive to transmit mode. If the reverse channel SCF does not switch on within 8 seconds after the terminal switches on the RTS line, the RTS line will be switched off, the reverse channel SCA will switch back on, and the Model 820 KSR terminal will return to the receive mode.

3.4.5.4 Console Operation. The console modes of operation are provided for hard-wired (back-to-back), high-speed applications that do not use a data set. The console modes should not be used in conjunction with a data set; conversely, data set modes cannot be used for hard-wired applications.

The console full-duplex mode operates generally the same as the data set full-duplex mode, except that no timing constraints are placed on the communication interface and the *ready/busy* status is reported via the *reverse channel transmit* (SCA) line. The EIA control lines DCD and DSR must be ON for the Model 820 KSR to receive data. The control lines DSR and CTS must be ON for the Model 820 KSR to transmit data. The Model 820 KSR maintains DTR and RTS in an ON condition.

3.5 OPTIONS

Operation of the various Model 820 KSR options is explained in this section.

3.5.1 DEVICE/FORMS CONTROL (DFC). The *device/forms control* option provides the terminal the capability to recognize special commands (ESC sequences) and to perform two classes of functions:

- Extended device control
- Forms control.

In addition, the DFC option provides the capability to evaluate the ASCII control characters HT (horizontal tabulation) and VT (vertical tabulation).

Two sets of DFC commands are implemented. The first set contains those commands most frequently used by the *operator*. These commands typically require only two entries from the keyboard - ESC plus another key. (The keyboard bezel is engraved with a legend which identifies most of the commands in this set.) The second set of commands is intended to be received from the communications interface in the *received data*

but also may be entered from the keyboard. Table 3-6 lists the device control commands and Table 3-7 lists the forms control commands. (Refer to paragraph 3.3.2 for a definition of the format parameters.)

NOTE

Configuration parameter 81 must be enabled before ESC sequences will be recognized in the received data.

Table 3-6. Device Control Commands

COMMAND TYPE	COMMAND SEQUENCE (ESC FOLLOWED BY:)		COMMAND DEFINITION
	KEYBOARD ENTRY	RECEIVED DATA	
PRINTER CONTROL	— = > <	PA\ PB\ PC\ PD\ PE\ PF\	Set single space print (6 lines/inch) Set double space print (3 lines/inch) Set standard width print (10 char/inch) Set compressed width print (16.5 char/inch)* Turn printer OFF (DO NOT print received data0 Turn printer ON (print received data)
DISPLAY (TSD) CONTROL	LINE FEED Space bar		Set terminal status display = current line Set terminal status display = next column
KEYBOARD CONTROL		` b	Lockout the keyboard Unlock the keyboard
REPORT CONTROL		[c [n	Transmit configuration report† Transmit status report†

*Do not issue a command to set compressed print unless the compressed print option is installed; erroneous terminal operation will result.
†Transmitted Reports Have the Following Formats:
Configuration: ESC[820;C1;C2;....;CNcX
Status: EXC[820;C1;C2;....;CNnX
Where C is a 2 Digit Configuration/Status Code
And X Represents the LTA Character (If Present)

3.5.2 COMPRESSED PRINT. The *compressed print* option provides printing at a 16.5 characters per inch (CPI) pitch in addition to the standard 10 CPI pitch. The 16.5 CPI pitch permits printing full 132-column lines on 215.9 mm (8.5 inches) wide forms. (Maximum line length is 132 columns, regardless of pitch).

With the compressed print option installed compressed printing may be selected from the keyboard as part of the configuration procedure by enabling parameter 88. If the *device/forms control* option is installed, pitch also may be selected using the appropriate ESC sequences entered from the keyboard or received from the communications line, provided the terminal is not configured with the parameter 88 set (compressed print only). For satisfactory operation horizontal pitch changes should be made only at the beginning of a new print line.

IMPORTANT NOTE

Selecting compressed print operation, either by configuration code or DFC command, on a terminal without the compressed print option will cause abnormal printing operation.

Table 3-7. Forms Control Commands

COMMAND TYPE	COMMAND SEQUENCE (ESC FOLLOWED BY:) KEYBOARD ENTRY	RECEIVED DATA	COMMAND DEFINITION
FORMS	5N;	[Nt	Set top of form at present line with N = form length (1 to 84)
	5;		Set top of form at present line
	50;		Set bottom of form at present line
FORMS MARGINS	6		Set left margin at present column
	7		Set right margin at present column
	8		Set top margin at current line
	9		Set bottom margin at current line
	0		Set left margin at column 1; set right margin at column 132*; set top margin at line 1 and set bottom margin = FORM LENGTH.
		[Nr	Set top margin at line N (N = 1 to 84)
		[;Mr	Set bottom margin at line M (M = 1 to 84)
		[N;Mr	Set top margin at line N, bottom margin at line M ($1 \leq N \leq M \leq 84$)
		[Ns	Set left margin at column N (N = 1 to 132)
		[;Ms	Set right margin at column M (M = 1 to 132)
		[N;Ms	Set left margin at column N, right margin at column M ($1 \leq N \leq M \leq 132$)
HORIZONTAL TABULATION	1	H	Set TAB stop at present column
		[M_1;...;M_nu	Set TAB stops at columns indicated by M_1 to M_n (M = 1 to 132; $n \leq 16$)†
	2	[0g	Clear TAB stop at present column
		[2g	Clear all horizontal TAB stops
		[M`	TAB right to column M (M = 1 - 132)
		[Ma	TAB M columns to the right (M = 1 - 132)
VERTICAL TABULATION	3	J	Set TAB stop at current line
		[N_1;...;N_nv	Set TAB stops at lines indicated by N_1 to N_n (N = 1 to 84; $n \leq 16$)†
	4	[1g	Clear TAB stop at current line
		[4g	Clear all vertical TAB stops
		[Nd	Advance to line N (N = 1 to 84)
		[Ne	Advance N lines from current line (N = 1 to 84)

*If configuration parameter 89 is enabled, the right margin is set at column 80.

†Although the maximum number of tab stops which may be set with a single command is 16, tab stops may be set at all locations by using multiple commands.

3.5.3 USER-DEFINED CONFIGURATION SETS. Configuration codes 01 through 08 are reserved in the Model 820 KSR for user-defined configuration options. A choice of two configuration options is available; each option enables the user to predefine up to eight, complete, configuration parameter sets. The two configuration options are

- Default configuration option
- Protected configuration option.

The *default configuration* option consists of from one to eight predefined terminal configuration sets which must be specified when the Model 820 KSR is purchased. Each of these sets is permanently stored in an inalterable memory (read-only type) supplied as part of the option. The currently selected set may be modified if desired, via the keyboard while in the CONFIGURE mode, by enabling or disabling any of the parameter codes. The selected set, including any parameter code changes, is stored in nonvolatile memory for retention when power is switched OFF.

The *protected configuration* option consists of from one to eight predefined terminal configuration sets which must be specified at the time of purchase. Each of these sets is permanently stored in an inalterable memory (read-only type) supplied as part of the option. No parameter changes are possible when this version of the option is installed. The selected set is stored in nonvolatile memory for retention when the power is switched off.

To select a configuration set, proceed as follows:

a. Enter the CONFIGURE mode as described in paragraph 2.10.1.

b. Type the two-digit codes corresponding to the desired set.

c. Momentarily press the RETURN key.

d. Listen for an audible tone and ascertain that the code just entered is displayed, signifying that the previous configuration has been replaced with the new set.

e. Terminate the CONFIGURE mode as described in paragraph 2.10.8.

For both the protected and default configuration options any attempt to select a configuration for which no parameter set is defined will cause a configuration error status. If either configuration option is installed, the terminal will default to the configuration set defined by code 01 (rather than the standard default configuration defined by code 09) upon failure of the power-up diagnostic test of nonvolatile memory.

3.5.4 ALTERNATE CHARACTER SET - ASCII/APL. The optional APL keyboard shown in Figure3-5 enables the terminal to transmit and receive both the standard ASCII and the APL characters. The SO-SI/LOCK switch and ALTN CHAR indicator shown in Figure 3-6 are added to the control panel with this option installed. The SO-SI/LOCK switch, in conjunction with the O, N, and CTRL keys and the control codes SI and S0, permit selection of either the APL or the ASCII mode. With the SO-SI/LOCK switch in the SO-SI position and the terminal in the LCL mode, APL mode is selected by pressing the N key while the CTRL key is pressed and held [which generates the control character SO (*shift out*)]. The ALTN CHAR (alternate character) indicator lamp will light to signify that the terminal is in the APL mode. The terminal may be switched to ASCII mode by pressing and holding the CTRL key and pressing the O key, which generates the control character SI (shift in) and causes the ALTN CHAR indicator lamp to extinguish.

With the terminal in LINE mode, the APL/ASCII mode may be selected from the keyboard only if *local copy of transmitted data* (parameter 82) is configured. Otherwise, the terminal will respond only to SO and SI characters received from the communications line. If fixed mode operation (always APL or always ASCII) is

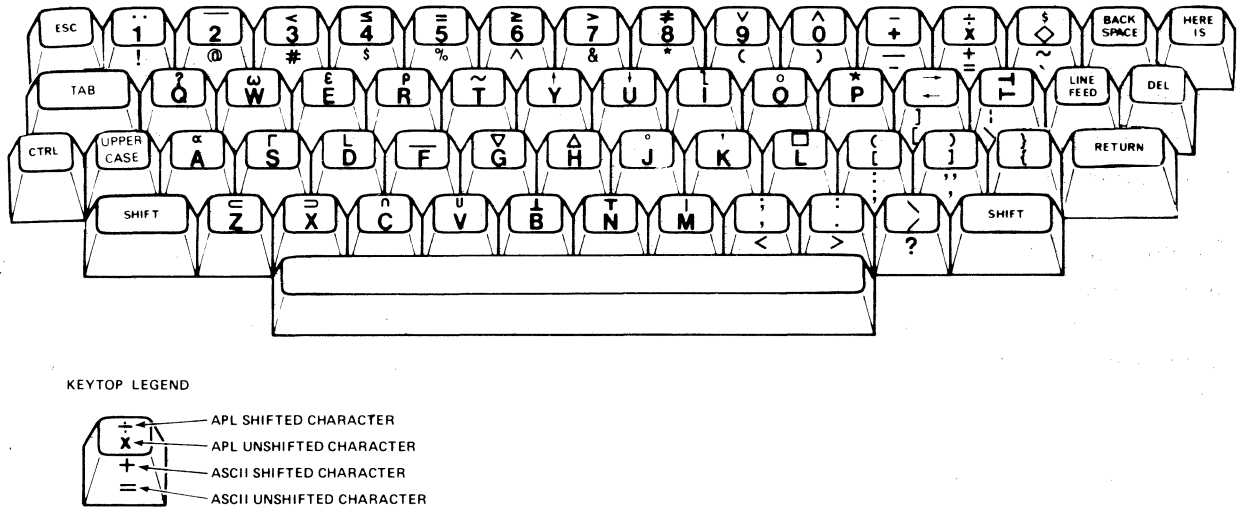


Figure 3-5. APL Keyboard

required, the desired mode is selected while the terminal is in LCL mode and the SO-SI/LOCK switch is placed in LOCK position. With the switch in LOCK position, the terminal will ignore SO and SI characters whether generated from the keyboard or received from the communications line.

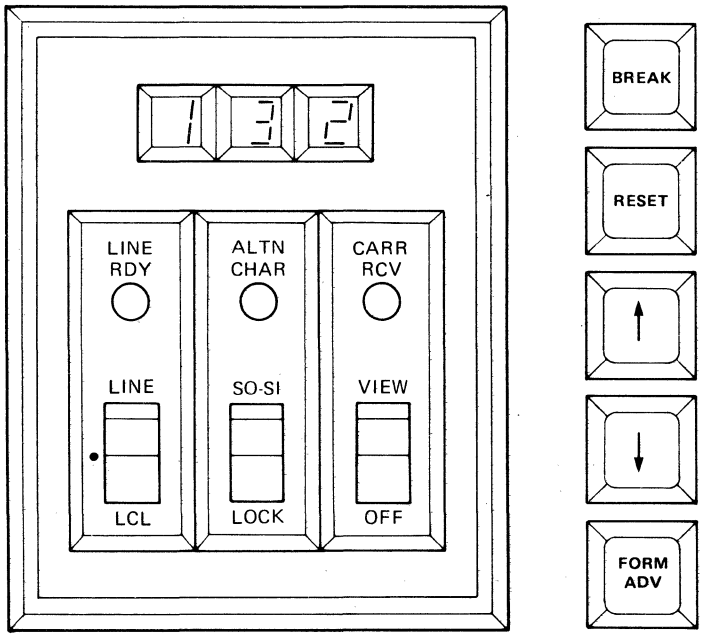


Figure 3-6. Control Panel, USASCII/APL Option

3.5.5 NUMERIC KEYPAD. An optional 18-key numeric keypad is available for high volume data entry applications. Since the numeric keypad must be physically mounted on the main keyboard printed-wiring circuit, this option is usually factory installed. Field upgrade requires replacement of the keyboard assembly.

Numeric keypad layout and symbolization are shown in Figure 3-7. The keypad is available on the standard ASCII and on the optional APL keyboards. The ENTER key is user-programmable as described in Section II. None of the keys on the numeric keypad have automatic-character-repeat operation. The mode control keys (i.e., SHIFT, UPPER CASE, and CTRL) of the typewriter keyboard have no effect on the numeric keypad functions.

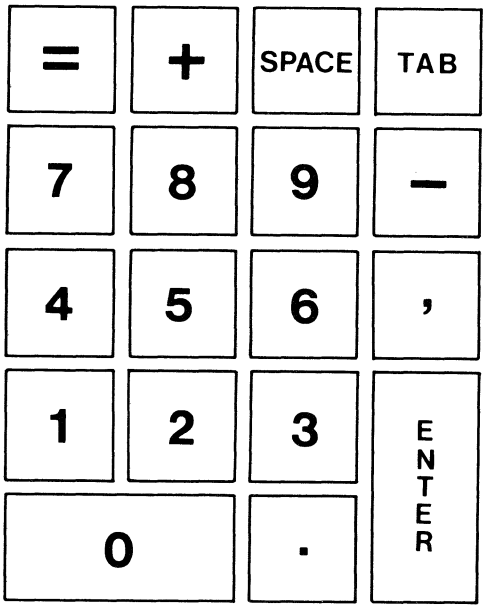


Figure 3-7. Numeric Keypad

3.6 OPERATOR'S REFERENCE CARDS. A set of *Operator Reference Cards* is contained in the pull-tab tray located at the front left corner of the terminal. These cards provide a summary of the operational features of the Model 820 KSR terminal.

SECTION IV

THEORY OF OPERATION

4.1 GENERAL

This section describes the theory of operation of the Model 820 KSR terminal. The Model 820 KSR consists of the following major functional components:

- Power supply
- Terminal controller
- Operator Interface
- Communications interface
- Ribbon drive subsystem
- Terminal controller/printer controller interface
- Printer controller subsystem
- Paper drive subsystem
- Printhead carriage drive subsystem
- Printhead.

A block diagram illustrating the relationship of the functional components is shown in Figure 4-1. In addition to the simplified diagrams accompanying this discussion, the text also lists references to the logic diagrams and schematics reproduced in Section VII of this manual. On the logic diagrams a signal is considered active when it is high (logic ONE) unless a slash (/) appears before the mnemonic, in which case it is considered active when it is low (logic ZERO). The mnemonics for all signals are listed in Appendix F of this manual.

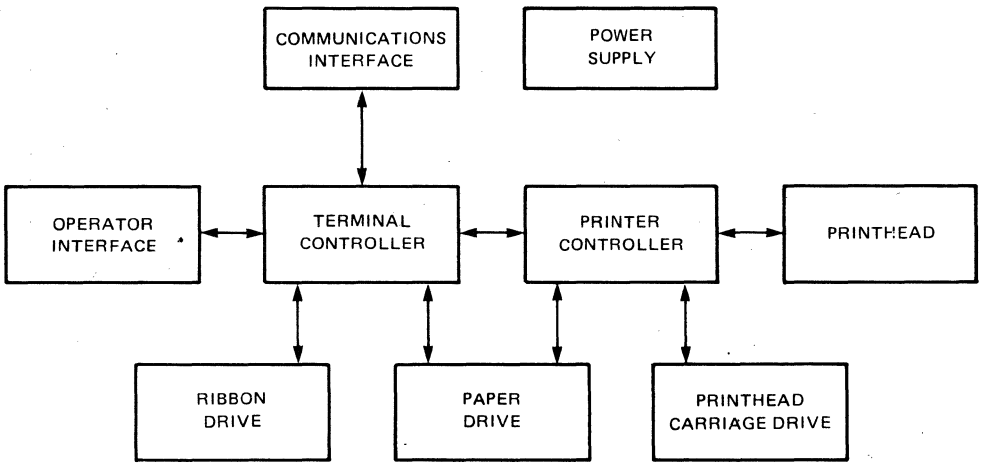


Figure 4-1. Model 820 KSR, Simplified Functional Block Diagram

4.2 POWER SUPPLY

The Model 820 power supply operates on a *self-referencing power conversion* principle. The self-referencing power converter operates over an input voltage range of 90 to 280 Vac at a frequency range of 47 to 400 Hz. Jumpers on the terminal electronics printed-wiring board switches the terminal from 115 Vac to 230 Vac operation.

The self-referencing power supply consists of six major parts:

- Input voltage selection and rectification
- Soft-start circuit
- Blocking oscillator
- Reference/sense circuit
- Secondary filtering and regulation
- Power good circuit.

A simplified block diagram of the Model 820 KSR power supply is shown in Figure 4-2. Schematics of the power supply are shown on sheets 13 and 14 of drawing 999692 in Section VII.

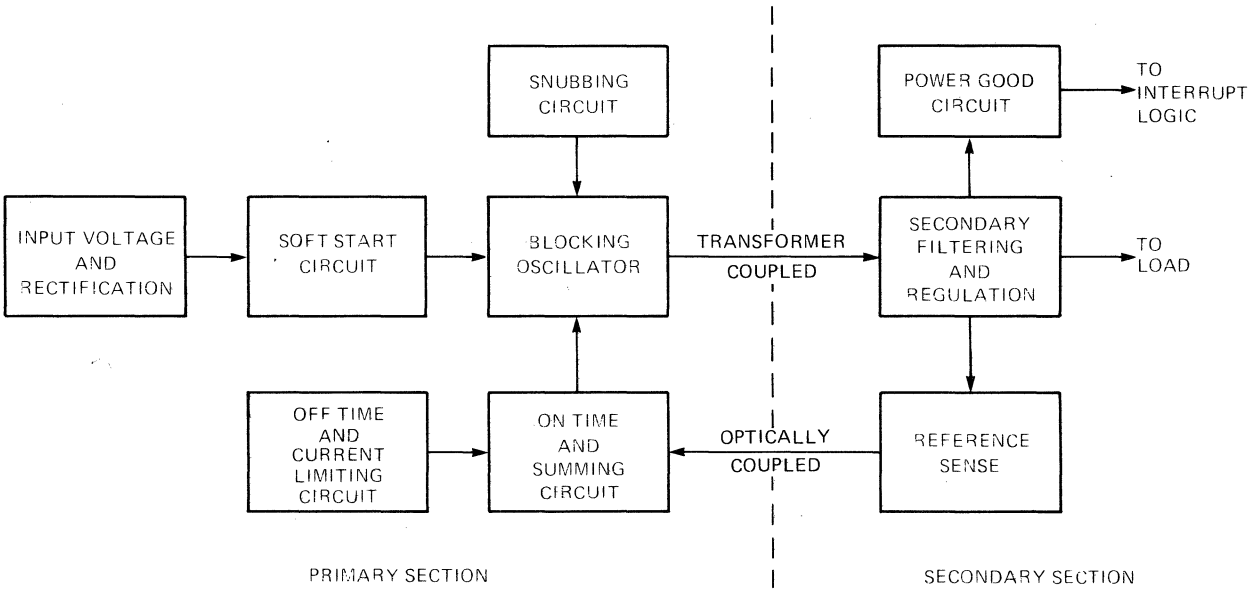
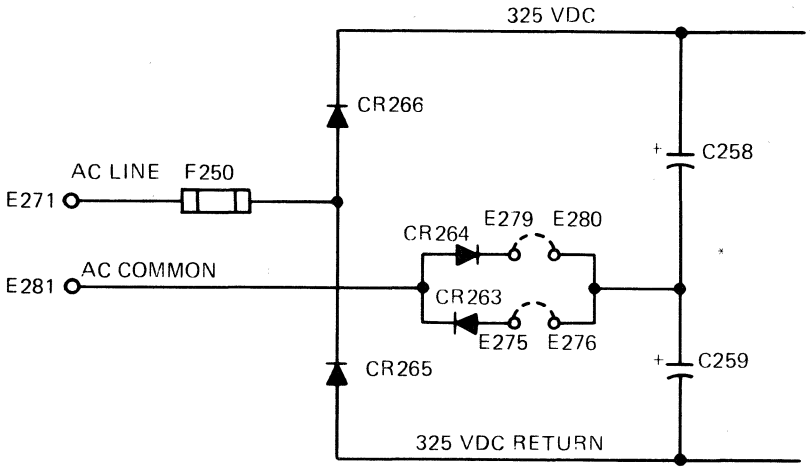
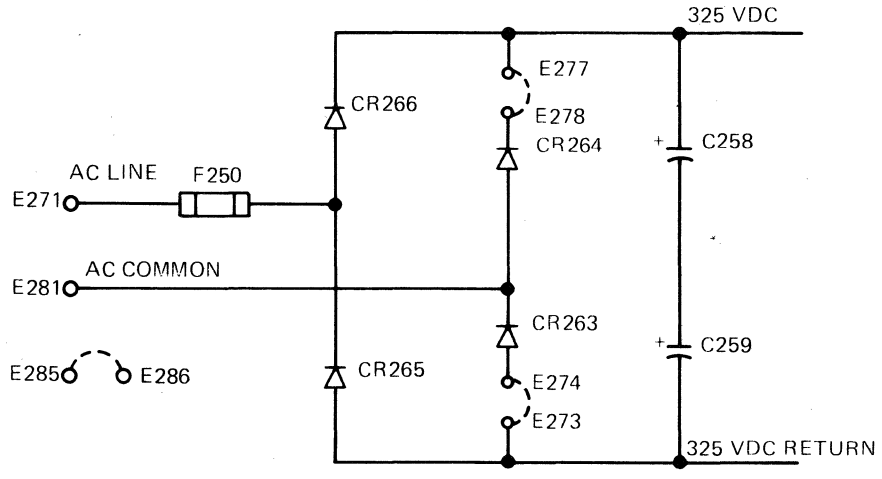


Figure 4-2. Power Supply Block Diagram

4.2.1 INPUT VOLTAGE SELECTION AND RECTIFICATION. Power is supplied through the line filter and power-on switch (drawing 999883, sheet 1) to E271 and E281 (drawing 999692, sheet 13). If the terminal is configured for 115 Vac operation, jumpers are installed from E279 to E280 and from E275 to E276 to form a voltage doubler as shown in Figure 4-3. For 230 Vac operation jumpers are installed from E273 to E274 and from E277 to E278 to form a full wave bridge as shown in Figure 4-3. The jumper between E285 and E286 acts as a switch to indicate the input voltage configuration to automatic test equipment. Capacitor C262 is an ac bypass from the 325 Vac return to chassis ground, and J202 is a connector provided for future optional equipment (see drawing number 999692, sheet 13). Capacitors C258 and C259 provide the primary energy storage for the terminal.



A) (115 VAC) VOLTAGE DOUBLER CONFIGURATION



B) (230 VAC) FULL WAVE BRIDGE CONFIGURATION

* SOFT START COMPONENTS
NOT SHOWN

Figure 4-3. Input Voltage Selection and Rectification

4.2.2 SOFT-START CIRCUIT. During power-up initial current surge is limited by resistor R271 in the soft-start circuit as shown in Figure 4-4. After a safe period, when capacitors C258 and C259 are charged, SCR Q255 fires and bypasses R271 for more efficient operation. Resistors R269 and R270 with capacitor C261 provide the RC time constant delay used to fire the soft-start SCR. R268 and C260 filter the voltage on the gate of Q255. CR262 provides a low-impedance path around R271 when C258 and C259 discharge.

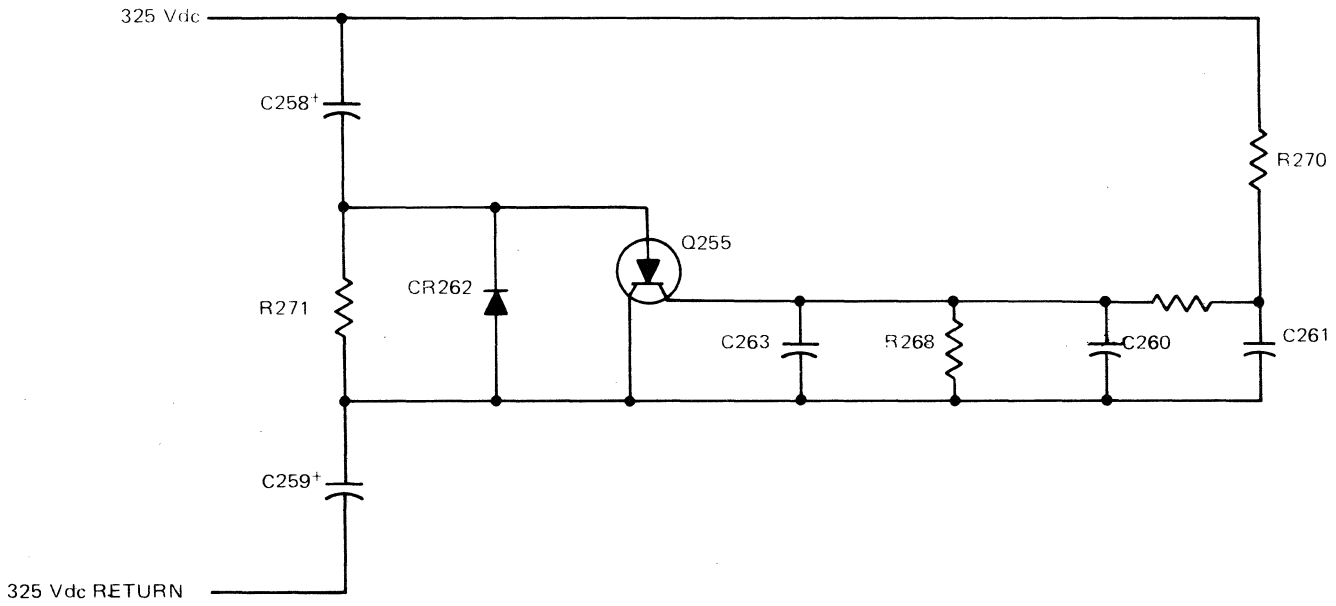


Figure 4-4. Soft-Start Circuit

4.2.3 BLOCKING OSCILLATOR CIRCUIT. The blocking oscillator circuit (drawing 999692, sheet 13) is a self-starting switching circuit which uses the primary winding of transformer T201 as a collector load. When the switching transistor is on, energy is stored in the primary winding of transformer T201. When the switching transistor goes off, the induced electromgnetic field in the primary collapses and couples energy into the secondary windings of the transformer.

Transistor Q250 controls the current being applied to the primary winding of T201. When Q250 is switched on, current passes through the primary winding of T201 and current sensing resistor R251. Transistor Q251 follows the voltage changes of R251 and applies a ramp voltage proportional to the current change through R251 to a summing point at R259.

The summing point receives the ramp voltage from Q251 and from the reference sensing circuit connected to the secondary windings of T201. When the voltage at this summing point reaches approximately 0.6 volts, transistors Q252, Q253, and Q254 switch on which, in turn, switches off Q250. The current through the primary of T201 stops, and the induced field begins to collapse. The collapsing field couples energy to the secondary windings through flyback action. Q250 remains off until the voltage at the summing point allows transistor Q252 to switch back off.

Two jumpers are provided in the blocking oscillator circuit to assist in testing. The jumper between E264 and E265 connects the collector of Q250 to T201. The jumper between E262 and E263 connects the base of Q250 to the self-starting circuit R265.

4.2.4 REFERENCE SENSING CIRCUIT. The 5-volt winding rectified by CR205 (drawing 999692, sheet 14) is used as the reference winding. Because of the tight coupling used in the secondary windings of T201, any load variations in the other secondaries will be reflected in the 5-volt winding. The 5-volt output is tapped off before fuse F200 and applied to pin 2 of operational amplifier (op-amp) U202. The output of the 5-volt winding is compared to a reference voltage developed across CR201. When the input to pin 2 of the op-amp is less than the reference voltage, the output of the op-amp is high, and switching transistor Q250 continues to deliver full power into the primary winding. When the input at pin 2 exceeds the reference voltage, the output of the op-amp is optically coupled back to the summing point at R259 where it is combined with the ramp voltage to switch off transistor Q250.

4.2.5 SECONDARY FILTERING AND REGULATION CIRCUITS. Transformer T201 has four secondary windings which are used to produce the voltages required to drive the terminal. The windings produce 33 volts, +5 volts, and ±16 volts. The +33 volt winding is rectified by CR203 and then split to facilitate testing the motor driver and printhead circuits. The jumper from E205 to E206 connects +33 volts to +33 VHD which applies +33 volts to the ribbon motor drive through fuse F101 and to the printhead through fuse F102. The jumper from E207 to E208 connects +33 volts to +33 VMTR which applies +33 volts to the carriage motor drive and papermotor drive through fuse F103.

The output of the +5 volt winding is rectified by CR205, filtered, and sensed by the reference/sensing circuit. The +5 volt supply is split after fuse F200 to facilitate testing of the driver and logic circuits. The jumper from E212 to E213 connects +5V to the logic circuits. The jumper from E213 to E214 connects +5V to +5 DVR for the motor driver circuits and is used to develop +5 VSW (drawing 999692, sheet 7).

The 16-volt secondary rectified by CR 209 is filtered and input to the three-terminal regulator U205; this output is the regulated +12 volt supply for the terminal. The second 16-volt winding is filtered and regulated by regulator U206; this produces the −12 volt supply for the terminal and the input to regulator U204. The output of U204 is the −5 volt supply for the terminal.

4.2.6 POWER-GOOD CIRCUIT. The power-good circuit (PWRGOOD) monitors the power supply voltages and produces a logic output signal that enables terminal operation. If either of the power supply voltages (+5 or −12) drops to less than 95 percent of its normal voltage output, transistor Q201 (drawing 999692, sheet 14) switches on, sinking the PWRGOOD signal to ground. The loss of the PWRGOOD signal causes a RESET interrupt to the terminal processor (TMS 9980) and disables all printer mechanism drive circuits by disabling the +5 VSW drive enable signal.

4.3 TERMINAL CONTROLLER SUBSYSTEM

The Model 820 KSR terminal controller is a TMS 9980 microprocessor. A simplified block diagram of the termial controller subsystem is illustrated in Figure 4-5. The terminal controller works in a master-slave relationship with the printer controller (TMS 9940); that is, the TMS 9980 controls the TMS 9940. The major components of the terminal controller sybsystem are

- TMS 9980 microprocessor
- System clock and interrupt logic
- Memory control logic
- Memory.

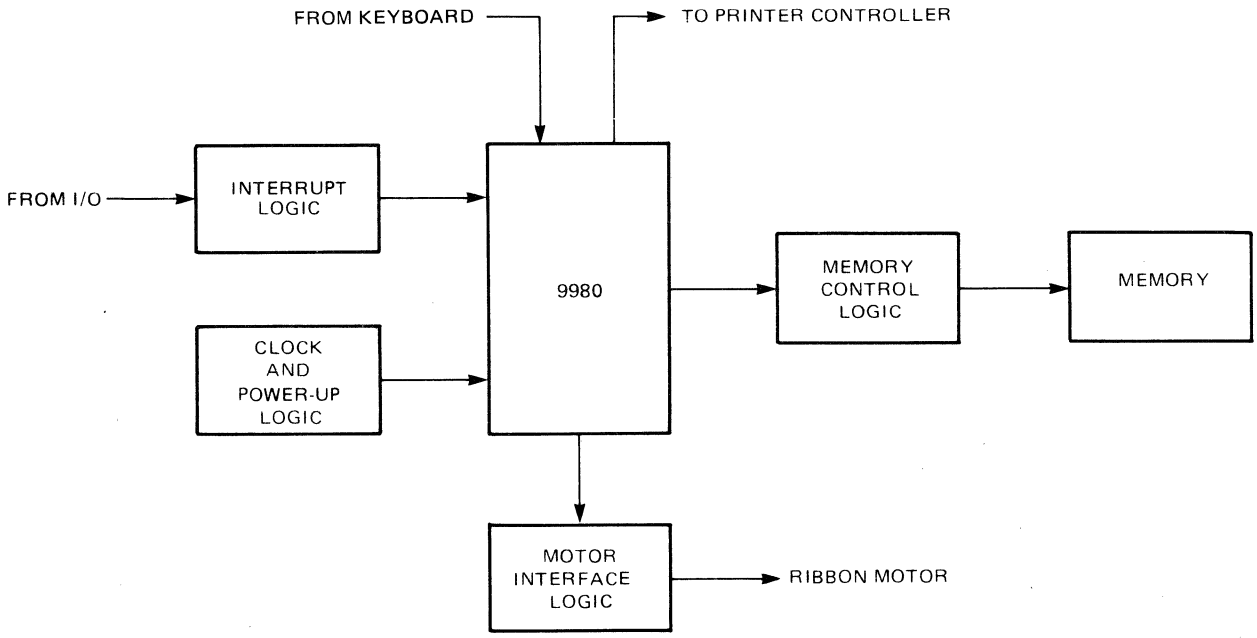


Figure 4-5. Terminal Controller Simplified Block Diagram

4.3.1 TMS 9980 MICROPROCESSOR. The TMS 9980 is a single-chip 16-bit microprocessor which accepts four levels of interrupts. The TMS 9980 has an eight-bit bidirectional data bus and a 14-bit address bus, permitting addressing a maximum of 16, 384 bytes (eight bits per byte) of memory. The TMS 9980 utilizes a versatile I/O interface called the communications register unit (CRU). The CRU can address up to 2,048 devices external to the TMS 9980.The CRU provides serial data outputs on CRUOUT which is connected to each device that is to receive data or commands from the TMS 9980. Each time a data bit is transmitted on the CRUOUT data path, an address appears on the CRU address lines. (Note that since the CRU address lines are also used to address memory locations, /MEMEN is inactive during CRU operations). The CRU bus is composed of the CRU address lines (A0-A12) and CRUOUT (A13). All external devices connected to the CRU bus have an address decoder to gate the data from CRUOUT. When a decoder detects its own address, data on CRUOUT is accepted at CRUCLK. Conversely, if the address on the CRU bus is not correct for a particular device, its decoder ignores the data on CRUOUT.

Data from devices external to the TMS 9980 is also accessed by the CRU. The CRU input operation is essentially identical to the CRU output operation; the main difference is that when an external device recognizes (i.e., decodes) its address on the CRU address lines, it places the data on the CRUIN line and this line is read by the TMS 9980.

4.3.2 TERMINAL CONTROLLER MEMORY. The memory used by the terminal controller subsystem is composed of

- Read-only memory (ROM)
- CMOS random access memory (CMOS RAM)
- Random access memory (RAM)
- Programmable read only memory (PROM)

The terminal controller memory schematics are located in Section VII, drawing 999692, sheets 4 and 5. The references in the following paragraphs apply to these schematics.

4.3.2.1 Read Only Memory. The control programs and built-in testing functions for the standard Model 820 KSR terminal are contained in 8K bytes of read only memory (ROM) located on the terminal electronics PWB (lower PWB). The terminal controller ROM consists of two 4K by 8-bit TMS 4732 ROM devices installed in sockets XU9 and XU10. Data is exchanged with the ROM's via the TMS 9980 bidirectional data bus. The ROM's are enabled by the memory control logic (refer to paragraph 4.3.3) and are addressed via the TMS 9980 address lines. An additional TMS 4732 ROM (socket XU11) is provided with the Device/Forms Control (DFC) option.

4.3.2.2 Nonvolatile Memory. The Model 820 KSR uses a complementary metal oxide semiconductor (CMOS) random access memory (RAM) and a battery to provide nonvolatile storage of configuration and format parameters. The CMOS RAM contains 256 bytes of memory and is located on the terminal electronics PWB (U12 and U13). The CMOS RAM is enabled by the memory control logic. When power to the Model

820 KSR is switched off, a +3 volt, silver oxide battery provides power to the CMOS RAM (refer to Section V for information on battery installation and replacement.)

4.3.2.3 Random Access Memory. The terminal electronics PWB has 1,024 (1K) bytes of RAM for temporary storage of data and workspace for data processing by the TMS 9980. The terminal processor RAM consists of two 1K by 4-bit TMS 4045 RAM devices in U4 and U5. The RAM is enabled by the memory control logic.

4.3.2.4 Programmable Read Only Memory (Optional). The terminal electronics PWB provides two programable read only memory (PROM) sockets, XU2 and XU3, which are used for optional character sets and fixed configurations. Refer to Section III for details on these options.

4.3.3 MEMORY CONTROL LOGIC. The memory control logic enables the TMS 9980 to address all memory chips on the terminal electronics PWB through the use of select signals. The select signals are created by a 256 by 8-bit PROM located at U25. The five most significant address lines (A0-A4), BWE (buffered write enable), DBIN (data bus input), and BMEMEN (buffered memory enable) select a memory location in the PROM. The contents of the selected address produce one of eight select signals. Refer to Section VII, drawing 999692, sheet 4, which contains a truth table for the memory control PROM. The truth table infers that when any one memory is selected, all other memories are disabled. When the /BMEMEN signal is high, indicating that the TMS 9980 is performing a nonmemory function, all outputs of the PROM are high; hence, all memory chips are disabled. The BWE and DBIN inputs to the PROM have two states listed for both RAMSEL (RAM select) and CMRAMSEL (CMOS RAM select); two states are necessary because the RAM and CMOS RAM can be used to store data (BWE) as well as read data (DBIN).

4.3.4 SYSTEM CLOCK AND INTERRUPT LOGIC. The terminal electronics PWB employs a 10-MHz crystal-controlled oscillator to provide the clock pulses for the Model 820 KSR. The output of the system clock is buffered and input to pin 34 of the TMS 9980. The clock for the Printer Controller (TMS 9940) is provied by applying the output of the 10-MHz oscillator into a divide-by-two device (U44) to produce a 5-MHz output.

The TMS 9980 can accept four levels of interrupts and a RESET. The RESET has the highest priority and is always honored above all other processor actions. A RESET interrupt results when the PWRGOOD input from the power supply switches to a low state, indicating that power has been interrupted. The level-1 interrupt is used for automatic system tests at the factory. The level-2 interrupt indicates that the TMS 9940 has acknowledged the transfer of data from the TMS 9980. The level-3 interrupt is used for communications interrupt from the TMS 9902. The lowest level of interrupt, level 4, indicates an interrupt from an optional auxiliary port interface. Refer to drawing 999692 for schematics of the interrupt logic.

4.4 OPERATOR INTERFACE

The upper PWB of the Model 820 KSR terminal contains the operator interface which consists of the alphanumeric keyboard, the operator control panel, the terminal status display, terminal indicators, and asociated support circuits. The operator interface components are connected to the terminal controller processor through the keyboard interface (drawing 999692, sheet 6). The keyboard scan, matrix, terminal status display and indicators, and the interface logic are described in the following paragraphs.

4.4.1 KEYBOARD/SWITCH SCAN. The keyboard is scanned once every four milliseconds. During each scan the keyboard matrix is read, the terminal indicators are updated, and one of the seven-segment LED displays on the operator's panel is updated. Three keyboard scans are required to completely update the keyboard displays. At the beginning of the keyboard matrix scan, the terminal controller loads a digital word into the shift registers in the interface logic. This word places a ZERO on row zero (R0) and a ONE on rows one (R1) through row eleven (R11). Therefore, at the beginning of the scan, only row R0 is enabled. After reading the column outputs, the registers are right-shifted, meaning that only R1 is now enabled. The columns are read again. The shift registers are right-shifted every time the columns are read until all of the rows have been enabled once.

4.4.2 KEYBOARD MATRIX. The keyboard matrix encodes key/switch actuation information to be read by the terminal controller. The matrix consists of twelve rows and eight columns that are part of the PWB (drawing 999822, sheet 2). The rows are enabled (low) one at a time by the terminal controller. When a key connected to an enabled row is actuated, current flows through the 6.8K ohm pull-up resistor, through the key/switch, through the diode, and into the enabled row (see Figure 4-6). While the current is flowing, the column output will be low.

The diode prevents current flow from an unenabled row to an enabled row when two switches on the same column are actuated. The output of each matrix column is fed into a voltage comparator (U2, U3; drawing 999822, sheet 1). The reference voltage for the comparator is taken from a voltage divider. The reference voltage should be about 1.74 volts. The output of the voltage comparator is routed through J1 to the keyboard interface logic. The row inputs from J1 are bufferd through two hex bus drivers (U7, U8; drawing 999822, sheet 1).

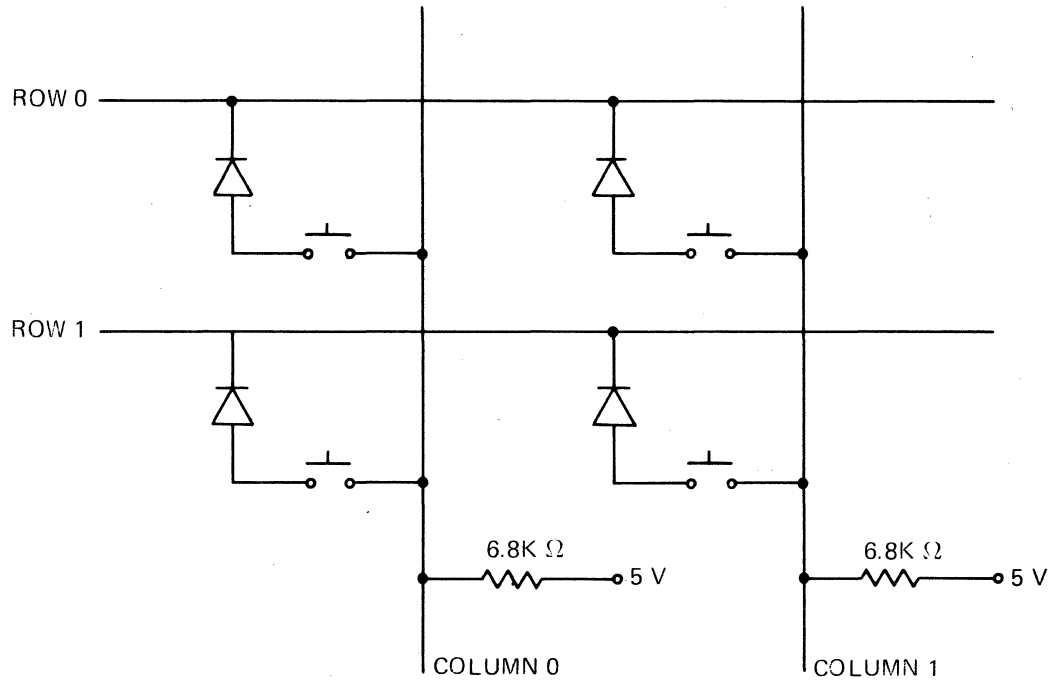


Figure 4-6. Keyboard Matrix Simplified Diagram

4.4.3 TERMINAL STATUS DISPLAY AND INDICATORS. The terminal status display (TSD) is controlled by rows R0-R3 and R9-R11. Outputs R9-R11 strobe the seven-segment LED displays by forward-biasing transistors Q1, Q2, Q3. These three transistors supply the current to the common-anode segment LED diodes of the display. The display is driven by a BCD-to-seven-segment decoder/driver (U1; drawing 999822, sheet 1). The four inputs (A-D) for the decoder/driver are R0-R3, respectively (see Figure 4-7). The other terminal indicators are controlled by R5-R7 and are activated by enabling their respective row (low).

4.4.4 KEYBOARD INTERFACE. All references in this subsection apply to drawing 999692, sheet 6. The keyboard interface connects the data bus of the terminal controller processor to the row inputs and the column outputs of the keyboard. The keyboard interface also connects the data bus to the ribbon motor drive inputs. The data bus is an eight-bit bidirectional bus. The terminal electronics PWB, which includes the keyboard interface logic, is connected to the keyboard PWB by a 25-conductor ribbon cable (the center conductor is not used). A simplified block diagram of the keyboard PWB is shown in Figure 4-8.

The keyboard interface logic is controlled by the eight inputs. The /IOSEL input enables the entire interface logic when active (low). The BA5 input enables the ribbon motor drive interface logic when active (high) and enables the row and column interface logic when inactive (low).

The rows are interfaced by three, 4-bit, parallel access, shift registers (U34, U35, U36). The registers are parallel-loaded by applying the data to the data bus, activating /BMEMEN (low), and making a high-to-low transition on /BWE. If BCRUOUT is high, the data is clocked onto R0-R7; and if it is low, the data is clocked onto R8-R11.

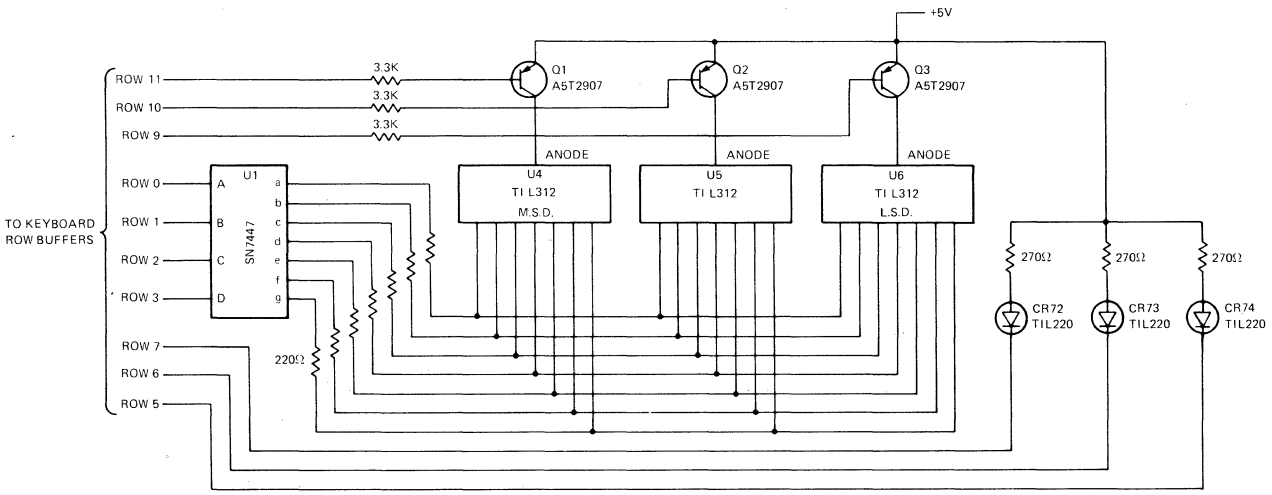


Figure 4-7. Terminal Displays, Simplified Diagram

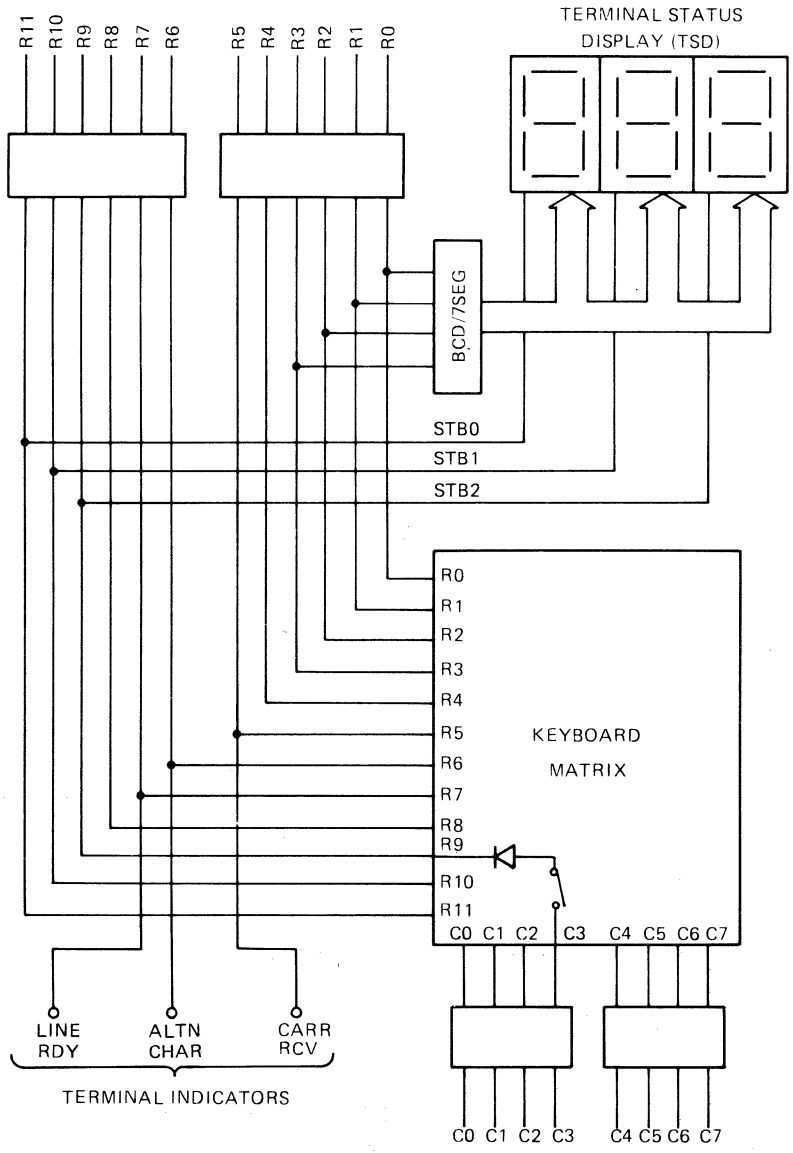


Figure 4-8. Keyboard PWB Simplified Diagram

After the output of the columns is scanned, the output of the shift register is right-shifted. Shifting is accomplished by making /BMEMEN inactive (high), activating KBDENA (high), and making a low-to-high transition on BCRUCLK. The serial input on the shift register which outputs R0-R3 is tied high. This shifts high data into the register.

The columns are interfaced by two, 3-state hex bus drivers (U37 and U38). The column outputs are read onto the data bus line by activating /DBIN (low).

The ribbon motor drive is interfaced by a hex, D-type flip-flop. Data from data lines D0-3 is clocked onto the flip-flop when /IOSEL is low, BA5 is high, BCRUOUT is low, and a high-to-low transition is made on /BWE.

4.5 COMMUNICATIONS INTERFACE

The communications interface, controlled directly by the TMS 9980, utilizes a TMS 9902 Asynchronous Communication Controller as well as CRU-addressable inputs and outputs. All communications interface *input* signals are converted from EIA/C.C.I.T.T. levels to TLL levels as described in EIA standard RS-232-C. The communications interface logic is shown on drawing 0999692, sheet 7, and discussed in Section 3.

4.5.1 INTERFACE SIGNALS. The Model 820 KSR terminal supports the communications interface signals described in Section 3.4 of this manual. All communication interface signals are routed from the 25-pin connector mounted on the rear of the terminal to connector J3 on the terminal electronics PWB by the internal EIA cable assembly (drawing 0999742). The signals in this cable are designated by both the EIA and C.C.I.T.T. circuit names. For example, the received data signal is designated ***BB/104***.

4.5.2 SIGNAL-LEVEL CONVERSION. All inputs from J3 are converted from EIA/C.C.I.T.T. levels to TTL logic levels by the logic elements in locations U47 and U49. All outputs to J3 are converted from TTL logic levels to EIA/C.C.I.T.T. levels by the logic element in location U46.

4.5.3 ASYNCHRONOUS COMMUNICATION CONTROLLER. The TMS 9902 Asynchronous Communication Controller (ACC) transmits and receives asynchronous, serial data and provides the interface signals *data set ready* (DSR), *request to send* (RTS), and *clear to send* (CTS). The character structure of the transmitted and received data is shown in Figure 4-9.

All remaining interface signals are under direct control of the terminal controller via the CRU interface, utilizing the input device in location U45 and the output device in location U30.

4.6 RIBBON DRIVE SUBSYSTEM

4.6.1 RIBBON MOTOR DRIVE. The terminal processor also controls the speed and direction of the ribbon drive motor. The ribbon drive motor is a four-phase pulse-modulated device operated in a stepping motor unipolar, single-phase, voltage-switched mode. The motor steps each time a different phase winding is energized. The ribbon motor drive circuit (drawing 999692, sheet 11) receives the inputs to the phase windings, ROA-ROD, from a latch connected to the buffered data lines of the TMS 9980.

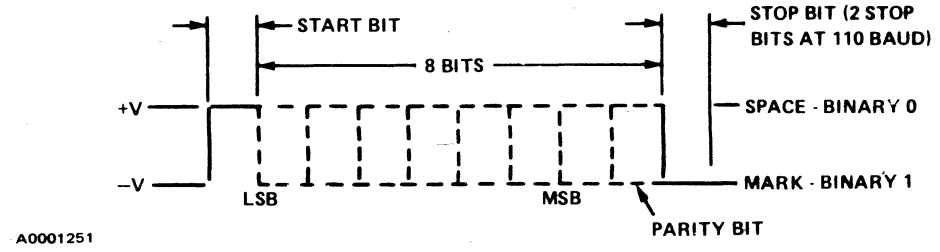


Figure 4-9. Asynchronous Data Format

Clockwise rotation of the motor is induced by the following sequence:

Tcw = ROA ROB ROC ROD ROA

Counterclockwise rotation is obtained by the following sequence:

Tccw = ROA ROD ROC ROB ROA

Each motor phase is switched between +33 volts and ground using a four-stage monolithic Darlington amplifier. For example, motor detent at RPHSA is achieved with ROA at a logic ONE. Current is sourced to the base of the Darlington at input pin 6. The emitter-to-base (V_{BE}) of the Darlington clamps at approximately 1.5 volts. When saturated, the Darlington switch clamps the output (pin 7) to approximately 1 volt. When logic input ROA is returned to a logic ZERO, the Darlington is switched off and the inductive flyback diode is clamped at approximately 1 volt above the supply voltage. The magnetic detent will maintain the rotor at RPHSA detent until one of the phases is energized.

4.6.2 RIBBON MOTOR DIRECTION. Ribbon motor direction is determined by the order in which the phase windings are energized. The ribbon mounted on the ribbon drive continues to move in one direction until the ribbon supply reel is almost empty, at which time an eyelet in the ribbon actuates the ribbon reverse switch (RIBREVSW) located on the ribbon drive deck. When the switch is actuated, a signal is applied to a Schmitt trigger (drawing 999692, sheet 8) which is applied to tristate buffer U45 and read into the TMS 9980 on the CRUIN line. When the TMS 9980 detects RIBREVSW switch actuation, it reverses the order in which the phase windings of the ribbon motor are energized and the motor reverses direction.

4.7 TERMINAL CONTROLLER/PRINTER CONTROLLER INTERFACE

The TMS 9980 terminal controller serially transfers operands to the TMS 9940 printer controller over the CRUOUT line of the TMS 9980. The TMS 9940 gates in one bit of data from the TMS 9980 each time the TMS 9940 CRUTC input is toggled by the TMS 9980 CRUCLK output. When all 16 bits of the command are transferred to the TMS 9940, the TMS 9980 sends an interrupt which causes the TMS 9940 to transfer the command from its multiple processor system interface (MPSI) register into its internal RAM. The TMS 9940 acknowledges the transfer by sending an interrupt back to the TMS 9980.

Figure 4-10 illustrates the signals necessary to transmit commands to the TMS 9940. The TMS 9980 places the first command data bit to be transferred on the CRUOUT line; at the same time address lines A5 and A7 are set high (logic ONE) and A6 is set low (logic ZERO). This combination causes U20 to set low the MPSI output which is passed through an inverter and is applied to an AND gate along with the CRUCLK signal. Each time the CRUCLK line is pulsed, a CRUTC signal is applied to the TC input of the 9940.

When all 16 bits of the command have been transferred, the 9980 sets the A7 line low, activating SLINT2 (slave interrupt 2). The SLINT2 signal causes an interrupt on the INT2 (interrupt 2) input of the 9940. When the data from the MPSI register has been transferred to internal RAM and the command has been completed, the 9940 sends an interrupt back to the 9980 on its MSINT1 line. This interrupt is received by the 9980 as a level-2 interrupt, completing the transfer of one command.

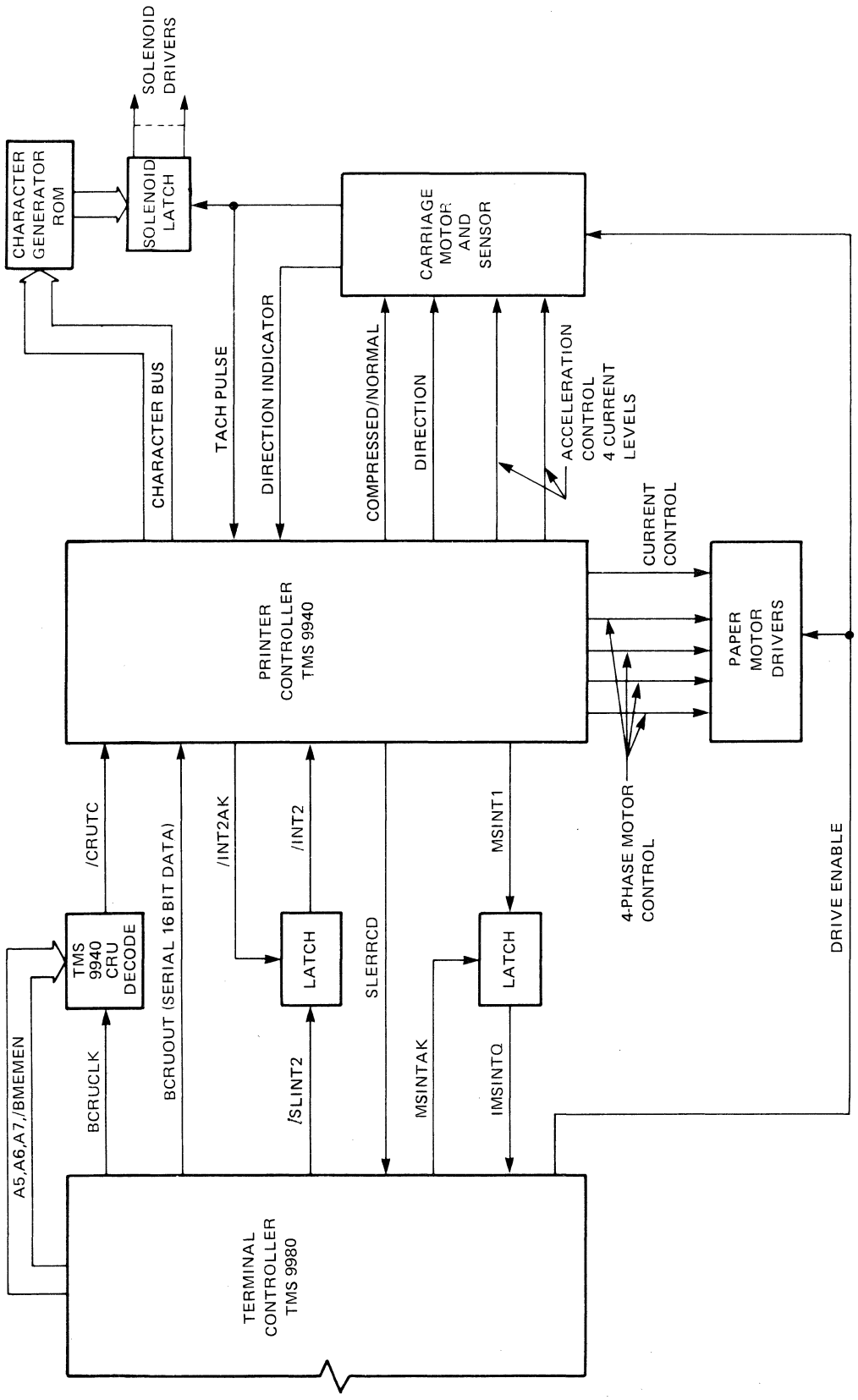


Figure 4-10. Terminal Controller/Printer Controller Interface Simplified Block Diagram

4.8 PRINTER CONTROLLER SUBSYSTEM

The printer controller subsystem (TMS 9940 emulator), also referred to as the slave MPU, is a 16-bit microcomputer. The TMS 9940 single-chip microcomputer is, at the date this manual was printed, in the final stages of development. Its functions are currently performed by an emulator. All references to the printer controller (TMS 9940) in this section apply to the emulator in those terminals with an emulator, and apply to the TMS 9940 single-chip device in terminals so equipped. Both printer controllers function identically.

The TMS 9940, itself controlled by the terminal controller, controls all functions of the printer mechanism except the ribbon drive motor and paper-out detection. The earlier printer controller (emulator) is contained on two PWB's. The later single-chip TMS 9940 printer controller is installed in socket U17 of the terminal electronics.

Figure 4-10 illustrates the relationship between the printer controller, the terminal controller, and the printer mechanism. The slave printer controller receives commands from the terminal controller to print characters, feed the printing paper, or move the printhead. The printer controller programs, stored in ROM, provides the printer controller the instructions necessary to decode commands from the TMS 9980 and send, in turn, the appropriate control signals to the printer mechanism.

The printer controller is responsible for the following functions:

- Printhead positioning and velocity control
- Detection of carriage jams
- Character printing
- Paper (forms) feed.

The printer controller positions the printhead via a carriage powered by a dc servo motor. Direction and acceleration signals from the printer controller provide the input to the carriage motor; tachometer feedback from the motor completes the servo loop. Characters to be printed and the column position where the characters are to be printed are sent from the 9980 to the 9940. The printer controller decodes and develops the necessary information to be input to a character ROM. The output of the character ROM provides the input to the printhead drivers. A four-phase paper drive motor controlled by the printer controller is used to move the paper vertically either up or down. Carriage jams are detected through a time-out sequence by the printer controller.

When the Model 820 KSR is powered up, the terminal controller performs a series of automatic diagnostic tests. When the diagnostics are complete, the 9980 sends a DRIVENA (drive enable) signal to U43 (refer to drawing 999692, sheet 7). DRIVENA is ANDed with the PWRGOOD (power good) signal from the power supply. If the DRIVENA and PWRGOOD signals both are active, the network of Q1, Q2 and Q3 produce the +5VSW signal which enables all drive circuits discussed herein. Without the +5VSW signal the printer mechanism driver circuits remain disabled.

+5VSW signal which enables all drive circuits discussed herein. Without the +5VSW signal the printer mechanism driver circuits remain disabled.

4.9 PAPER DRIVE SUBSYSTEM

4.9.1 PAPER MOTOR DRIVER CIRCUIT. The printer controller receives paper motion commands from the TMS 9980 terminal controller. The printer controller decodes the commands and develops the necessary signals required to drive the paper motor. The paper motor is a four-phase, permanent magnet, stepping motor. The speed of the motor is determined by the speed at which the phase signal input (POA-POD) from the printer controller causes the motor to step. Motor direction is determined by the order in which the motor phase windings are enabled. Each eight steps of the motor will cause the paper (form) to advance (or reverse) one line.

The phases are enabled in pairs for stepping motion. When a phase line goes high, it switches on the appropriate transistor which supplies current to the selected phase winding in the motor. The current enters the motor through pins 1 through 4 of J104 and returns through pins 1, 3, 4, and 5 of J106 (drawing 999692, sheet 10). For example, phase A and phase B are both on; after a period of time determined by the printer controller, phase A is switched off and phase C is switched on. The motor rotates one step at that time. When phase B is switched off, phase D is switched on, producing another motor step.

When the motor is not stepping, a detent or holding torque is requird to lock the motor at the position at which it stops. The detent signal is enabled by the PDMCC (paper drive motor current control) line from the printer controller. By applying higher current to the two-phase windings of the stepper motor enabled by the phase signal input from the printer controller, the stepper motor is electrically "locked" into the last stepped position. When the PDMCC line is disabled, the current through the selected phase windings will return to the stepping level, and the stepping motor will begin to step when the phase signals begin to change.

The paper motor driver operates as a current-controlled, switching mode regulator in an integrating choke circuit configuration. The current consists of a current-sensing comparator U113; motor phase selector Q116, Q114, Q117, or Q115; and a power switch Q113. When PDMCC is low, a detent motor current is established; when PDMCC is high, the motor current is increased to a level sufficient to develop motor torque to meet the worst-case friction torque. Clockwise rotation is induced by the following sequence (based on single-phase drive):

Tcw = POA POB POC POD POA

Counterclockwise rotation is induced by the following sequence:

Tccw = POA POD POC POB POA

For example, after power becomes good the +5VSW signal goes high and one or more motor phases can be selected. If P0A is high, the Darlington transistor Q116 is switched on, which switches on transistor Q119, causing Q113 to switch on and saturate. This causes current to be input to motor winding PDRV and out PPHSA, where it is sinked by transistor Q116. When sufficient motor current is flowing, the voltage developed across resistor R133 will cause the comparator to change states, causing U113-7 to go low. This

action switches off Q119 which removes the base drive from Q113. Motor current will now flow from the anode of CR116, through PDRV, through PPHSA, through Q116 and sense resistor R133. The circuit exhibits a long recovery time in this mode. As the current flowing through R133 decays, the voltage drop across R133 decreases until, eventually, the comparator will return to the original state, permitting U113-7 to go high, which switches on Q119 and Q113.

The loop continues operating in a self-oscillating, chopping mode as long as one of the phase-select inputs is enbled. As in the above example in which Q116 is switched off, Q113 switches off, providing the motor winding inductance a fast recovery path through CR116, through PDRV, through PPHSA, the zener CR117, CR132, and through CR124. Circuit operation is similar for any of the other selected phases. If more than one phase is selected at a time, the current will divide approximately equally through the windings.

4.9.2 PAPER-OUT DETECTION. When the paper-out switch (PAPOUTSW) in the printing mechanism is actuated, indicating that there is no paper in the mechanism, a Schmitt trigger produces an input to the tristate buffer U45 (drawing 999692, sheet 8). The paper-out signal is then read by the 9980 on the CRUIN line, and the 9980 displays an error code on the terminal status display. Operation cannot be restored until the switch is opened; that is, paper is installed in the mechanism.

4.10 PRINTHEAD CARRIAGE DRIVE SUBSYSTEM

4.10.1 PRINTHEAD POSITIONING. The TMS 9980 is responsible for determining the position at which a character is to be printed, and the 9940 is responsible for determining which direction the printhead must move to accomplish a 9980 command. The printer controller selects direction of printhead travel only for incremental printing. When higher speed printing requires bidirectional printing, the 9980 determines printhead direction for printing.

The character and position commands from the 9980 are sent serially to the printer controller via the CRU. The printer controller responds to the position commands by sending a direction signal and one of four possible acceleration commands. Motor direction is selected by the CMFWD (carriage motor forward) line. The acceleration of the motor is determined by the ACC1 and ACC2 lines; these two lines provide four posible combinations of acceleration commands. Since carriage motor acceleration is a function of motor current, the acceleration signals cause the motor driver circuit to act as a selectable, constant-current source for the carriage motor. Table 4-1 lists the current output of the motor driver circuit for all four acceleration combinations.

The printer controller is responsible for maintaining the appropriate motor speed for the function commanded by the TMS 9980. By comparing the time between tachometer signals with a reference, the printer controller determines which acceleration signals are required to maintain correct printhead travel speed.

Motor speed and direction digital control signals from the printer controller are converted to analog drive signals by the Model 820 KSR carriage motor driver circuit (drawing 999692, sheet 9). Motor direction is changed by reversing the motor voltage polarity with the CMFWD line. When the CMFWD line is high (logic ONE), driver transistor Q105 is switched on and driver transistor Q106 is switched off. If the CMFWD line is low (logic ZERO), indicating a reverse motor command, Q105 is off and Q106 is on.

TABLE 4-1. MOTOR DRIVER ACCELERATION CONTROL OUTPUT

ACC1	ACC2	Motor Current (Amperes)
0	0	0.00
0	1	0.66
1	0	1.43
1	1	2.86

The carriage motor driver circuit is a constant-current switching regulator. Current for the carriage motor, when it is moving the printhead forward (left to right), is supplied by the +33 volt motor supply, through Q108 (which has been switched ON by Q105), through the motor winding (CMTRA to CMTRB), and to the motor return line via Q110 and current sensing resistor R125. If the motor is commanded to travel in the reverse direction (right to left), the current path is now through Q109, the motor winding (CMTRB to CMTRA), Q111, and to sensing resistor R125. The appropriate curent path is selected by the CMFWD line.

The current sensing resistor R125 produces an output proportional to the amount of current passing through it. As the amount of current passing through R125 increases, the voltage drop across it increases. This change is level shifted and input to pin 2 of voltage comparator U113. The acceleration signals from the TMS 9940 provide a different reference to voltage comparator U113 for each combination received. The output of this comparator controls transistor Q107 to provide current regulation switching for the carriage motor.

The motor draws current through current sense resistor R125 until the voltage drop across it produces a difference signal into comparator U113. When this occurs, Q107 is switched off which switches off the driver transistor (Q105 if forward direction or Q106 if reverse direction). When the current is switched OFF, the voltage drop across R125 decreases and comparator U113 switches Q107 back ON. This, in turn, switches ON the appropriate driver transistor, and the drive voltage is again applied to the carriage motor. The result is a constant-current source which is regulated by the voltage reference selected by the TMS 9940 acceleration signals.

The carriage motor is coupled with an optical tachometer assembly mounted on the rear of the motor casing. The tachometer assembly is an integral part of the motor and cannot be removed. The tachometer optoelectrics are supplied with a +5 volt supply through J5 (drawing 999692, sheet 8). The output of the normal print tachometer is T0A1 and T0B1 which is fed to Schmitt trigger circuits and through the compressed print option selection logic. The output of the selection logic is two pulses displaced 90 degrees from each other. The printer controller clock (/9940CLK) gates the pulses into latch U42 and PROM U41. The resulting output is a pulse on the SENSOR line that represents 0.2158 mm (8.33 mils) of printhead movement in normal (not compressed) print mode and a signal (DIRECT) that indicates printhead direction of travel. A logic high on the DIRECT line indicates printhead travel from left to right and a low represents travel from right to left.

The TMS 9940 printer controller maintains a printhead position counter in its internal RAM. Each time the SENSOR line is pulsed, the INT1 interrupt flip-flop (drawing 999692, sheet 8) is set, which presents an interrupt to the printer controller. The printer controller clears the interrupt with the INT1ACK (interrupt 1 acknowledge) line. The register containing the printhead position is incremented or decremented (depending upon the direction the printhead is traveling) with each INT1 pulse.

The printer controller initially determines (upon power-up) printhead position by moving the printhead to the left margin. Once the printhead has positioned itself to the left margin the printer controller uses the tachometer feedback from the carriage motor to determine where the printhead is at any given time. When the terminal is powered-up, the printer controller must assume the printhead has been able to move to the left margin.

NOTE

If the printhead is obstructed when the terminal is powered-up, the printer controller will assume the position where the printhead stopped is the left bumper. This will cause all future printhead position information to be incorrect. If this occurs, remove the obstruction and cycle the power off and on.

4.10.2 CARRIAGE JAM DETECTION. Carriage jams are detected by the printer controller. When the carriage motor circuit receives acceleration signals to move the printhead, the printer controller monitors the sensor pulses from the terminal electronics PWB interface logic and starts a timer. If the printer controller does not receive tachometer pulses within a specified time, a SLERRCD (slave error code) signal is sent to the TMS 9980 on the CRU bus. The TMS 9980 is then interrupted by the TMS 9940 and a carriage jam error code is displayed on the TSD. The audible tone is sounded for 1 second to alert the operator to an error.

4.11 CHARACTER PRINTING

The printer controller receives single-word commands from the 9980, indicating what characters are to be printed. The 9940 operating system decodes the commands and generates a series of sequential addresses which are applied to the character generator ROM located at U16 (drawing 999692, sheet 8). Each address selected by the 9940 address lines (CGA0 - CGA11) produces an eight-bit digital word at the output of the character ROM. The output of the character ROM is gated into latch U15 with each SENSOR pulse. After the contents have been in the latch 400 microseconds, the latch is cleared by the SLERRCD line.

The eight-bit digital output of the latch makes up one of the nine columns used to create a character by the impact printhead. Each character is composed of nine seven-dot columns as illustrated in Figure 4-11 which shows how the letter "E" is printed. The printhead prints one seven-dot column at a time. As the printhead travels along the form, each column is printed until all nine columns for each character are printed. The dot patterns for characters printed are illustrated in Appendix A. Dot patterns used with the various international keyboard options are also shown in Appendix A.

The eight-bit digital output of the latch (SF1-SF8) is sensed by the printhead driver circuit (drawing 999692, sheet 12) which closes the path for the selected solenoids in the printhead. Each transistor (U102 and U103) acts as a switch for a solenoid in the printhead. Each solenoid controls one wire of the seven in the printhead.

When an input is enabled, the circuit is closed and the selected wire impacts the printing paper through the ribbon. The eighth input to the printhead driver (SF8) is an enabling line and must be enabled for the printhead to function. Each time a column is to be printed the SF8 line must be enabled. Current regulation for the printhead solenoids is provided by transistors Q101 through Q104 with comparator U107 providing current regulation switching control to Q104. Diodes CR105 through CR111 provide flyback protection from the printhead solenoids when the circuit is opened.

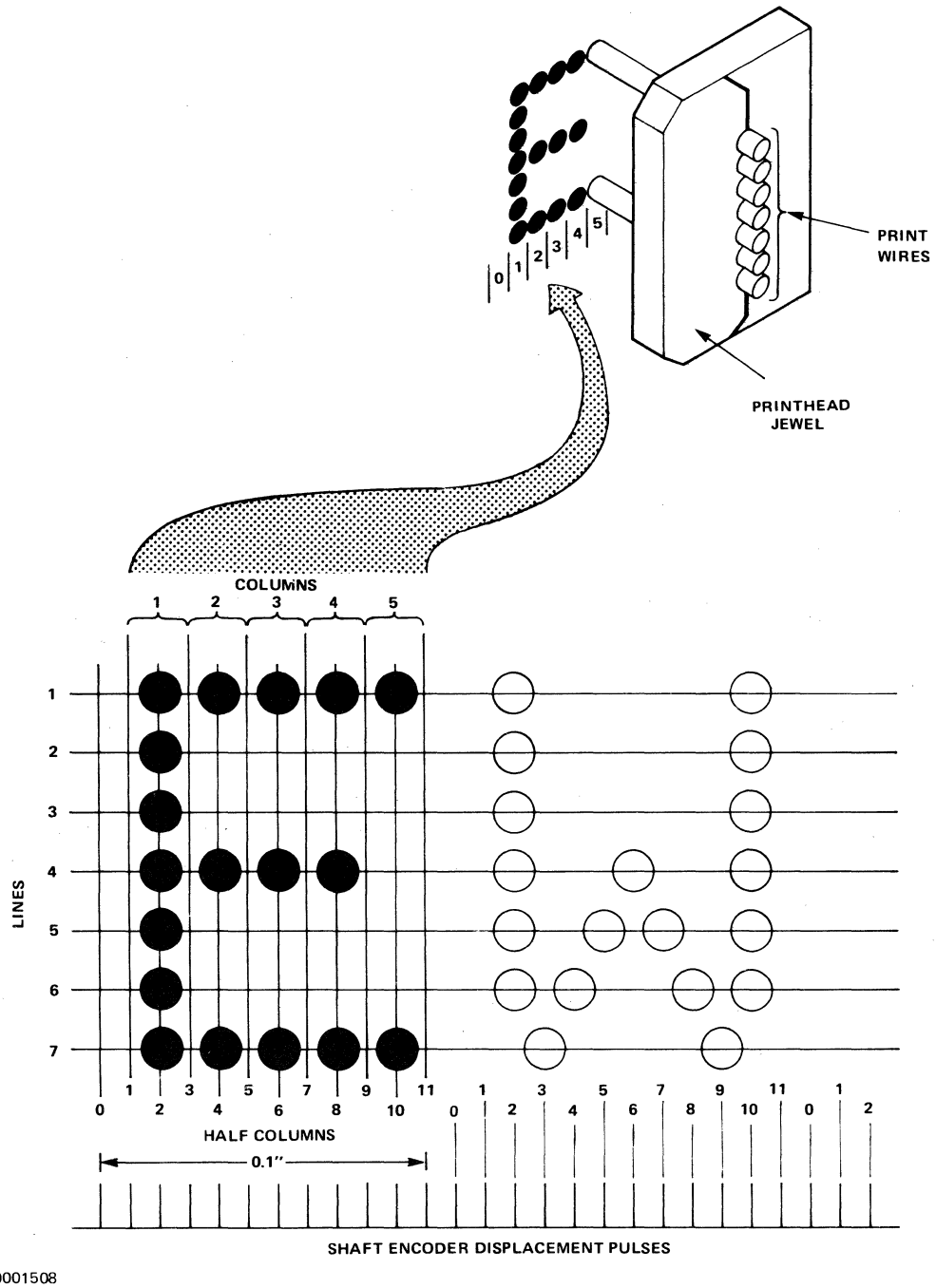


Figure 4-11. Printing The Letter "E"

SECTION V

MAINTENANCE

5.1 INTRODUCTION

Preventive maintenance procedures for the Model 820 KSR and the use of the self-test functions to isolate faults to a replaceable assembly are explained in this section. The procedures for removal and replacement of the electronic and mechanical assemblies of the Model 820 KSR, as well as methods of adjustment, are also described.

5.2 PREVENTIVE MAINTENANCE

A preventive maintenance schedule and the methods for performing the necessary scheduled maintenance are presented in the following paragraphs.

WARNING

Verify that power has been removed from the terminal before performing any maintenance (except self-tests).

5.2.1 PREVENTIVE MAINTENANCE SCHEDULE. To ensure satisfactory operation of the Model 820 KSR in normal service, the following schedule must be followed:

Procedure	Period
Vacuum the printhead area	Every month
Oil the top guide rod and clean ribbon guides and lower guide rod	Every 2 months

5.2.2 VACUUM THE PRINTHEAD AREA.

a. Switch the terminal power OFF.

b. Raise the terminal cover by grasping the left and right front corners and lifting up until the cover stops.

c. Carefully vacuum the paper chaff from the printhead and the ribbon path (see Figure 5-1).

d. Close the terminal cover and press down on the front corners to snap shut the closures.

5.2.3 OIL TOP GUIDE ROD AND CLEAN RIBBON GUIDES AND LOWER GUIDE ROD.

WARNING

Do not use cleaning agents containing chlorinated hydrocarbons, such as carbon tetrachloride.

a. Switch the terminal power OFF. Refer to Figure 5-1 for the location of the components mentioned in the following steps.

b. Clean both the top and bottom guide rods and all ribbon guides with a clean cloth dampened with denatured alcohol (TI part number 0230007).

c. Lubricate the top guide rod only with oil supplied in the Model 820 KSR maintenance kit (service kit TI part number 994472).

d. Manually slide the printhead carriage back and forth several times to lubricate the printhead carriage bearings.

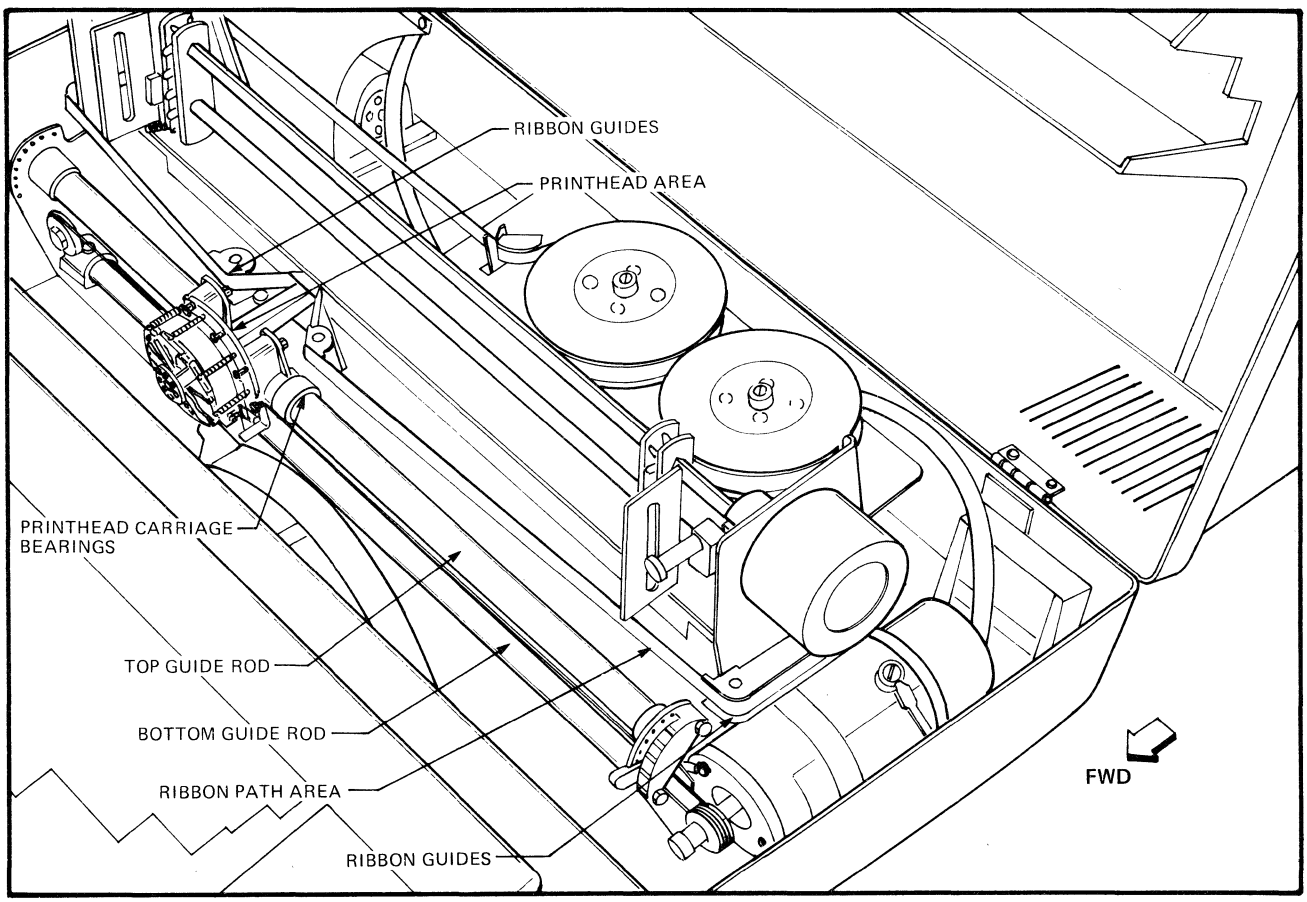


Figure 5-1. Printhead Area, Guide Rods, and Ribbon Guide

5.3 SELF-TESTS

The Model 820 KSR provides automatic self-test functions to verify correct terminal operation. Two types of self-tests are built into the Model 820 KSR:

- Power-up diagnostic tests
- Maintenance tests.

5.3.1 POWER-UP DIAGNOSTIC TESTS. The following sequence of tests is performed automatically by the Model 820 KSR, in the order indicated, each time power is applied to the terminal.

5.3.1.1 Indicator Test. The indicator test is initiated at the beginning of the power-up sequence. The LED indicators switch on, and the terminal status display (TSD) shows 888. The indicator test continues until the power-up sequence is complete (approximately two seconds).

5.3.1.2 RAM Test. The terminal main processor exercises its random access memory (RAM) to verify that data can be written to (recorded) and read (played back) from each memory location. A checkboard pattern is written and read, followed by writing and reading of an inverted checkerboard pattern. If an error is detected, a RAM failure error code is activated and is displayed on the TSD. The processor proceeds to the next test, but there is no assurance that subsequent test results are valid if this test fails. (Note: a small portion of the RAM, required to execute the test program, is not tested by the checkerboard pattern).

5.3.1.3 ROM Test. The terminal controller performs a cyclic redundancy character check (CRC) of its standard read-only memory (ROM), plus any installed optional ROM's. The internal ROM of the printer controller processor and the character generator (dot table) ROM are not tested. If the result of the CRC test is unsatisfactory, a ROM failure error code is activated and displayed on the TSD. The processor proceeds to the next test, but subsequent test results may not be valid if this test fails.

5.3.1.4 Nonvolatile Memory Test. The terminal controller computes the checksum of the contents of the nonvolatile memory (configuration and format parameters). If an error is found, the processor reloads the configuration memory with default configuration and format parameters, and a nonvolatile memory error code is activated and displayed.

5.3.1.5 Audible Tone Test. Upon completion of the memory tests and memory initialization, the audible tone is sounded for 80 milliseconds. The terminal controller and printer controller circuits then execute a power-up sequence. The last portion of the sequence causes the printhead to align to the left margin.

If any power-up test failures occurred, the audible tone will sound for 1 second, and the appropriate error code(s) will be displayed in the TSD. In either case the LED indicators assume their normal status.

5.4 MAINTENANCE TESTS

The maintenance tests must be manually initiated from the keyboard. Two maintenance tests may be performed on the standard Model 820 KSR terminal:

- Barberpole test
- Communications test.

5.4.1 BARBERPOLE TEST. The barberpole test causes the printer mechanism to print all 95 characters of the standard character set in a repetitive ''barberpole'' pattern at maximum print speed. The pattern is printed within the defined margins.

To exercise the terminal logic to the fullest extent possible, the test pattern is generated by the terminal controller, transmitted, and looped back internally (inside the EIA interface circuits and any optional line interface) from the terminal transmitter output to the terminal receiver input before printing.

The barberpole test may be initiated using the following procedure:

a. Set the LINE/•/LCL switch to LCL.

b. Simultaneously press the CTRL, SHIFT, and 1 keys. The terminal will respond by printing the barberpole pattern and displaying a status code 39 (test in progress) on the TSD.

c. Terminate the test by pressing the RESET key.

Figure 5-2 shows an example of the barberpole test in standard (10 CPI) and compressed (16.5 CPI) character spacing.

5.4.2 COMMUNICATIONS TEST.

5.4.2.1 Using EIA Plug.

NOTE

This test helps to isolate communications problems whether within the Model 820 KSR terminal or outside the terminal.

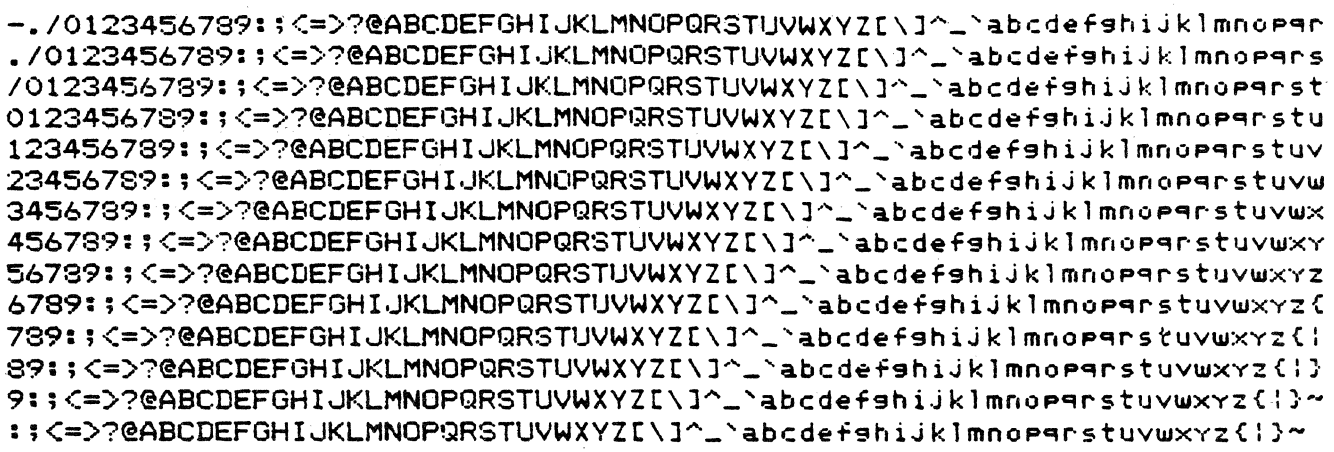
The communications system of the terminal can be tested by using a test plug that connects to the EIA port in the rest of the terminal. The plug accepts the signals from the transmit side of the terminal and returns the same signals to the terminal receiver. The procedure for using the test plug is as follows:

a. Set the CONFIGURE/OPERATE switch (on the keyboard under the terminal cover) and verify that the following terminal parameters are set:

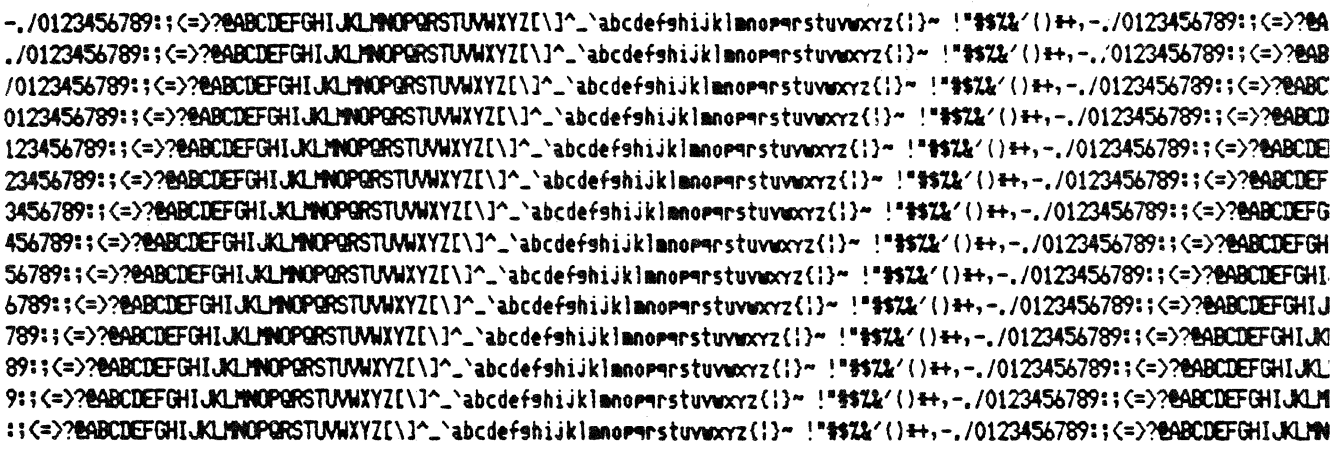
- Full duplex reverse channel ON for ready (configuration code 14)
- Baud — any baud rate.

b. Set the CONFIGURE/OPERATE switch to OPERATE.

c. Insert the test plug (TI part number 999925-0001) into the communications interface connector at the rear of the terminal.



A. STANDARD PRINTING TEST



B. COMPRESSED PRINTING TEST

Figure 5-2. Normal Results of Barberpole Test

d. Type any printable characters on the keyboard.

e. The terminal should print the text that is typed; if it does, the communications system (EIA portion) is functioning normally.

5.4.2.2 Acoustic Coupler Transmit Level Adjustments. The communications test initiates a signal pattern to test the communications line. When the test is initiated, pressing any code generating key on the keyboard will cause the terminal to transmit the corresponding code continuously until another key is pressed or the test is terminated. The character is transmitted at the configured baud rate (speed). The procedure for initiating and terminating the test is described below:

a. Set the LINE/●/LCL switch to LINE.

b. Simultaneously press the CTRL, SHIFT, and 2 keys. The terminal will respond by displaying status code 39 (test in progress) on the TSD.

c. Press any code generating key on the keyboard. If different characters are required during the test, simply press the key for the new character desired. Each time a character key is pressed, the terminal will terminate transmission of the current character and begin to transmit the new character.

d. To terminate the test, momentarily press the RESET key: The display on the TSD will resume its normal indication.

5.4.3 CONFIGURATION REPORT. This test provides a printed report of the current terminal configuration. The configuration report may be initiated as follows:

a. Set the LINE/•/LCL switch to LCL (or •).

b. Simultaneously press the CTRL, SHIFT, and 3 keys. The terminal will respond by printing:

C1;C2.....CNX

Each term (**C1, C2,** etc.) is a two-digit number corresponding to the enabled configuration parameters. The term **X** in the example above is the programmed line turnaround character(s).

NOTE

Parameter **09** is never reported, and parameters **01** through **08** are not reported unless the associated configuration set is protected. Program mode commands **60, 70,** and **80** also are not reported.

5.4.4 ROM IDENTIFICATION REPORT. This maintenance test provides a printed report which identifies the ROM's installed in the Model 820 KSR data terminal. The ROM identification report may be initiated as follows:

a. Set the LINE/•/LCL switch to LCL.

b. Simultaneously press the CTRL, SHIFT, and 4 keys. The terminal will respond by printing:

NNA/NNA/NNA or NNA/NNA/—

The term **NN** is a two-digit (decimal) dash number for the ROM (stored in one byte of the ROM). The term **A** is the revision letter of the ROM obtained from a code stored in one byte of the ROM. If the DFC-option ROM is installed, the final **NNA** term will be printed; if the DFC option ROM is not installed, the "—" will be printed.

5.5 TROUBLESHOOTING

Table 5-1 is intended to aid in identifying malfunctioning terminal components. Reading the chart from the left side, after identifying the failure categories, read across to the lowest number, then upwards to the area of failure. Corrective actions are suggested in the right side of the table. Tables 5-2 and 5-3 include information on option parts and locations.

5.6 ASSEMBLIES REMOVAL AND REPLACEMENT

The following subsections provide removal and replacement procedures for replaceable parts. Refer to Section VI for Texas Instruments' part numbers for assemblies and components.

CAUTION

Do not attempt to remove the connectors named in the following procedures by grasping the cables since the connector bodies can become detached from the plastic housing. If the connectors do not disconnect easily, use needlenose pliers to grasp the connector bodies, not the cables.

5.6.1 REMOVAL AND REPLACEMENT OF TERMINAL COVER. Remove the terminal cover as follows:

a. Unplug the power cord from the power receptable at the rear of the terminal.

b. Open the terminal cover by grasping the right and left front corners and gently lifting until the cover will raise no further. A plastic stay at the inside right rear holds the cover open at approximately 45 degrees from horizontal.

c. While holding the terminal cover with one hand, grasp the top of the plastic stay with the other hand and move the stay to the right.

d. Move the top of the plastic stay to the right until it clears the mounting pin.

e. Holding the stay clear of the pin, the terminal cover can now be swung back until it rests on the desk or table-top in a fully opened position.

Replace the terminal cover as follows:

a. Holding the terminal cover with your left hand and the plastic stay attached to the inside right rear of the cover with your right hand, return the cover to an approximate 45 degree position.

b. Supporting the terminal cover with the plastic stay, align the mounting pin with the stay and engage the plastic stay into the mounting pin.

c. Close the terminal cover by gently pushing the cover down until the closures snap shut.

d. Plug the power cord into the power receptacle at the rear of the Model 820 KSR.

Table 5-1.820 KSR Failure Analysis Chart

FAILURE CATEGORY / PROBABLE AREA OF FAILURE	TMS 4732 (996750-2/3)	DFC OPTION ROM (996750-4)	CUSTOMER DEFINED PROM	MAIN ELECT. PCB (999820)	EMULATOR PCB ASSY (999903)	CARRIAGE MOTOR (994238)	POWER CORD (999884)	LINE FUSE (416434-0303)	PRINTHEAD (999732)	BATTERY KIT (999907)	PAPER MOTOR ASSY (999730)	RIBBON MOTOR ASSY (999738)	FAN MOTOR ASSY (999819)	PAPER FEED TRACTORS (994183)	MECHANICAL ASSY (999689)	REMARKS
1. FAILURE TO ALIGN CARRIAGE																
NO LED'S LIGHT ON TERMINAL STATUS DISPLAY (TSD)					3*		1	2								1. CHECK THE PROPER POWER CORD MATING WITH THE TERMINAL RECEPTACLE 2. DEFECTIVE POWER SWITCH 3. LINE FUSE IS 3A 250 V 3AG LIT 312003 4. CHECK E27 AND E28 CONNECTIONS
LED ON				3	2	1										1. CARRIAGE JAM (STATUS CODE 11). RESET 2. CHECK WIRE ROPE (DEFECTIVE OR IMPROPERLY SECURED) 3. CHECK RIBBON (TWISTING) 4. CARRIAGE MOTOR CONNECTIONS J105/J8 5. EMULATOR CABLE CONNECTIONS

*NUMBER IN BOX INDICATES PROBABLE ORDER OF FAILURE

Table 5-1. 820 KSR Failure Analysis Chart (Continued)

FAILURE CATEGORY / PROBABLE AREA OF FAILURE	KEYBOARD	TMS 4732 (996750-02 AND 03)	DFC OPTION ROM (996750-4)	CUSTOMER DEFINED PROM	MAIN ELECT. PCB (999820)	EMULATOR PCB ASSY (999903)	CARRIAGE MOTOR (984238)	POWER CORD (999884)	LINE FUSE (416434-0303)	PRINTHEAD (999732)	BATTERY KIT (999907)	PAPER MOTOR ASSY (999730)	RIBBON MOTOR ASSY (999738)	FAN MOTOR ASSY (999819)	PAPER FEED TRACTORS (994183)	MECHANICAL ASSY (999689)	REMARKS
2. POWER UP																	
DISPLAY OTHER THAN 888																	CHECK KEYBOARD CABLE
STATUS CODE 00 ON TSD					1*												
STATUS CODE 01 ON TSD		1															U9 AND U10
STATUS CODE 02 ON TSD			1														U11
STATUS CODE 03 ON TSD					2						1						
3. PRINT QUALITY																	
LIGHT PRINT/MISSING DOTS					2					1							1. PRINTHEAD TO PLATEN ADJUSTMENT 2. WORN OUT RIBBON 3. RIBBON NOSE GUIDE ADJUSTMENT
MISSING CHARACTERS					1												
4. PAPER FEED																	
NO PAPER FEED, BUT CARRIAGE DRIVE OK	3					1						2					CHECK CONNECTIONS J6 AND J106
NO PAPER FEED, AND NO CARRIAGE DRIVE	3				2	1											

* NUMBER IN BOX INDICATES PROBABLE ORDER OF FAILURE

Table 5-1. 820 KSR Failure Analysis Chart (Concluded)

FAILURE CATEGORY / PROBABLE AREA OF FAILURE	TMS 4732 (996750-2 AND -3)	DFC OPTION ROM (996750-4)	CUSTOMER DEFINED PROM	MAIN ELECT. PCB (999820)	EMULATOR PCB ASSY (999903)	CARRIAGE MOTOR (994238)	POWER CORD (999884)	LINE FUSE (416434-0303)	PRINTHEAD (999732)	BATTERY KIT (999907)	PAPER MOTOR ASSY (919730)	RIBBON MOTOR ASSY (919730)	FAN MOTOR ASSY (999819)	PAPER FEED TRACTORS (994183)	MECHANICAL ASSY. (999689)	REMARKS
5. RIBBON DRIVE INOPERATIVE				2*	1							3				CHECK CONNECTIONS J6 AND J101
6. UNIT OVERHEATS				2									1			CHECK FAN CONNECTION J203
7. PRINTHEAD STOPS																CHECK XU17 PLUG CONNECTOR AND SENSOR (J8) CONNECTIONS
8. ERRATIC OPERATIONS (CHARACTERS PRINTED WITHOUT KEYS BEING DEPRESSED, RIBBON RUNS CONTINUOUSLY																CHECK ALL GROUND CONNECTIONS ON KEYBOARD AND MAIN ELECTRONIC PCB
9. FAN STOPPED				1									2			CHECK FOR FROZEN FAN MOTOR
10. CARRIAGE MOVES AND STOPS				2		1										1. CLEAN AND LUBRICATE CARRIAGE RODS 2. PRINTHEAD TO PLATEN ADJUSTMENT
11. PAPER FEEDS OUT OF TRACTORS														1	2	ADJUST LATERAL TRACTOR TENSION (R.H. TRACTOR): CHECK PAPER BOX ALIGNMENT WITH CHUTE

*NUMBER IN BOX INDICATES PROBABLE ORDER OF FAILURE

TABLE 5-2. OPTION PROM/ROM PART NUMBERS AND LOCATIONS

Option	TI Part Number	Logic PWB (999694-0001) Device	Socket
DFC Option	0996750-0004	ROM	XU11
User-Defined Configuration	0999935-0001 0999935-0001	PROM PROM	XU3 XU50 (Spare)
(European Character Sets)	See Table C2 See Table C2	PROM PROM	XU2 XU40 (Spare)

TABLE 5-3. STRAPPABLE OPTION ON LOGIC PWB (999694-0001)

Option	Jumper Location
To connect signal ground to chassis ground	E222 to E223
To isolate signal ground from chassis ground (STANDARD)	E221 to E222

5.6.2 REMOVAL AND REPLACEMENT OF THE KEYBOARD PLENUM. Remove the keyboard plenum as follows:

a. Unplug power cord.

b. Lift open the terminal cover.

c. Remove the keyboard bezel by grasping the extreme right and left edges and lifting up.

d. Manually move the printhead to the right approximately 4 inches to the right of the center of the platen.

e. Using a standard slot screwdriver, disengage the four retainer clips at the front of the keyboard plenum.

f. Grasping the right and left front edges of the keyboard plenum, raise the front of the plenum approxmately 10 degrees to clear the clip latches.

g. While supporting the plenum at approximately 10 degrees, disengage the three rear latches beginning with right rear latch.

h. Lift the plenum clear of the terminal with slight forward motion and set it aside.

Replace the keyboard plenum as follows:

a. Verify that the printhead is positioned approximately 4 inches to the right of the center of the platen.

b. Verify that the cable from the mechanism to the PWB is routed correctly and secured properly.

c. Grasp the edges of the plenum and insert the rear of the plenum between the printhead and cables, ensuring that the plenum fits over the rear fan plenum housing.

d. Lift the front of the fan plenum approximately 10 degrees and insert the three rear tabs into their respective slots inside the terminal.

e. Gently push the front of the fan plenum down until it rests on the four front retaining tabs.

f. Using a standard slot screwdriver, engage the retaining tabs into their respective latches.

g. Replace the keyboard bezel and close the terminal cover.

5.6.3 REMOVAL AND REPLACEMENT OF THE FAN ASSEMBLY. Remove the fan assembly as follows:

a. Unplug power cord.

b. Remove the terminal cover as described in subsection 5.6.1.

c. Remove the keyboard plenum as described in subsection 5.6.2.

d. Using a standard slot screwdriver, remove the single retaining screw located on top of the fan plenum.

e. Move the rear of the fan plenum toward the front of the terminal to remove it from under the hinge nut plate. Disengage the feet and lift the plenum up and to the left to remove it from the base.

NOTE

Observe the routing of the fan cable so you can reinstall it the same way.

f. Disconnect the fan cable (connector P203) at J203 on the PWB and remove the cable from the snap-in type routing guides.

g. Using a standard slot screwdriver, remove the two mounting screws and lift out the fan assembly.

h. Slip the fan motor out of its bracket.

Replace the fan assembly as follows:

a. Install the fan motor into the fan bracket.

b. Mount the fan bracket with the two mounting screws while tightly grasping the bracket around the fan motor with needlenose pliers. Make sure that the fan blade can rotate freely before securing the two mounting screws.

c. Reroute the fan assembly cable on the logic PWB as it was originally routed.

d. Reconnect connector P203 to the PWB.

e. Replace the fan plenum and the fan plenum retaining screw (ensuring that the two bottom plenum feet are engaged with the base slots and secured with the hinge nut plate).

f. Replace the keyboard plenum as described in subsection 5.6.2.

g. Apply power and verify operation.

h. Replace the terminal cover as described in subsection 5.6.1.

5.6.4 REMOVAL AND REPLACEMENT OF THE KEYBOARD ASSEMBLY (Keyboard PWB or Emulator Decrementor PWB's).

a. Unplug power cord.

b. Lift the terminal cover.

c. Remove the keyboard bezel by grasping the extreme right and left edges and lifting up the bezel.

d. Remove the keyboard plenum as described in subsection 5.6.2.

e. Remove the 33 mm (1¼ inch) wide sheet metal ground strap attached to the front left corner of the keyboard PWB by pulling it down and away from the plastic connector.

f. Loosen the four keyboard PWB keepers along the rear edge of the PWB, using both hands to press in at the base of the keepers while lifting the keyboard slightly.

g. For Emulator and Decrementor PWB removal, disconnect connectors P101, P106, P105, P104, P6 and P8 from the Logic PWB (the PWB at the base of the case).

h. Lift the tach motor cable, paper drive motor cable, and ribbon drive motor out of their cable retainers on the right side of the case.

i. Remove the 25-conductor ribbon cable from its connector on the Keyboard PWB.

j. Snap the keyboard keepers up and away from the keyboard.

k. Lift the keyboard assembly up from the rear and remove the Keyboard PWB out of its plastic mounting assembly.

.l If the Emulator PWB or Decrementer PWB is to be removed, disconnect the cables and slide the two logic boards out of their plastic mounting assemblies.

Replace the keyboard assembly as follows:

a. Place the Emulator/Decrementor PWB's or Keyboard PWB, as applicable, into the plastic keyboard mounting assembly.

b. Reconnect the 25-conductor ribbon cable to the Keyboard PWB.

c. Snap the four keyboard assembly keepers back in place (if removed).

d. Replace the tach motor cable, paper drive motor cable, and ribbon drive motor cable back into their holders on the right side of the case.

e. Reconnect connectors P101, P106, P105, P104, P6 and P8 (if removed).

f. Reconnect the ground strap to the front left corner of the Keyboard PWB.

g. Replace the plenum as described in subsection 5.6.2.

h. Replace the keyboard bezel and close the terminal cover.

i. Replace the power cord and apply power to verify operation.

5.6.5 REMOVAL AND REPLACEMENT OF THE LOGIC PWB (Main Electronic PWB). Remove the Logic PWB as follows:

a. Unplug power cord.

b. Remove the keyboard assembly as described in subsection 5.6.4 (steps a. through i.).

c. Lift the keyboard assembly from the terminal.

d. Remove the two ac power connectors located in the lower left corner of the Logic PWB at E281 and E271 and disconnect the fan cable from J203.

e. Disconnect I/O interface connector P3 and the ground leads from the aluminum ground shield.

f. Lift the Logic PWB from the terminal.

NOTE

When replacing the Logic PWB, refer to Tables 5-2 for location of the option PROM's and other components which must be transferred to the replacement PWB assembly. Table 5-3 lists strappable options.

Replace the Logic PWB as follows:

a. Place the Logic PWB in the bottom of the terminal case.

b. Attach the ac power connectors at E281 and E271 and reconnect the I/O interface connector P3, fan connector P203, and ground leads to the aluminum ground shield.

c. Reinstall the keyboard assembly by inserting the keyboard keeper posts in the slots provided on the Logic PWB.

d. Complete replacement of the keyboard assembly as described in subsection 5.6.4.

5.6.6 REMOVAL AND REPLACEMENT OF LOGIC PWB BATTERY. Remove the Logic PWB battery as follows:

a. Unplug the power cord.

b. Remove the keyboard assembly as described in subsection 5.6.4 (steps a. through i.).

c. Disconnect the battery cable at J9 located in the upper right corner of the Logic PWB.

d. Gently deflect the battery clip tabs and remove the battery from the logic PWB. (Early models have the battery RTVed in place and replacement should be likewise).

Replace the Logic PWB battery as follows:

a. Insert a new battery (TI part number 999880-0001) and reconnect the connector at J9 Figure 5-3 illustrates the PWB battery details.

b. Reinstall the keyboard assembly as described in subsection 5.6.4.

5.6.7 REMOVAL AND REPLACEMENT OF PWB FUSE (250V, 3A).

a. Remove the keyboard assembly as described in subsection 5.6.4 (steps a through i).

b. Replace the fuse (TI part number 416434-0303, LCT — 312003) located in the front left corner of the PWB at F250.

c. Reinstall the keyboard assembly as described in subsection 5.6.4.

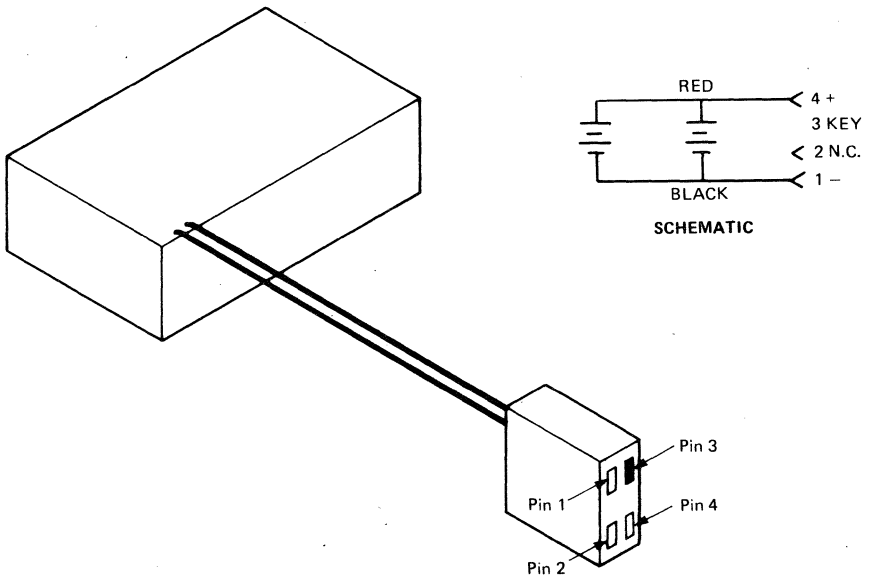


Figure 5-3. Logic PWB Battery Details

5.6.8 REMOVAL AND REPLACEMENT OF PAPER DRIVE MOTOR. Remove the paper drive motor as follows:

a. Unplug the power cord.

b. Remove the terminal cover as described in subsection 5.6.1.

c. Open the paper drive tractor flaps and remove any paper from the terminal.

d. Remove the keyboard plenum as described in subsection 5.6.2.

e. Lift both ribbon spools off their spindles and carefully remove the ribbon from the ribbon guides. Wind the excess ribbon onto either spool and set the ribbon spools aside.

f. Using a standard slot screwdriver, remove single screw holding the ribbon guide on the right side of the printer subassembly as shown in Figure 5-1. Lay the guide aside. Remove all cable ties from the paper drive motor cable-to-cable bundle (observe location of the cable ties for subsequent replacement).

g. Using a standard slot screwdriver, loosen the two screws that hold the paper drive motor to the printer subassembly frame.

h. Grasp the motor with your right hand while removing the screws and washers with your left; take care to avoid dropping the parts into the terminal base. Set the screws and washers aside.

i. Pull the motor out of the pinion hole and gently lift the motor cable from around the carriage motor (located below the paper drive motor), the cable clip, and the cable holders of the keyboard keepers.

j. Set the motor on a bench or table top and remove connectors P106 and P104.

Replace the paper drive motor as follows:

a. Insert the paper drive motor shaft into the hole provided in the printer mechanism frame and seat the motor flange flush with the mechanism side plate. Apply silicone grease (TI Part Number 0232334-6050) between the rivet on the end of the gear and the motor flange.

b. Push in on the motor and the plastic tractor drive and rotate the motor slightly back and forth until the motor flange and the tractor drive fit flush against the frame.

c. Align the mounting holes.

d. Insert the top front screw through the gear bearing housing and frame until the screw engages the motor flange. Start the screw with a screwdriver.

e. Insert the rear bottom screw through the gear bearing housing and frame and align it in the motor flange. Start the screw by hand.

f. Tighten both screws.

g. Route the cable around and under the rear of the carriage motor (located below the paper drive motor) and along the right side of the carriage motor. Insert the cable into the cable restraint and close the restraint.

h. Place the cable into the two keyboard keepers on the right side. Replace the cable ties removed in step f. of the removal procedure.

i. Connect P104 and P106 to J104 and J106 on the Logic PWB. Ensure that the connectors are seated all the way down or erratic terminal operation may result.

j. Replace the right ribbon guide, ensuring that the paper drive motor cable is safely captured between the guide and the side plate.

k. Replace the ribbon; replace the keyboard plenum as instructed in subsection 5.6.2; and replace the terminal cover as described in subsection 5.6.1.

5.6.9 REMOVAL AND REPLACEMENT OF THE TRACTOR ASSEMBLY. Remove the tractor assembly as follows:

a. Remove the terminal cover as described in subsection 5.6.1.

b. Remove the inside **E**-ring from the ***round*** tractor support rod by applying pressure between the rod and the ring with a screwdriver. Once the ring begins to detach, hold it with your free hand to prevent it from flying off.

c. Remove the outer snap ring by hand.

d. Loosen the locking device on the tractors and slide the round rod to the left and out of the mechanism.

e. Use a standard slot screwdriver to remove the left bearing which supports the tractor ***square*** drive shaft. Carefully avoid dropping washers and nuts into the terminal base and do not lose the hub and spring located on that end of the bar.

f. Remove the tractor assembly from the mechanism. (If the tractor drive gear remains on the end of the bar, slide it off and set it aside).

g. Slide the tractors off the bar; take care not to bend the bar.

Replace the tractor assembly as follows:

a. Slide the tractors onto the square drive bar. Verify that the locking device for the left tractor is on theleft and the locking drive for the right trctor is on the right and that the alignment mark on both tractors' drive sprockets align with same corner of the square drive shaft.

b. With the tractor doors facing you, place the drive gear (gear fitted tightly on the shaft) on the right end of the shaft with the semicircle portion of the gear adjacent to each flat surface of the shaft.

c. Insert the gear and shaft into the bearing on the right side plate.

d. Replace the hub with spring on the left end of the drive shaft with the semicircles of the hub adjacent to each drive shaft surface. Slip the bearing onto the hub and fasten the left side plate.

e. Slide the round rod (non-grooved end first) from left to right through the left side plate, through the tractors, and through the right side plate.

f. Using needlenose pliers, replace the **E**-ring on the round rod, ensuring it is located inside the left side plate.

g. Replace the outer snap ring on the round rod outside the left side plate.

h. Position the paper tractors as required and reload printing paper.

5.6.10 REMOVAL AND REPLACEMENT OF THE PRINTHEAD. Remove the printhead as follows:

a. Disconnect the powr cord at the power receptacle located at the rear of the Model 820 KSR.

b. Lift the terminal cover.

c. Remove the keyboard plenum as described in subsection 5.6.2.

d. Remove and save the plastic cable retainer clip at the pointer where the printhead cable is folded beneath the printhead.

e. Using a small wrench or pliers, remove the two long hex nuts located behind the printhead and facing the ribbon guides.

f. Grasp the printhead and pull it towards the front of the terminal until the two mounting bolts clear the mounting frame.

g. Disconnect the printhead ribbon cable connector (J20) from the connector at the bottom of the printhead.

Replace the printhead as follows:

CAUTION

When handling the new printhead, take care not to damage the springs after removing the foam shipping material. Grasp the printhead only by the mounting plate or the plastic needle housing. DO NOT handle the printhead by the springs around the circumference of the printhead.

a. Connect the printhead ribbon cable connector (J20) to the connector at the bottom of the printhead.

b. Position the printhead so that the mounting screws align with the mounting holes in the support frame and slide the printhead toward the platen as far as it will go.

c. Start the two long nuts on the mounting screws and hand tighten.

d. With a small wrench or pliers tighten the long nuts **1/6 turn** past hand tightened.

e. Replace the plastic cable clip, starting the clip at the end with the notched corner.

f. Replace the plenum as described in subsection 5.6.2 and reconnect the power cord to the rear of the terminal.

g. If the printhead smudges the paper during printing and the problem cannot be corrected with the form thickness adjustment, it may be necessary to adjust the ribbon guide at the nose of the printhead as described in subsection 5.6.11.

h. Close the terminal cover.

5.6.11 PRINTHEAD RIBBON GUIDE ADJUSTMENT.

a. Lift the terminal cover and rotate the printhead adjustment lever all the way towards the keyboard.

b. Remove the ribbon as described in step 5.6.8.e above.

c. Loosen the two screws on either side of the nose of the printhead and slide the ribbon guide away from the platen, exposing the printhead nose through the ribbon guide window.

d. Place a shim (file card or equivalent) between the platen and the printhead nose.

e. Using the adjustments lever, push the printhead nose against the shim until it is held firmly against the platen.

f. Slide the ribbon guide toward the platen holding it flush against the shim and tighten the screws. Using the adjust lever remove the shim.

g. Replace the printing ribbon and set the printhead adjust lever for proper printing.

5.6.12 REMOVAL AND REPLACEMENT OF THE RIBBON DRIVE SUBASSEMBLY. Remove the ribbon drive subassembly as follows:

a. Unplug the power cord.

b. Remove the terminal cover as described in subsection 5.6.1.

c. Remove the printing ribbon spools from the ribbon spindles and guides and set aside.

d. Remove the three screws that attach the ribbon drive subassembly to the printer mechanism frame.

e. Tilt the subassembly backward to rest in the rear cavity of the terminal base.

f. Remove the two spade lugs from the ribbon reverse switch, noting their orientation for reconnection to the replacement unit.

g. Cut the cable tie that secures the motor cable to the rear bar of the printer mechanism frame and the cable ties attaching it to the rest of cable, noting position of cable ties.

h. Disconnect cable connector P101 from the Logic PWB (the main PWB) and carefully lift the cable out of the keyboard keepers, the cable restraint and from around the carriage motor.

Replace the ribbon drive subassembly as follows:

a. Lay the replacement assembly in the rear cavity of the terminal base.

b. Attach the two spade lugs to the ribbon reverse microswitch of the ribbon drive subassembly. Verify that the the connections are oriented the same as the unit that was removed or the ribbon will not reverse automatically.

c. Attach a cable tie to hold the motor cable to the rear frame bar of the print mechanism.

d. Hold the ribbon drive subassembly in place and install the three screws that secure the subassembly to the rear of the print mechanism framework.

e. Route the ribbon drive motor cable around and under the carriage motor and through the cable restraint. Using cable ties replace those removed in step **g** of the removal instructions.

f. Connect P101 at J101 on the Logic PWB, ensuring that the connector is snugly joined.

g. Place the cables in the keyboard keeper cable retainer.

h. Replace the printing ribbon. It may be necessary to readjust the subassembly (by loosening the three mounting screws and moving the assembly to front or rear and retightening the screws) so that the ribbon passes through the center of the slots in the shift arm.

i. Replace the terminal cover as instructed in subsection 5.6.1.

5.6.13 REMOVAL OF THE CARRIAGE MOTOR AND MECHANISM (Or Wire Rope Or Mechanism).

a. Unplug the power cord.

b. Remove the terminal cover and plenums as described in subsections 5.6.1, 5.6.2 and 5.6.3, respectively.

c. Disconnect the ground strap on the left side of the mechanism that is attached to the PWB ground plane.

d. Disconnect the ground lug at the rear of the terminal to the left of the EIA connector.

e. Disconnect all the connectors at the rear of the Logic PWB, (including the printhead ribbon cable) and lift the cables out of the cable restraint and keyboard keepers. Remove all cable ties, noting their positions.

f. Push the idler pulley support to the right until the slot on the bottom of the support catches on the right sideplate of the print mechanism frame.

g. Insert a slotted screwdriver at an angle next to the upper printhead carriage rod to remove the front two mounting screws.

h. Remove the two rear mounting screws.

i. Lift the entire printer mechanism subassembly up and out of the terminal. **DO NOT LIFT THE MECHANISM BY THE SQUARE TRACTOR DRIVE SHAFT.**

j. Remove the wire rope from the capstan by disengaging the end of the wire rope from either end of the capstan and unwrapping the wire.

k. Remove the ground strap screw from the front of the motor and remove the ground strap.

l. Loosen the motor strap retaining screw inside the bottom of the right sideplate.

m. Press down on the top of the motor strap to disengage the strap from the sideplate.

n. Remove the carriage motor.

o. Remove the plastic cradle from the carriage motor by removing the screw that holds the cradle to the motor.

p. Remove the two wires from the motor terminal, noting their orientation for connecting the replacement unit.

Replace the carriage motor and mechanism as follows:

a. Connect the motor drive cable spade lugs to the carriage motor terminals as they were connected to the old motor.

b. Attach the plastic cradle to the motor.

c. Position the motor against the sideplate.

d. Hook the motor strap onto the tab in the sideplate and tighten the retaining screw.

e. Replace the ground strap onto the front of the motor with the screw that previously held it.

f. Turn the wire rope capstan so that the rear wire rope is at the top.

g. Insert the ball of the top wire rope end into the slot. The tip of a screwdriver may be required to press the ball for a snug fit.

h. Holding the wire rope between your left thumb and forefinger, turn the capstan clockwise 6½ turns.

i. Guide the wire rope into the capstan grooves. When complete, the outer capstan slot should be pointing up.

j. Wrap the lower end of the wire rope counterclockwise around the capstan starting with the groove adjacent to the last one filled by the upper rope end.

k. Insert the ball into the capstan slot.

l. Loop the printhead cable and the motor cables over the tractor drive bar to keep them out of the way during installation of the printer mechanism subassembly.

m. Replace the printer mechanism into the terminal base so that mounting screw holes are aligned with the mounting holes in the base. **DO NOT LIFT THE MECHANISM BY THE SQUARE TRACTOR DRIVE SHAFT.**

n. Insert the mounting screws and partially tighten them.

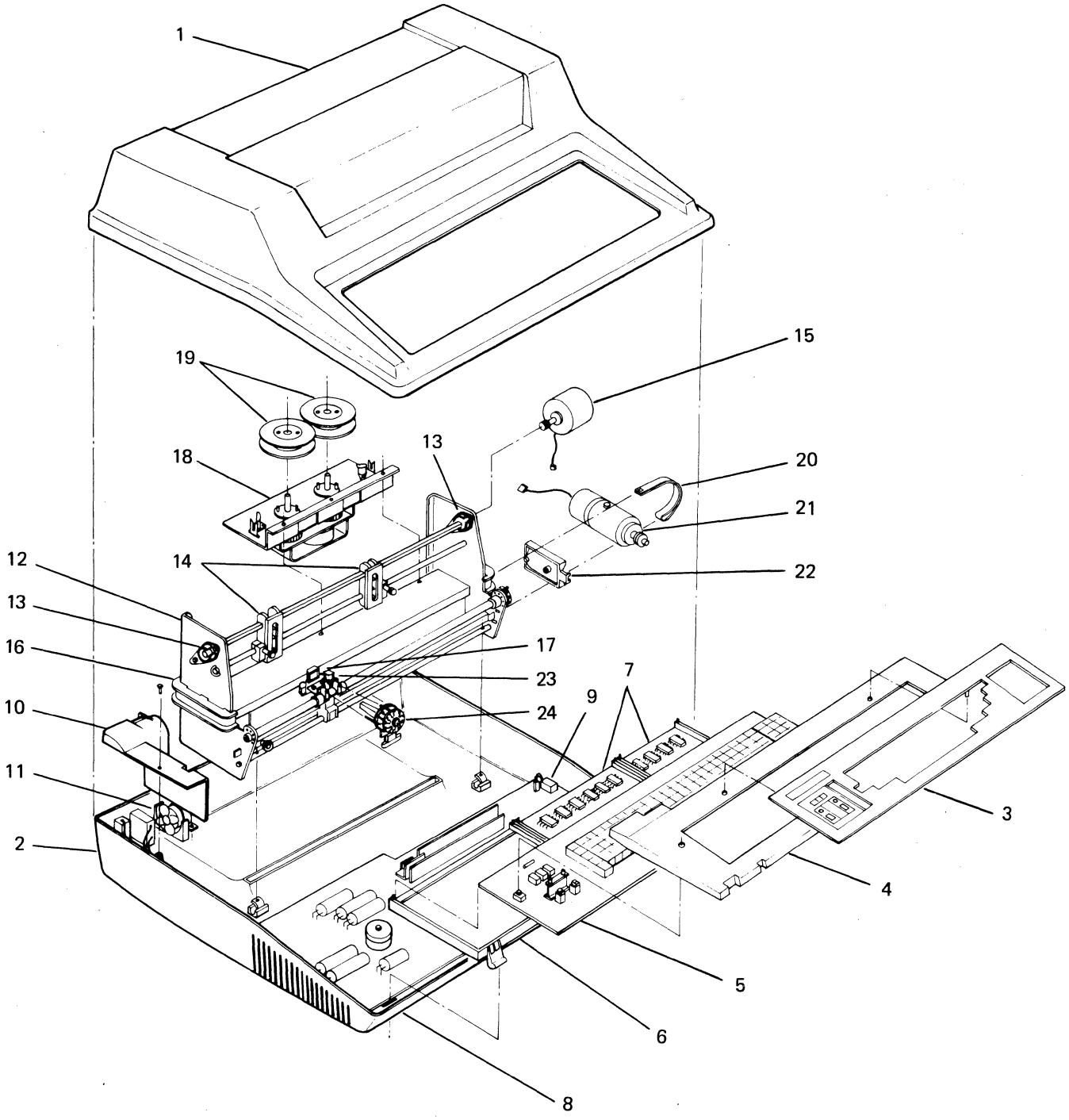
o. Gently return the idler pully support to the operating position by lifting the right end while holding the support to the right with your free hand, preventing the pulley from snapping back.

p. Route and connect all the cables, including the ground lugs to the left of the EIA connector and the ground strap on the left side. Replace all cable ties removed in step **e.** of the removal procedure.

q. Replace the plenums and terminal cover as described in subsections 5.6.3, 5.6.2 and 5.6.1, respectively.

SECTION VI

ASSEMBLY DRAWINGS AND LISTS OF MATERIALS



1. Terminal Cover
2. Terminal Base
3. Keyboard Bezel
4. Plenum, PWB
5. Keyboard PWB
6. Card Frame, Keyboard/Option
7. Emulator/Decrementer Kit
8. Terminal Electronics
9. Kit, Battery, Package
10. Fan Plenum
11. Fan Assembly
12. Printer Mechanism Assembly
13. Paper Advance Bearing
14. Tractor, Paper, Precision
15. Motor Assembly, Paper Drive
16. Ribbon Guide
17. Nose Guide, Printhead
18. Ribbon Drive
19. Ribbon Spools
20. Strap, Motor
21. Carriage Drive Motor Assembly
22. Cradle, Motor
23. Carriage Assembly, Printhead
24. Printhead Assembly, 30V

Figure 6-1. Model 820 KSR Illustrated Major Assembles.

NOTES UNLESS OTHERWISE SPECIFIED

1. CABLE CLAMP SCREWS & RETAINER CLIPS & SCREWS INCLUDED WITH ITEM 2
2. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME SIDE AS SCREW HEAD
3. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIPS

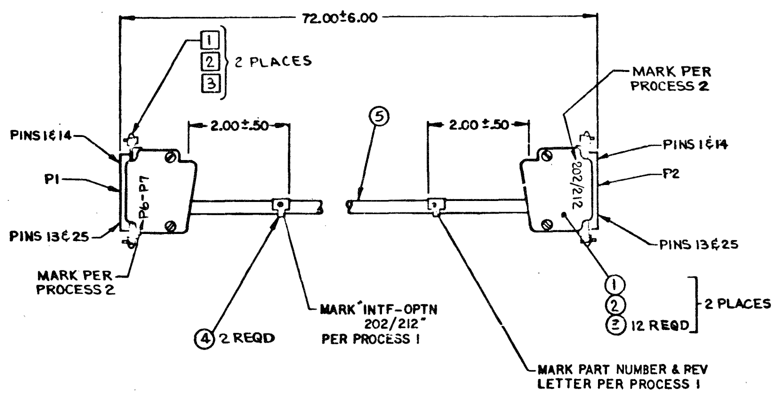
WIRE NO.	DESCRIPTION	START STATION	FINISH STATION	SIGNATURE	ITEM NO	REMARKS
1	22 AWG-CABLE-BLK	P1 -1	P2 -1	AA	5	
2	-WHT	-2	-2	BA		
3	-RED	-3	-3	BB		
4	[illegible]	-4	-4	CA		
5	[illegible]	-5	-5	CB		
6	-BLU	-6	-6	CC		
7	-ORN	-7	-7	AB		
8	-YEL	-8	-8	CF		
9	-VIO	-11	-11	SCA		
10	-GRY	-12	-12	SCF		
11	[illegible]	-20	-20	CD		
12	22 AWG-CABLE-TAN	P1 -22	P2 -22	CE	5	

993205

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	415775(C) 11/5/76 REV PER ENGR MARKUP	11/12/76	

FORMAL RELEASE



SEQ NO	IDENT	P SPEC	NO	ADDITIONAL	NOTES
2	MARK	100-07	712	COLOR WHITE, TYPE 9	
1	MARK	100-07	712	COLOR BLACK, TYPE 6	

PROCESS — CLASSIFICATION

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
993104	8744
993102	8744

APPLICATION

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSY, 202/212 DATA SET

D 96214 993205

REV A

LM

6-3

INCORPORATED

DATE 12/01/76

LIST OF MATERIAL

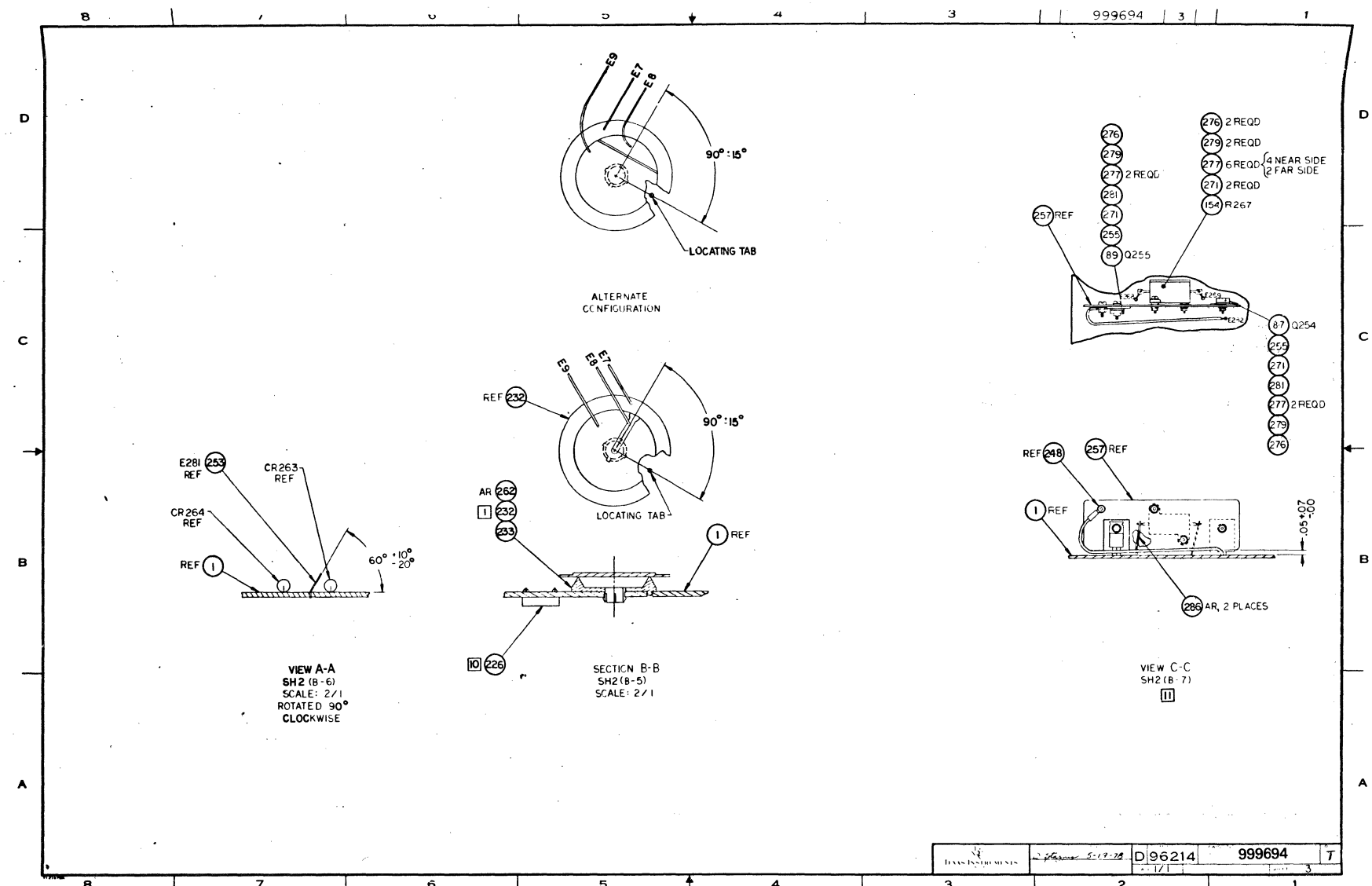
PAGE 1 of 1

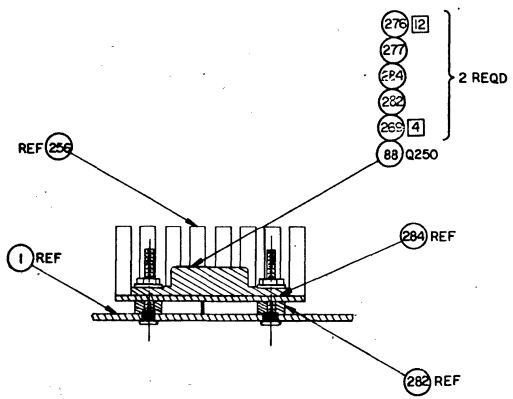
PART NUMBER LM0993205-0001 REV A

ITEM NUMBER	QUANTITY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
001	00002.000	EA		0539409-0005	CONNECTOR,PLUG 25 PINS	AMP -205208-1
002	00002.000	EA		0539903-0001	HOOD,CONN 25 PIN WITH RETAINERS	AMP - 206478-3
003	00024.000	EA		0539430-0003	CONTACT,PIN 24-20AWG .068 INSUL DIA	AMP -205202-2 ST
004	00002.000	EA		0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	QPL - MS3368-6-9
005	00006.500	FT		0972444-0005	CABLE,12COND 22AWG UL LISTED	019007-6914UL
006	REF	EA		0983404-9901	TEST PGM,202/212 DATA SET CABLE-OMNI	

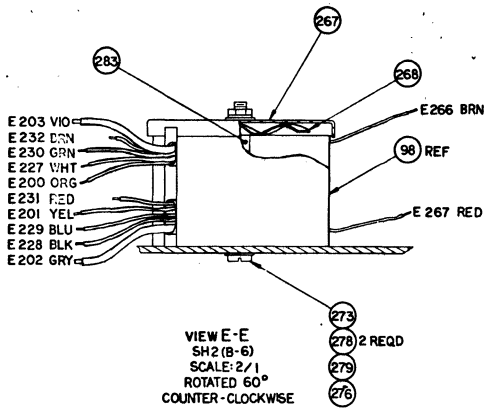
DRAFTSMAN / DATE	CHECKED / DATE	DESIGN ENGINEER / DATE	TITLE
	12-3-76		CABLE ASSY,202/212 DATA SET
		RELEASED / DATE	PART NUMBER LM0993205-0001 REV A

34

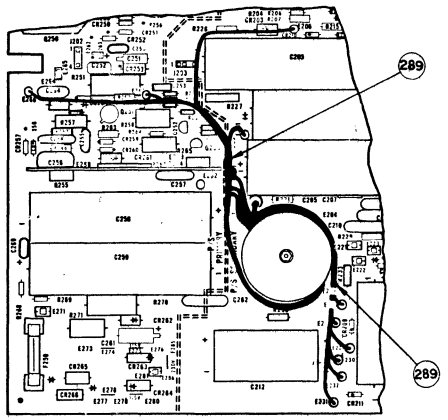

999694
E9
E7
E8
90° ±15°
LOCATING TAB
ALTERNATE CONFIGURATION
276 2 REQD
279 2 REQD
277 6 REQD { 4 NEAR SIDE 2 FAR SIDE
271 2 REQD
154 R267
276
279
277 2 REQD
281
271
255
89 Q255
257 REF
87 Q254
255
271
281
277 2 REQD
279
276
E281 253 REF
CR263 REF
CR264 REF
REF 1
60° +10° -20°
VIEW A-A
SH2 (B-6)
SCALE: 2/1
ROTATED 90° CLOCKWISE
REF 232
AR 262
1 232
233
LOCATING TAB
1 REF
10 226
SECTION B-B
SH2 (B-5)
SCALE: 2/1
REF 248
257 REF
1 REF
.05 +.07 -.00
286 AR, 2 PLACES
VIEW C-C
SH2 (B-7)
11
TEXAS INSTRUMENTS
D 96214
999694
T
1/1



SECTION D-D
SH2 (C-7)
SCALE: 2/1
ROTATED 25° CLOCKWISE



VIEW E-E
SH2 (B-6)
SCALE: 2/1
ROTATED 60° COUNTER-CLOCKWISE



VIEW K
SH2 (A-7)

TEXAS INSTRUMENTS	5-23-78	D 96214	999694

993210

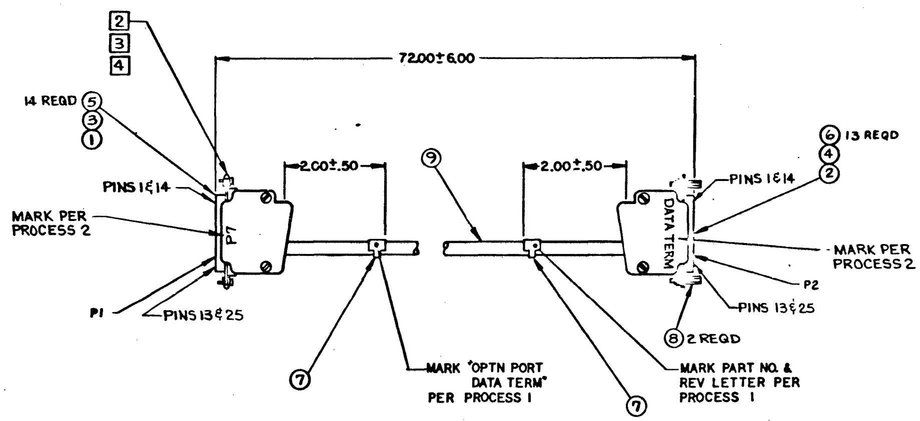
NOTES: UNLESS OTHERWISE SPECIFIED

1. TWO WIRES CRIMPED TOGETHER AT THIS STATION.
2. CABLE CLAMP SCREWS & RETAINER CLIPS & SCREWS INCLUDED WITH ITEM 3
3. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME SIDE AS SCREW HEAD
4. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIPS

WIRE NO.	DESCRIPTION		START STATION	FINISH STATION	SIGNATURE	ITEM NO	REMARKS
1	22 AWG	BLK	P1 -1	P2 -1	AA ←→ AA	9	
2	↑	WHT	↑ -2	↑ -3	BA → BB	↑	
3		RED	-3	-2	BB ← BA		
4		GRN	-4 [1]	-8	CA → CF		
5		BRN	-6	-20	CC ← CD		
6		BLU	-7	-7	AB ←→ AB		
7		GRG	-8	-4 [1]	CF ← CA		
8		YEL	-11	-12	SCA → SCF		
9		VIO	-12	-11	SCF ←→ SCA		
10		GRY	-15 [1]	-17	DB ←→ DD		
11	↓	PNK	-17 [1]	↓ -15	DD ←→ DB	↓	
12	22 AWG	TAN	-20	P2 -6	CD → CC	9	
13	26 AWG IPVC	WHT	↓ -4	P1 -5	CA → CB	10	2ND WIRE ON P1-4
14	↕	↕	P1 -15	P1 -24 [1]	DB ← AUXL10	↕	2ND WIRE ON P1-15
15	↕	↕	P2 -4	P2 -5	CA → CB	↕	2ND WIRE ON P2-4
16	26 AWG IPVC	WHT	P1 -17	P1 -24	DD ← AUXL10	10	2ND WIRE ON P1-17

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	415775(C) REV PER ENGR MARKUP	11/10/76	
	FORMAL RELEASE		
B	CN418858 1) ITEM 10 WAS EN538347-3999	8-5-77	



SEQ NO	PROCESS	IDENT			CLASSIFICATION	NOTES
2	MARK	100-07	712		COLOR WHITE, TYPE 9	
1	MARK	100-07	712		COLOR BLACK, TYPE 6	

PROCESSES — FOR CLASSIFICATION TO GOVT/IND SPECIFICATIONS

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
993105	8744

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ± ; 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER ... 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

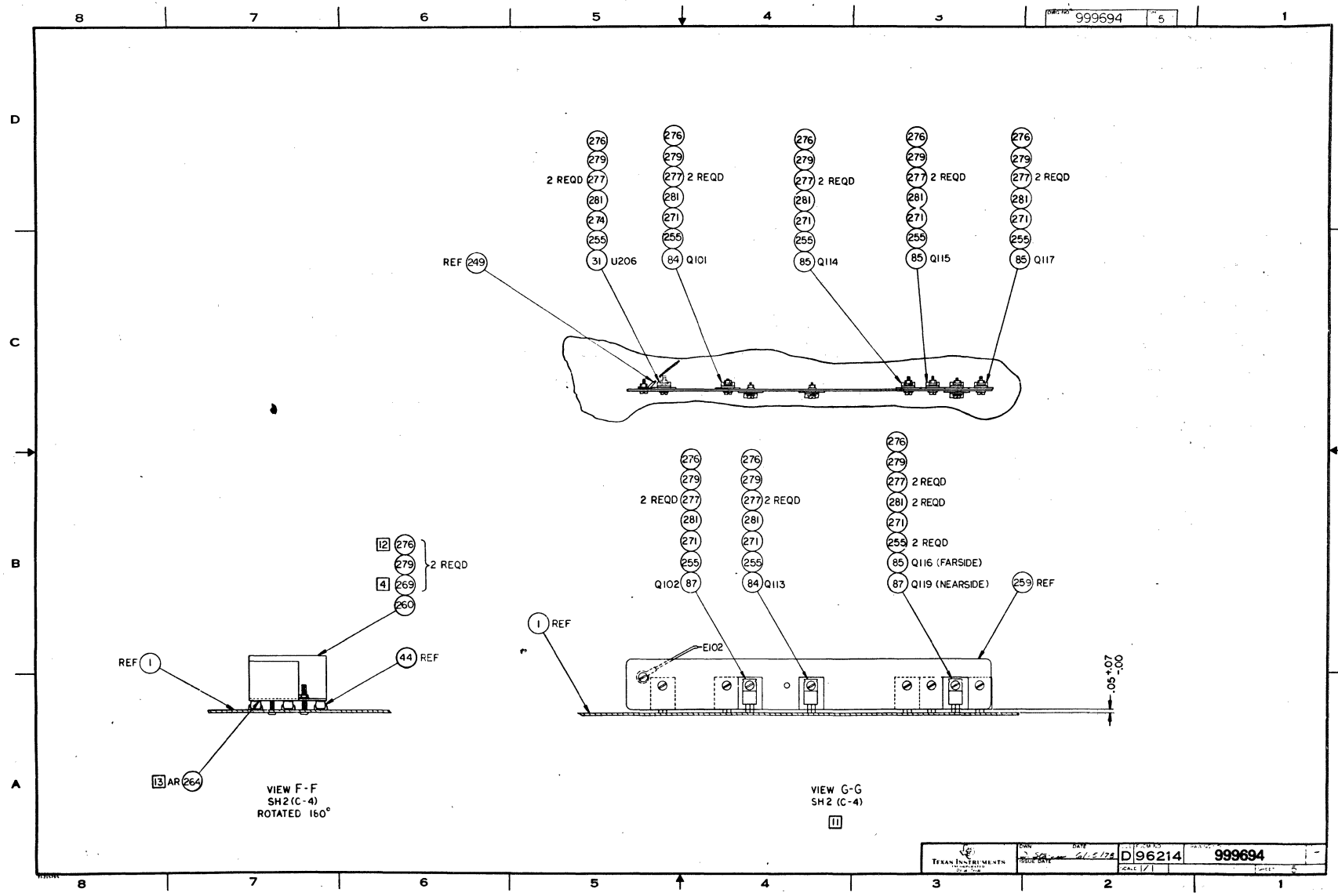
LENOVER 9-1-76

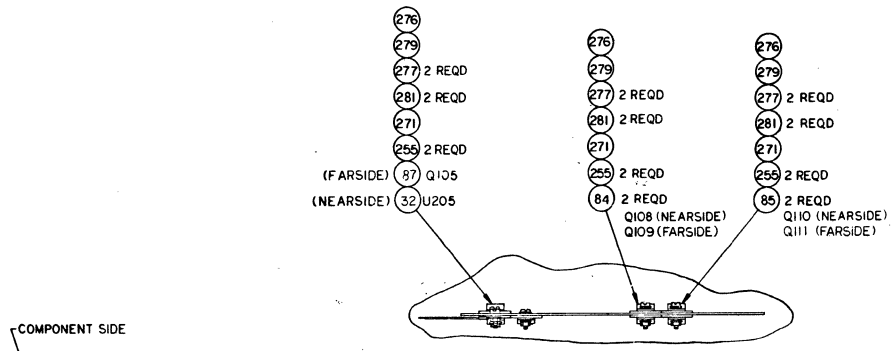
TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

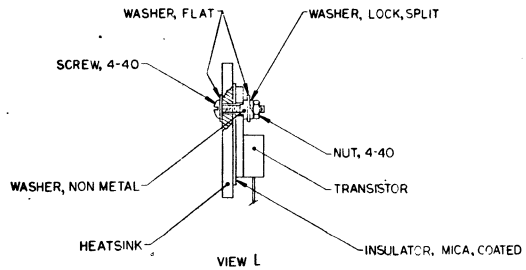
CABLE ASSEMBLY, DATA TERMINAL

D 96214 993210

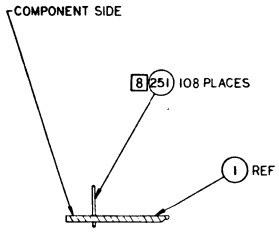
LM


999694 5
276
279
277 2 REQD
281
271
255
85 Q115
85 Q117
84 Q101
85 Q114
31 U206
REF 249
276
279
277 2 REQD
281
271
255
84 Q113
87 Q119 (NEARSIDE)
259 REF
85 Q116 (FARSIDE)
87 Q102
E102
1 REF
.05 +.07 -.00
12 276
279
2 REQD
4 269
260
REF 1
44 REF
13 AR 264
VIEW F-F
SH2 (C-4)
ROTATED 180°
VIEW G-G
SH2 (C-4)
11
TEXAS INSTRUMENTS
DWN
DATE
ISSUE DATE
6/5/78
D 96214
999694
SHEET 5

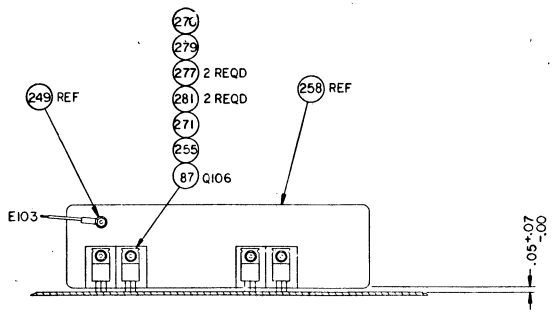




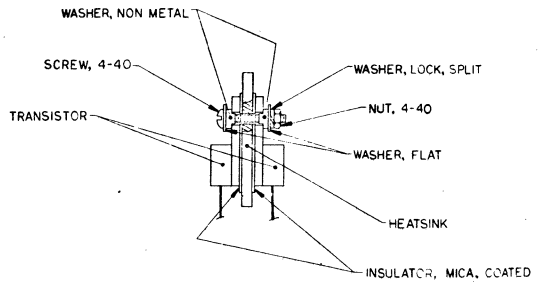
VIEW L
SCALE: NONE



VIEW J-J
SH2 (C-4)
SCALE: 2/1
ROTATED 90° COUNTER-CLOCKWISE



VIEW H-H
SH 2 (C-4)
11



VIEW M
SCALE: NONE

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/11/78

LIST OF MATERIAL

PAGE 1 of 21

LM 0999694-0101 REV V0

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999693-0001	PWB, TERMINAL ELECTRONICS	
0002	REF	EA		0999692-9901	DIAG,LOGIC,DETAILED TERMINAL ELECTRONICS	
0004	00004.000	EA		0222222-7417	NETWORK-SN7417N	
0004A					U104,U105,U108,U112	
0005	00002.000	EA		0972900-7400	NETWORK SN74LS00N	TI -SN74LS00N
0005A					U24,U43	
0006	00003.000	EA		0972900-7404	NETWORK SN74LS04N	
0006A					U22,U28,U111	
0007	00001.000	EA		0972749-0001	NETWORK, SN74LS08N	
0007A					U29	
0008	00001.000	EA		0972784-0002	NETWORK SN74LS14N	
0008A					U1	
0009	00001.000	EA		0972900-7402	NETWORK SN74LS02N	
0009A					U110	
0010	00001.000	EA		0972814-0001	NETWORK-SN74LS27N	
0010A					U23	
0012	00001.000	EA		0972900-7451	NETWORK SN74LS51N	TI -SN74LS51N
0012A					U8	
0013	00002.000	EA		0972900-7474	NETWORK SN74LS74N	
0013A					U27,U44	

DRAFTSMAN: 9-12-78 | CKD. DRAFTSMAN | DESIGN ENGINEER | TITLE: TERMINAL ELECTRONICS,115V

APPD.-MFG. | APPD. PROJECT ENGINEER | RELEASED | PROJECT NO. 8740 | LM 0999694-0101 REV V

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/11/78

LIST OF MATERIAL

PAGE 2 of

LM 0999694-0101 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0014	00003.000	EA		0972900-7495	NETWORK SN74LS95N	TI -SN74LS95N
0014A					U34,U35,U36	
0015	00001.000	EA		0222222-7406	NETWORK SN7406N	
0015A					U18	
0016	00001.000	EA		0999916-0001	PROM,PROGRAMMED-TACH SENSOR DECODE	
0017	00001.000	EA		0972900-7138	NETWORK SN74LS138N	TI -SN74LS138N
0017A					U20	
0019	00001.000	EA		0996726-0002	IC,SN74LS148N PRIORITY ENCODER	001295-SN74LS148N
0019A					U19	
0020	00001.000	EA		0972900-7174	NETWORK SN74LS174N	
0020A					U42	
0021	00001.000	EA		0972900-7175	NETWORK SN74LS175N	
0021A					U33	
0022	00001.000	EA		0996029-0001	IC,SN74LS273N OCTAL D-TYPE FLIP/FLOP	TI -SN74LS273N
0022A					U15	
0023	00001.000	EA		0972668-0001	NETWORK SN74LS251N	
0023A					U45	
0024	00001.000	EA		0972120-0001	NETWORK,SN74259 8-BIT ADDRESSABLE LATCH	001295-74259
0024A					U30	
0025	00004.000	EA		0972787-0003	NETWORK SN74LS367N	

DRAFTSMAN | CKD. DRAFTSMAN | DESIGN ENGINEER | TITLE: TERMINAL ELECTRONICS,115V

APPD.-MFG. | APPD. PROJECT ENGINEER | RELEASED | PROJECT NO. 8740 | LM 0999694-0101 REV V

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 3 of

PART NUMBER LM0999694-0101 REV V0

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0025A					U31,U32,U37,U38	
0026	00001.000	EA		0996015-0001	IC,QUAD LINE DRIVERS SN75188N	TI -SN75188N
0026A					U46	
0027	00002.000	EA		0972450-0002	NETWORK,SN75189AN/MC1489AL QUAD LINE RCR	SEE - TI DRAWING
0027A					U47,U49	
0028	00001.000	EA		0999917-0001	PROM,PROGRAMMED-MEMORY SELECTION DECODE	
0029	00001.000	EA		0222224-2741	NETWORK SN72741P OPERATIONAL AMP	-SN72741P
0029A					U202	
0030	00001.000	EA		0972872-0001	NETWORK,LM 320H-05 VOLTAGE REGULATOR	- -
0030A					U204	
0031	00001.000	EA		0972499-0002	NETWORK,VOLG REG,NEG,3 TERM-(-12V)	
0031A					U206	
0032	00001.000	EA		0972872-0012	NETWORK,LM 340-12T VOLTAGE REGULATOR	NSC - LM340-12T
0032A					U205	
0033	00001.000	EA		0972663-0001	NETWORK,LM339N	
0033A					U203	
0034	00002.000	EA		0996709-0001	IC, LM393P DIFFERENTIAL COMPARATOR	001295-LM393P
0034A					U107,U113	
0035	00001.000	EA		0996594-0001	ISOLATOR,OPTICALLY COUPLED	024972-CNY 21
0035A					U201	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,115V

APPD MFG. DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 REV V0

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 4 of

PART NUMBER LM0999694-0101 REV V0

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0037	00001.000	EA		0996481-0001	IC,TMS-9980,MPU 16-BIT	001295-TMS-9980
0037A					U21	
0039	00002.000	EA		2210020-0002	IC,TMS2532JL,BLANK EPROM	001295-TMS2532JL
0039A					U9,U10	
0041	00001.000	EA		0996483-0001	IC,TMS9902 COMMUNICATIONS CONTROLLER	001295-TMS9902
0041A					U48	
0042	00002.000	EA		0996464-0003	IC,2114 1024X4-BIT STATIC RAM	001295-TMS4045-45NL
0042A					U4,U5	
0043	00001.000	EA		0996750-0001	IC,TMS-4732NLZA3226,4096 X 8-BIT PREPGMD	001295-TMS4732NLZA322
0043A					U16	
0044	00003.000	EA		0996727-0002	IC,ULN2065B,DARLINGTON QUAD	056289-ULN2065B
0044A					U101,U102,U103	
0045	00002.000	EA		0996203-0002	IC,S 5101L-1 1024BIT(256 X 4)ST CMOS RAM	034649-S5101L-1
0045A					U12,U13	
0046	00001.000	EA		0972141-0041	NETWORK,RES. 1.0 K OHM 2 % 14 PIN DIP	BEC - 899-1-R1.0K
0046A					U106	
0047	00001.000	EA		0972141-0031	NETWORK,RES. 390 OHM 2 % 14 PIN DIP	BEC - 899-1-R390
0047A					U109	
0048	00001.000	EA		0972037-1910	NETWORK,RES 16 PIN 8 ELEM- 91.00 OHMS	BEC - 898-3-R91
0048A					U14	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,115V

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 REV V0

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 5 of

PART NUMBER LM0999694-0101 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0049	00001.000	EA		0972141-0062	NETWORK,RESISTOR 6.2K OHMS 2% 14 PIN	SEE - TI DRAWING
0049A					U39	
0051	00006.000	EA		0972932-0001	DIODE,1N914B SWITCHING 75V PIV 75MA 4NS	TI - 1N914B
0051A					CR2,CR112,CR113,	
0051B					CR210,CR256,CR3	
0052	00032.000	EA		0539468-0002	DIODE,1N4002 1AMP 100PIV RECTIFIER	TI - 1N4002
0052A					CR1,CR101-CR111	
0052B					CR123-CR132,CR250	
0052C					CR251,CR252,CR135-CR138,	
0052D					CR204,CR208,CR254	
0053	00001.000	EA		0539468-0007	DIODE,1N4007 1AMP 1000PIV RECTIFIER	TI -1N4007
0053A					CR258	
0055	00001.000	EA		0972116-0001	X DIODE UTG1249 (MAY USE 1N5808/1N5809)	UNT --UTG 1249
0055A					CR205	
0056	00006.000	EA		0996036-0003	DIODE,3 AMP 100V RECTIFIER	004713-MR 851
0056A					CR114,CR116,CR118-CR121	
0057	00001.000	EA		0972164-0001	DIODE,MR501	
0057A					CR255	
0058	00005.000	EA		0972164-0006	DIODE,3 AMP 1,000V SILICONE	004713-MR510
0058A					CR262-CR266	

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD MFG. DATE	APPD. PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO. 8740

PART NUMBER LM0999694-0101 REV V

TI 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 6 of

PART NUMBER LM0999694-0101 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0059	00001.000	EA		0803297-0001	DIODE,SCHOTTKY BARRIER,UHF MIXER	028480-5082-2900(6476
0059A					CR4	
0060	00003.000	EA		0972268-0006	DIODE IN4937 1 AMP	SEE - TI DRAWING
0060A					CR257,CR259,CR260	
0061	00002.000	EA		0972268-0002	DIODE 1N4934-1 AMP	MOT - 1N4934
0061A					CR209,CR211	
0062	00001.000	EA		0996036-0004	DIODE,MR852 RECTIFIER SILICON FAST RCVY	004713-MR852
0062A					CR203	
0064	00002.000	EA		0972460-0007	DIODE,SILICON,ZENER 1%	SEE - TI DRAWING
0064A					CR201,CR202	
0065	00002.000	EA		0972460-0006	DIODE E7918,SILICON,ZENER-1%	075222-E7918
0065A					CR115,CR122	
0068	00001.000	EA		0801295-0062	SEMICONDUCTOR DEVICE,DIODE 1N5338B 5W	004713-1N5338B
0068A					CR253	
0069	00001.000	EA		0972118-0001	DIODE, 1N5339B	
0069A					CR207	
0070	00001.000	EA		0972118-0005	SEMICONDUCTOR DEVICE,DIODE-1N5350B	004713-1N5350B
0070A					CR206	
0071	00004.000	EA		0801295-0084	SEMICONDUCTOR DEVICE,DIODE 1N5360B 5W	004713-1N5360B
0071A					CR133,CR134,CR117,CR139	

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD MFG. DATE	APPD. PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO. 8740

PART NUMBER LM0999694-0101 REV V

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 7 of

PART NUMBER LM0999694-0101 REV V#

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0072	00001.000	EA		0996036-0006	DIODE,MR856 RECTIFIER SILICON FAST RCVY	004713-MR856
0072A					CR261	
0076	00009.000	EA		0972057-0001	TRANSISTOR-A5T2222 NPN SILICON	TI- -A5T2222
0076A					Q2,Q3,Q4,Q103,Q104,Q107,	
0076B					Q202,Q252	
0077	00004.000	EA		0800523-0001	TRANSISTOR A5T2907 PNP SILICON	TI- -A5T2907
0077A					Q1,Q203,Q204,Q253	
0079	00001.000	EA		0772116-0003	TRANSISTOR,SYMM N-CHANNEL FET TIS73	001295-TIS73
0079A					Q201	
0082	00001.000	EA		0972542-0001	TRANSISTOR,HV PNP FN5416/S41802	- -
0082A					Q251	
0084	00004.000	EA		0996712-0001	TRANSISTOR,TIP105 P-N-P POWER	001295-TIP105
0084A					Q101,Q108,Q109, ,C113	
0085	00006.000	EA		0996801-0001	TRANSISTOR,TIP100 N-P-N,DARLINGTON	001295-TIP100
0085A					Q110,Q111,Q114-Q117	
0087	00005.000	EA		0996711-0002	TRANSISTOR,TIP73A N-P-N POWER	001295-TIP73A
0087A					Q102,Q105,Q106,Q254,Q119	
0088	00001.000	EA		0996703-0001	TRANSISTOR,2N6545 NPN, 125 WATT POWER	004713-2N6545
0088A					Q250	
0089	00001.000	EA		0972465-0003	THYRISTORS,TRIODE-P-N-P-N SIL	TI -TIC106D

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,115V

APPD MFG. DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 | REV V#

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 8 of

PART NUMBER LM0999694-0101 REV V#

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0089A					Q255	
0098	00001.000	EA		0999789-0001	TRANSFORMER,SWITCH MODE,820 PWR SUPPLY	GFSMFG-77-484-1
0098A					T201	
0099	00001.000	FA		0996873-0001	TOROID CORE	090797-ZF-42206-TC
0099A					T250	
0101	00001.000	EA		0972946-0025	RES FIX 22.0 OHM 5 % .25 W.CARBON FILM	ROH - R-25
0101A					R17	
0103	00001.000	EA		0972946-0038	RES FIX 75.0 OHM 5 % .25 W.CARBON FILM	ROH - R-25
0103A					R11	
0104	00004.000	EA		0972946-0041	RES FIX 100 OHM 5 % .25 W CARBON FILM	ROH - R-25
0104A					R14,R104,R138,R255	
0105	00001.000	EA		0972946-0045	RES FIX 150 OHM 5 % .25 W CARBON FILM	ROH - R-25
0105A					R268	
0106	00001.000	EA		0972946-0047	RES FIX 190 OHM 5 % .25 W CARBON FILM	ROH - R-25
0106A					R15	
0108	00003.000	EA		0972946-0053	RES FIX 330 OHM 5 % .25 W CARBON FILM	ROH - R-25
0108A					R116, R120,R121	
0109	00001.000	EA		0972946-0051	RES FIX 270 OHM 5 % .25 W CARBON FILM	ROH - R-25
0109A					R208	
0110	00004.000	EA		0972946-0057	RES FIX 470 OHM 5 % .25 W CARBON FILM	ROH - R-25

[illegible] DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,115V

[illegible] DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 | REV V#

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 9 of

PART NUMBER LM0999694-0101 REV V0

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0110A					R22,R24,R250,R261	
0111	00001.000	EA		0972946-0058	RES FIX 510 OHM 5 % .25 W CARBON FILM	ROH - R-25
0111A					R19	
0112	00006.000	EA		0972946-0065	RES FIX 1.0K OHM 5% .25 W CARBON FILM	ROH - R-25
0112A					R12,R13,R25,R27,R110,R126	
0114	00016.000	EA		0972946-0072	RES FIX 2.0K OHM 5 % .25 W CARBON FILM	ROH - R-25
0114A					R1-R6,R16,R26,R28,R30,	
0114B					R112,R127,R37,R228,R35,R32	
0116	00002.000	EA		0972946-0085	RES FIX 6.8K OHM 5 % .25 W CARBON FILM	ROH - R-25
0116A					R211,R209	
0117	00007.000	EA		0972946-0089	RES FIX 10K OHM 5% .25 W CARBON FILM	ROH - R-25
0117A					R10,R21,R29,R31,R33,	
0117B					R264,R213	
0120	00002.000	EA		0972946-0093	RES FIX 15K OHM 5% .25 W CARBON FILM	ROH - R-25
0120A					R216,R34	
0122	00001.000	EA		0972946-0115	RES FIX 120K OHM 5 % .25 W CARBON FILM	ROH - R-25
0122A					R18	
0125	00001.000	EA		0972946-0059	RES FIX 560 OHM 5 % .25 W CARBON FILM	ROH - R-25
0125A					R269	
0126	00004.000	EA		0972946-0137	RES FIX 1.0M OHM 5 % .25 W CARBON FILM	ROH - R-25

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,115V

APPD-MFG. DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 REV V0

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 10 of

PART NUMBER LM0999694-0101 REV V0

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0126A					R109,R203,R140,R128	
0127	00001.000	EA		0972946-0139	RES FIX 1.2M OHM 5 % .25 W CARBON FILM	ROH - R-25
0127A					R220	
0128	00002.000	EA		0972946-0145	RES FIX 2.2M OHM 5 % .25 W CARBON FILM	ROH - R-25
0128A					R217,R218	
0131	00001.000	EA		0972946-0113	RES FIX 100K OHM 5 % .25 W CARBON FILM	ROH - R-25
0131A					R254	
0133	00001.000	EA		0972946-0081	RES FIX 4.7K OHM 5 % .25 W CARBON FILM	ROH - R-25
0133A					R200	
0134	00001.000	EA		0972946-0033	RES FIX 47.0 OHM 5 % .25 W.CARBON FILM	ROH - R-25
0134A					R212	
0135	00002.000	EA		0972946-0077	RES FIX 3.3K OHM 5 % .25 W CARBON FILM	ROH - R-25
0135A					R206,R210	
0137	00004.000	EA		0972947-0031	RES FIX 39 OHM 5 % .5 W CARBON FILM	ROH - R-50
0137A					R111,R118,R119, R135	
0139	00003.000	EA		0972947-0053	RES FIX 330 OHM 5% .5 W CARBON FILM	ROH - R-50
0139A					R101,R113,R132	
0140	00001.000	EA		0972947-0102	RES FIX 36 K OHM 5% .5 W CARBON FILM	ROH - R-50
0140A					R266	
0142	00001.000	EA		0972947-0103	RESISTOR,39K .5W 5% FX,FILM,INSULATED	019345-CF 1/2

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,115V

APPD-MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 REV V0

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 — LIST OF MATERIAL — PAGE 11 of — PART NUMBER LM0999694-0101 REV V0

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0142A					R253	
0143	00001.000	EA		0972947-0137	RES FIX 1.0M OHM 5% .5 W CARBON FILM	ROH - R-50
0143A					R229	
0144	00001.000	EA		0972554-0001	RESISTOR,FIXED,WIREWOUND,.1 OHM 5W 5%	SEE - TI DRAWING
0144A					R102	
0145	00001.000	EA		0972947-0120	RES FIX 200K OHM 5% .5 W CARBON FILM	ROH - R-50
0145A					R263	
0146	00001.000	EA		0972947-0127	RES FIX 390K OHM 5% .5W CARBON FILM	ROH - R-50
0146A					R262	
0147	00002.000	EA		0972554-0011	RESISTOR,.25 OHM 3W 1% FX WW	001686-TR-2A
0147A					R125,R133	
0148	00001.000	EA		0972947-0055	RES FIX 390 OHM 5% .5 W CARBON FILM	ROH - R-50
0148A					R207	
0149	00001.000	EA		0972978-0149	RESISTOR,.10 MEG OHM 1W 5% FIXED CMPSN	-RCR32G104JS
0149A					R257	
0150	00001.000	EA		0972947-0072	RES FIX 2.0K OHM 5% .5 W CARBON FILM	ROH - R-50
0150A					R252	
0151	00001.000	EA		0972947-0038	RES FIX 75 OHM 5% .5 W CARBON FILM	ROH - R-50
0151A					R231	
0152	00002.000	EA		0972947-0065	RES FIX 1.0K OHM 5% .5 W CARBON FILM	ROH - R-50

DRAFTSMAN DATE | CKD. DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: TERMINAL ELECTRONICS,115V

APPD. MFG. DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 REV V0

TI 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 — LIST OF MATERIAL — PAGE 12 of — PART NUMBER LM0999694-0101 REV V0

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0152A					R232,R233	
0153	00001.000	EA		0972947-0079	RES FIX 3.9K OHM 5% .5 W CARBON FILM	ROH - R-50
0153A					R226	
0154	00001.000	EA		0972055-0003	RESISTOR,600 OHM 25W NON-INDUCTIVE WW	001686-NH-256300HM,3%
0154A					R267	
0155	00001.000	EA		0972942-0191	RESISTOR,12.7K OHMS 5W 5% WW PWR	
0155A					R270	
0156	00001.000	EA		0972942-0190	RESISTOR,.5 OHM 5W 5% FX,WW PWR	
0156A					R251	
0157	00002.000	EA		0539370-0440	RES FIX FILM 3.74K OHM 1% .25 WATT	COR - NA55
0157A					R259,R36	
0158	00001.000	EA		0539370-0405	RES FIX FILM 1.62K OHM 1% .25 WATT	COR - NA55
0158A					R221	
0159	00001.000	EA		0539370-0410	RES FIX FILM 1.82K OHM 1% .25 WATT	COR - NA55
0159A					R222	
0160	00001.000	EA		0539370-0477	RES FIX FILM 9.09K OHM 1% .25 WATT	COR - NA55
0160A					R205	
0161	00001.000	EA		0539370-0479	RES FIX FILM 9.53K OHM 1% .25 WATT	COR - NA55
0161A					R204	
0163	00001.000	EA		0539370-0460	RES FIX FILM 6.04K OHM 1% .25 WATT	COR - NA55

DRAFTSMAN DATE | CKD. DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: TERMINAL ELECTRONICS,115V

APPD. MFG. DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0101 REV V0

TI 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 — LIST OF MATERIAL — PAGE 13 of

PART NUMBER LM0999694-0101 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0163A					P137	
0164	00001.000	EA		0539370-0504	RES FIX FILM 17.4K OHM 1% .25 WATT	COR - NA55
0164A					R139	
0165	00006.000	EA		0539370-0481	RES FIX FILM 10.0K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0165A					R107,R114	
0165B					R141,R142,R143,R230	
0166	00001.000	EA		0539370-0558	RES FIX FILM 63.4K OHM 1% .25 WATT	COR - NA55
0166A					R122	
0169	00001.000	EA		0539370-0512	RES FIX FILM 21.0K OHM 1% .25 WATT	COR - NA55
0169A					R106	
0170	00002.000	EA		0539370-0514	RES FIX FILM 22.1K OHM 1% .25 WATT	COR - NA55
0170A					R105,R108	
0171	00001.000	EA		0539370-0577	RES FIX FILM 100 K OHM 1% .25 WATT	COR - NA55
0171A					R202	
0172	00003.000	EA		0539370-0510	RES FIX FILM 20.0K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0172A					R260,R115,R117	
0173	00001.000	EA		0539370-0498	RES FIX FILM 15.0K OHM 1% .25 WATT	COR - NA55
0173A					R256	
0175	00001.000	EA		0539370-0539	RES FIX FILM 40.2K OHM 1% .25 WATT	COR - NA55
0175A					R123	

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD.-MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO. 8740

PART NUMBER LM0999694-0101 REV V

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 — LIST OF MATERIAL — PAGE 14 of

PART NUMBER LM0999694-0101 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0178	00001.000	EA		0539370-0450	RES FIX FILM 4.75K OHM 1% .25 WATT	COR - NA55
0178A					R225	
0179	00001.000	EA		0539370-0467	RES FIX FILM 7.15K OHM 1% .25 WATT	COR - NA55
0179A					R219	
0180	00001.000	EA		0539370-0469	RES FIX FILM 7.50K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0180A					R103	
0182	00001.000	EA		0532439-0399	RESISTOR,1.40K OHMS 1% 1W WW FIXED	-RW70U1401F
0182A					R215	
0183	00001.000	EA		0539812-0064	RESISTOR,8.25K OHM 1/8W .1% FX FILM	001295-MC55C
0183A					R130	
0184	00001.000	EA		0539812-0001	RES FIX FILM 4.12K OHM .1% .125 WATT	COR - NC4-50PPM/C
0184A					R224	
0185	00004.000	EA		0539812-0057	RES FIXED 10K OHMS .1%	TI -MC55C
0185A					R214,R223,R129,R131	
0188	00001.000	EA		0539371-0486	RES FIX FILM 11.3K OHM 1% .13 WATT	COR -NC4-50PPM/C
0188A					R124	
0188B					TO BE SELECTED	
0189	00001.000	EA		0538425-0045	RES 18. OHM 5% 2WATT FIX COMP	RCR -42G180JS/QPL39
0189A					R271.	
0191	00001.000	EA		0538425-0119	RESISTOR,22K OHMS 2W 5% FIXED CMPSN	-RCR42G223JS

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD.-MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0101 REV V

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 — **LIST OF MATERIAL** — PAGE 15 of — PART NUMBER LM0999694-0101 — REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0191A					R258	
0193	00001.000	EA		0538425-0123	RES 33000. OHM 5% 2WATT FIX COMP	RCR -42G333JS/QPL39
0193A					R265	
0201	00034.000	EA		0972763-0021	CAP.,FIXED,AXIAL LEAD,.047 UF,+80%,-20%	
0201A					C1-C16,C18-C20,C23-C30,C32	
0201B					C33,C102,C103,C106,C107,	
0201C					C215	
0202	00001.000	EA		0972929-0361	CAP FIX CERAMIC 10.0 PF 10 % 200 V	QPL -M39014/01-1361
0202A					C21	
0203	00001.000	EA		0972929-0376	CAP FIX CERAMIC 68.0 PF 10 % 200 V	QPL -M39014/01-1376
0203A					C31	
0204	00001.000	EA		0972929-0379	CAP FIX CERAMIC 100 PF 10 % 200 V	QPL -M39014/01-1379
0204A					C22	
0205	00002.000	EA		0972929-0403	CAP .0022 UF 10% 100V	
0205A					C17,C108	
0206	00002.000	EA		0410529-0203	CAP FIX CERAMIC .02UF +80%-20% 600 V	CRL - DD203
0206A					C257,C264	
0207	00001.000	EA		0972924-0007	CAP FIX TANT SOLID 120 MFD 10 % 10 VOLT	QPL -M39003/1-2263
0207A					C261	
0209	00004.000	EA		0972924-0014	CAP FIX TANT SOLID 15 MFD 10 % 20 VOLT	QPL -M39003/1-2289

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740 — PART NUMBER LM0999694-0101 — REV V

TI 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 — **LIST OF MATERIAL** — PAGE 16 of — PART NUMBER LM0999694-0101 — REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0209A					C206,C207,C214,C251	
0210	00001.000	EA		0972924-0017	CAP FIX TANT SOLID 1.0 MFD 10 % 35 VOLT	SPR -150D105X9035A
0210A					C202	
0211	00001.000	EA		0058023-0016	CAP FIX .100 MFD 5 % 100V MYLAR FOIL	TRW - 663UW
0211A					C104	
0212	00001.000	EA		0972928-0024	CAP FIX MICA 500V 5000PF 5%	QPL - CMR06F502J0D
0212A					C256	
0213	00001.000	EA		0972757-0003	CAP,FIXED CERAMIC 150 PF 10% 50V	UC -C51C151K
0213A					C105	
0214	00003.000	EA		0412645-0015	CAPACITOR,.1 UF +80,-20% 500VDC CER DIEL	SPR -41C92
0214A					C208-C210	
0215	00001.000	EA		0972929-0415	CAP FIX CERAMIC .010 UF 10 % 100 V	QPL -M39014/01-1415
0215A					C253	
0216	00002.000	EA		0972927-0020	CAP FIX MICA 500V 51.0 PF 5 %	QPL -CM05E510J0D
0216A					C252,C255	
0217	00004.000	EA		0972929-0433	CAP FIX CERAMIC .100 UF 10 % 50 V	QPL -M39014/01-1433
0217A					C201,C250,C260,C200	
0218	00001.000	EA		0996813-0037	CAPACITOR,3900PF 400V 20% CER,DIN TYPE	DRALOR-SDPJ184J0VN
0218A					C262	
0219	00001.000	EA		0410529-0133	CAP FIX CERAMIC .010 MF GMV 1 KV	CRL - DD-133

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740 — PART NUMBER LM0999694-0101 — REV V

TI 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 08/03/77

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0993210-0001

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
001	00001.000	EA		0539409-0005	CONNECTOR,PLUG 25 PINS	AMP -205208-1
002	00001.000	EA		0539409-0006	CONNECTOR,RCPT 25 PINS	AMP -205207-1
003	00001.000	EA		0539903-0001	HOOD,CONN 25 PIN WITH RETAINERS	AMP - 206478-3
004	00001.000	EA		0539903-0006	HOOD,CONNECTOR	
005	00014.000	EA		0539430-0003	CONTACT,PIN 24-20AWG .068 INSUL DIA	AMP -205202-2
006	00013.000	EA		0539430-0004	CONTACT,SOCKET 24-20AWG .068 INSUL DIA	AMP -205201-3
007	00002.000	EA		0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	QPL-MS-3368-1-9B
008	00002.000	EA		0406769-0001	SCREW,SPECIAL,CONNECTOR LOCKING	CIE - 020418-2
009	00006.500	FT		0972444-0005	CABLE,12COND 22AWG UL LISTED	019007-6914UL
010	AR	FT		0538347-1999	WIRE HOOK UP B-26 AWG 19 STR WHITE	JUD - HH0109
011	REF	EA		0983399-9901	TEST PGM,DATA TERMINAL CABLE-OMNI	

DRAFTSMAN / DATE	CKD DRAFTSMAN / DATE	DESIGN ENGINEER / DATE	TITLE		
Smith 8-5-71	Parker 8/4		CABLE ASSY,DATA TERMINAL		
APPD MFG / DATE	**APPD PROJECT ENGINEER / DATE**	**RELEASED / DATE**	**PROJECT NO**		**PART NUMBER**
			744	F[illegible]D	LM0993210-0001

TI 13849

1/1

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 17 of

PART NUMBER LM0999694-0101 REV V B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0219A					C254	
0220	00001.000	EA		0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	QPL - CK068X104K
0220A					C101	
0221	00002.000	EA		0972601-0004	CAPACITOR,330UF 20DV 10% ALUM ELECTLT	090201-TCM331N200N3C3
0221A					C258,C259	
0223	00001.000	EA		0972931-0024	CAP,FIXED 14000MFD 7.5V 10%	SPR - 604D143G7R5J6
0223A					C205	
0224	00002.000	EA		0972931-0049	X CAP 1800 UF-10	
0224A					C211,C212	
0225	00002.000	EA		0972931-0084	CAPACITOR,2300UF 40V FX ELCTLT ALUM	056289-604D292G040JS6
0225A					C203,C204	
0226	00001.000	EA		0539544-0001	SOCKET,14PIN IC LOW PROFILE SOLDER TAIL	TI -C93-14-02
0226A					TP7	
0227	00004.000	EA		0539544-0007	SOCKET,24PIN IC LOW PROFILE SOLDER TAIL	TI -C93-24-02
0227A					XU10,XU11,XU16,XU9	
0228	00004.000	EA		0539544-0010	SOCKET,20PIN IC LOW PROFILE SOLDER TAIL	TI -C93-20-02
0228A					XU2,XU3,XU40,XU50	
0229	00002.000	EA		0539544-0009	SOCKET,40PIN IC LOW PROFILE SOLDER TAIL	TI -C93-40-02
0229A					XU17,XU21	
0231	00001.000	EA		0972445-0004	CHRYSTAL,HC 18U,10MHZ,QUARTZ	013454-10MHZHC-18/U

DRAFTSMAN DATE	CKD. DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD -MFG. DATE	APPD. PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO. 8740

PART NUMBER LM0999694-0101 REV V B

T.I. 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 18 of

PART NUMBER LM0999694-0101 REV V B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0231A					Y1	
0232	00001.000	EA		0972461-0001	DISC,SOUND-PIEZO-ELECT 3200 + 600HZ	SEE - TI DRAWING
0232A					DS1	
0233	00001.000	EA		0983910-0001	SUPPORT,TONE GENERATOR	
0236	00001.000	EA		0537399-0012	FUSE 5AMP .014 OHM	LIT -276005
0236A					F200	
0237	00003.000	EA		0537399-0010	FUSE 3AMP	LIT -276003
0237A					F103, F102,F101	
0238	00001.000	EA		0416434-0303	FUSE 3.0 A 250V 3AG	LIT - 312003
0238A					F250	
0240	00002.000	EA		0772635-0001	CLIP,FUSE	LIT -102068
0242	00001.000	EA		0996707-0001	THERMISTOR, DISC	015801-NA22J1
0242A					R227	
0243	00001.000	EA		0996865-0005	HEADER ASSY,9 POS RIGHT ANGLE,.100	000779-640099-9
0243A					J103	
0244	00001.000	EA		0972519-0025	SOCKET,IC 25POSITIONS SINGLE IN-LINE	000779-530633-1
0244A					J2	
0245	00002.000	EA		0972519-0023	SOCKET,SINGLE-IN-LINE 12 POS(GOLD CONT)	-1-583780-5
0245A					J10	
0248	00001.000	EA		0983836-0003	CABLE,HEATSINK GROUND,BLK/WHT,4.20"	

DRAFTSMAN DATE	CKD. DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD -MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0101 REV V B

T.I. 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE19 of

PART NUMBER LM0999694-0101 REV V #

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0249	00002.000	EA		0983836-0002	CABLE,HEATSINK GROUND,GRN/YEL,4.20"	
0250	00001.000	EA		0999869-0001	CABLE ASSY,SIGNAL/CHASSIS,GROUND-OPTION	
0251	00108.000	EA		0972456-0002	PIN,.025 SQUARE	BEI - 75481-002
0251A					E30 THRU E33,E205 THRU E220	
0251B					E10 THRU E13,E262 THRU E265	
0251C					J3-1 THRU J3-18,	
0251D					J3-20 THRU J3-24.	
0251E					J4-1 THRU J4-13.	
0251F					J4-15 THRU J4,18,	
0251G					J8-1,J8-3 THRU J8-8,	
0251H					J6-1 THRU J6-4,J6-6,J9-1,	
0251J					J9-2,J9-4,J101-2,J101-3,	
0251K					J101-4 THRU J101-10,	
0251L					J104-1 THRU J104-4,J105-1,	
0251M					J105-2,J105-4,J106-1,J106-3	
0251N					J106-4,J106-5,J202-1,J202-4	
0251P					J203-1,J203-2,J203-4	
0252	00000.000	EA		0972494-0001	PIN,.025 SQUARE	AMP - 4-87022-2
0253	00005.000	EA		0996706-0002	POST, .715LG PRINTED CIRCUIT	000779-1-86147-8
0253A					E221,E222,E223,E271,E281	

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD MFG. DATE	APPD. PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0101 REV V #

T.I. 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE20 of

PART NUMBER LM0999694-0101 REV V #

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0254	00013.000	EA		0972487-0001	JUMPER PLUG,CONNECTOR BLACK	
0255	00018.000	EA		0972779-0001	INSULATOR,MICA COATED,TO-220 CASE	
0256	00001.000	EA		0800482-0003	HEATSINK,TO-3 ALUM	013103-60148
0257	00001.000	EA		0999802-0001	HEATSINK,PAPER MOTOR DRIVER	
0258	00001.000	EA		0999803-0001	HEATSINK,CARRIAGE DRIVER	
0259	00001.000	EA		0999804-0001	HEATSINK,PAPER DRIVER	
0260	00001.000	EA		0999863-0001	HEATSINK,PRINTHEAD/RIBBON DRIVE MOTOR	
0261	00002.000	EA		0232583-0008	TO-5 MOUNTING PAD,4-LEADS,NYLON	13103S-EE DRAWING
0262	AR	TU		0417559-0001	SILICONE RUBBER (RTV) DOW 3140	SEE - TI DRAWING
0263	AR	PT		0417200-0004	PRIMER,SILICONE RUBBER-RED	COR - 1203
0264	AR	EA		0415886-0001	GREASE,SILICONE,HEAT COND. (8 OZ TUBE)	WAK - 120
0266	00014.000	EA		0988967-0001	CLIP,INTEGRATED CIRCUIT	
0267	00001.000	EA		0972306-0003	COVER,RND-1.807LG .019THK ALUM,SEAMLESS	002875-HJ-29000K-AL
0268	00001.000	EA		0972621-0001	SPRING,RING	FER -991-191-00
0269	00004.000	EA		0972355-0006	STUD,SELF-CLINCHING 4-40 X .750LG PWB	046384-KFH-440-12
0270	00003.000	EA		0972988-0013	SCREW 4-40 X .250 PAN HEAD CRES	
0271	00015.000	EA		0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0273	00001.000	EA		0972988-0023	SCREW 4-40 X 1.50 PAN HEAD CRES	
0274	00001.000	EA		0972988-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0276	00004.000	EA		0416453-0021	NUT,PLAIN,4-40 UNC-2B HEX,CRES,SMALL	QPL - NAS671-C4

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0101 REV V #

T.I. 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/11/78

LIST OF MATERIAL

PAGE 21 of

PART NUMBER LM0999694-0101 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0277	00004.000	EA		0411027-0803	WASHER .125 X .250 X .022 FLAT CRES	QPL - MS15795-803
0278	00002.000	EA		0416622-0011	WASHER #4 FLAT	QPL - AN960C4L
0279	00019.000	EA		0411104-0135	WASHER #4 LOCKSPLIT	QPL - MS35338-135
0280	00003.000	EA		0411101-3057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	QPL - MS35335-57
0281	00019.000	EA		0972628-0001	WASHER,#4 .115ID .200OD-SHLDR NON-MET	SEA -5607-45
0282	00002.000	EA		0416925-0600	SPACERS-SCREW & BOLT #6 1/4 X.049	- NAS43DD1-8
0283	00001.000	EA		0416925-0417	SPACERS-SCREW AND BOLT #4 3/16 X .026	-NAS43DD-76
0284	00002.000	EA		0999862-0001	SPACER, POWER TRANSISTOR	
0286	00010.200	FT		0411400-0018	WIRE,BARE TINNED,18AWG, COPPER BUS	IWP -18-630
0287	00030.500	FT		0411400-0022	WIRE 22AWG ELETRO-TIN-PLATED,COPPER	
0288	00001.400	FT		0538347-3099	WIRE HOOKUP 8-22 AWG 19 STR BK/WH	JUD - HH0115
0289	00002.000	EA		0418212-0040	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	QPL - MS3367-4-9
0290	00000.050	FT		0411634-1310	SLEEVE,PVC, .133 DIA. CLEAR	QPL - MIL-I-631

DRAFTSMAN / DATE	CKD. DRAFTSMAN / DATE	DESIGN ENGINEER / DATE	TITLE
			TERMINAL ELECTRONICS,115V
APPD. MFG. / DATE	APPD. PROJECT ENGINEER / DATE	RELEASED / DATE	PROJECT NO: 8740

PART NUMBER LM0999694-0101 REV V

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 1 of 21

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999693-0001	PWB, TERMINAL ELECTRONICS	
0002	REF	EA		0999692-9901	DIAG,LOGIC,DETAILED TERMINAL ELECTRONICS	
0004	00004.000	EA		0222222-7417	NETWORK-SN7417N	
0004A					U104,U105,U108,U112	
0005	00002.000	EA		0972900-7400	NETWORK SN74LS00N	TI -SN74LS00N
0005A					U24,U43	
0006	00003.000	EA		0972900-7404	NETWORK SN74LS04N	
0006A					U22,U28,U111	
0007	00001.000	EA		0972749-0001	NETWORK, SN74LS08N	
0007A					U29	
0008	00001.000	EA		0972784-0002	NETWORK SN74LS14N	
0008A					U1	
0009	00001.000	EA		0972900-7402	NETWORK SN74LS02N	
0009A					U110	
0010	00001.000	EA		0972814-0001	NETWORK-SN74LS27N	
0010A					U23	
0012	00001.000	EA		0972900-7451	NETWORK SN74LS51N	TI -SN74LS51N
0012A					U8	
0013	00002.000	EA		0972900-7474	NETWORK SN74LS74N	
0013A					U27,U44	

DRAFTSMAN: L.V. Sepulveda DATE 9/12/78 | CKD DRAFTSMAN | DESIGN ENGINEER | TITLE: TERMINAL ELECTRONICS,230V

APPD-MFG | APPD PROJECT ENGINEER | RELEASED | PROJECT NO 8740 | PART NUMBER LM0999694-0201 REV V

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 2 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0014	00003.000	EA		0972900-7495	NETWORK SN74LS95N	TI -SN74LS95N
0014A					U34,U35,U36	
0015	00001.000	EA		0222222-7406	NETWORK SN7406N	
0015A					U18	
0016	00001.000	EA		0999916-0001	PROM,PROGRAMMED-TACH SENSOR DECODE	
0017	00001.000	EA		0972900-7138	NETWORK SN74LS138N	TI -SN74LS138N
0017A					U20	
0019	00001.000	EA		0996726-0002	IC,SN74LS148N PRIORITY ENCODER	001295-SN74LS148N
0019A					U19	
0020	00001.000	EA		0972900-7174	NETWORK SN74LS174N	
0020A					U42	
0021	00001.000	EA		0972900-7175	NETWORK SN74LS175N	
0021A					U33	
0022	00001.000	EA		0996029-0001	IC,SN74LS273N OCTAL D-TYPE FLIP/FLOP	TI -SN74LS273N
0022A					U15	
0023	00001.000	EA		0972668-0001	NETWORK SN74LS251N	
0023A					U45	
0024	00001.000	EA		0972120-0001	NETWORK,SN74259 8-BIT ADDRESSABLE LATCH	001295-74259
0024A					U30	
0025	00004.000	EA		0972787-0003	NETWORK SN74LS367N	

DRAFTSMAN | CKD DRAFTSMAN | DESIGN ENGINEER | TITLE: TERMINAL ELECTRONICS,230V

APPD-MFG | APPD PROJECT ENGINEER | RELEASED | PROJECT NO 8740 | PART NUMBER LM0999694-0201 REV V

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 3 of

PART NUMBER LM0999694-0201 REV V#

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0025A					U31,U32,U37,U33	
0026	00001.000	EA		0996015-0001	IC,QUAD LINE DRIVERS SN75198N	TI -SN75198N
0026A					U46	
0027	00002.000	EA		0972450-0002	NETWORK,SN75189AN/MC1489AL QUAD LINE RCR	SEE - TI DRAWING
0027A					U47,U49	
0028	00001.000	EA		0999917-0001	PROM,PROGRAMMED-MEMORY SELECTION DECODE	
0029	00001.000	EA		0222224-2741	NETWORK SN72741P OPERATIONAL AMP	-SN72741P
0029A					U202	
0030	00001.000	EA		0972872-0001	NETWORK,LM 320H-05 VOLTAGE REGULATOR	- -
0030A					U204	
0031	00001.000	EA		0972499-0002	NETWORK,VOLG REG,NEG,3 TERM-(-12V)	
0031A					U206	
0032	00001.000	EA		0972872-0012	NETWORK,LM 340-12T VOLTAGE REGULATOR	NSC - LM340-12T
0032A					U205	
0033	00001.000	EA		0972663-0001	NETWORK,LM339N	
0033A					U203	
0034	00002.000	EA		0996709-0001	IC, LM393P DIFFERENTIAL COMPARATOR	001295-LM393P
0034A					U107,U113	
0035	00001.000	EA		0996594-0001	ISOLATOR,OPTICALLY COUPLED	026972-CNY 21
0035A					U201	

DRAFTSMAN DATE | CKD. DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,230V

APPD. MFG. DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO. 8740 | PART NUMBER LM0999694-0201 REV V#

T.I. 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 4 of

PART NUMBER LM0999694-0201 REV V#

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0037	00001.000	EA		0996481-0001	IC,TMS-9980,MPU 16-BIT	001295-TMS-9980
0037A					U21	
0039	00002.000	EA		2210020-0002	IC,TMS2532JL,BLANK EPROM	001295-TMS2532JL
~~0039A~~					~~U9,U10~~	
0041	00001.000	EA		0996483-0001	IC,TMS9902 COMMUNICATIONS CONTROLLER	001295-TMS9902
0041A					U48	
0042	00002.000	EA		0996464-0003	IC,2114 1024X4-BIT STATIC RAM	001295-TMS4045-45NL
0042A					U4,U5	
0043	00001.000	EA		0996750-0001	IC,TMS-4732NLZA3226,4096 X 8-BIT PREPGMD	001295-TMS4732NLZA322
0043A					U16	
0044	00003.000	EA		0996727-0002	IC,ULN2065B.DARLINGTON QUAD	056289-ULN2065B
0044A					U101,U102,U103	
0045	00002.000	EA		0996203-0002	IC,S 5101L-1 1024BIT(256 X 4)ST CMOS RAM	034649-S5101L-1
0045A					U12,U13	
0046	00001.000	EA		0972141-0041	NETWORK,RES. 1.0 K OHM 2 % 14 PIN DIP	BEC - 899-1-R1.0K
0046A					U106	
0047	00001.000	EA		0972141-0031	NETWORK,RES. 390 OHM 2 % 14 PIN DIP	BEC - 899-1-R390
0047A					U109	
0048	00001.000	EA		0972037-1910	NETWORK,RES 16 PIN 8 ELEM- 91.00 OHMS	BEC - 898-3-R91
0048A					U14	

DRAFTSMAN DATE | CKD. DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE TERMINAL ELECTRONICS,230V

APPD. MFG. DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO. 8740 | PART NUMBER LM0999694-0201 REV V#

T.I. 13849

TEXAS INSTRUMENTS INCORPORATED — DATE 09/11/78 — LIST OF MATERIAL — PAGE 5 of — PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0049	00001.000	EA		0972141-0062	NETWORK,RESISTOR 6.8K OHMS 2% 14 PIN	SEE - TI DRAWING
0049A					U39	
0051	00006.000	EA		0972932-0001	DIODE,1N9148 SWITCHING 75V PIV 75MA 4NS	TI - 1N9148
0051A					CR2,CR112,CR113,	
0051B					CR210,CR256,CR3	
0052	00032.000	EA		0539468-0002	DIODE,1N4002 1AMP 100PIV RECTIFIER	TI - 1N4002
0052A					CR1,CR101-CR111	
0052B					CR123-CR132,CR250	
0052C					CR251,CR252,CR135-CR138,	
0052D					CR204,CR208,CR254	
0053	00001.000	EA		0539468-0007	DIODE,1N4007 1AMP 1000PIV RECTIFIER	TI -1N4007
0053A					CR258	
0055	00001.000	EA		0972116-0001	X DIODE UTG1249 (MAY USE 1N5808/1N5809)	UNT --UTG 1249
0055A					CR205	
0056	00006.000	EA		0996036-0003	DIODE,3 AMP 100V RECTIFIER	004713-MR 851
0056A					CR114,CR116,CR118-CR121	
0057	00001.000	EA		0972164-0001	DIODE,MR501	
0057A					CR255	
0058	00005.000	EA		0972164-0006	DIODE,3 AMP 1,000V SILICONE	004713-MR510
0058A					CR262-CR266	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: TERMINAL ELECTRONICS,230V

APPD.-MFG. DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0201 REV V8

T.I. 13049

TEXAS INSTRUMENTS INCORPORATED — DATE 09/11/78 — LIST OF MATERIAL — PAGE 6 of — PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0059	00001.000	EA		0803297-0001	DIODE,SCHOTTKY BARRIER,UHF MIXER	028480-5082-2900(6476
0059A					CR4	
0060	00003.000	EA		0972268-0006	DIODE IN4937 1 AMP	SEE - TI DRAWING
0060A					CR257,CR259,CR260	
0061	00002.000	EA		0972268-0002	DIODE 1N4934-1 AMP	MOT - 1N4934
0061A					CR209,CR211	
0062	00001.000	EA		0996036-0004	DIODE,MR852 RECTIFIER SILICON FAST RCVY	004713-MR852
0062A					CR203	
0064	00002.000	EA		0972460-0007	DIODE,SILICON,ZENER 1%	SEE - TI DRAWING
0064A					CR201,CR202	
0065	00002.000	EA		0972460-0006	DIODE E7918,SILICON,ZENER-1%	075222-E7918
0065A					CR115,CR122	
0068	00001.000	EA		0801295-0062	SEMICONDUCTOR DEVICE,DIODE 1N5338B 5W	004713-1N5338B
0068A					CR253	
0069	00001.000	EA		0972118-0001	DIODE, 1N5339B	
0069A					CR207	
0070	00001.000	EA		0972118-0005	SEMICONDUCTOR DEVICE,DIODE-1N5350B	004713-1N5350B
0070A					CR206	
0071	00004.000	EA		0801295-0084	SEMICONDUCTOR DEVICE,DIODE 1N5360B 5W	004713-1N5360B
0071A					CR133,CR134,CR117,CR139	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: TERMINAL ELECTRONICS,230V

APPD.-MFG. DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0201 REV V8

T.I. 13049

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 7 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0072	00001.000	EA		0996036-0006	DIODE,MR856 RECTIFIER SILICON FAST RCVY	004713-MR856
0072A					CR261	
0076	00008.000	EA		0972057-0001	TRANSISTOR-A5T2222 NPN SILICON	TI- -A5T2222
0076A					Q2,Q3,Q4,Q103,Q104,Q107,	
0076B					Q202,Q252	
0077	00004.000	EA		0800523-0001	TRANSISTOR A5T2907 PNP SILICON	TI- -A5T2907
0077A					Q1,Q203,Q204,Q253	
0079	00001.000	EA		0772116-0003	TRANSISTOR,SYMM N-CHANNEL FET TIS73	001295-TIS73
0079A					Q201	
0082	00001.000	EA		0972542-0001	TRANSISTOR,HV PNP FN5416/S41802	- -
0082A					Q251	
0084	00004.000	EA		0996712-0001	TRANSISTOR,TIP105 P-N-P POWER	001295-TIP105
0084A					Q101,Q108,Q109, ,Q113	
0085	00006.000	EA		0996801-0001	TRANSISTOR,TIP100 N-P-N,DARLINGTON	001295-TIP100
0085A					Q110,Q111,Q114-Q117	
0087	00005.000	EA		0996711-0002	TRANSISTOR,TIP73A N-P-N POWER	001295-TIP73A
0087A					Q102,Q105,Q106,Q254,Q119	
0088	00001.000	EA		0996703-0001	TRANSISTOR,2N6545 NPN, 125 WATT POWER	004713-2N6545
0088A					Q250	
0089	00001.000	EA		0972465-0003	THYRISTORS,TRIODE-P-N-P-N SIL	TI -TIC106D

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V

T.I. 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 8 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0098A					Q255	
0098	00001.000	EA		0999789-0001	TRANSFORMER,SWITCH MODE,820 PWR SUPPLY	GFSMFG-77-484-1
0098A					T201	
0099	00001.000	EA		0996873-0001	TOROID CORE	090797-ZF-42206-TC
0099A					T250	
0101	00001.000	EA		0972946-0025	RES FIX 22.0 OHM 5 % .25 W.CARBON FILM	ROH - R-25
0101A					R17	
0103	00001.000	EA		0972946-0038	RES FIX 75.0 OHM 5 % .25 W.CARBON FILM	ROH - R-25
0103A					R11	
0104	00004.000	EA		0972946-0041	RES FIX 100 OHM 5 % .25 W CARBON FILM	ROH - R-25
0104A					R14,R104,R138,R255	
0105	00001.000	EA		0972946-0045	RES FIX 150 OHM 5 % .25 W CARBON FILM	ROH - R-25
0105A					R268	
0106	00001.000	EA		0972946-0047	RES FIX 180 OHM 5 % .25 W CARBON FILM	ROH - R-25
0106A					R15	
0108	00003.000	EA		0972946-0053	RES FIX 330 OHM 5 % .25 W CARBON FILM	ROH - R-25
0108A					R116, R120,R121	
0109	00001.000	EA		0972946-0051	RES FIX 270 OHM 5 % .25 W CARBON FILM	ROH - R-25
0109A					R208	
0110	00004.000	EA		0972946-0057	RES FIX 470 OHM 5 % .25 W CARBON FILM	ROH - R-25

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V

T.I. 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 9 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0110A					R22,R24,R250,R261	
0111	00001.000	EA		0972946-0058	RES FIX 510 OHM 5 % .25 W CARBON FILM	ROH - R-25
0111A					R19	
0112	00006.000	EA		0972946-0065	RES FIX 1.0K OHM 5% .25 W CARBON FILM	ROH - R-25
0112A					R12,R13,R25,R27,R110,R126	
0114	00016.000	EA		0972946-0072	RES FIX 2.0K OHM 5 % .25 W CARBON FILM	ROH - R-25
0114A					R1-R6,R16,R26,R28,P30,	
0114B					R112,R127,P37,R228,R35,R32	
0116	00002.000	EA		0972946-0085	RES FIX 6.8K OHM 5 % .25 W CARBON FILM	ROH - R-25
0116A					R211,R209	
0117	00007.000	EA		0972946-0089	RES FIX 10K OHM 5% .25 W CARBON FILM	ROH - R-25
0117A					R10,R21,R29,R31,R33,	
0117B					R264,R213	
0120	00002.000	EA		0972946-0093	RES FIX 15K OHM 5% .25 W CARBON FILM	ROH - R-25
0120A					R216,R34	
0122	00001.000	EA		0972946-0115	RES FIX 120K OHM 5 % .25 W CARBON FILM	ROH - R-25
0122A					R18	
0125	00001.000	EA		0972946-0059	RES FIX 560 OHM 5 % .25 W CARBON FILM	ROH - R-25
0125A					R269	
0126	00004.000	EA		0972946-0137	RES FIX 1.0M OHM 5 % .25 W CARBON FILM	ROH - R-25

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V

T.I. 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 10 of

PART NUMBER LM0999694-0201 V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0126A					R109,R203,R140,R128	
0127	00001.000	EA		0972946-0139	RES FIX 1.2M OHM 5 % .25 W CARBON FILM	ROH - R-25
0127A					R220	
0128	00002.000	EA		0972946-0145	RES FIX 2.2M OHM 5 % .25 W CARBON FILM	ROH - R-25
0128A					R217,R218	
0131	00001.000	EA		0972946-0113	RES FIX 100K OHM 5 % .25 W CARBON FILM	ROH - R-25
0131A					R254	
0133	00001.000	EA		0972946-0081	RES FIX 4.7K OHM 5 % .25 W CARBON FILM	ROH - R-25
0133A					R200	
0134	00001.000	EA		0972946-0033	RES FIX 47.0 OHM 5 % .25 W CARBON FILM	ROH - R-25
0134A					R212	
0135	00002.000	EA		0972946-0077	RES FIX 3.3K OHM 5 % .25 W CARBON FILM	ROH - R-25
0135A					R206,R210	
0137	00004.000	EA		0972947-0031	RES FIX 39 OHM 5 % .5 W CARBON FILM	ROH - R-50
0137A					R111,R118,R119, R135	
0139	00003.000	EA		0972947-0053	RES FIX 330 OHM 5% .5 W CARBON FILM	ROH - R-50
0139A					R101,R113,R132	
0140	00001.000	EA		0972947-0102	RES FIX 36 K OHM 5% .5 W CARBON FILM	ROH - R-50
0140A					R266	
0142	00001.000	EA		0972947-0103	RESISTOR,39K .5W 5% FX,FILM,INSULATED	019345-CF 1/2

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V

T.I. 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 11 of

PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0142A					R253	
0143	00001.000	EA		0972947-0137	RES FIX 1.0M OHM 5% .5 W CARBON FILM	ROH - R-50
0143A					R229	
0144	00001.000	EA		0972554-0001	RESISTOR,FIXED,WIREWOUND,.1 OHM 5W 5%	SEE - TI DRAWING
0144A					R102	
0145	00001.000	EA		0972947-0120	RES FIX 200K OHM 5% .5 W CARBON FILM	ROH - R-50
0145A					R263	
0146	00001.000	EA		0972947-0127	RES FIX 390K OHM 5% .5W CARBON FILM	ROH - R-50
0146A					R262	
0147	00002.000	EA		0972554-0011	RESISTOR,.25 OHM 3W 1% FX WW	001686-IR-2A
0147A					R125,R133	
0148	00001.000	EA		0972947-0055	RES FIX 330 OHM 5% .5 W CARBON FILM	ROH - R-50
0148A					R207	
0149	00001.000	EA		0972978-0149	RESISTOR,.10 MEG OHM 1W 5% FIXED CMPSN	-RCR32G104JS
0149A					R257	
0150	00001.000	EA		0972947-0072	RES FIX 2.0K OHM 5% .5 W CARBON FILM	ROH - R-50
0150A					R252	
0151	00001.000	EA		0972947-0038	RES FIX 75 OHM 5% .5 W CARBON FILM	ROH - R-50
0151A					R231	
0152	00002.000	EA		0972947-0065	RES FIX 1.0K OHM 5% .5 W CARBON FILM	ROH - R-50

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V8

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 12 of

PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0152A					R232,R233	
0153	00001.000	EA		0972947-0079	RES FIX 3.9K OHM 5% .5 W CARBON FILM	ROH - R-50
0153A					R226	
0154	00001.000	EA		0972055-0003	RESISTOR,630 OHM 25W NON-INDUCTIVE WW	001686-NH-256000HM,3%
0154A					R267	
0155	00001.000	EA		0972942-0191	RESISTOR,12.7K OHMS 5W 5% WW PWR	
0155A					R270	
0156	00001.000	EA		0972942-0190	RESISTOR,.5 OHM 5W 5% FX,WW PWR	
0156A					R251	
0157	00002.000	EA		0539370-0440	RES FIX FILM 3.74K OHM 1% .25 WATT	COR - NA55
0157A					R259,R36	
0158	00001.000	EA		0539370-0405	RES FIX FILM 1.62K OHM 1% .25 WATT	COR - NA55
0158A					R221	
0159	00001.000	EA		0539370-0410	RES FIX FILM 1.82K OHM 1% .25 WATT	COR - NA55
0159A					R222	
0160	00001.000	EA		0539370-0477	RES FIX FILM 9.09K OHM 1% .25 WATT	COR - NA55
0160A					R205	
0161	00001.000	EA		0539370-0479	RES FIX FILM 9.53K OHM 1% .25 WATT	COR - NA55
0161A					R204	
0163	00001.000	EA		0539370-0460	RES FIX FILM 6.04K OHM 1% .25 WATT	COR - NA55

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V8

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 13 of

PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0163A					R137	
0164	00001.000	EA		0539370-0504	RES FIX FILM 17.4K OHM 1% .25 WATT	COR - NA55
0164A					R139	
0165	00006.000	EA		0539370-0481	RES FIX FILM 10.0K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0165A					R107,R114	
0165B					R141,R142,R143,R230	
0166	00001.000	EA		0539370-0558	RES FIX FILM 63.4K OHM 1% .25 WATT	COR - NA55
0166A					R122	
0169	00001.000	EA		0539370-0512	RES FIX FILM 21.0K OHM 1% .25 WATT	COR - NA55
0169A					R106	
0170	00002.000	EA		0539370-0514	RES FIX FILM 22.1K OHM 1% .25 WATT	COR - NA55
0170A					R105,R108	
0171	00001.000	EA		0539370-0577	RES FIX FILM 100 K OHM 1% .25 WATT	COR - NA55
0171A					R202	
0172	00003.000	EA		0539370-0510	RES FIX FILM 20.0K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0172A					R260,R115,R117	
0173	00001.000	EA		0539370-0498	RES FIX FILM 15.0K OHM 1% .25 WATT	COR - NA55
0173A					R256	
0175	00001.000	EA		0539370-0539	RES FIX FILM 40.2K OHM 1% .25 WATT	COR - NA55
0175A					R123	

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD-MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8750

PART NUMBER LM0999694-0201 REV V8

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 14 of

PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0178	00001.000	EA		0539370-0450	RES FIX FILM 4.75K OHM 1% .25 WATT	COR - NA55
0178A					R225	
0179	00001.000	EA		0539370-0467	RES FIX FILM 7.15K OHM 1% .25 WATT	COR - NA55
0179A					R219	
0180	00001.000	EA		0539370-0469	RES FIX FILM 7.50K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0180A					R103	
0182	00001.000	EA		0532439-0399	RESISTOR,1.40K OHMS 1% 1W WW FIXED	-RW70U1401F
0182A					R215	
0183	00001.000	EA		0539812-0064	RESISTOR,8.25K OHM 1/8W .1% FX FILM	001295-MC55C
0183A					R130	
0184	00001.000	EA		0539812-0001	RES FIX FILM 4.12K OHM .1% .125 WATT	COR - NC4-50PPM/C
0184A					R224	
0185	00004.000	EA		0539812-0057	RES FIXED 10K OHMS .1%	TI -MC55C
0185A					R214,R223,R129,R131	
0188	00001.000	EA		0539371-0486	RES FIX FILM 11.3K OHM 1% .13 WATT	COR -NC4-50PPM/C
0188A					R124	
0188B					TO BE SELECTED	
0189	00001.000	EA		0538425-0045	RES 18. OHM 5% 2WATT FIX COMP	RCR -42G180JS/QPL39
0189A					R271	
0191	00001.000	EA		0538425-0119	RESISTOR,22K OHMS 2W 5% FIXED CMPSN	-RCR42G223JS

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD-MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V8

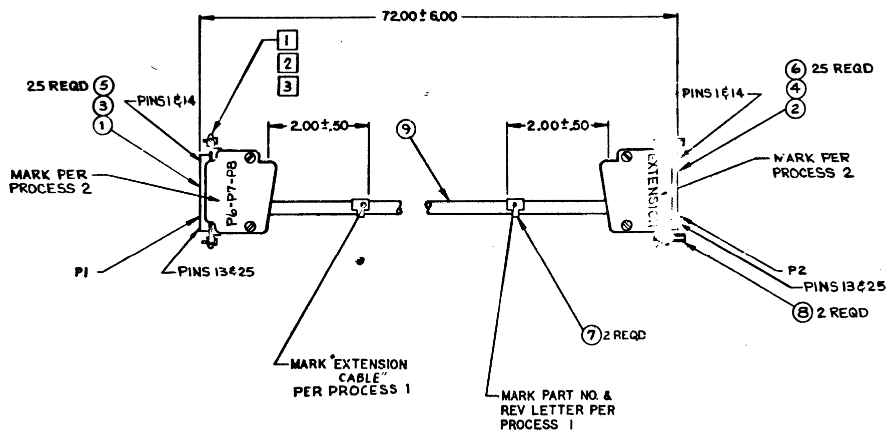
TI 13849

REV	DESCRIPTION	DATE	APPROVED
A	415775(C) REV PER ENGR MARKUP [illegible] 11/10/76	[illegible]	[illegible]
	FORMAL RELEASE		

NOTES: UNLESS OTHERWISE SPECIFIED

1. CABLE CLAMP SCREWS & RETAINER CLIPS & SCREWS INCLUDED WITH ITEM 3
2. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME SIDE AS SCREW HEAD
3. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIPS

WIRE NO.	DESCRIPTION	START STATION	FINISH STATION	SIGNATURE	ITEM NO	REMARKS
1	22AWG-BLK	P1-1	P2-1	CRKT-1	9	
2	-WHT	-2	-2	-2		
3	-RED	-3	-3	-3		
4	-GRN	-4	-4	-4		
5	-ORN	-5	-5	-5		
6	-BLU	-6	-6	-6		
7	-WHT/BLK	-7	-7	-7		
8	-RED/BLK	-8	-8	-8		
9	-GR[illegible]/BLK	-9	-9	-9		
10	-O[illegible]K	-10	-10	-10		
11	-BL[illegible]K	-11	-11	-11		
12	-BL[illegible]T	-12	-12	-12		
13	-RE[illegible]T	-13	-13	-13		
14	-G[illegible]T	-14	-14	-14		
15	-[illegible]T	-15	-15	-15		
16	-[illegible]D	-16	-16	-16		
17	-W[illegible]D	-17	-17	-17		
18	-[illegible]D	-18	-18	-18		
19	-BL[illegible]D	-19	-19	-19		
20	-[illegible]	-20	-20	-20		
21	-[illegible]	-21	-21	-21		
22	-BL[illegible]D	-22	-22	-22		
23	-[illegible]D	-23	-23	-23		
24	-[illegible]HT	-24	-24	-24		
25	22AWG-GRN/BLK/WHT	P1-25	P2-25	CRKT-25	9	



SEQ NO	PROCESS	IDENT	TYPE	NO	CLASSIFICATION	NOTES
2	MARK	100-07	712		COLOR WHITE, TYPE 9	
1	MARK	100-07	712		COLOR BLACK, TYPE 6	

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
993000	8744

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ±.010 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-STD-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125: +.004 -.001	.126 THRU .250: +.005 -.001	.251 THRU .500: +.006 -.001
.501 THRU [illegible]: +.008 -.001	[illegible]: +.010 -.001	1.001 THRU [illegible]: +.012 -.001

DRAWN [illegible] 9-2-76
[illegible] 11-2-76
ENGR [illegible] 11-29-76
[illegible] 11-30-76
[illegible] 12-3-76
[illegible] 12/3
[illegible] 12/3/76

TEXAS INSTRUMENTS INCORPORATED Dallas Texas

CABLE ASSY, EIA EXTENSION

SIZE D FSCM NO [illegible]6214 DRAWING NO 993211

REV A

LM

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 15 of

PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0191A					R258	
0193	00001.000	EA		0538425-0123	RES 33000. OHM 5% 2WATT FIX COMP	RCR -42G333JS/QPL39
0193A					R265	
0201	00034.000	EA		0972763-0021	CAP.,FIXED,AXIAL LEAD,.047 UF,+80%,-20%	
0201A					C1-C16,C18-C20,C23-C30,C32	
0201B					C33,C102,C103,C106,C107,	
0201C					C215	
0202	00001.000	EA		0972929-0361	CAP FIX CERAMIC 10.0 PF 10 % 200 V	QPL -M39014/01-1361
0202A					C21	
0203	00001.000	EA		0972929-0376	CAP FIX CERAMIC 68.0 PF 10 % 200 V	QPL -M39014/01-1376
0203A					C31	
0204	00001.000	EA		0972929-0379	CAP FIX CERAMIC 100 PF 10 % 200 V	QPL -M39014/01-1379
0204A					C22	
0205	00002.000	EA		0972929-0403	CAP .0022 UF 10% 100V	
0205A					C17,C108	
0206	00002.000	EA		0410529-0203	CAP FIX CERAMIC .02UF +80%-20% 600 V	CRL - DD203
0206A					C257,C264	
0207	00001.000	EA		0972924-0007	CAP FIX TANT SOLID 120 MFD 10 % 10 VOLT	QPL -M39003/1-2263
0207A					C261	
0209	00004.000	EA		0972924-0014	CAP FIX TANT SOLID 15 MFD 10 % 20 VOLT	QPL -M39003/1-2239

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V8

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 16 of

PART NUMBER LM0999694-0201 REV V8

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0209A					C206,C207,C214,C251	
0210	00001.000	EA		0972924-0017	CAP FIX TANT SOLID 1.0 MFD 10 % 35 VOLT	SPR -150D105X9035A
0210A					C202	
0211	00001.000	EA		0058023-0016	CAP FIX .100 MFD 5 % 100V MYLAR FOIL	TRW - 663UW
0211A					C104	
0212	00001.000	EA		0972928-0024	CAP FIX MICA 500V 5000PF 5%	QPL - CMR06F502J00
0212A					C256	
0213	00001.000	EA		0972757-0003	CAP,FIXED CERAMIC 150 PF 10% 50V	UC -C51C151K
0213A					C105	
0214	00003.000	EA		0412645-0015	CAPACITOR,.1 UF +80,-20% 500VDC CER DIEL	SPR -41C92
0214A					C208-C210	
0215	00001.000	EA		0972929-0415	CAP FIX CERAMIC .010 UF 10 % 100 V	QPL -M39014/01-1415
0215A					C253	
0216	00002.000	EA		0972927-0020	CAP FIX MICA 500V 51.0 PF 5 %	QPL -CM05E510J00
0216A					C252,C255	
0217	00004.000	EA		0972929-0433	CAP FIX CERAMIC .100 UF 10 % 50 V	QPL -M39014/01-1433
0217A					C201,C250,C260,C200	
0218	00001.000	EA		0996810-0007	CAPACITOR,3900PF 400V 20% CER,DIN TYPE	DRALOR-SDPJ18400VN
0218A					C262	
0219	00001.000	EA		0410529-0103	CAP FIX CERAMIC .010 MF GMV 1 KV	CRL - DD-103

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V8

TA 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 17 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0219A					C254	
0220	00001.000	EA		0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	QPL - CK06BX104K
0220A					C101	
0221	00002.000	EA		0972601-0004	CAPACITOR,330UF 200V 10% ALUM ELECTLT	090201-TCW331N200N3C3
0221A					C258,C259	
0223	00001.000	EA		0972931-0024	CAP,FIXED 14000MFD 7.5V 10%	SPR - 604D143G7R5J6
0223A					C205	
0224	00002.000	EA		0972931-0049	X CAP 1800 UF-10	
0224A					C211,C212	
0225	00002.000	EA		0972931-0084	CAPACITOR,2300UF 40V FX ELCTLT ALUM	056289-604D292G040JS6
0225A					C203,C204	
0226	00001.000	EA		0539544-0001	SOCKET,14PIN IC LOW PROFILE SOLDER TAIL	TI -C93-14-02
0226A					TP7	
0227	00004.000	EA		0539544-0007	SOCKET,24PIN IC LOW PROFILE SOLDER TAIL	TI -C93-24-02
0227A					XU10,XU11,XU16,XU9	
0228	00004.000	EA		0539544-0010	SOCKET,20PIN IC LOW PROFILE SOLDER TAIL	TI -C93-20-02
0228A					XU2,XU3,XU40,XU50	
0229	00002.000	EA		0539544-0009	SOCKET,40PIN IC LOW PROFILE SOLDER TAIL	TI -C93-40-02
0229A					XU17,XU21	
0231	00001.000	EA		0972445-0004	CHRYSTAL,HC 18U,10MHZ,QUARTZ	013454-10MHZHC-18/U

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V

T.I. 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 18 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0231A					Y1	
0232	00001.000	EA		0972461-0001	DISC,SOUND-PIEZO-ELECT 3200 + 600HZ	SEE - TI DRAWING
0232A					DS1	
0233	00001.000	EA		0983910-0001	SUPPORT,TONE GENERATOR	
0236	00001.000	EA		0537399-0012	FUSE 5AMP .014 OHM	LIT -276005
0236A					F200	
0237	00003.000	EA		0537399-0010	FUSE 3AMP	LIT -276003
0237A					F103 F102,F101	
0238	00001.000	EA		0416434-0303	FUSE 3.0 A 250V 3AG	LIT - 312003
0238A					F250	
0240	00002.000	EA		0772635-0001	CLIP,FUSE	LIT -102068
0242	00001.000	EA		0996707-0001	THERMISTOR, DISC	015801-NA22J1
0242A					R227	
0243	00001.000	EA		0996865-0005	HEADER ASSY,9 POS RIGHT ANGLE,.100	000779-643099-9
0243A					J103	
0244	00001.000	EA		0972519-0025	SOCKET,IC 25POSITIONS SINGLE IN-LINE	000779-533633-1
0244A					J2	
0245	00002.000	EA		0972519-0023	SOCKET,SINGLE-IN-LINE 12 POS(GOLD CONT)	-1-583780-5
0245A					J10	
0248	00001.000	EA		0983836-0003	CABLE,HEATSINK GROUND,BLK/WHT,4.20"	

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			TERMINAL ELECTRONICS,230V
APPD MFG. DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740

PART NUMBER LM0999694-0201 REV V

T.I. 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 19 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0249	00002.000	EA		0983836-0002	CABLE,HEATSINK GROUND,GRN/YEL,4.20"	
0250	00001.000	EA		0999869-0001	CABLE ASSY,SIGNAL/CHASSIS,GROUND-OPTION	
0251	00109.000	EA		0972456-0002	PIN,.025 SQUARE	BEI - 75481-002
0251A					E30 THRU E33,E205 THRU E220	
0251B					E10 THRU E13,E262 THRU E265	
0251C					J3-1 THRU J3-18,	
0251D					J3-20 THRU J3-24,	
0251E					J4-1 THRU J4-13,	
0251F					J4-15 THRU J4,19,	
0251G					J8-1,J8-3 THRU J9-8,	
0251H					J6-1 THRU J6-4,J6-6,J9-1,	
0251J					J9-2,J9-4,J101-2,J101-3,	
0251K					J101-4 THRU J101-10,	
0251L					J104-1 THRU J104-4,J105-1,	
0251M					J105-2,J105-4,J106-1,J106-3	
0251N					J106-4,J106-5,J202-1,J202-4	
0251P					J203-1,J203-2,J203-4	
0252	00000.000	EA		0972494-0001	PIN,.025 SQUARE	AMP - 4-87022-2
0253	00005.000	EA		0996706-0002	POST, .715LG PRINTED CIRCUIT	000779-1-86147-8
0253A					E221,E222,E223,E271,E281	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: TERMINAL ELECTRONICS,230V

APPD MFG. DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0201 REV V

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE 20 of

PART NUMBER LM0999694-0201 REV V

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0254	00013.000	EA		0972487-0001	JUMPER PLUG,CONNECTOR BLACK	
0255	00019.000	EA		0972779-0001	INSULATOR,MICA COATED,TO-220 CASE	
0256	00001.000	EA		0800482-0003	HEATSINK,TO-3 ALUM	013103-60148
0257	00001.000	EA		0999802-0001	HEATSINK,PAPER MOTOR DRIVER	
0258	00001.000	EA		0999803-0001	HEATSINK,CARRIAGE DRIVER	
0259	00001.000	EA		0999804-0001	HEATSINK,PAPER DRIVER	
0260	00001.000	EA		0999863-0001	HEATSINK,PRINTHEAD/RIBBON DRIVE MOTOR	
0261	00002.000	EA		0232583-0008	TO-5 MOUNTING PAD,4-LEADS,NYLON	13103S-EE DRAWING
0262	AR	TU		0417559-0001	SILICONE RUBBER (RTV) DOW 3140	SEE - TI DRAWING
0263	AR	PT		0417200-0004	PRIMER,SILICONE RUBBER-RED	COR - 1203
0264	AR	EA		0415886-0001	GREASE,SILICONE,HEAT COND. (8 OZ TUBE)	WAK - 120
0266	00014.000	EA		0988967-0001	CLIP,INTEGRATED CIRCUIT	
0267	00001.000	EA		0972306-0003	COVER,RND-1.807LG .019THK ALUM,SEAMLESS	002875-HU-2900CK-AL
0268	00001.000	EA		0972621-0001	SPRING,RING	FER -991-191-00
0269	00004.000	EA		0972355-0006	STUD,SELF-CLINCHING 4-40 X .750LG PWB	046384-KFH-440-12
0270	00003.000	EA		0972988-0013	SCREW 4-40 X .250 PAN HEAD CRES	
0271	00015.000	EA		0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0273	00001.000	EA		0972988-0023	SCREW 4-40 X 1.50 PAN HEAD CRES	
0274	00001.000	EA		0972988-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0276	00024.000	EA		0416453-0021	NUT,PLAIN,4-40 UNC-2B HEX,CRES,SMALL	QPL - NAS671-C4

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: TERMINAL ELECTRONICS,230V

APPD MFG. DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999694-0201 REV V

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/11/78 **LIST OF MATERIAL** PAGE21 of

PART NUMBER LM0999694-0201 REV V

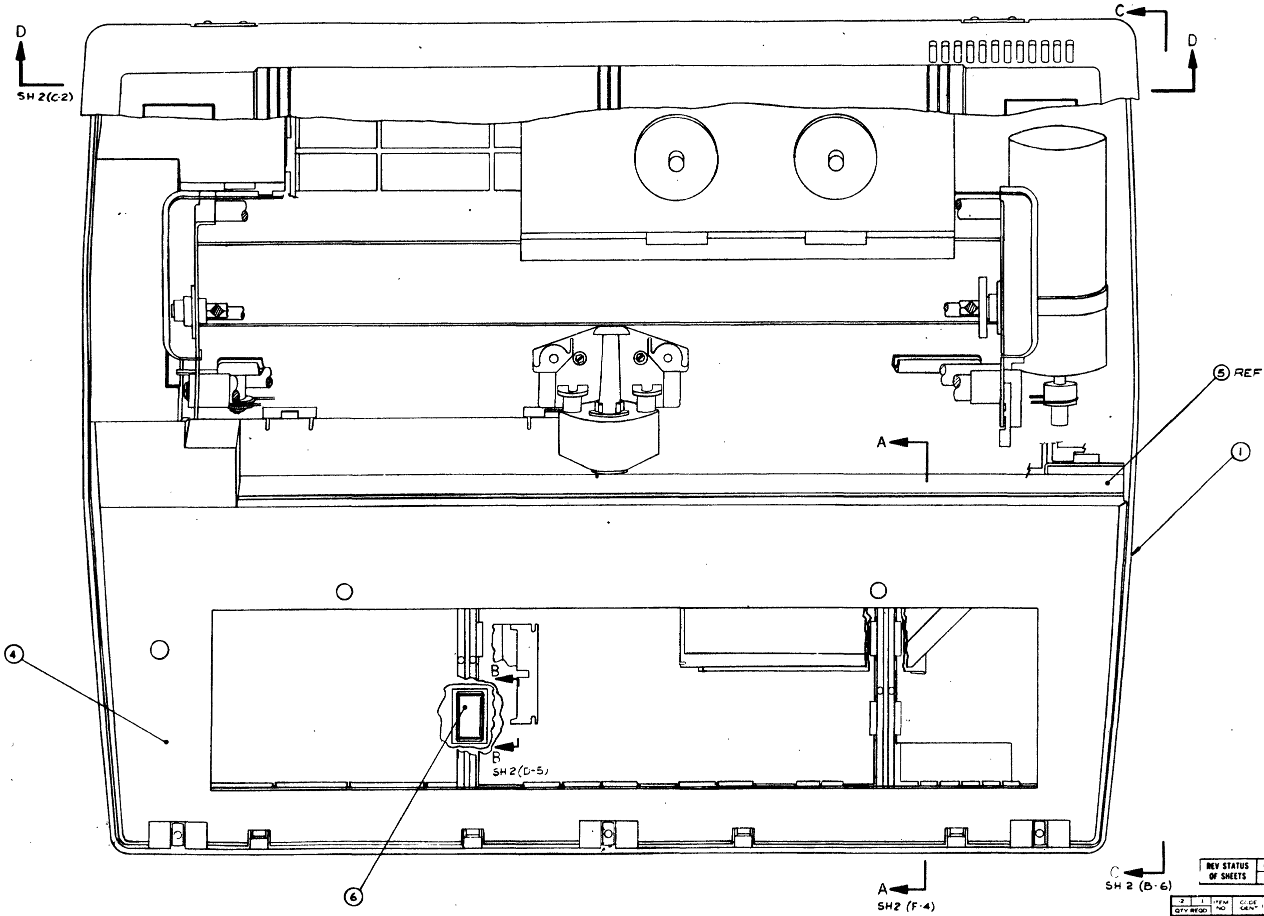
PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0277	00004.000	EA		0411027-0803	WASHER .125 X .250 X .022 FLAT CRES	QPL - MS15795-803
0278	00002.000	EA		0416622-0011	WASHER #4 FLAT	QPL - AN960C4L
0279	00019.000	EA		0411104-0135	WASHER #4 LOCKSPLIT	QPL - MS35338-135
0280	00003.000	EA		0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	QPL - MS35335-57
0281	00018.000	EA		0972628-0001	WASHER,#4 .115ID .2000D-SHLDR NON-MET	SEA -5607-45
0282	00002.000	EA		0416925-0600	SPACERS-SCREW & BOLT #6 1/4 X.049	- NAS43001-6
0283	00001.000	EA		0416925-0417	SPACERS-SCREW AND BOLT #4 3/16 X .028	-NAS4300-76
0284	00002.000	EA		0999862-0001	SPACER, POWER TRANSISTOR	
0286	00000.200	FT		0411403-0018	WIRE,BARE TINNED,18AWG, COPPER BUS	IWP -18-630
0287	00000.500	FT		0411400-0022	WIRE 22AWG ELETRO-TIN-PLATED,COPPER	
0288	00001.400	FT		0538347-3099	WIRE HOOKUP 8-22 AWG 19 STR BK/WH	JUD - HH0115
0289	00002.000	EA		0418212-0340	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	QPL - MS3367-4-9
0290	00000.050	FT		0411634-1310	SLEEVE,PVC, .133 DIA. CLEAR	QPL - MIL-I-631

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE TERMINAL ELECTRONICS,230V	
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740	PART NUMBER LM0999694-0201 REV V

TI 13849

NOTES:

1. THE WINDOW SHALL BE FREE OF ANY OBVIOUS FLAWS AND SCRATCHES WHEN VIEWED FROM A DISTANCE OF 2 FEET AND HAVING A NORMAL VIEWING ANGLE OF 30°. OVERHEAD LIGHTING HAVING 75 TO 100 FOOT CANDLES IS REQUIRED WITH AN INSPECTION TIME PER WINDOW OF 4 SECONDS. WINDOW MUST BE PROPERLY ASSEMBLED IN THE COVER WITH THE BACKGROUND BEING 132 COLUMNS OF PRINTED BARBERPOLE TEXT.



PART NUMBER	DESCRIPTION
999695-0201	820 KSR TERMINAL 220 V, 10 CPI
999695-0101	820 KSR TERMINAL 115 V, 10 CPI

REV STATUS OF SHEETS | REV | SH

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL STD 100

HOLE TOLERANCE

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: 3 PLACE DECIMALS ±.010, 2 PLACE DECIMALS ±.02

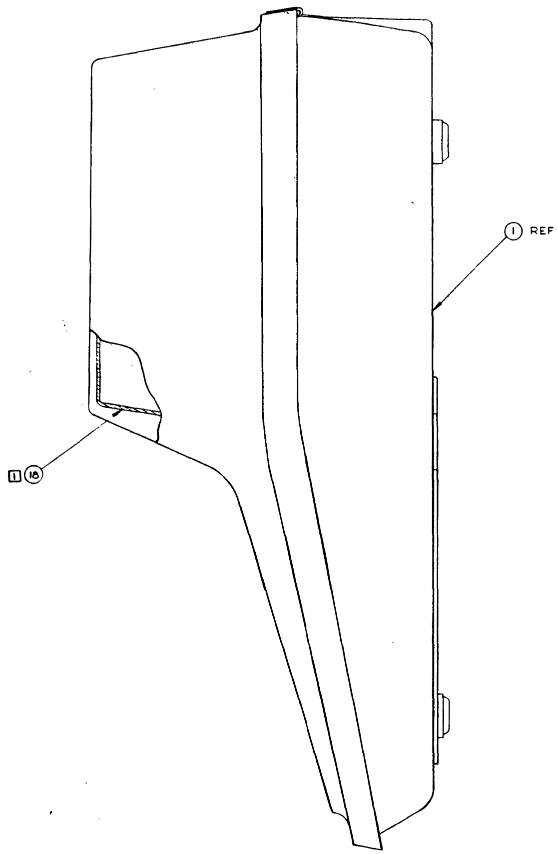
MATERIAL

APPLICATION

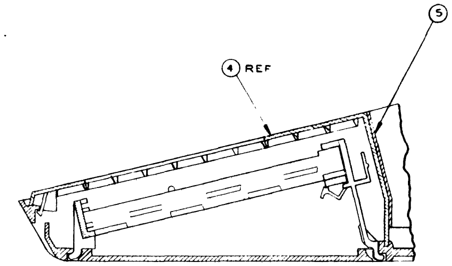
TEXAS INSTRUMENTS

820 KSR TERMINAL

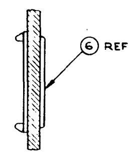
E 96214 999695



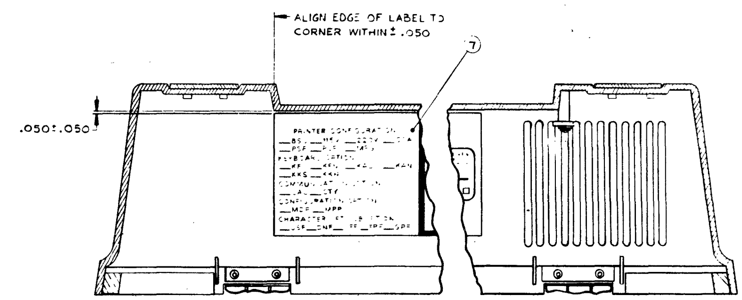
VIEW C-C
SH 1 (A-3)



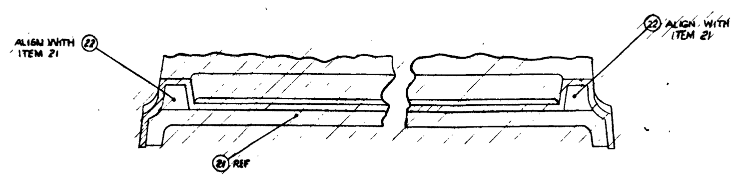
SECTION A-A
SH 1 (A-4)
ROTATED 90° CLOCKWISE



SECTION B-B
SH 1 (B-6)
SCALE 2/1



SECTION D-D
SH 1 (F-8)



SECTION E-E
(D-7)
ROTATED 12° CLOCKWISE

QTY REQD	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.251 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.750 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES
ANGLES ±1°
3 PLACE DECIMALS ±.010
2 PLACE DECIMALS ±.02

MATERIAL

CHK
ENGR
APVD
CONTR NO
DESIGN ACTIVITY RELEASE

TEXAS INSTRUMENTS
INCORPORATED

820 KSR TERMINAL

E 96214 999695

TEXAS INSTRUMENTS INCORPORATED

DATE 10/05/78 **LIST OF MATERIAL** PAGE 1 of 2

PART NUMBER: LM 0999695-0101 REV: F

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999690-0101	820 TERMINAL,BASIC-115V,10CPI	
0004	00001.000	EA		0999746-0001	PLENUM,PWB	
0005	00001.000	EA		0999747-0001	INSULATOR, SOUND AIR PLENUM	
0006	00001.000	EA		0999748-0001	COVER,TEST	
0007	00001.000	EA		0999834-0001	LABEL,INSTRUCTION PAPER & RIBBON LOADING	
0008	00001.000	EA		0996704-0001	RIBBON,BLK MATRIX-SINGLE 60 YARD	000494-
0009	00001.000	EA		0999854-9701	MANUAL, USER GUIDE	
0010	00000.020	EA		0996472-0001	PAPER,CPC-1 PART PREMIUM	093287-1412RH
0012	00001.000	EA		0999456-9701	MANUAL,INFORMATION REQUEST FORM	
0013	REF	EA		0999760-9901	SHIPPING CONTAINER INDEX, 820 TERM	
0014	00001.000	EA		0979457-9701	MANUAL,FIELD SERVICE FLYER	
0016	REF	EA		0999858-9701	INSTRUCTIONS, PACKING	
0017	00001.000	EA		0999860-9701	MANUAL, RIBBON & PAPER RECOMMENDATIONS	
0018	00001.000	EA		0999713-0001	WINDOW, TERMINAL	
0023	00001.000	EA		0994472-0001	SERVICE KIT,MODEL 810 PRINTER	
0024	00001.000	EA		0993205-0001	CABLE ASSY,202/212 DATA SET	
0025	00001.000	EA		0996289-0001	CORD SET,3-PIN PWR-DOMESTIC BLACK	080126-0-7889-006-GY
0025A					ITEM 26 MAY BE USED IN	
0025B					PLACE OF ITEM 25	
0026	00000.000	EA		0996289-0002	CORD SET,3-PIN PWR-DOMESTIC GRAY W/CLIP	080126-0-7919-008-GY

DRAFTSMAN: L.O. Sepeda [illegible] DATE 10-6 — CKD DRAFTSMAN: [illegible] — DESIGN ENGINEER — TITLE: 820 KSR TERMINAL,115V 10 CPI

APPD MFG — APPD PROJECT ENGINEER — RELEASED — PROJECT NO 8740 — FILMED — LM 0999695-0101 REV F

TI 13049

TEXAS INSTRUMENTS INCORPORATED

DATE 10/05/78 **LIST OF MATERIAL** PAGE 2 of 2

PART NUMBER: LM 0999695-0101 REV: F

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0026A					ITEM 25 MAY BE USED IN	
0026B					PLACE OF ITEM 26	

DRAFTSMAN — CKD DRAFTSMAN — DESIGN ENGINEER — TITLE: 820 KSR TERMINAL,115V 10 CPI

APPD MFG — APPD PROJECT ENGINEER — RELEASED — PROJECT NO 8740 — LM 0999695-0101 REV F

TI 13049

TEXAS INSTRUMENTS
INCORPORATED

DATE 10/05/78 **LIST OF MATERIAL** PAGE 1 of 1

PART NUMBER REV. LM 0999695-0201 F

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999690-0201	820 TERMINAL,BASIC-220V,10 CPI	
0004	00001.000	EA		0995746-0001	PLENUM,PWB	
0005	00001.000	EA		0999747-0001	INSULATOR, SOUND AIR PLENUM	
0006	00001.000	EA		0999748-0001	COVER,TEST	
0007	00001.000	EA		0995834-0001	LABEL,INSTRUCTION PAPER & RIBBON LOADING	
0008	00001.000	EA		0996704-0001	RIBBON,BLK MATRIX-SINGLE 50 YARD	000494-
0009	00001.000	EA		0995854-9701	MANUAL, USER GUIDE	
0010	00000.020	EA		0996472-0001	PAPER,LPC-1 PART PREMIUM	093287-1412RH
0012	00001.000	EA		0999456-9701	MANUAL,INFORMATION REQUEST FORM	
0013	REF	EA		0999760-9901	SHIPPING CONTAINER INDEX, 820 TERM	
0014	00001.000	EA		0999457-9701	MANUAL,FIELD SERVICE FLYER	
0016	REF	EA		0995858-9701	INSTRUCTIONS, PACKING	
0017	00001.000	EA		0999860-9701	MANUAL, RIBBON & PAPER RECOMMENDATIONS	
0018	00001.000	EA		0999713-0001	WINDOW, TERMINAL	
0023	00001.000	EA		0994472-0001	SERVICE KIT,MODEL 810 PRINTER	
0024	00001.000	EA		0993205-0001	CABLE ASSY,202/212 DATA SET	
0025	00001.000	EA		0996250-0001	CORD SET,POWER-WEST EUROPEAN	

DRAFTSMAN / DATE	CKD. DRAFTSMAN / DATE	DESIGN ENGINEER / DATE	TITLE
L.O. Espada 10-6			820 KSR TERMINAL,220V 10 CPI
APPD. MFG / DATE	APPD. PROJECT ENGINEER / DATE	RELEASED / DATE	PROJECT NO / PART NO. / REV.
			874 LM 0999695-0201 F

TI 13849

NOTES: UNLESS OTHERWISE SPECIFIED

1. MARK SITE/DATE CODE ON ASSEMBLY IN LOCATION INDICATED PER ITEM 32 PARAGRAPH 4.0 AND PROCESS 1.

2. INDICATES COMPONENTS NOT USED.

3. MARK APPROPRIATE REVISION LETTER IN LOCATION SHOWN PER REVISION LEVEL BLOCK AND PROCESS 1.

4. INSTALL LOWER BASE OF SWITCH (ITEM 23) PRIOR TO PROCESS 2. AFTER BOARD IS CLEANED AND DRIED, SNAP UPPER HALF IN PLACE.

5. ORIENTATE BOTH CONNECTORS (ITEM 22) USING VENDOR IDENTIFICATION MOLDED INTO PART AND POSITION AS SHOWN.

999712 | I

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
H	CN 439596 6/2/78 LM UPDATE		
J	CN 439961 6/16/78 LM UPDATE		

PART NUMBER	DESCRIPTION
999712-0102	KEYBOARD, 820-STD ASCII W/ NUMERIC CLUSTER OPTION
999712-0101	KEYBOARD, 820-STD ASCII

REV STATUS OF SHEETS	REV	J	J	J
	SH	1	2	3

FILMED

SEQ NO	IDENT	F SPEC	NO	ADDITIONAL
2	SLDR	124-02	00	
1	MARK	100-02	21	HEIGHT: .06; COLOR: BLACK

PROCESS — CLASSIFICATION

PROCESSES — FOR CORRELATION TO GOVT IND SPECIFICATIONS SEE DRAWING

PWB 999711
SCHEMATIC 999710 A
ASSEMBLY 999712 J

999691 | 8740

APPLICATION

D. Flarga 6-7-78

6-20-78

TEXAS INSTRUMENTS

KEYBOARD, 820 KSR - STD ASCII

D 96214 999712 FILMED

1 OF 3

32

H-MT LM

TEXAS INSTRUMENTS
INCORPORATED

DATE 06/19/78 — **LIST OF MATERIAL** — PAGE 1 of 3 — PART NUMBER LM 0999712-0101 REV J

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999711-0001	PWB, 820 KEYBOARD	
0002	REF ~~00001.000~~	EA		0999710-9901	DIAG,LOGIC,DETAILED 820 KSR ASCII KYBD	
0003	00002.000	EA		0972787-0003	NETWORK SN74LS367N	
0003A					U7,U8	
0004	00001.000	EA		0222222-7447	NETWORK SN7447N	
0004A					U1	
0005	00002.000	EA		0972663-0001	NETWORK,LM339N	
0005A					U2,U3	
0006	00003.000	EA		0996698-0001	IC, TIL312 DIGITAL DISPLAY	001295-TIL312
0006A					U4,U5,U6	
0007	00002.000	EA		0539480-0003	OPTOELECTRONIC DEVICE-TIL 220	
0007A					CR72,CR74	
0008	00067.000	EA		0972932-0001	DIODE,1N914B SWITCHING 75V PIV 75MA 4NS	TI - 1N9148
0008A					CR2 THRU CR48,CR52 THRU	
0008B					CR61,CR63 THRU CR71 & CR88	
0009	00003.000	EA		0800523-0001	TRANSISTOR A5T2907 PNP SILICON	TI- -A5T2907
0009A					Q1 THRU Q3	
0010	00001.000	EA		0999717-0001	KEYSWITCH CLUSTER, 63 POSITION	
0010A					S6 THRU S51,S54 THRU S65 &	
0010B					S68	
0011	00001.000	EA		0999719-0001	KEYSWITCH CLUSTER, 5 POSITION	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: KYBD, 820 KSR- STD ASCII FILMED

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO. 8740 | PART NUMBER LM 0999712-0101 REV J

TL 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 06/19/78 — **LIST OF MATERIAL** — PAGE 2 of 3 — PART NUMBER LM 0999712-0102 REV J

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0010B		--			S68	
0011	00001.000	EA		0999719-0001	KEYSWITCH CLUSTER, 5 POSITION	
0011A					S1 THRU S5	
0012	00002.000	EA		0972946-0051	RES FIX 270 OHM 5 % .25 W CARBON FILM	ROH - R-25
0012A					R4,R6	
0013	00003.000	EA		0972946-0077	RES FIX 3.3K OHM 5 % .25 W CARBON FILM	ROH - R-25
0013A					R1 THRU R3	
0014	00008.000	EA		0972946-0085	RES FIX 6.8K OHM 5 % .25 W CARBON FILM	ROH - R-25
0014A					R27 THRU R34	
0015	00001.000	EA		0539370-0455	RES FIX FILM 5.36K OHM 1% .25W	COR --NA55D-100PPM/
0015A					R18	
0016	00001.000	EA		0539370-0481	RES FIX FILM 10.0K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0016A					R17	
0017	00005.000	EA		0972763-0021	CAP.,FIXED,AXIAL LEAD,.047 UF,+80%,-20%	
0017A					C2 THRU C6	
0018	00001.000	EA		0972924-0011	CAP FIX TANT SOLID 68 MFD 10 % 15 VOLT	QPL -M39003/1-2274
0018A					C1	
0019	00001.000	EA		0996432-0003	SWITCH,ON-NONE-ON,W/GRY ROCKER,PCB,SPDT	009353-7101J1V48E
0019A					S89	
0020	00003.000	EA		0996734-0001	CONNECTOR,14 PINS DUAL-IN-LINE PKG SKT	073803-C91-14-00

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: KYBD,820KSR,STD. ASCII,W/NUM CLST OPTION

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO. 8740 | PART NUMBER LM 0999712-0102 REV J

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 12/01/76

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0993211-0001 REV A

PRNT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0539409-0005	CONNECTOR,PLUG 25 PINS	AMP -205208-1
0002	00001.000	EA		0539409-0006	CONNECTOR,RCPT 25 PINS	AMP -205207-1
0003	00001.000	EA		0539903-0001	HOOD,CONN 25 PIN WITH RETAINERS	AMP - 206474-3
0004	00001.000	EA		0539903-0006	HOOD,CONNECTOR	
0005	00025.000	EA		0539430-0003	CONTACT,PIN 24-20AWG .068 INSUL DIA	AMP -205202-2 ST
0006	00025.000	EA		0539430-0004	CONTACT,SOCKET 24-20AWG .068 INSUL DIA	AMP -205201-3 SI
0007	00002.000	EA		0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	QPL - MS3368-6-9
0008	00002.000	EA		0406769- 001	SCREW,SPECIAL,CONNECTOR LOCRING	CIE - D20418-2
0009	00006.500	FT		0972444-0006	CABLE,25COND 22AWG UL LISTED	019007-6918UL
0010	REF	EA		0983398-9901	TEST PGM,EIA EXTENSION CABLE-UNN1	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
		A. Rodriguez	12-3-76			CABLE ASSY,EIA EXTENSION
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8749

PART NUMBER LM0993211-0001 REV A

TI 15849

34

1/1

TEXAS INSTRUMENTS
INCORPORATED

DATE 06/19/78

LIST OF MATERIAL

PART NUMBER LM 0999712-0102 REV J

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0020A					XU4,XU5,XU6	
0021	00001.000	EA		0999716-0001	SPACER, LED, 820 KEYBOARD	
0022	00002.000	EA		0972519-0023	SOCKET,SINGLE-IN-LINE 12 POS(GOLD CONT)	-1-583780-5
0022A					J1	
0023	00001.000	EA		0996700-0001	SLIDE SWITCH,PC BOARD MOUNTING	010389-24-140-020
0023A					S86	
0024	00007.000	EA		0972946-0049	RES FIX 220 OHM 5 % .25 W CARBON-FILM	ROH - R-25
0024A					R10 THRU R16	
0025	00001.000	EA		0996432-0005	SWITCH,ON-OFF-ON,ROCKER,PCB,SPDT (GRAY)	009353-7103J1V48E
0025A					S87	
0026	00001.000	EA		0996860-0001	CONNECTOR,TAB .032 THK	000779-61246-2
0026A					J2	
0027	00001.000	EA		0999718-0001	KEYSWITCH CLUSTER, 17 POSITION	
0027A					S69 THRU S84,S92,S93	
0028	00001.000	EA		0972988-0013	SCREW 4-40 X .250 PAN HEAD CRES	
0029	00001.000	EA		0416453-0021	NUT,PLAIN,4-40 UNC-2B HEX,CRES,SMALL	QPL - NAS671-C4
0030	00001.000	EA		0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	QPL - MS35335-57
0031	00010.000	EA		0972363-0406	SCREW, PLASTITE, 4-20X3/8(SLOT PAN HD)	
0032	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						KYBD,820KSR,STD. ASCII,W/NUM CLST OPTION
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740

PART NUMBER LM 0999712-0102 REV J

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 06/19/78

LIST OF MATERIAL

PAGE 1 of 3

PART NUMBER LM 0999712-0102 REV J

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999711-0001	PWB, 820 KEYBOARD	
0002	REF	EA		0999710-9901	DIAG,LOGIC,DETAILED 820 KSR ASCII KYBD	
0003	00002.000	EA		0972787-0003	NETWORK SN74LS367N	
0003A					U7,U8	
0004	00001.000	EA		0222222-7447	NETWORK SN7447N	
0004A					U1	
0005	00002.000	EA		0972663-0001	NETWORK,LM339N	
0005A					U2,U3	
0006	00003.000	EA		0996698-0001	IC, TIL312 DIGITAL DISPLAY	001295-TIL312
0006A					U4,U5,U6	
0007	00002.000	EA		0539480-0003	OPTOELECTRONIC DEVICE-TIL 220	
0007A					CR72,CR74	
0008	00085.000	EA		0972932-0001	DIODE,1N914B SWITCHING 75V PIV 75MA 4NS	TI - 1N914B
0008A					CR2 THRU CR48,CR52 THRU	
0008B					CR61,CR63 THRU CR71	
0008C					CR77 THRU CR93,CR96,CR97	
0009	00003.000	EA		0800523-0001	TRANSISTOR A5T2907 PNP SILICON	TI- -A5T2907
0009A					Q1 THRU Q3	
0010	00001.000	EA		0999717-0001	KEYSWITCH CLUSTER, 63 POSITION	
0010A					S6 THRU S51,S54 THRU S65 &	

DRAFTSMAN DATE | CKD. DRAFTSMAN Theresa Parker 4/20/78 DATE | DESIGN ENGINEER Scott Russell 4/20/78 DATE | TITLE KYBD,820KSR,STD. ASCII,W/NUM CLST OPTION

APPD.-MFG. 4/20/78 DATE | APPD. PROJECT ENGINEER 4/20/78 DATE | RELEASED 6/21/78 DATE | PROJECT NO. 8740 | PART NUMBER LM 0999712-0102 REV J

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 06/19/78 **LIST OF MATERIAL** PAGE 3 of

PART NUMBER LM 0999712-0101 REV J

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0022	00002.000	EA		0972519-0023	SOCKET,SINGLE-IN-LINE 12 POS(GOLD CONT)	-1-583780-5
0022A					J1	
0023	00001.000	EA		0996700-0001	SLIDE SWITCH,PC BOARD MOUNTING	010389-24-140-020
0023A					S86	
0024	00007.000	EA		0972946-0049	RES FIX 220 OHM 5 % .25 W CARBON FILM	ROH - R-25
0024A					R10 THRU R16	
0025	00001.000	EA		0996432-0005	SWITCH,ON-OFF-ON,ROCKER,PCB,SPDT (GRAY)	009353-7103J1V48E
0025A					S87	
0026	00001.000	EA		0996860-0001	CONNECTOR,TAB .032 THK	000779-61246-2
0026A					J2	
0028	00001.000	EA		0972988-0013	SCREW 4-40 X .250 PAN HEAD CRES	
0029	00001.000	EA		0416453-0021	NUT,PLAIN,4-40 UNC-2B HEX,CRES,SMALL	QPL - NAS671-C4
0030	00001.000	EA		0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	QPL - MS35335-57
0031	00007.000	EA		0972363-0406	SCREW, PLASTITE, 4-20X3/8(SLOT PAN HD)	
0032	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						KYBD, 820 KSR- STD ASCII
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO. 8740

PART NUMBER LM 0999712-0101 REV J

T.I. 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 06/19/78 **LIST OF MATERIAL** PAGE 2 of

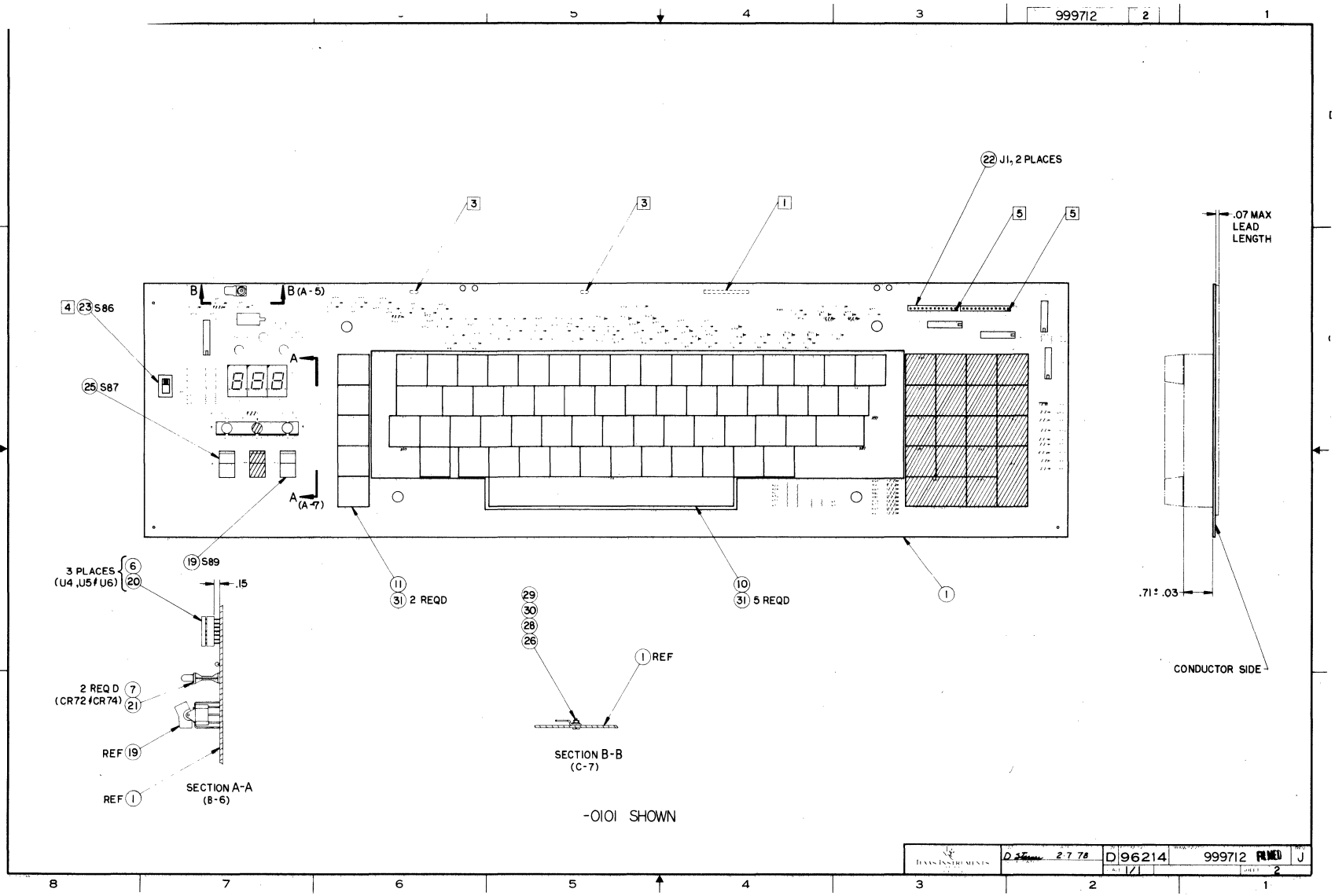
PART NUMBER LM 0999712-0101 REV J

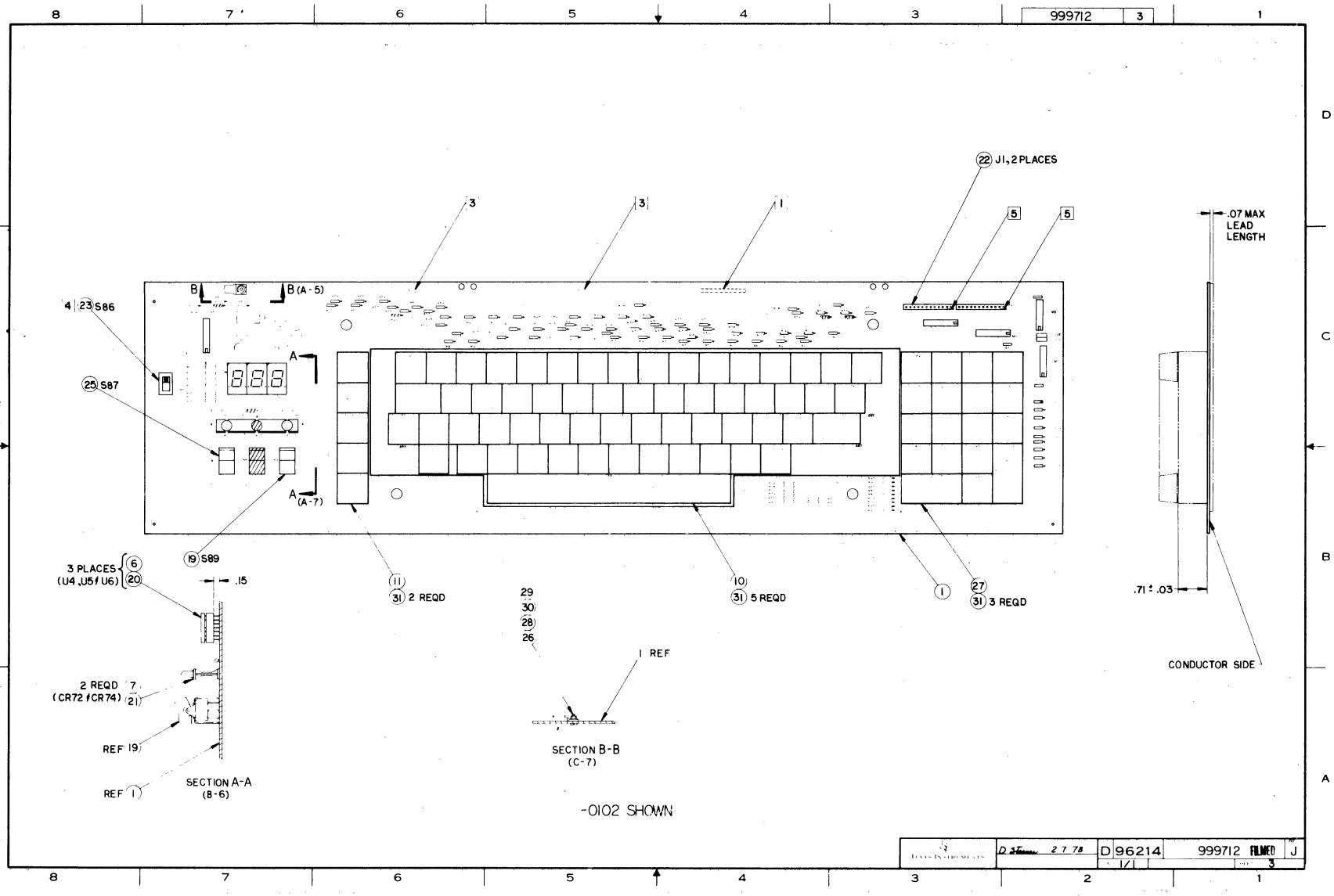
PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0011A					S1 THRU S5	
0012	00002.000	EA		0972946-0051	RES FIX 270 OHM 5 % .25 W CARBON FILM	ROH - R-25
0012A					R4,R6	
0013	00003.000	EA		0972946-0077	RES FIX 3.3K OHM 5 % .25 W CARBON FILM	ROH - R-25
0013A					R1 THRU R3	
0014	00008.000	EA		0972946-0085	RES FIX 6.8K OHM 5 % .25 W CARBON FILM	ROH - R-25
0014A					R27 THRU R34	
0015	00001.000	EA		0539370-0455	RES FIX FILM 5.36K OHM 1% .25W	COR --NA55D-100PPM/
0015A					R18	
0016	00001.000	EA		0539370-0481	RES FIX FILM 10.0K OHM 1% .25 WATT	COR -NA55D-100PPM/C
0016A					R17	
0017	00005.000	EA		0972763-0021	CAP.,FIXED,AXIAL LEAD,.047 UF,+80%,-20%	
0017A					C2 THRU C6	
0018	00001.000	EA		0972924-0011	CAP FIX TANT SOLID 68 MFD 10 % 15 VOLT	QPL -M39003/1-2274
0018A					C1	
0019	00001.000	EA		0996432-0003	SWITCH,ON-NONE-ON,W/GRY ROCKER,PCB,SPDT	009353-7101J1V48E
0019A					S89	
0020	00003.000	EA		0996734-0001	CONNECTOR,14 PINS DUAL-IN-LINE PKG SKT	073803-C91-14-00
0020A					XU4,XU5,XU6	
0021	00001.000	EA		0999716-0001	SPACER, LED, 820 KEYBOARD	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						KYBD, 820 KSR- STD ASCII
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO. 8740

PART NUMBER LM 0999712-0101 REV J

T.I. 13849


999712
22 J1, 2 PLACES
3
3
1
5
5
.07 MAX LEAD LENGTH
B
B (A-5)
4 23 S86
25 S87
A
A (A-7)
19 S89
3 PLACES (6 20) (U4, U5 & U6)
.15
11 31 2 REQD
10 31 5 REQD
1
.71 ± .03
CONDUCTOR SIDE
29
30
28
26
1 REF
SECTION B-B (C-7)
2 REQ D (7 21) (CR72 & CR74)
REF 19
REF 1
SECTION A-A (B-6)
-0101 SHOWN
TEXAS INSTRUMENTS
D 96214
999712
J
SHEET 2


999712 3
22 J1, 2 PLACES
3
3
1
5
5
.07 MAX LEAD LENGTH
B
B (A-5)
4 23 S86
25 S87
A
A (A-7)
19 S89
3 PLACES (U4, U5 f U6) 6 20
.15
11 31 2 REQD
10 31 5 REQD
1
27 31 3 REQD
.71 ± .03
CONDUCTOR SIDE
29
30
28
26
1 REF
2 REQD 7 (CR72 f CR74) 21
REF 19
REF 1
SECTION A-A (B-6)
SECTION B-B (C-7)
-0102 SHOWN
D 96214
999712 FILMED
J

NOTES: UNLESS OTHERWISE SPECIFIED

1. INSTALL KEY (ITEM 4) IN POSITIONS P104-5 AND P106-2

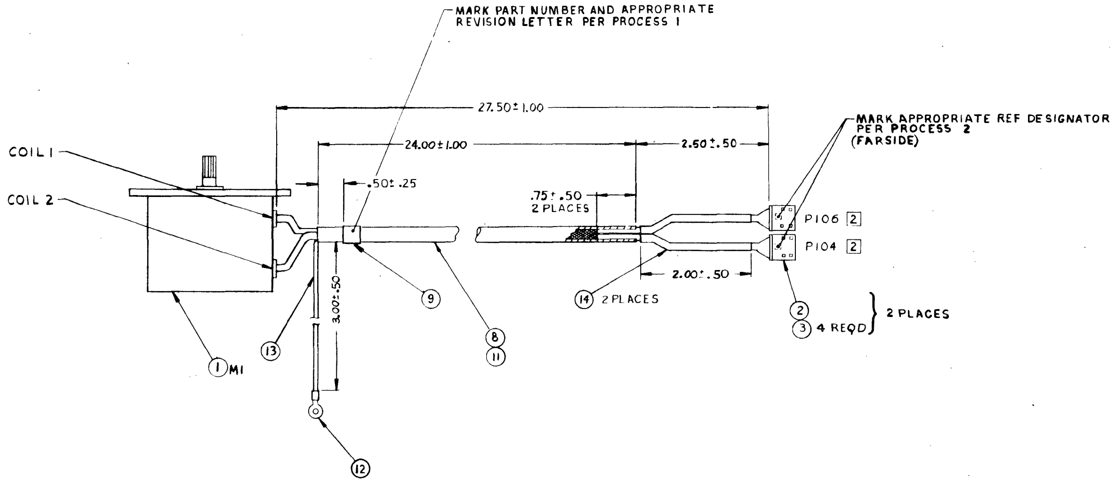
[2] PIN 1 IDENTIFIER IS VENDOR NAME MOLDED INTO PART

WIRE NO	DESCRIPTION	SIGNATURE	START	FINISH	REMARKS	LM ITEM NO
1	WHITE	PDRV	MI-COIL 2	P106-1		1
2	YELLOW	PDRV	MI-COIL 1	P106-3		
3	YELLOW	PDRV	MI-COIL 2	P106-4		
4	WHITE	PDRV	MI-COIL 1	P106-5		
5	BLACK	PPHSA	MI-COIL 2	P104-1		
6	RED	PPHSB	MI-COIL 1	P104-2		
7	BLACK	PPHSD	MI-COIL 1	P104-3		
8	RED	PPHSC	MI-COIL 2	P104-4		1
9	YELLOW/GREEN	GROUND	MI-SHIELD	TERM-1		13

DWG NO 999730 SH

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN425822 [signature] 10/28/77 1) LM UPDATES		
B	CN 439793 [signature] 4/17/78 1) LM UPDATES	5/15/78	[signature]
C	CN439600 J. CLARK 1.) ZD-4, SIGNATURE PDRV WAS PCDDRV(#1), PDRV WAS PABDRV (#2), PDRV WAS PCDDRV(#3) PDRV WAS PABDRV(#4) PPHSB WAS PPHSC (#6) PPHSC WAS PPHSB(#8)	6/22/78	[signature]
D	CN440314 J. CLARK (1) ZD-5, WIRE COLOR DESCRIPTION (WIRE Nº 1 THRU 8) WAS BLUE, WHITE, WHITE, BLUE, RED, BLACK, RED, BLACK (2) LM: IT. 11 DESCRIPTION WAS "WIRE BRAID FLAT .438 WIDE	9-11-78	[signature]



3	SLDR	127-01	00		
2	MARK	100-07	7/2	COLOR WHITE, TYPE 9	
1	MARK	100-07	7/2	COLOR BLACK, TYPE 6	
SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS. SEE TI DRAWING 729467

TI-7914H

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999689	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
  3 PLACE DECIMALS ±.010
  2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL D 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.251 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.751 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

DWN [signature] DATE 5-8-78
CHK [signature] 5/15/78
ENGR [signature] 5/16/78
APVD [signature] 5/16/78
QA [signature] 5/16/78
CONTR [signature] 5/15/78
REL [signature] 5/16/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

MOTOR ASSEMBLY, PAPER DRIVE

SIZE D FSCM NO 96214 DRAWING NO 999730 FILMED

SCALE 1/1 SHEET

LM

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/07/78

LIST OF MATERIAL

PAGE 1 of |

PART NUMBER LM0999730-0001 REV D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999828-0001	MOTOR,STEPPING DR.,W/PINION (DUAL COIL)	
0001A					M1	
0002	00002.000	EA		0972484-0005	CONNECTOR HOUSING 5 CONTACT	TII --87175-2
0002A					P104,P106	
0003	00008.000	EA		0972104-0001	CONTACT ELEC-LOCKING,WIRE-TO.025 SQ POST	AMP - 87124-1
0004	00002.000	EA		0972599-0001	KEY,POLARIZATION,CONNECTOR	AMP - 87179-1
0008	00002.100	FT		0972436-0013	INSULATION,SLEEVING 2 X .263 PVC	03890H-T-105C-2
0009	00001.000	EA		0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	QPL-MS-3368-1-98
0011	00002.100	FT		0417371-0005	WIRE,BRAID,FLAT,.250 WIDE	070903-8663
0012	00001.000	EA		0539882-0002	LUG #6 AWG.22-16 RING TONGUE VINYL INSUL	AMP -2-31882-3
0013	00000.300	FT		0996286-5455	WIRE,#18 B-18 19 STRANDS GRN/YEL	
0014	00000.400	FT		0972146-0005	TUBING, 3/16 D BLK HEAT SHRINK PVC	003890-PO-135-125C

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
	9-8-78		MOTOR ASSEMBLY,PAPER DRIVE
APPD-MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO. 8740 FILMED PART NUMBER LM0999730-0001 REV D

T.I. 13849

A.F.F. 999732 1

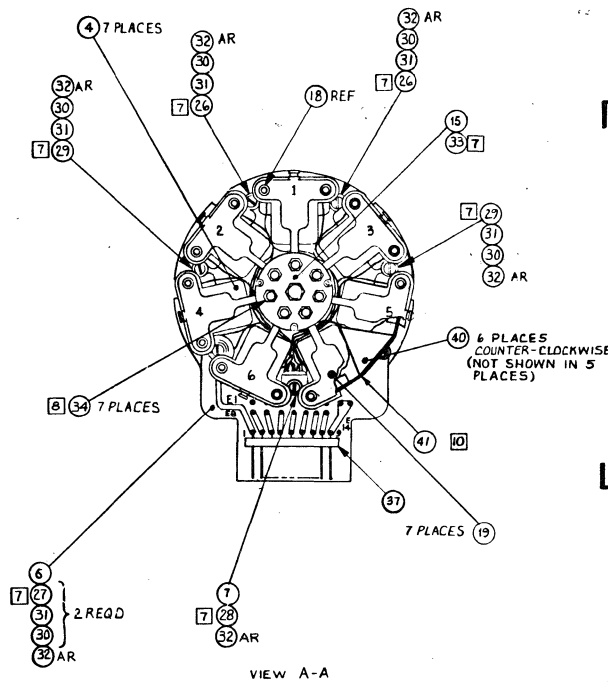
NOTES: UNLESS OTHERWISE SPECIFIED

1. CLEAN BOTH SURFACES TO BE BONDED WITH CLEAN ALCOHOL. APPLY SMALL AMOUNT OF ITEM 11 IN RECESS OF ITEM 2. PLACE ITEM 10 IN RECESS WITH A LONG SIDE ALIGNED PARALLEL TO ADJACENT SIDE OF RECESS. HOLD FIRMLY IN PLACE FOR 10 SECONDS. THERE MUST NOT BE ANY ADHESIVE IN HOLES OF ITEM 10 OR PROTRUDING ABOVE OUTSIDE SURFACES OF ITEM 10 OR 2.
2. INITIAL ADJUSTMENT IS ONE TURN BACK FROM FULLY SEATED ARMATURE (ITEM 19) POSITION.
3. GRIND NEEDLES SO THAT WITH SOLENOIDS ENERGIZED (.90±.05 AMPS) END OF NEEDLE IS .012±.001 BEYOND END OF ITEM 2.
4. ADJUST GAP ADJUSTMENT SCREW (ITEM 14) SUCH THAT WHEN SOLENOID COIL CURRENT IS REMOVED, END OF NEEDLE IS .0020±.0005 FROM END OF ITEM 2
5. MARK SITE/DATE CODE AND SERIAL NUMBER IN POSITION PER PROCESS1 AND PER ITEM 36 PARAGRAPH 3.0 ON ITEM 42.

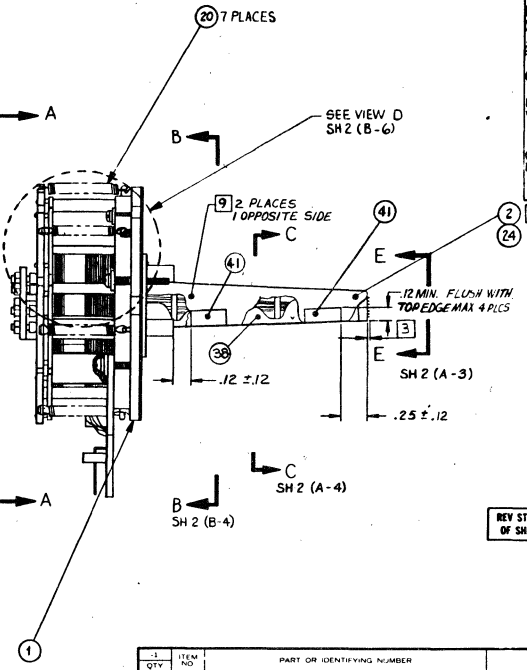
WIRE NO	DESCRIPTION	TOTAL LENGTH	SIGNATURE	START STATION	FINISH STATION	REMARKS	LM ITEM NO
1	COIL ASSEMBLY		SOLENOID 1	E5	E12		4
2			2	E3	F10		
3			3	E7	E14		
4			4	E2	E9		
5			5	E4	E11		
6			6	E1	E8		
7	COIL ASSEMBLY		SOLENOID 7	E6	E13		4

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN439771 (1) CORRECTED PWB (ITEM 6) PICTORIAL & NO'S (2) ADD ITEM 37 TO LM (3) ADD PROCESS 2	4-19-78	
B	CN439742 (1) DELETE ITEM 22, QTY 1, PN 994581-1 (2) DELETE ITEM 25, QTY 4, PN 4164222-20 (3) ADD ITEMS 14A AND 14B, 16, 23 38, 39, 40 AND 41 (4) NOTE 1 WAS CLEAN SURFACES TO BE BONDED APPLY SMALL AMOUNT OF ITEM 11 IN CORNERS OF RECESS OF ITEM 2. PLACE ITEM 10 IN RECESS. THERE MUST NOT BE ANY ADHESIVE IN HOLES OF ITEM 10 OR PROTRUDING ABOVE SURFACE OF ITEM 10 OR 2. (5) ITEM 24 QTY WAS 8 (6) ADD NOTES 9, 10 AND 11 (7) NOTE 5 WAS MARK ----- PARAGRAPH 3.0 (8) ITEM 11 P.N WAS 0417630-1 QTY AR	9-11-78	
C	CN440309 (1) LAST TWO LINES OF NOTE 4 WAS, "END OF NEEDLE IS FLUSH ±.001 FROM END OF ITEM 2."	9-23-78	9/25/78
D	CN 439895 D.VYKOUKAL (1) ADD ITEM 42 TO LM & DWG SH 2 ZC4 (2) DELE FLAG, NOTE 6 Z B-5 (3) SH 1 NOTE 5 DELE ··· PARA 3.0 AFTER ITEM 39 HAS BEEN APPLIED TO ITEM 1; ADD ··· PARA 3.0 ON ITEM 42. (4) SH 2 NOTE 11 DELE ··· PER PROC 1 AFTER ITEM 39 HAS BEEN APPLIED TO ITEM 1; ADD ··· PER PROC 1 ··· (5) SH 1 Z C-6 DELE FLAG NOTE 7 FROM ITEM 15; ADD FLAG NOTE 7 TO ITEM 33 (6) ADD NOTE 12 & 13 (7) SH 1 Z B-4 ITEM 41 ADD ±.12 TOL TO .25 DIM; DELE .25±.06 REPLACE WITH .12 MIN FLUSH ··· 4 PL (8) SH 1 Z B-4 ADD .12±.12; DELE 1.00 DIM FROM OUTSIDE EDGE OF ITEM 41 TO OUTSIDE EDGE OF ITEM 2. (9) SH 1 Z B-4 REDRAW ITEM 41 TO SCALE 2 PLCS (10) DELE S/N XXXXXXXXX FROM ITEM 39 (11) DELE RECTANGLES FROM BEHIND ASSY & REV ITEM 39 SH 2 Z C4 (12) DELE NOTE FLAG 11 FROM ASSY & REV ITEM 39 SH 2 Z C4 (13) ADD DASHED HALF-CIRCLES TO ITEM 39 3 PLCS	11-10-78	



VIEW A-A



REV STATUS OF SHEETS	REV	D	D		
	SH	1	2		

SEQ NO	ITEM	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES
2	SLDR	127-01	00		
1	MARK	100-02	21	HEIGHT .12 COLOR BLACK	5, 11

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS SEE T.I. DRAWING 729-67

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
  - 3 PLACE DECIMALS ± .010
  - 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-STD-100
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY, MACHINED DIAMETERS .010 T.I.R.
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF. ONLY

HOLE TOLERANCE

.013 THRU .064 / 1/5 .001	.129 THRU .005 / .250 .002	.751 TO .880 .003 / .500 .001
.501 THRU .008 / .750 .001	.751 THRU .013 / 1.000 .001	1.001 THRU .012 / 2.000 .001

999689	8740
NEXT ASSY	USED ON
APPLICATION	

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

PRINTHEAD ASSEMBLY, 30 VOLT

SIZE D | CODE IDENT NO 96214 | DRAWING NO 999732

A.F. 21 | SHEET 1 OF 2

LM

6 TIGHTEN TO 3 ±.5 IN-LB

7 TIGHTEN TO 6 ± 1 IN-LB

8 AFTER FINAL GAP ADJUSTMENT, TIGHTEN TO 2 ±.5 IN-LB

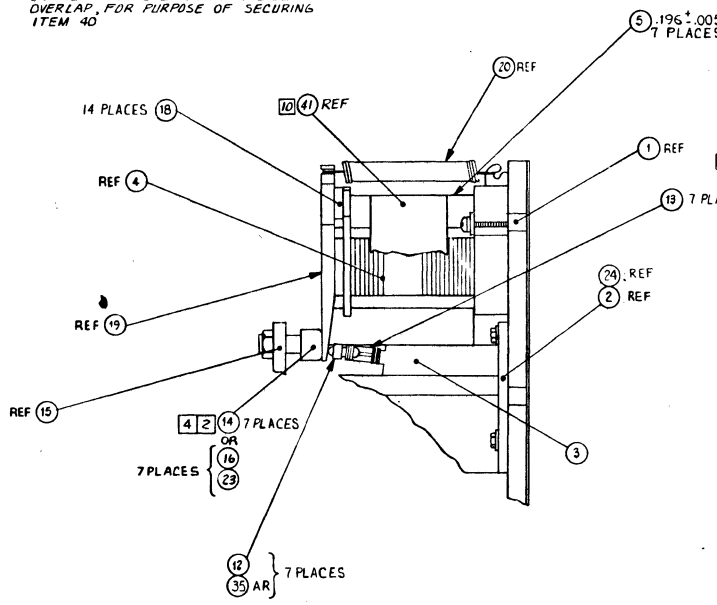
9 CLEAN SURFACES AS INDICATED WITH CLEAN ALCOHOL

10 TAPE (ITEM 41) TO BE WRAPPED AROUND ENTIRE PRINTHEAD WITH MIN 2.00 IN OVERLAP, FOR PURPOSE OF SECURING ITEM 40

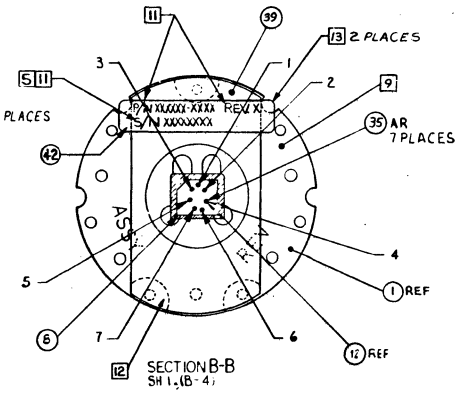
11 MARK "S/N", "P/N" AND APPROPRIATE PART NUMBER, "REV" AND APPROPRIATE REV LETTER IN POSITION PER PROCESS 1 ON ITEM 42.

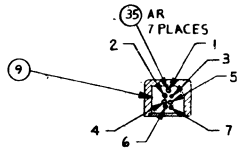
12 PROTUDING SCREWS 3 PLACES MAY CAUSE UP TO .50 DIA OF ITEM 39 NOT TO STICK TO ITEM 1

13 CORNERS OF ITEM 42 WILL FOLD OVER DUE TO NOTCHES IN ITEM 1.

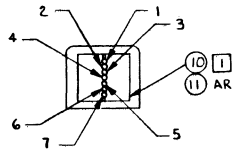


VIEW D
SCALE: NONE
SH 1, (C-3)





SECTION C-C
SH 1, (B-4)



VIEW E-E
SCALE: NONE
SH 1, (B-3)

SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	999732	D
SCALE 2/1		SHEET 2	

D 999732

TEXAS INSTRUMENTS INCORPORATED

DATE 10/05/78 — **LIST OF MATERIAL** — PAGE 1 of 3 — PART NUMBER: LM 0999732-0001 — REV: D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0994271-0001	PLATE,MOUNTING	
0002	00001.000	EA		0994295-0001	HOUSING,NEEDLE	
0003	00001.000	EA		0994280-0001	GUIDE,REAR	
0004	00007.000	EA		~~0995814-0001~~	~~COIL ASSY, 3V~~	
0005	00350.000	EA		0995815-0001	LAMINATION, SOLENOID	
0006	00001.000	EA		0995816-0001	FLE,PRINTHEAD, 9 CONDUCTOR	
0007	00001.000	EA		0994334-0001	SEPARATOR,WIRE	
0008	00001.000	EA		0994283-0001	BEARING,REAR	
0009	00001.000	EA		0994282-0001	BEARING,FRONT	
0010	00001.000	EA		0994332-0001	BEARING,JEWELLED	
0011	00000.001	BT		0996527-0002	ADHESIVE,LOCTITE 414 SUPER BONDER	005972-414 1 OZ
0012	00007.000	EA		0994274-0001	NEEDLE	
0013	00007.000	EA		0994278-0001	SPRING,NEEDLE	
0014	00007.000	EA		0994279-0001	BUMPER	
0014A					USE ITEMS 16 AND 23	
0014B					TOGETHER AS ALTERNATE.	
0015	00001.000	EA		0994281-0001	DISC,ADJUSTMENT	
0016	00000.000	EA		0994494-0001	BUMPER, PRINTHEAD	
0016A					ALTERNATE FOR ITEM 14,	
0016B					ITEMS 16 AND 23 MUST BE	

DRAFTSMAN: L.O. Sepida (signature) DATE 10-6 — CKD DRAFTSMAN: (signature) — DESIGN ENGINEER — TITLE: PRINTHEAD ASSEMBLY,30VOLT
APPD-MFG — APPD. PROJECT ENGINEER — RELEASED — PROJECT NO. 8740 — PART NUMBER: LM 0999732-0001 — REV: D

TA 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 10/05/78 — **LIST OF MATERIAL** — PAGE 2 of 3 — PART NUMBER: LM 0999732-0001 — REV: D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0016C					USED TOGETHER.	
0018	00014.000	EA		0994276-0001	BUSHING	
0019	00007.000	EA		0994275-0001	ARMATURE	
0020	00007.000	EA		0994277-0001	SPRING,ARMATURE	
0023	00000.000	EA		0411134-0092	SETSCREW-2-56 X 1/4 HEX SOCKET,HOLESS	-AN565FC2H4
0023A					ALTERNATE FOR ITEM 14,	
0023B					ITEMS 16 AND 23 MUST BE	
0023C					USED TOGETHER.	
0024	00004.000	EA		0972679-0004	SCREW # 2-28 X 3/8 SLOTTED HEX	
0026	00002.000	EA		0972588-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0027	00002.000	EA		0972588-0015	SCREW 4-40 X .375 PAN HEAD CRES	
0028	00001.000	EA		0972588-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0029	00002.000	EA		0972588-0018	SCREW 4-40 X .625 PAN HEAD CRES	
0030	00006.000	EA		0416622-0011	WASHER #4 FLAT	QPL - AN960C4L
0031	00006.000	EA		0411104-0135	WASHER #4 LOCKSPLIT	QPL - MS35338-135
0032	AR	TU		0235182-0001	SEALANT LOCTITE GRADE A RED	LOC -88
0033	00001.000	EA		0972679-0009	SCREW #4-20 X 3/8"LG THD FORM,HEX	
0034	00007.000	EA		0416453-0019	NUT,PLAIN 2-56 UNC-2B HEX CRES,SMALL	QPL - NAS671C2
0035	AR	EA		0232573-0001	OIL #43 TERRESTIC	HUM -
0036	REF	EA		0994396-9931	PROCEDURE,SITE & DATE CODE SERIALIZATION	

DRAFTSMAN — CKD DRAFTSMAN — DESIGN ENGINEER — TITLE: PRINTHEAD ASSEMBLY,30VOLT
APPD-MFG — APPD. PROJECT ENGINEER — RELEASED — PROJECT NO. 8740 — PART NUMBER: LM 0999732-0001 — REV: D

TA 13849

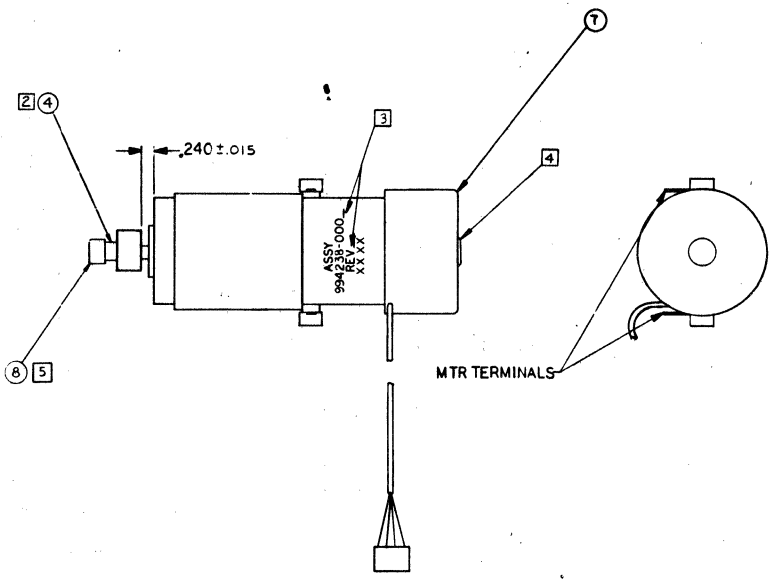
994238

NOTES: UNLESS OTHERWISE SPECIFIED:

1. MOUNTING HARDWARE PROVIDED WITH ITEM 1 WHEN USED AS ALTERNATE TO ITEM 7
2. ALIGN FLATS ON MTR SHAFT AND CAPSTAN
3. MARK ASSY NUMBER AND REV ON ITEM 6 PER PROCESS 1. MARK SITE/DATE CODE ON ITEM 6 PER PROCESS 1 AND PER ITEM 5, PARAGRAPH 4.0 WHERE SHOWN.
4. REMOVE HOLE PLUG/COVER SO MOTOR SHAFT CAN BE SUPPORTED WHILE INSTALLING CAPSTAN. REPLACE AFTER CAPSTAN INSTALLATION.
5. INSTALL ON CAPSTAN PRIOR TO INSTALLING CAPSTAN ON MOTOR

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
C	416975(C) [illegible] 10-15-76		
	LM-0001 DELETED ITEMS 1,2,5,6,7,9,11 THRU 17 & 19 ADDED ITEM 1 (P/N 996336-1, QTY 1) LM-0002 DELETED ITEMS 1,2,5, THRU 19 ADDED ITEM 1 (P/N 996336-1, QTY 1)		
	FORMAL RELEASE		
D	CN418887 Linda Sims NOTE 3 WAS MARK PER ITEM 5 AND PROCESS 1 WHERE SHOWN	4/7/77	[illegible]
E	CN421017 C. [illegible] 1) ADDED REFERENCES TO ITEM 6 IN NOTE 3 2) ADDED ITEM 6 TO LM	3-22-77	[illegible]
F	CN424044 Linda King 1) ITEMS 1 & 3 QTY WAS 1 (2) ADD ITEMS [illegible] ITEM 7 (4) ADD TO NOTE 1 --- WHEN USED --- ITEM --- (5) F/D REPLACED ITEMS 1 & 3 WITH ITEM 7	7-7-77	[illegible]
G	CN439792 (C.R. Coleman (1) ADDED -3 & -4 TO LM AND F/D	6/6/78	[illegible]
H	CN437156 (D) J. BAIZA (1) ADDED BOSS CAP TO CAPSTAN (2) ADDED NOTE 5 (3) CHANGE .240 ± .010 TO .240 ± .015 (4) ADDED ITEM 8 TO ALL L/M'S -0001 THRU -0004	8/16/78	[illegible]



994238-0004	CARRIAGE DRIVE MOTOR ASSY 10 + 16.5 CPI (BLDC)
994238-0003	CARRIAGE DRIVE MOTOR ASSY [illegible]
994238-0002	CARRIAGE DRIVE MOTOR ASSEMBLY -10 & 16.5 CPI
994238-0001	CARRIAGE DRIVE MOTOR ASSEMBLY -10 CPI
PART NUMBER	DESCRIPTION

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	MATERIAL	NOTE
		PARTS LIST			

999687	8740
994183	5733
NEXT ASSY	
APPLICATION	

MARK 100-02 C1 HEIGHT .12 [illegible]

PROCESS | CLASSIFICATION

Texas Instruments

MOTOR ASSY, CARRIAGE DRIVE

D 96214 994238

LM

TEXAS INSTRUMENTS
INCORPORATED

DATE 10/05/78 **LIST OF MATERIAL** PAGE 3 of 3

PART NUMBER LM 0999732-0001 REV D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0037	00001.000	EA		0996865-0005	HEADER ASSY,9 PCS RIGHT ANGLE,.100	000779-640099-9
0038	00001.000	EA		0999722-0001	INSULATOR, PRINTHEAD NOSE	
0039	00001.000	EA		0999723-0001	SOUNDFOIL,PRINTHEAD MOUNTING PLATE	
0040	00006.000	EA		0999755-0001	INSULATOR, SOUND PRINTHEAD	
0041	AR	RL		0411435-0012	TAPE,INSUL 3/8"W PRESS SENSITIVE TRANS	376381-54
0042	00001.000	SH		0232208-3500	LABEL WIRE MARKER DATABS VINYL CLOTH	BRA -1-2-0834

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						PRINTHEAD ASSEMBLY,SOVOLT
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740

PART NUMBER LM 0999732-0001 REV D

TI 13849

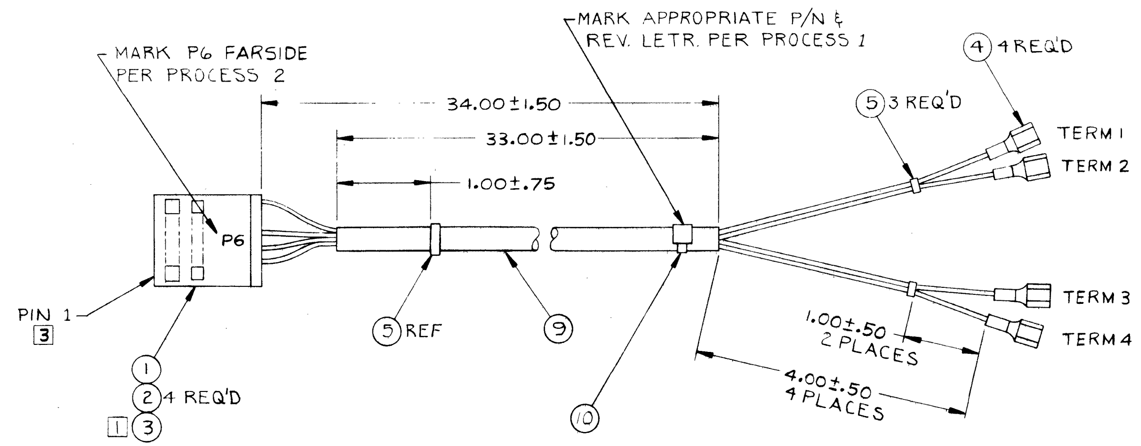
NOTES, UNLESS OTHERWISE SPECIFIED:

1. [1] INSTALL KEY (ITEM 3) IN POSITION P6-5
2. POSITION P6-1 IS NOT USED
3. [3] PIN 1 IDENTIFIER IS VENDOR NAME MOLDED IN PART

WIRE NO	DESCRIPTION	TOTAL LENGTH	SIGNATURE	COMPONENT CONNECTION FOR START STATION	COMPONENT CONNECTION FOR FINISH STATION	REMARKS	LM ITEM NO
1	BLU/WHT	AR	RIB REVSW	P6-2	TERM 1		11
2	VIO/WHT	AR	SWRTN	P6-3	TERM 2		12
3	YEL/WHT	AR	PAPOUTSW	P6-4	TERM 3		13
4	ORG/WHT	AR	SW RTN	P6-6	TERM 4		14

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 425867 LM UPDATE		
B	CN 439798 LM UPDATES		
C	CN 439607 ITEM 9 PN WAS 972436-12		



SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
2	MARK	100-07	712	COLOR WHITE, TYPE 9	
1	MARK	100-07	712	COLOR BLACK, TYPE 6	

PROCESS — CLASSIFICATION

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999689	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°; 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE: .013 THRU .125 +.004 -.001; .126 THRU .250 +.005 -.001; .251 THRU .500 +.006 -.001; .501 THRU .750 +.008 -.001; .751 THRU 1.000 +.010 -.001; 1.001 THRU 2.000 +.012 -.001

DWN J. Pierce 10-24-77

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSEMBLY, PAPER OUT/RIBBON SW.

SIZE C FSCM NO 96214 DRAWING NO 999735

SCALE NONE SHEET

1 LM

TI-9925H

999735

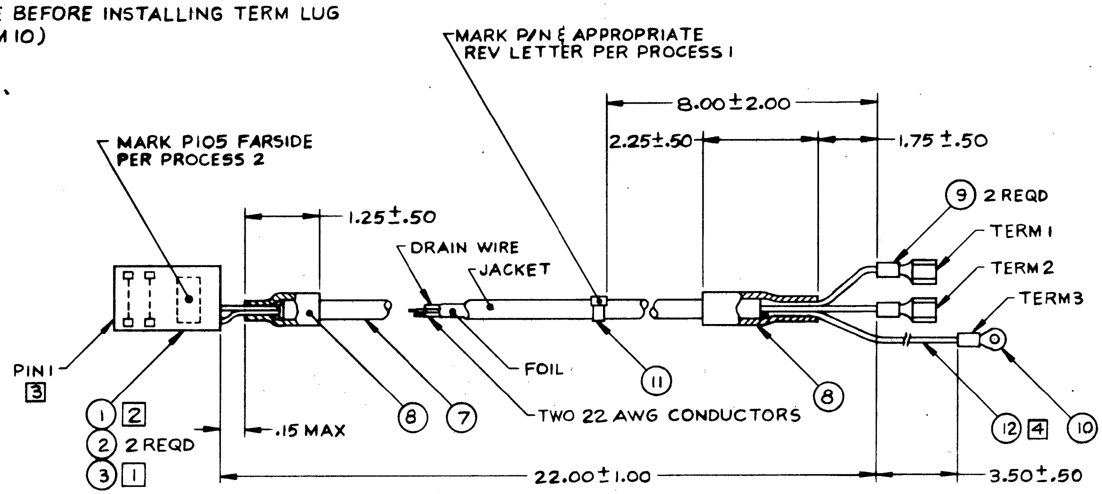
NOTES, UNLESS OTHERWISE SPECIFIED:

1. INSTALL KEY (ITEM 3) IN POSITION P105-3
2. POSITION P105-4 IS NOT USED
3. PIN 1 IDENTIFIER IS VENDOR NAME MOLDED INTO PART
4. INSTALL TUBING (ITEM 12) TO DRAIN WIRE BEFORE INSTALLING TERM LUG (ITEM 10)

WIRE NO	TOT LG	DESCRIPTION	SIGNATURE	START STA	FINISH STA	REMARKS	LM ITEM NO
1	AR	CLEAR	CMTRA	P105-1	TERM1	SPLY	7
2	AR	BLACK	CMTRB	P105-2	TERM2	RETRN	7
3	AR	DRAIN	GND	—	TERM3	GND	7

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 439797 LM UPDATES	4/13/78	
B	CN440310 J.CLARK 1) LM: IT.7 P/N WAS 230252-3 "DESCRIPTION CABLE 20 2COND POLY BEDFOIL" 2) F/D: "TWO 22 AWG (2B-3) WAS TWO 20 AWG"	8-17-78	



SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
2	MARK	100-07	712	COLOR WHITE, TYPE 9	
1	MARK	100-07	712	COLOR BLACK, TYPE 6	

PROCESS — CLASSIFICATION

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999689	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°, 3 PLACE DECIMALS ±.010, 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSEMBLY, CARRIAGE DRIVE

SIZE C | FSCM NO 96214 | DRAWING NO 999736

SCALE NONE

999736

34

1 LM

FILMED

TEXAS INSTRUMENTS
INCORPORATED

DATE 08/02/78

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM 0999736-0001 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0972484-0004	CONNECTOR HOUSING 4 CONTACT	TI1 --87175-0
0001A					P105	
0002	00002.000	EA		0972104-0001	CONTACT ELEC-LOCKING,WIRE-TO.025 SQ POST	AMP - 87124-1
0003	00001.000	EA		0972599-0001	KEY,POLARIZATION,CONNECTOR	AMP - 87179-1
0007	00002.000	FT		0230252-0020	CABLE,2COND,22AWG,COMMUNICATIONS,BLK/CLR	070903-8761
0008	00000.250	FT		0972146-0006	TUBING,HEAT SHRINKABLE .250 ID BLACK	
0009	00002.000	EA		0996334-0002	TERMINAL .187 X .020 MALE	AMP - 2-350799-2
0010	00001.000	EA		0539882-0002	LUG #6 AWG.22-16 RING TONGUE VINYL INSUL	AMP -2-31882-3
0011	00001.000	EA		0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	QPL-MS-3368-1-98
0012	00000.500	FT		0972146-0002	TUBING,1/16 ID BLK HEAT SHRINK PVC	003890-PO-135-125C

DRAFTSMAN	DATE	CLD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
Arthur Clark	8/3/78	Theresa Parks	8/3/78			CABLE ASSY, CARRIAGE DRIVE
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO. 8740

FILMED

PART NUMBER LM 0999736-0001 REV B

TI 13849

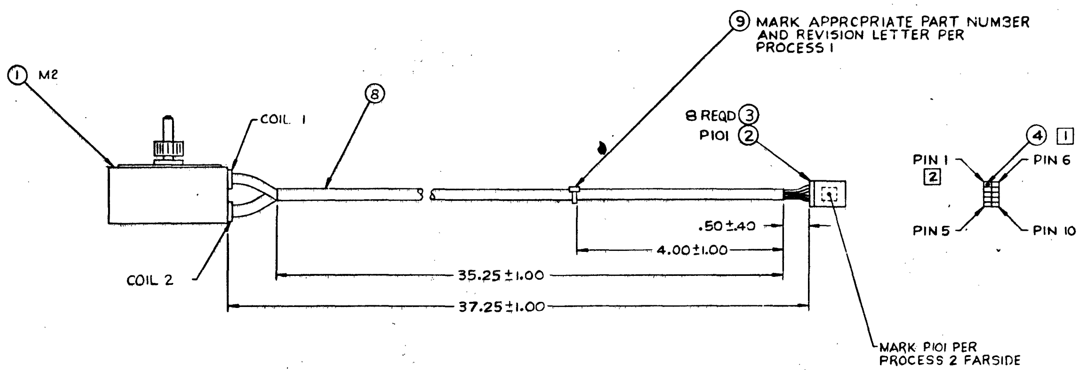
999738

NOTES: UNLESS OTHERWISE SPECIFIED:
[1] INSTALL KEY (ITEM 4) IN POSITION SHOWN
[2] USE KEY AS PIN 1 IDENTIFIER
3. PIN P 101-6 IS NOT USED

WIRE NO	DESCRIPTION	SIGNATURE	START	FINISH	REMARKS	ITEM NO
1	YEL	RDRV	M1-COIL 1	P101-4		1
2	YEL	RDRV	COIL 2	-3		1
3	WHT	RDRV	COIL 1	-2		1
4	WHT	RDRV	COIL 2	-5		1
5	RED	RPHSD	COIL 1	-9		1
6	BLK	RPHSC	COIL2	-8		1
7	BLK	RPHSB	COIL 1	-7		1
8	RED	RPHSA	M1-COIL 2	P101 10		1

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 425872 LM UPDATE	10-26-77	
B	CN 439730 LM UPDATE	3-29-78	
C	CN 432398 LM UPDATE	4/1/78	
D	CN445454 Z D4 CHANGE WIRE LIST START COLUMN	11-28-78	



SEQ NO	IDENT	F SPEC	NO	ADDITIONAL
2	MARK	100-07	712	COLOR, WHT TYPE 9
1	MARK	00-07	712	COLOR, BLK TYPE 6
	PROCESS			CLASSIFICATION

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

PARTS LIST

NEXT ASSY	USED ON
999689	8740

APPLICATION

TEXAS INSTRUMENTS

MOTOR ASSY, RIBBON DRIVE

D 96214 999738

TEXAS INSTRUMENTS INCORPORATED

DATE 11/22/78 **LIST OF MATERIAL** PAGE 1 of

PART NUMBER LM0999738-0001 REV D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999819-0001	MOTOR,STEPPING RIBBON DRIVE	
0001A					M2	
0002	00001.000	EA		0996566-0005	HOUSING,CONN-LOPOS SELF-RETAINING CONT	000779-87133-2
0002A					P101	
0003	00009.000	EA		0972104-0001	CONTACT ELEC-LOCKING,WIRE-TO.025 SQ POST	AMP - 87124-1
0004	00001.000	EA		0972599-0001	KEY,POLARIZATION,CONNECTOR	AMP - 87179-1
0008	00003.000	FT		0972436-0013	INSUL SLVG, .263DIA X .020 WALL THK PVC	03990H-T-105C-2
0009	00001.000	EA		0618201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	QPL-MS-3369-1-98

DRAFTSMAN	DATE	CRD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
L. Espeda	11-27-78					MOTOR ASSY, RIBBON DRIVE
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740

PART NUMBER LM0999738-0001 REV D

TI 13849

96-9

DWG NO 999742 SH

NOTES: UNLESS OTHERWISE SPECIFIED:

[1] INSTALL KEY (ITEM 9) IN POSITION P3-19

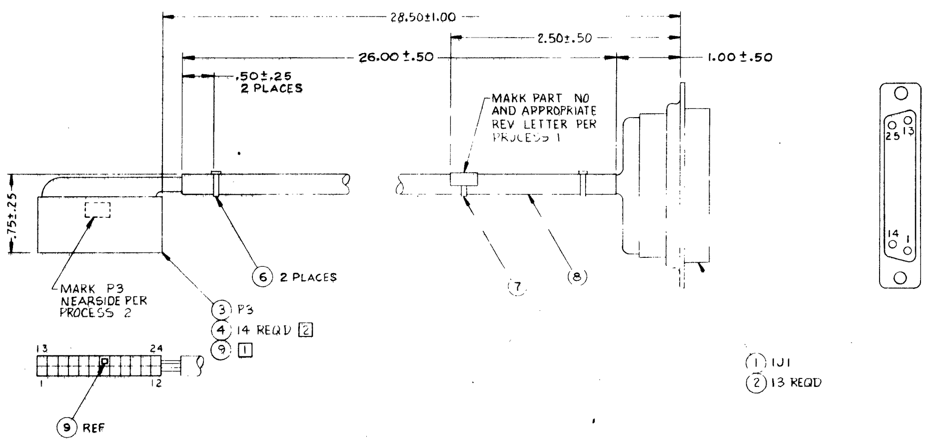
[2] INSTALL CONTACT (ITEM 4) IN UNUSED POSITIONS P3-13

WIRE NO.	DESCRIPTION	SIGNATURE EIA	SIGNATURE CCITT	START	FINISH	REMARKS	LM IT NO
1	24AWG WHITE	AA	101	P3-12	1J1-1		5
2	↕	BA	103	6	2		↕
3		BB	104	9	3		
4		CA	105	1	4		
5		CB	106	11	5		
6		CC	107	4	6		
7		AB	102	7	7		
8		CF	109	10	8		
9		SCA	118	2	11		
10		SCF	119	3	12		
11		CD	108	8	20		
12	↕	CE	125	-5	-22		↕
13	24AWG WHITE	CH	111	P3-24	1J1-23		5

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 430884 LM UPDATE	4/10/78	
B	CN440303 J.CLARK 1.) LM: ITEM 2 QTY WAS 12, ITEM 5 QTY WAS 32.5 AND DASH Nº WAS-3999, DESC. OF WIRE WAS B-22 AWG ITEM 8 DASH Nº WAS-0013, DESC. WAS .203 PVC 2.) ADDED WIRE Nº 13 IN ZC-5, IN ZD-4 ADDED "EIA & CCITT"; DELETED SIGNATURES UNDER REMARKS COLUMN 3.) ZD-8, [2] WAS "INSTALL CONTACTS..... P3-13 AND P3-24	5/19/78	
C	CN439733 J.CLARK 1.) ZB-8 "NEARSIDE" WAS FARSIDE	6/05/78	
D	CN439511 J.CLARK 1.) ZD-5 UNDER "FINISH" 1J1-22 WAS 1J1-21	7/29/78	

23



SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
2	MARK	100-07	7/2	COLOR WHITE TYPE 9	
1	MARK	100-07	7/2	COLOR BLACK, TYPE 6	
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS. SEE TI DRAWING 729467

TI-7914H

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999690	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ±.010 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL D 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.251 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.751 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

DWN DATE 10-10-77
CHK 4/10/78
ENGR 4/10/78
APVD 4/10/78
QA
CONTR
RLSE 4/11/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSEMBLY, EIA (INTERNAL)

SIZE D FSCM NO 96214 DRAWING NO 999742

SCALE NONE SHEET

34 LM

FILMED

TEXAS INSTRUMENTS
INCORPORATED

DATE 05/05/78 **LIST OF MATERIAL** PAGE 1 of 1

PART NUMBER LM0999742-0001 REV D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0539409-0006	CONNECTOR,RCPT 25 PINS	AMP -205207-1
0001A					1J1	
0002	00013.000	EA		0539430-0004	CONTACT,SOCKET 24-20AWG .068 INSUL DIA	AMP -205201-3 ST
0003	00001.000	EA		0972202-0025	CONNECTOR,.100 CENTER DUAL MINIATCH	BEI - 65043-025
0003A					P3	
0004	00014.000	EA		0972482-0006	CONTACT,ELECTRICAL,CRIMP	BEI - 75691-006
0005	00035.000	FT		0538347-2999	WIRE HOOKUP 8-24 AWG 19 STR WHITE	JUD - HH0112
0006	00002.000	EA		0418212-0040	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	QPL - MS3367-4-9
0007	00001.000	EA		0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	QPL-MS-3368-1-98
0008	00002.250	FT		0972436-0012	INSULATION,FLEXIBLE	
0009	00001.000	EA		0800335-0001	KEY,POLARIZATION,CONNECTOR	BEI --65307-001

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
Cathie Clark	5/8/78	Theresa Parker	5/8/78			CABLE ASSEMBLY, EIA (INTERNAL)
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740 FILMED PART NUMBER LM0999742-0001 REV D

T.I 13849

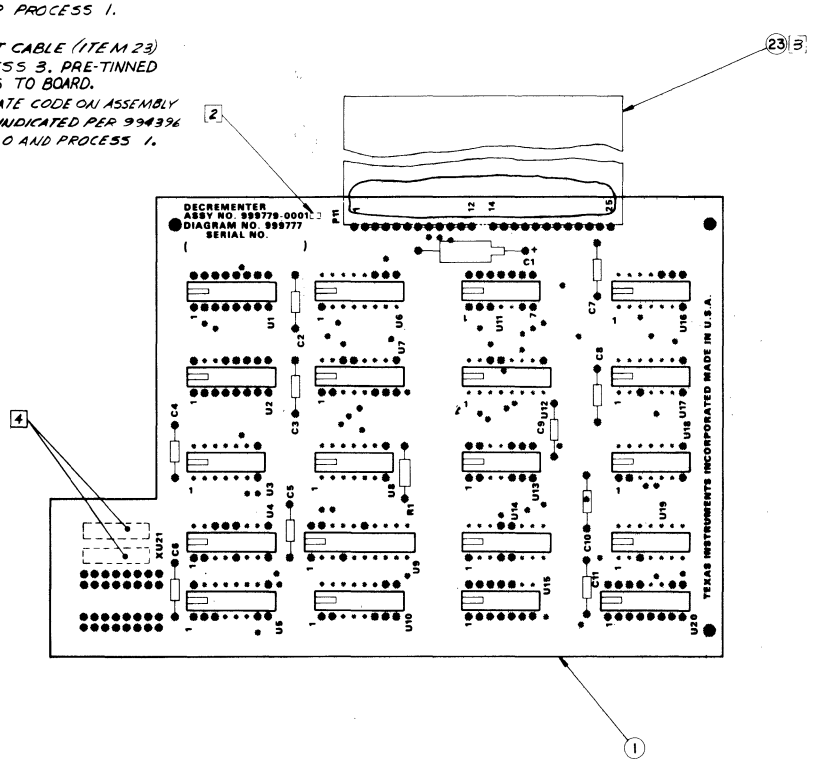
DWG NO 999779 SH

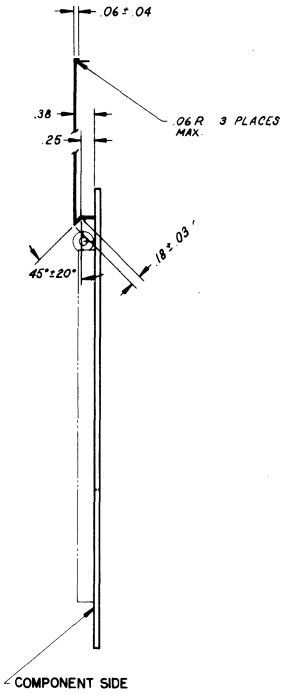
NOTES: UNLESS OTHERWISE SPECIFIED

1. .07 MAX LEAD LENGTH BELOW SURFACE OF BOARD.
2. MARK APPROPRIATE REVISION LETTER PER PROCESS 1.
3. INSTALL FLAT CABLE (ITEM 23) PER PROCESS 3. PRE-TINNED CONNECTORS TO BOARD.
4. MARK SITE/DATE CODE ON ASSEMBLY IN LOCATION INDICATED PER 994396 PARAGRAPH 4.0 AND PROCESS 1.

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN439843 6/7/78 LM UP DATE D. STARNES	6/7/78	D Starnes
B	CN439531 M Hogsdon 9-25-78 (1) ADDED DIM TO SHOW BENDS IN CABLE C-3 & D-3 (2) REVISION LEVEL BLOCK UPDATED	9-27-78	D Starnes
C	CN445450 D VYKOUKAL (1) ADD TO NOTE 3 ···PROC 3 PRE-TINNED···	10/26/78	D Starnes





PARTS LIST

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES
-1					

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
  2 PLACE DECIMALS ± .010
  3 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL D 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125	.004 .001	.128 THRU .250 .005 .001
.251 THRU .500	.006 .001	.501 THRU .750 .008 .001
.751 THRU 1.000	.010 .001	1.001 THRU 2.000 .012 .001

DRAWN	DATE
D Starnes	6-26-78
[illegible]	7/13/78
[illegible]	7/13/78
D Starnes	9-27-78
[illegible]	10-26-78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

DECREMENTER

SIZE	FSCM NO	DRAWING NO
D	96214	999779

SCALE 2/1 SHEET

SEQ NO	IDENT	P-SPEC	NO	ADDITIONAL
3	SLDR	127-02	00	
2	SLDR	124-02	00	
1	MARK	100-02	21	HEIGHT: .06; COLOR: BLACK

PROCESS — CLASSIFICATION — NOTES: 3, 2, 4

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 722467

REVISION LEVEL

	C	C
PWB 999778	#	#
SCHEMATIC 999777	A	B
ASSEMBLY 999779		

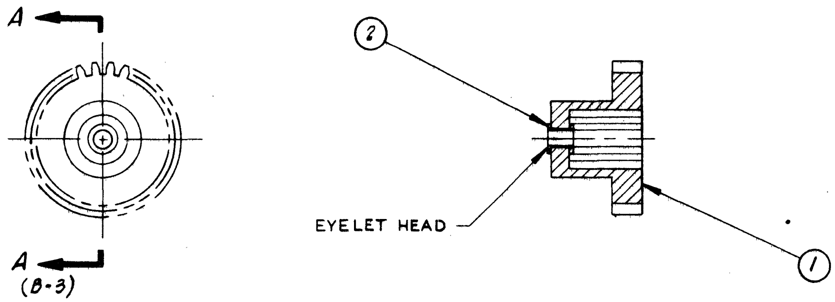
999903	8740
NEXT ASSY	USED ON
APPLICATION	

4 32

1 LM

NOTES, UNLESS OTHERWISE SPECIFIED:

REV	DESCRIPTION	DATE	APPROVED
A	CN 428952 LM UPDATES	10/28/77	



SECTION A-A
(B-4)

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999689	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ±.010 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 −.001	.126 THRU .250 +.005 −.001	.251 THRU .500 +.006 −.001
.501 THRU .750 +.008 −.001	.751 THRU 1.000 +.010 −.001	1.001 THRU 2.000 +.012 −.001

DWN 10-3-77 | CHK | ENG 31 OCT 77 | 10/31 | 11/1/77 | CONT 10/31/77 | 11/4/77

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

GEAR ASSY, PAPER ADVANCE

SIZE C | FSCM NO 96214 | DRAWING NO 999780

SCALE 2/1 | SHEET

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

TI-6925H

DWG NO 999780 SH

LM

FILMED

6-99

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/28/78

LIST OF MATERIAL

PAGE 1 of

PART NUMBER LM0994238-0001 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00000.000	EA		0996336-0001	ENCODER,SHAFT	
0001A					ITEM 1 CAN BE USED WITH	
0001B					ITEM 3 AS AN ALTERNATE TO	
0001C					ITEM 7	
0003	00000.000	EA		0994206-0001	MOTOR-D.C. SERVO 25 AMPERES	ELR - 7-1417
0003A					ITEM 3 CAN BE USED WITH -	
0003B					ITEM 1 AS AN ALTERNATE TO	
0003C					ITEM 7	
0004	00001.000	EA		0994177-0001	CAPSTAN,MOTOR	
0005	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	
0006	AR	BX		0232208-7000	LABEL 1X3INS RECTL SELF-ADHESIVE	DEN -43551
0007	00001.000	EA		0994437-0001	ENCODER/MOTOR ASSEMBLY	
0008	00001.000	EA		2210037-0001	FASTENER, PLASTIC BOSS	CAPSYS-GTC234-213

DRAFTSMAN	DATE	CHG DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
		9/14/78				CARRIAGE DRIVE MOTOR ASSY -10 CPL
APPD MFG.	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8733/8740

PART NUMBER LM0994238-0001 REV H

TEXAS INSTRUMENTS
INCORPORATED

DATE 10/24/77

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0999780-0001 REV A

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999728-0001	GEAR, PAPER ADVANCE	
0002	00001.000	EA		0085936-0016	EYELET .121 BARREL OD X.156 LG FLANGE	USH - #SE-45

DRAFTSMAN	DATE	CKD. DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
[signature]	10/28/77	Theresa Parker	10/25	[signature]	31OCT77	GEAR ASSY, PAPER ADVANCE
APPD. MFG.	DATE	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO
[signature]	10/31/77	[signature]	10/31	[signature]	11/4/77	8740

FILMED

PART NUMBER LM0999780-0001 REV A

TI 13849

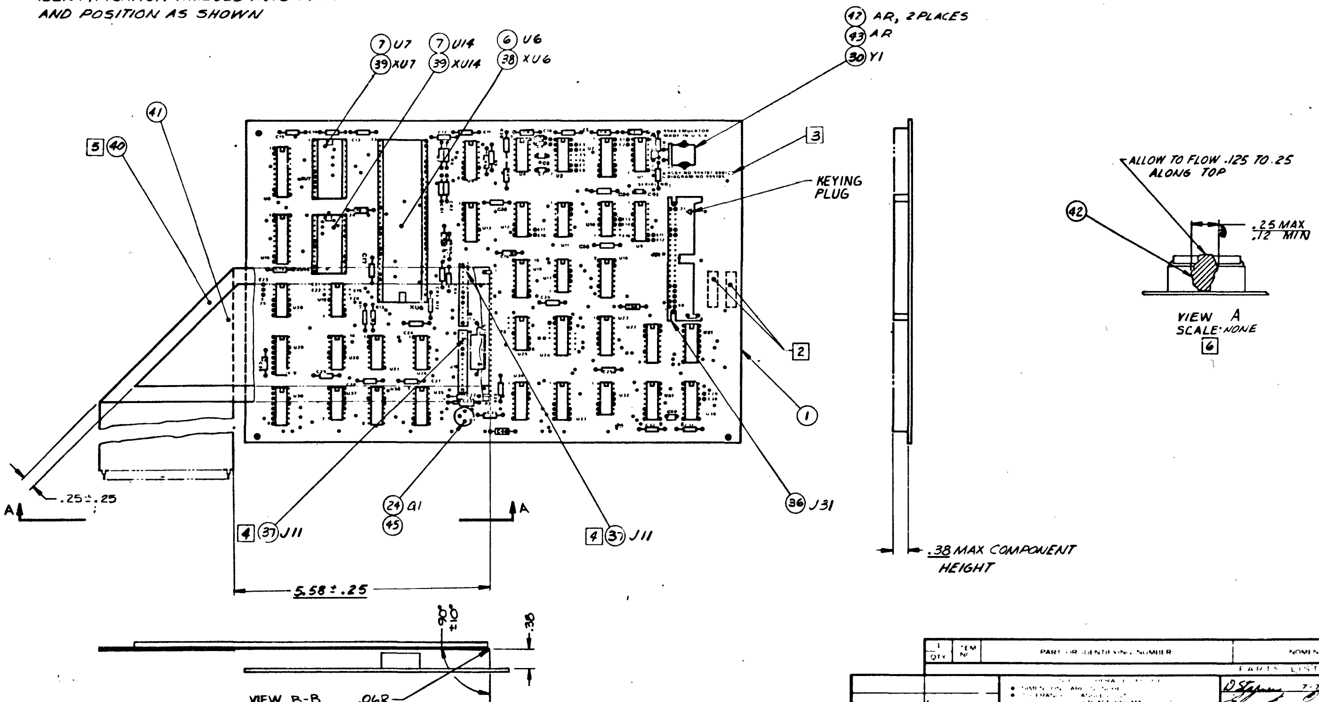
6-101

NOTES UNLESS OTHERWISE SPECIFIED

1. MAX LEAD LENGTH BELOW SURFACE OF BOARD .07
2. [2] MARK SITE/DATE CODE ON ASSEMBLY IN LOCATION INDICATED PER 994396 PARAGRAPH 4.0 AND PROCESS 1
3. [3] MARK APPROPRIATE REVISION LETTER PER PROCESS 1
4. [4] ORIENTATE BOTH CONNECTORS (ITEM 37) USING VENDOR IDENTIFICATION MOLDED INTO PART AND POSITION AS SHOWN
5. [5] INSTALL FLAT CABLE (ITEM 40) PER PROCESS 3
6. [6] SECURE DEVICES (ITEM 6 AND 7) TO SOCKETS (ITEM 38 AND 39) WITH ITEM 42 AT BOTH ENDS PER VIEW A

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 439844 6/6/78 LM UPDATE R. NILSSON	6/6/78	D Starnes
B	CN 439855 6/22/78 LM UPDATE D. STARNES	6/22/78	D Starnes
C	CN 439839 7-11-78 B LENOVER LM UPDATE	7/11/78	D Starnes
D	CN 439516 7-11-78 B LENOVER LM UPDATE	7/11/78	D Starnes
E	CN 436322 7/13-78 D Starnes LM UPDATE	7/13/78	D Starnes
F	CN 439534 Joe Johnson 1) QTY OF ITEM 41 WAS .67 (2) B-B DIM .25 ±.25 WAS .50±.50	10-13-78	[signature]
G	CN 439551 Joe Johnson (1) DELETED ITEM 7 P/N WAS 996708-1 QTY 2 (2) ADDED. ITEM 44 QTY WAS 3, DELETED C37 LINE 44A (3) F/D REF DESG. U6 NOTCH WAS OPP END. (4) ADDED ITEM 4, 5 & 45	11-3-78	[signature]
H	CN 439535 L Sepeda 1) ADDED VIEW B-B	11-20-78	Felipe Espinoza



SEQ NO	IDENT	F SPEC	NO	ADDITIONAL
3	SLDR	127-02	00	
2	SLDR	124-00	00	
1	MARK	100-02	21	HEIGHT: .06. COLOR: BLACK

PROCESS — CLASSIFICATION

PROCESSES — FOR CORRELATION TO GOVT IND SPECIFICATIONS SEE TI DRAWING 729467

NOTES: [5] [2] [3]

REVISION LEVEL

PWB 999786	A	B	C	D	E	E
SCHEMATIC 999785	*	*	*	*	*	A
ASSEMBLY 999787	A	B	C	E	F	G	H

PARTS LIST

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

NEXT ASSY	USED ON
999903	8740

APPLICATION

TEXAS INSTRUMENTS INCORPORATED Dallas Texas

9940 EMULATOR

D 96214 999787

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/78 — **LIST OF MATERIAL** — PAGE 1 of 4 — PART NUMBER LM0999787-0001 — REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999786-0001	PWR, EMULATOR	
0002	REF	EA		0999785-9901	DIAG,LOGIC-9940 EMULATOR	
0004	00001.000	EA		0999936-0001	INTEGRATED CIRCUIT, 16K EPROM, PREPRGMD	
0004A					U7	
0005	00001.000	EA		0999936-0002	INTEGRATED CIRCUIT, 16K EPROM, PREPRGM	
0005A					U14	
0006	00001.000	EA		0972671-0001	NETWORK,MICROPROCESSOR,TMS9900	
0006A					U6	
0008	00002.000	EA		0972452-0003	NETWORK,TMS4036-2NL 64WORD X 8BIT ST RAM	001295-TMS4036-2NL
0008A					U8,U15	
0009	00001.000	EA		0222222-7400	NETWORK SN7400N	-SN7400N
0009A					U4	
0010	00002.000	EA		0972900-7400	NETWORK SN74LS00N	TI -SN74LS00N
0010A					U20,U26	
0011	00003.000	EA		0972900-7404	NETWORK SN74LS04N	
0011A					U1,U12,U27	
0012	00003.000	EA		0972900-7410	NETWORK SN74LS10N	
0012A					U10,U17,U32	
0013	00001.000	EA		0972749-0001	NETWORK, SN74LS08N	
0013A					U25	

DRAFTSMAN L. Sepeda — DATE — CKD DRAFTSMAN — DATE — DESIGN ENGINEER — DATE — TITLE 9940 EMULATOR

APPD MFG — DATE — APPD PROJECT ENGINEER — DATE — RELEASED — DATE — PROJECT NO 8740 — PART NUMBER LM0999787-0001 — REV H

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/78 — **LIST OF MATERIAL** — PAGE 2 of 4 — PART NUMBER LM0999787-0001 — REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0014	00002.000	EA		0972814-0001	NETWORK-SN74LS27N	
0014A					U3,U19	
0015	00001.000	EA		0972900-7432	NETWORK SN74LS32N	TI -SN74LS32N
0015A					U11	
0016	00001.000	EA		0972900-7138	NETWORK SN74LS138N	TI -SN74LS138N
0016A					U18	
0017	00002.000	EA		0972688-0001	NETWORK SN74LS164N	
0017A					U28,U37	
0018	00001.000	EA		0972900-7175	NETWORK SN74LS175N	
0018A					U2	
0019	00004.000	EA		0972668-0001	NETWORK SN74LS251N	
0019A					U29,U34,U36,U38	
0020	00006.000	EA		0972120-0001	NETWORK,SN74259 8-BIT ADDRESSABLE LATCH	001295-74259
0020A					U16,U22,U23,U31,U33,U35	
0021	00004.000	EA		0972787-0003	NETWORK SN74LS367N	
0021A					U9,U13,U21,U30	
0022	00001.000	EA		0996179-0001	IC,SN75355N,TTL-TO-MOS DRIVERS	TI -SN75355N
0022A					U5	
0023	00001.000	EA		0972900-7174	NETWORK SN74LS174N	
0023A					U24	

DRAFTSMAN — DATE — CKD DRAFTSMAN — DATE — DESIGN ENGINEER — DATE — TITLE 9940 EMULATOR

APPD MFG — DATE — APPD PROJECT ENGINEER — DATE — RELEASED — DATE — PROJECT NO 8740 — PART NUMBER LM0999787-0001 — REV H

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/78 — LIST OF MATERIAL — PAGE 3 of 4 — PART NUMBER LM0999787-0001 — REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0024	00001.000	EA		0972872-0001	NETWORK,LM 320H-05 VOLTAGE REGULATOR	- -
0024A					Q1	
0025	00005.000	EA		0972929-0361	CAP FIX CERAMIC 10.0 PF 10 % 200 V	QPL -M39014/01-1361
0025A					C1,C7,C8,C9,C10	
0026	00001.000	EA		0972929-0379	CAP FIX CERAMIC 100 PF 10 % 200 V	QPL -M39014/01-1379
0026A					C2	
0027	00030.000	EA		0972763-0021	CAP.,FIXED,AXIAL LEAD,.047 UF,+80%,-20%	
0027A					C3 THRU C6,C11 THRU C20,C22	
0027B					C24 THRU C36,C38,C40	
0028	00001.000	EA		0972924-0009	CAP FIX TANT SOLID 3.3 MFD 10 % 15 VOLT	QPL -M39003/1-2268
0028A					C23	
0029	00001.000	EA		0972924-0011	CAP FIX TANT SOLID 68 MFD 10 % 15 VOLT	QPL -M39003/1-2274
0029A					C21	
0030	00001.000	EA		0972445-0004	CHRYSTAL,HC 18U,10MHZ,QUARTZ	013454-10MHZHC-18/U
0030A					Y1	
0031	00004.000	EA		0972932-0001	DIODE,1N914B SWITCHING 75V PIV 75MA 4NS	TI - 1N914B
0031A					CR1,CR2,CR3,CR4	
0032	00004.000	EA		0972946-0021	RES FIX 15.0 OHM 5 % .25 W.CARBON FILM	ROH - R-25
0032A					R7,R8,R9,R10	
0033	00004.000	EA		0972946-0051	RES FIX 270 OHM 5 % .25 W CARBON FILM	ROH - R-25

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE 9940 EMULATOR

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999787-0001 | REV H

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/78 — LIST OF MATERIAL — PAGE 4 of 4 — PART NUMBER LM0999787-0001 — REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0033A					R3,R4,R5,R6	
0034	00002.000	EA		0972946-0057	RES FIX 470 OHM 5 % .25 W CARBON FILM	ROH - R-25
0034A					R1,R2	
0035	00003.000	EA		0972946-0089	RES FIX 10K OHM 5% .25 W CARBON FILM	ROH - R-25
0035A					R11,R12,R13	
0036	00001.000	EA		0972706-0005	HEADER, CONN, RIGHT ANGLE, 40 CONTACTS	075037-3495-1002
0036A					J31	
0037	00002.000	EA		0972519-0023	SOCKET,SINGLE-IN-LINE 12 POS(GOLD CONT)	-1-583780-5
0037A					J11	
0038	00001.000	EA		0945244-0001	SOCKET,INTEGRATED CIRCUIT,64 PIN	
0038A					XU6	
0039	00002.000	EA		0539544-0007	SOCKET,24PIN IC LOW PROFILE SOLDER TAIL	TI -C93-24-02
0039A					XU7,XU14	
0040	00001.000	EA		2210070-0001	CABLE, 18"LG FLAT, FLEXIBLE	000779-88178-8
0041	AR	RL		0972361-0007	TAPE,FOAM,VINYL,.12THK X 2"W	012624-V544
0042	AR	TU		0417559-0001	SILICONE RUBBER (RTV) DOW 3140	SEE - TI DRAWING
0043	00000.050	FT		0411634-1310	SLEEVE,PVC, .133 DIA. CLEAR	QPL - MIL-I-631
0044	00002.000	EA		0972929-0433	CAP FIX CERAMIC .100 UF 10 % 50 V	QPL -M39014/01-1433
0044A					C39,C41	
0045	00001.000	EA		0939862-0001	SPACER, POWER TRANSISTOR	

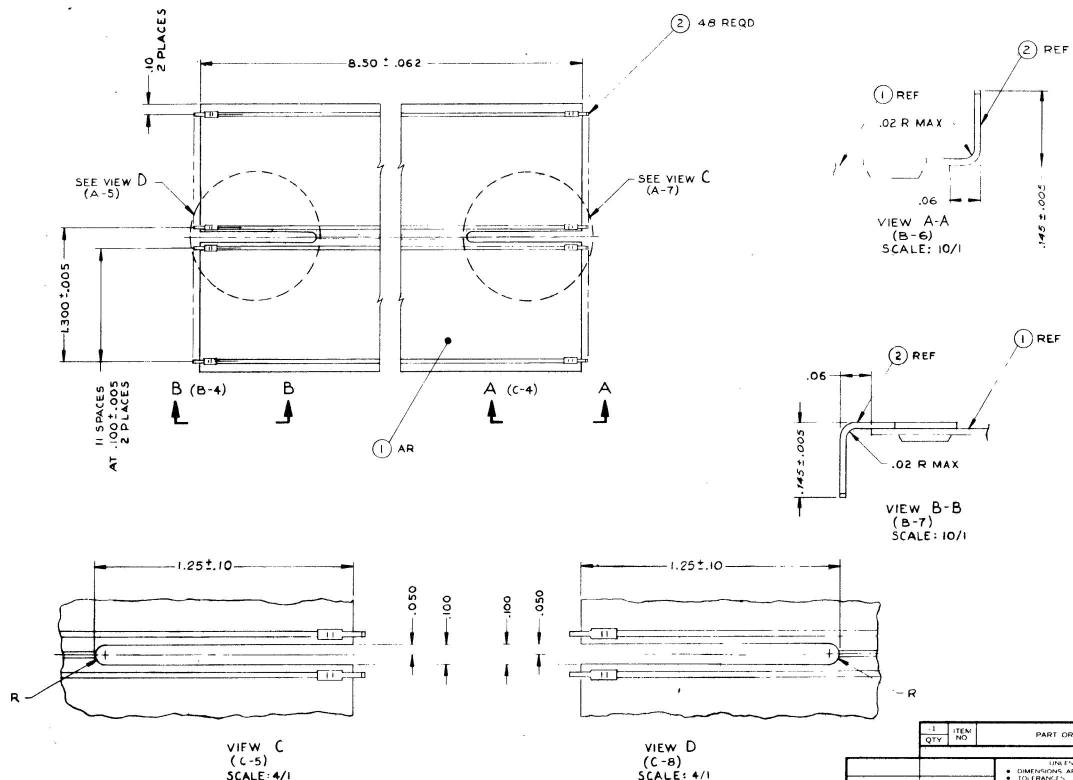
DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE 9940 EMULATOR

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999787-0001 | REV H

TI 13849

NOTES: UNLESS OTHERWISE SPECIFIED:

REV	DESCRIPTION	DATE	APPROVED
A	CN430886 J. CLARK 1. UPDATE LM	3/6/78	[signature]
B	CN439528 [signature] 8-23-78 1. VIEW A-A, ZONE B-4 & VIEW B-B, ZONE C-4 DIMENSION .145±.005 WAS 12±.02/.00	8-30-78	[signature]



QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999686	8740
999695	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°; 3 PLACE DECIMALS ±.010; 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125: +.004 -.001	.126 THRU .250: +.005 -.001	.251 THRU .500: +.006 -.001
.501 THRU .750: +.008 -.001	.751 THRU 1.000: +.010 -.001	1.001 THRU 2.000: +.012 -.001

DWN E. H. De Leon 10/21/77
CHK [signature] 2/15/78
ENGR [signature] 3/1/78
APVD [signature] 3/1/78
QA [signature] 3/8/78
CONTR [signature] 3/1/78
RLSE [signature] 3/6/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSEMBLY, KEYBOARD

SIZE D | FSCM NO 96214 | DRAWING NO 999790

SCALE 2/1 | SHEET

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

TI-7014m

34 LM 1 FILMED

6-104 23 5

TEXAS INSTRUMENTS
INCORPORATED

DATE 02/10/78

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0999790-0001 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	0000.710	FT		0996742-0003	CABLE,ELEC 26AWG 25CNDCT MULTI FLAT	017217-8038160/25
0002	0048.000	EA		0996748-0004	SOLDER TAB,PLATED 30MIN GOLD OVER NICKEL	000779-86705-6
0003	0000.000	FA		0996774-0001	CABLE,ELECTRICAL, FLAT, FLEXIBLE	000779-88178-3
0003A					ITEM 3 MAY BE USED AS AN	
0003B					ALTERNATE FOR ITEM 1 & 2	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
[illegible]	2/14/78	Teresa Parker	2/17/78	Scott Runde	3/1/78	CABLE ASSEMBLY, KEYBOARD
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO
[illegible]	3/1/78	Jim Bain	3/2/78	[illegible]	3/6/78	E140

FILMED

PART NUMBER LM0999790-0001 REV B

TI 13849

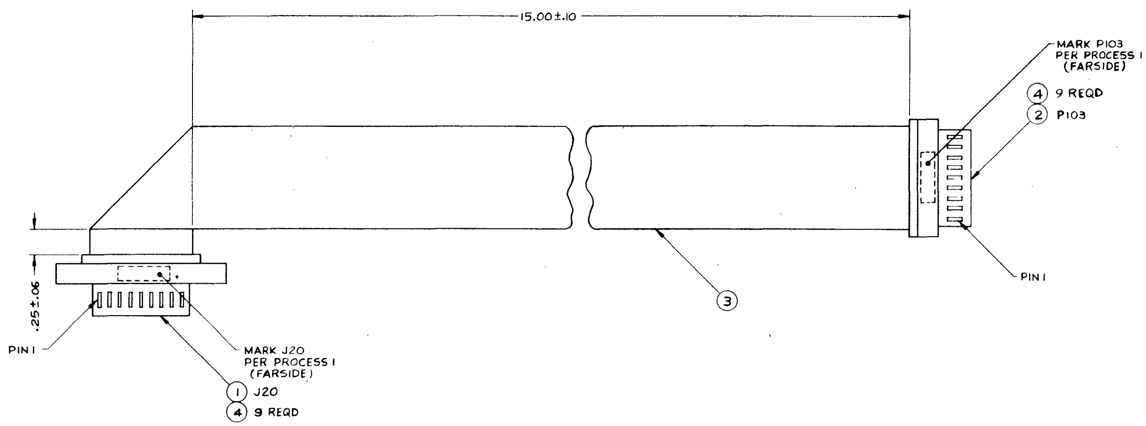
NOTES: UNLESS OTHERWISE SPECIFIED:

WIRE NO.	DESCRIPTION	SIGNATURE	START	FINISH	REMARKS	LM ITEM NO.
1	CABLE, FLAT	GND	J20-1	P103-1		3
2	↕	SOL 6	↕ 2	↕ 2		↕
3		4	3	3		
4		2	4	4		
5		5	5	5		
6		1	6	6		
7		7	7	7		
8		SOL 3	8	8		
9	CABLE, FLAT	COMMON	J20-9	P103-9		3

DWG NO 999791

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 439799 LM UPDATE		



SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
1	MARK	100-07	712	COLOR WHITE TYPE 9	
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999689	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ± 010 2 PLACE DECIMALS ± 02
- INTERPRET DRAWING PER MIL-D 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS 010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

013 THRU 125 +004 -001	126 THRU 250 +005 -001	251 THRU 500 +006 -001
501 THRU 750 +008 -001	751 THRU 1 000 +010 -001	1 001 THRU 2 000 +012 -001

DWN A. R. Patel DATE 4/4/78
CHK 4/19/78
ENGR Walt Russell 4/20/78
APVD 4/24/78
QA
CONTR 4/21/78
RLSE 4/26/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSEMBLY, PRINTHEAD

SIZE D FSCM NO 96214 DRAWING NO 999791 FILMED

SCALE 2/1 SHEET

LM

6-106

TEXAS INSTRUMENTS
INCORPORATED

DATE 04/13/79

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM9999791-0001 REV A

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	9999.999	EA		9998877-0001	HOUSING,CONN RCPT,SINGLE ROW,W/MTG EARS	000779-85553-1
0001A					J20	
0002	9999.999	EA		9998743-0001	HOUSING,CONN,9 POS,CABLE OR ROUND WIRE	000779-85572-1
0002A					P103	
0003	9999.499	FT		9998624-0001	CABLE, ELECTRICAL 9 CONDUCTOR, FLAT	GGA -8038160/9
0004	9999.999	EA		9998776-0001	CONTACT,RECEPTACLE	000779-88049-3

DRAFTSMAN [signature] DATE 4/9/79	CKD DRAFTSMAN [signature] DATE	DESIGN ENGINEER [signature] DATE 4/[illegible]	TITLE CABLE ASSY,PRINTHEAD				
APPD-MFG [signature] DATE	APPD PROJECT ENGINEER Jim Evans 4/24/79 DATE	RELEASED DATE	PROJECT NO 8740	FILMED	LM9999791-0001	REV A	

TI 13849

NOTES, UNLESS OTHERWISE SPECIFIED:

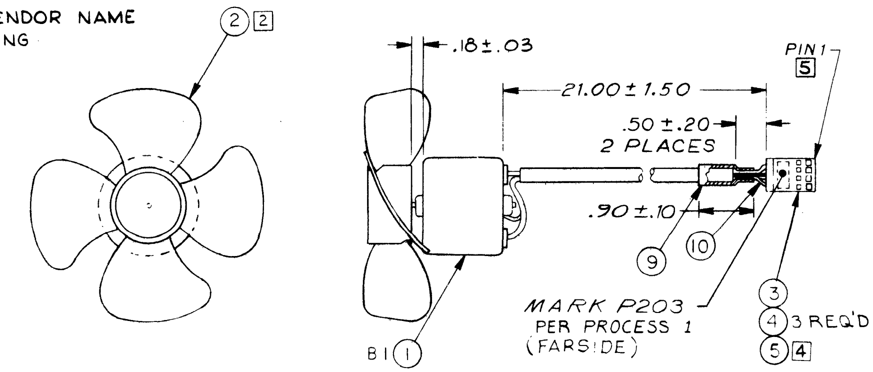
1. COLOR (BLACK, TYPE 6 OR WHITE, TYPE 9) SHALL CONTRAST COLOR OF ITEM 3.
2. SUPPORT SHAFT OF FAN (ITEM 1) AXIALLY WHILE INSTALLING FAN BLADE (ITEM 2)
3. ~~ADD TUBING (ITEM 9) TO SHIELD CABLE TO BE FLUSH TO CONNECTOR (ITEM 3) AND ALLOW ONE-TENTH INCH MAX GAP BETWEEN MOTOR SLEEVING~~
4. INSTALL KEY (ITEM 5) IN POSITION P203-3
5. PIN 1 IDENTIFIER IS VENDOR NAME MOLDED INTO HOUSING

WIRING LIST

WIRE NO.	DESCRIPTION	START STATION	FINISH STATION	REMARKS	ITEM NO
1	FAN MOTOR	B1-RED	P203-1	+12 VOLTS	1
2	FAN MOTOR	B1-BLACK	P203-2	GND	1
3	FAN MOTOR	B1-SHIELD	P203-4 [3]	SHIELD	1

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 430882 LM UPDATES	3/17/78	MRW
B	CN 439701 J. CLARK 1.) IN NOTE [1] ITEM 3 WAS ITEM 4, IN NOTE [3] ITEM 9 WAS WAS ITEM 7	5/15/78	
C	CN 439734 J. CLARK 1.) ZB-2 FARSIDE WAS NEARSIDE	5/30/78	
D	CN 445488 1.) Z C-2 DIM. WAS 24.00 ± .50 2.) DELETED FLAG NOTE 3 3.) LM QTY OF ITEM 9 WAS .04 FT. 4.) ADDED ITEM 10 5.) CHANGED PICTORIAL TO REFLECT ITEM CHANGES.	9-11-78	
E	CN 445489 1) Z C-3 DIM .18 ± .03 WAS .12	10/21/78	



SEQ NO	IDENT	F SPEC	NO	ADDITIONAL	NOTES
1	MARK	100-07	710		[1]

PROCESS — CLASSIFICATION

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999690	8740

APPLICATION

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

FAN ASSEMBLY

SIZE C CODE IDENT NO 96214 DRAWING NO 999819

SCALE NONE

30

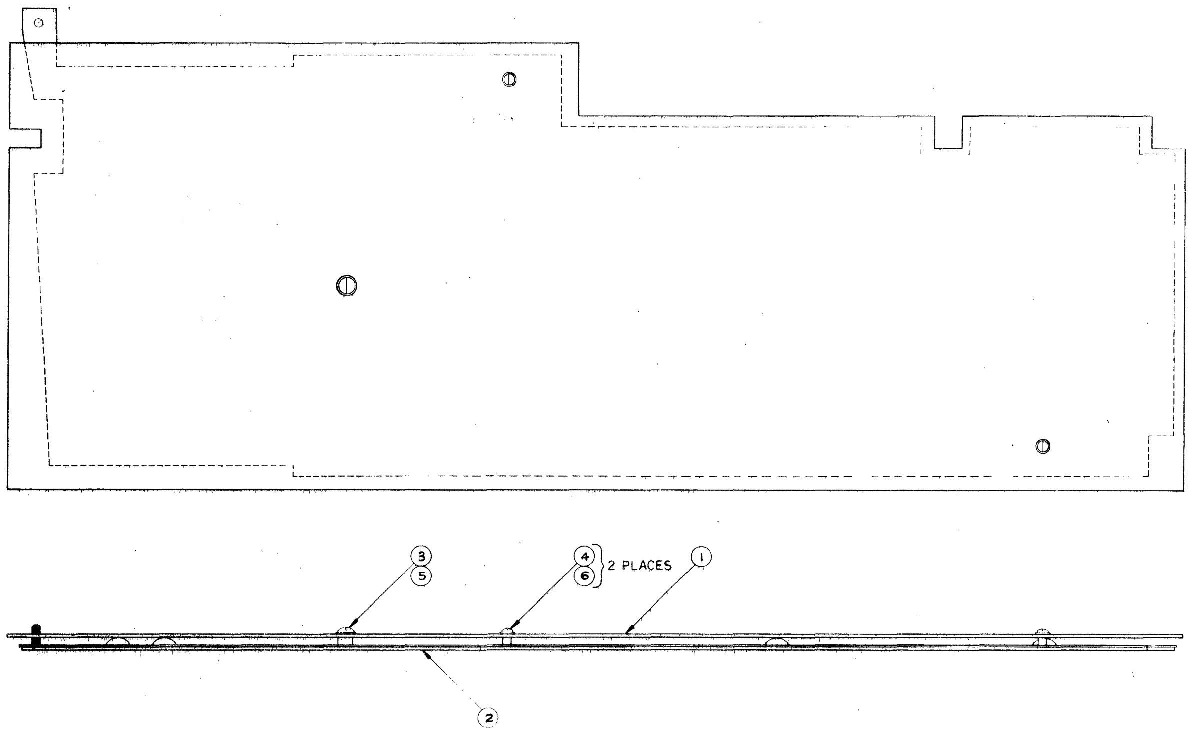
LM

NOTES: UNLESS OTHERWISE SPECIFIED

DWG NO 999820

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 440313 7/17/78 D STARNES UPDATE LM DASH NUMBERS	7/24/78	[signature]



PART NO.	DESCRIPTION	REMARKS
999820-0201	TERM ELECTRONICS W/GND PLANE (230V)	EUROPEAN
999820-0101	TERM ELECTRONICS W/GND PLANE (115V)	DOMESTIC

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTE

PARTS LIST

NEXT ASSY	USED ON
999690	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ±.010 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL D 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125: +.004 −.001	.126 THRU .250: +.005 −.001	.251 THRU .500: +.006 −.001
.501 THRU .750: +.008 −.001	.751 THRU 1.000: +.010 −.001	1.001 THRU 2.000: +.012 −.001

DWN A. Patel DATE 3-31-78
CHK [signature] 7/24/78
ENGR [signature] 7/24/78
APVD [signature] 7/24/78
[signature] 7/24/78
CONTR [signature] 7/24/78
REL [signature] 7/26/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

TERMINAL ELECTRONICS WITH GND PLANE

SIZE D FSCM NO 96214 DRAWING NO 999820

SCALE 1/1 SHEET

LM

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/08/78

LIST OF MATERIAL

PAGE 1 of

PART NUMBER LM0994238-0002 REV H

FIND OR ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00000.000	EA		0996336-0002	ENCODER,SHAFT	
0001A					ITEM 1 CAN BE USED WITH	
0001B					ITEM 3 AS AN ALTERNATE TO	
0001C					ITEM 7	
0003	00000.000	EA		0994206-0001	MOTOR-D.C. SERVO 25 AMPERES	ELP - 7-1417
0003A					ITEM 3 CAN BE USED WITH -	
0003B					ITEM 1 AS AN ALTERNATE TO	
0003C					ITEM 7	
0004	00001.000	EA		0994177-0001	CAPSTAN,MOTOR	
0005	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	
0006	AR	BX		0232208-7000	LABEL 1X3INS RECTL SELF-ADHESIVE	DEN -43551
0007	00001.000	EA		0994437-0002	ENCODER/MOTOR ASSEMBLY	
0008	00001.000	EA		2210037-0001	FASTENER, PLASTIC BOSS	CAPSYS-GTC204-213

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						CARRIAGE DRIVE MOTOR ASSY -10 & 16.5 CPI
APPD.-MFG.	DATE	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO.
						PART NUMBER LM0994238-0002 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 07/19/78

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0999820-0101 REV A

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999694-0101	TERMINAL ELECTRONICS,115V	
0002	00001.000	EA		0999872-0001	GROUND PLNE ASSY	
0003	00001.000	EA		0972988-0041	SCREW 8-32 X .250 PAN HEAD CRES	
0004	00002.000	EA		0972988-0013	SCREW 4-40 X .250 PAN HEAD CRES	
0005	00001.000	EA		0411101-0059	LOCKWASHER # 8 EXTERNAL TOOTH CRES	QPL - MS35335-59
0006	00002.000	EA		0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	QPL - MS35335-57

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
		Teresa Parker	7/24/78	[illegible] Russell	7/24/78	TERMINAL ELECTRONICS W/GND PLANE-115V
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO.
[illegible]	7/24					ILMED

PART NUMBER LM0999820-0101 REV A

T.I. 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 07/19/78

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0999820-0201 REV A

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999694-0201	TERMINAL ELECTRONICS,230V	
0002	00001.000	EA		0999872-0001	GROUND PLNE ASSY	
0003	00001.000	EA		0972988-0041	SCREW 8-32 X .250 PAN HEAD CRES	
0004	00002.000	EA		0972988-0013	SCREW 4-40 X .250 PAN HEAD CRES	
0005	00001.000	EA		0411101-0059	LOCKWASHER # 8 EXTERNAL TOOTH CRES	QPL - MS35335-59
0006	00002.000	EA		0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	QPL - MS35335-57

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
		[signature]	7/24	[signature]	7/24	TERMINAL ELECTRONICS W/GND PLANE-230V
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO.
[signature]	7/24					FILMED

PART NUMBER LM0999820-0201 REV A

T.I. 13849

NOTES: UNLESS OTHERWISE SPECIFIED:

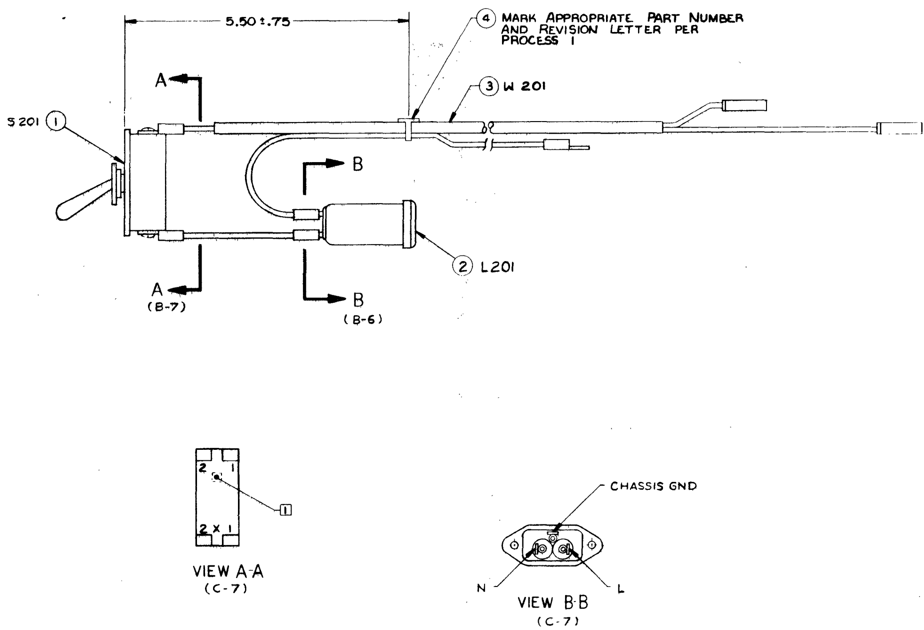
[1] ANY. LETTER (EXCEPT X) MAY BE SUBSTITUTED AT END OPPOSITE TO X

WIRE NO	DESCRIPTION	TOTAL LENGTH	SIGNATURE	START STATION	FINISH STATION	REMARKS	N/A LM ITEM NO
1	WHT/BROWN	—	115 VAC FILTER	L201-L	S201-X2		2
2	WHT/BLUE	—	AC COMM FILTER	L201-N	S201-X1		2
3	WHT/BROWN	—	115 VAC FILSW	W201-BRN	S201-D2	[1]	3
4	WHT/BLUE	—	AC COMM FILSW	W201-BLU	S201-D1	[1]	3

DWG NO 999835

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 445494 1) ZD-7 5.50±.75 WAS 4.50±.50 2) CHANGED VIEW A-A 3) ADDED FLAG NOTE [1] 4) ADDED [1] TO REMARKS COLUMN OF WIRE #3 AND #4	9/20/78	



SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
1	MARK	100-07	712	COLOR BLK, TYPE 6	
	PROCESS			CLASSIFICATION	

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS SEE TI DRAWING 729467

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999690	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°; 3 PLACE DECIMALS ±.010; 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 −.001	.126 THRU .250 +.005 −.001	.251 THRU .500 +.006 −.001
.501 THRU .750 +.008 −.001	.751 THRU 1.000 +.010 −.001	1.001 THRU 2.000 +.012 −.001

DWN A. P. Patel DATE 3/20/78
CHK 4/14/78
ENGR 4/14/78
APVD 4/14/78
QA
CONTR
4/14/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSEMBLY, POWER DISTRIBUTION.

SIZE D FSCM NO 96214 DRAWING NO 999835

SCALE 1/1 SHEET

LM

6-112

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/20/78 **LIST OF MATERIAL** PAGE 1 of 1

PART NUMBER LM0999835-0001 REV A

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0996656-0001	TOGGLE SWITCH	027193-7320K55
0001A					S201	
0002	00001.000	EA		0999875-0001	FILTER ASSY, EMI	
0002A					L201	
0003	00001.000	EA		0999876-0001	CABLE ASSY, PRIMARY POWER	
0003A					W201	
0004	00001.000	EA		0418201-0060	STRAP, MARKER, ADJUSTABLE, PLASTIC	QPL-MS-3368-1-98

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
L.O. Sypda	9-25-78					CABLE ASSY, POWER DISTRIBUTION
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740 FILMED

PART NUMBER LM0999835-0001 REV A

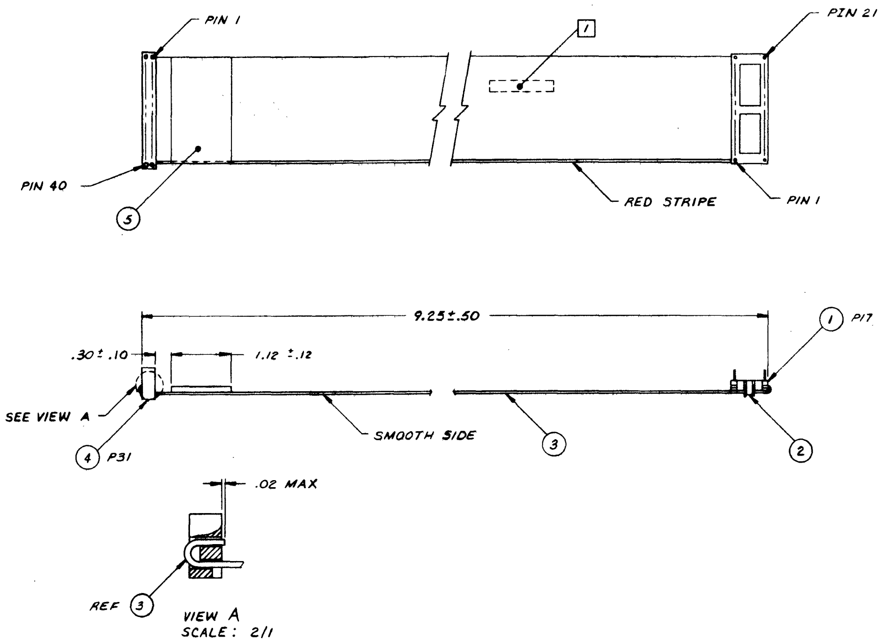
TI 13849

DWG NO 999837

NOTES: UNLESS OTHERWISE SPECIFIED:

1. MARK PART NUMBER AND APPROPRIATE REVISION LETTER FARSIDE PER PROCESS 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	CN 439842 R. NILSSON	2/7/78	D. STARNES
B	CN 439836 D. STARNES 6/27/78 LENGTH WAS 14.00 ± 1.00	6/27/78	D. STARNES
C	CN 439837 B LENOVER 7/5/78 ADD TO LM ITEM 5	7/5/78	D. STARNES
D	CN439520 D STARNES 7/12/78 ADD TO LM ITEM 1A & 4A	7/12/78	D. STARNES
E	CN439533 C. DAVIS LM CHANG, ITEM 5 QTY FROM .08 TO AR	10/21/78	



1	MARK	100-02	21	HEIGHT .12, COLOR BLK		1
SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL		NOTES
	PROCESS			CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999787	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ± 010 2 PLACE DECIMALS ± 02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS 010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

013 THRU 125 + 004 - 001	126 THRU 250 + 005 - 001	251 THRU 500 + 006 - 001
501 THRU 750 + 008 - 001	751 THRU 1.000 + 010 - 001	1.001 THRU 2.000 + 012 - 001

		DATE
DWN		7-5-78
CHK		7/13/78
ENGR		7/13/78
APVD		7/13/78
		7/13/78
CONTR		
RLSE		7-14-78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSEMBLY, 9940 EMULATOR

SIZE D | FSCM NO 96214 | DRAWING NO 999837 | SCALE 1/1 | SHEET

34

LM

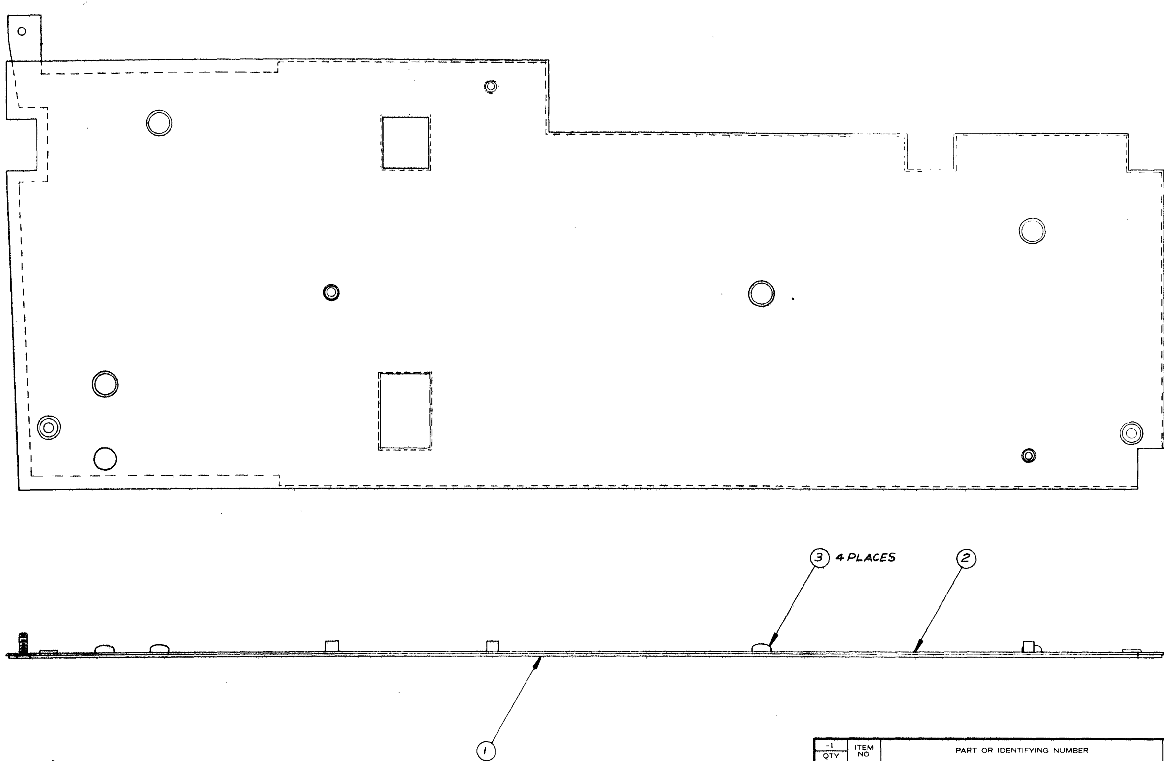
6-114

DWG NO 999872

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

NOTES: UNLESS OTHERWISE SPECIFIED.
1. INSTALL INSULATOR (ITEM 2) TO GROUND PLANE (ITEM 1)
2. INSTALL BUMPER (ITEM 3) TO GROUND PLANE (ITEM 1) USING POSITION HOLES IN INSULATOR (ITEM 2)



-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999820	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ± .010 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 −.001	.126 THRU .250 +.005 −.001	.251 THRU .500 +.006 −.001
.501 THRU .750 +.008 −.001	.751 THRU 1.000 +.010 −.001	1.001 THRU 2.000 +.012 −.001

DWN [signature] DATE 3/20/78
CHK [signature] 5/9/78
ENGR [signature] 5/11/78
APVD [signature] 5/12/78
QA [signature] 5/15/78
CONTR [signature] 5/…/78
[signature] 5/15/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

GROUND PLANE ASSY

SIZE D | FSCM NO 96214 | DRAWING NO 999872

SCALE 1/1 | SHEET

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL		NOTES
	PROCESS		CLASSIFICATION			

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

30 LM

TEXAS INSTRUMENTS
INCORPORATED

DATE 05/08/78 **LIST OF MATERIAL** PAGE 1 of 1

PART NUMBER LM0999872-0001 REV •

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999886-0001	PLATE, PC GROUND PLANE	
0002	00001.000	EA		0999805-0001	INSULATOR,GROUND PLANE	
0003	00004.000	EA		2210005-0003	BUMPER,RUBBER, ADHESIVE, GRAY	05515Z-SJ-5003GRAY

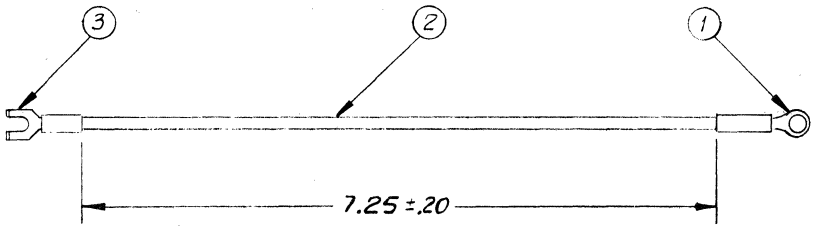
DRAFTSMAN DATE	CAD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE		
	Teresa Parker 5/9/78		GROUND PLNE ASSY		
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO	FILMED	PART NUMBER REV
	Jim Davis 5/12/78		750		LM0999872-0301 •

TI 13849

DWG NO 999873 SH

NOTES, UNLESS OTHERWISE SPECIFIED:

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	CN439832 A. CLARK 1. DIM 7.25±.20 WAS 6.25±.10	6/20/78	



-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES
			PARTS LIST		

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
  3 PLACE DECIMALS ± 010
  2 PLACE DECIMALS ± 02
- INTERPRET DRAWING PER MIL D 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 ± .004 .001	.126 THRU .250 ± .005 .001	.251 THRU .500 ± .006 .001
.501 THRU .750 ± .008 .001	.751 THRU 1.000 ± .010 .001	1.001 THRU 2.000 ± .012 .001

999690	8740
NEXT ASSY	USED ON
APPLICATION	

DWN K. Matsumoto 3-18-78
CHK Mike Wolf 4/13/78
ENGR [illegible] 4/14/78
APVD Doris 4/14/78
QA L.J. Sch 4/14/78
CONTR [illegible] 4/14/78
PLNG [illegible] 4/14/78

TEXAS INSTRUMENTS INCORPORATED
Dallas, Texas

CABLE ASSEMBLY, MECHANISM GROUND

SIZE	FSCM NO	DRAWING NO
B	96214	999873

SCALE NONE SHEET

TI-79137

FILMED

TEXAS INSTRUMENTS
INCORPORATED

DATE 04/12/78 **LIST OF MATERIAL** PAGE 1 of 1

PART NUMBER LM0999873-0001 REV A

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0232354-0008	LUG,CRIMP,22-16 AWG #8 RING,STRIP-REEL	000779-SEE DRAWING
0002	00000.550	FT		0996286-5455	WIRE,#18 B-18 19 STRANDS GRN/YEL	
0003	00001.000	EA		0232358-0001	LUG,CRIMP,22-16 AWG,SPADE,STRIP-FORM	000779-SEE DRAWING

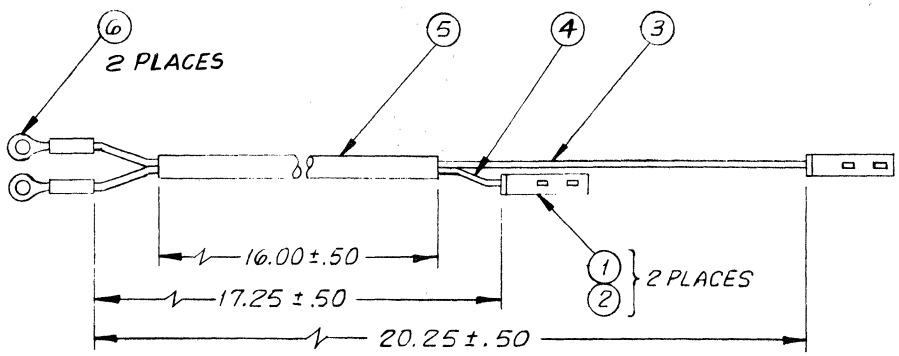
DRAFTSMAN R. Wilson DATE 4/13/78	CKD DRAFTSMAN DATE 4/14/78	DESIGN ENGINEER DATE 4/14/78	TITLE CABLE ASSY, MECHANISM GROUND				
APPD MFG DATE 4/14/78	APPD PROJECT ENGINEER DATE 4/14/78	RELEASED DATE	PROJECT NO. 8740	FILMED	PART NUMBER LM0999873-0001	REV A

TI 13849

DWG NO 999876 SH

NOTES, UNLESS OTHERWISE SPECIFIED:

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES
PARTS LIST					

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°
  3 PLACE DECIMALS ± .010
  2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 + .004 − .001	.126 THRU .250 + .005 − .001	.251 THRU .500 + .006 − .001
.501 THRU .750 + .008 − .001	.751 THRU 1.000 + .010 − .001	1.001 THRU 2.000 + .012 − .001

999835	8740
NEXT ASSY	USED ON
APPLICATION	

DWN K. Matsumoto 3-18-78
CHK 4/10/78
ENGR 4/10/78
APVD 4/10/78
QA 4/11/78
CONTR 4/11/78
RLSD 4/11/78

TEXAS INSTRUMENTS INCORPORATED
Dallas, Texas

CABLE ASSEMBLY, PRIMARY POWER

SIZE B | FSCM NO 96214 | DRAWING NO 999876

SCALE NONE | SHEET

LM

FILMED

6-119

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/08/78

LIST OF MATERIAL

PAGE 1 of

PART NUMBER LM0994238-0003 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00000.000	EA		0996336-0003	ENCODER,SHAFT TWO QDWTR AT 288 PUL P/REV	031255-
0001A					ITEM 1 CAN BE USED WITH	
0001B					ITEM 3 AS AN ALTERNATE TO	
0001C					ITEM 7	
0002	00000.000	EA		0994206-0001	MOTOR-D.C. SERVO 25 AMPERES	ELR - 7-1417
0003A					ITEM 3 CAN BE USED WITH	
0003B					ITEM 1 AS AN ALTERNATE TO	
0003C					ITEM 7	
0004	00001.000	EA		0994177-0001	CAPSTAN,MOTOR	
0005	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	
0006	AR	BX		0232208-7000	LABEL 1X3INS RECTL SELF-ADHESIVE	DEN -43551
0007	00001.000	EA		0994437-0003	ENCODER/MOTOR ASSEMBLY-19.0MCA LG	
0008	00001.000	EA		2210037-0001	FASTENER, PLASTIC BOSS	CAPSYS-STC204-213

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						CARRIAGE DRIVE MOTOR ASSY-10 CPI (820)
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO
						LM 0994238-0003 REV H

TEXAS INSTRUMENTS
INCORPORATED

DATE 03/31/78

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0999876-0001 REV *

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00002.000	EA		0996004-0018	HOUSING,SINGLE ROW,RCPT 1POSITION	000779-87270-1
0002	00002.000	EA		0996000-0004	CONTACT,RCPT .031 X .062PINS,STRIP PKD	000779-87269-2
0003	00001.690	FT		0538347-5699	WIRE HOOKUP B-18 AWG 19 STR BL/WH	JUD - HH0203
0004	00001.440	FT		0538347-5199	WIRE HOOKUP B-18 AWG 19 STR BN/WH	JUD - HH0203
0005	00001.330	FT		0972436-0011	INSULATION SLEEVING,PVC B X.133	003830-HT-105C-B
0006	00002.000	EA		0539882-0002	LUG #6 AWG,22-16 RING TONGUE VINYL INSUL	AMP -2-31882-3

DRAFTSMAN DATE	CKD DRAFTSMAN Theresa Porter 4/5/78 DATE	DESIGN ENGINEER DATE 4/6/78	TITLE CABLE ASSY, PRIMARY POWER				
APPD MFG DATE 4/6/78	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740	FILMED	PART NUMBER LM0999876-0001	REV *	

T.I. 13849

DWG NO 999913

REVISIONS

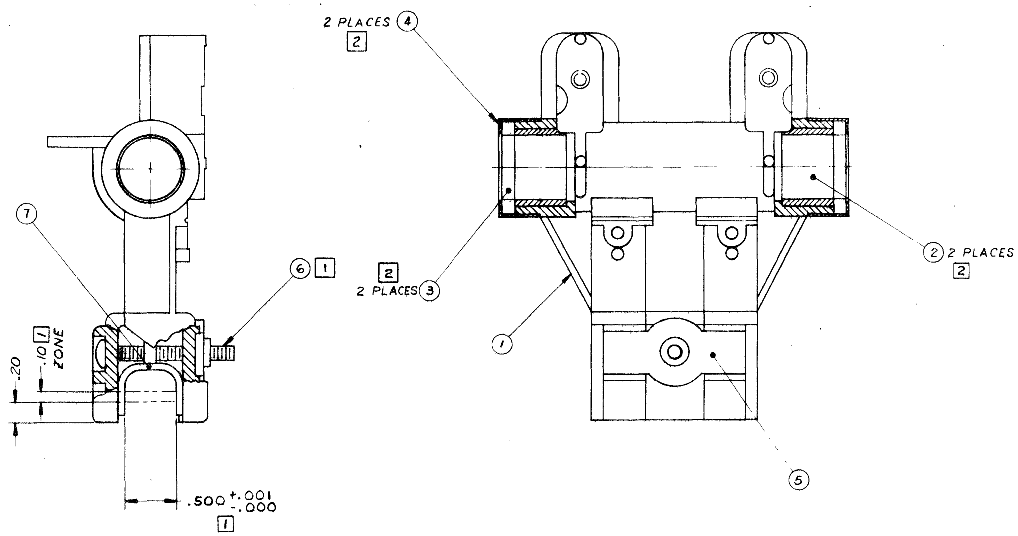
REV	DESCRIPTION	DATE	APPROVED

NOTES: UNLESS OTHERWISE SPECIFIED:

[1] ADJUST SCREW (ITEM 6) TO ACHIEVE SPACING IN ZONE INDICATED

[2] BEARINGS (ITEM 2), WIPER (ITEM 3) & RETAINERS (ITEM 4) SHALL BE INSTALLED SO THAT ASSEMBLY SLIDES FREELY (WITH NO EXTERNAL FORCES) IN BOTH DIRECTIONS ON A .6248 $^{+.0001}_{-.0000}$ DIA 16√ ROD WHEN HELD AT A 45° SLOPE

6-121



-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°; 3 PLACE DECIMALS ±.010; 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL D 1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.251 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.751 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

NEXT ASSY	USED ON
999689	8740

APPLICATION

DWN [signature] DATE 1/25/78
CHK [signature] 8/16/78
ENGR [signature] 16 AUG 78
APVD [signature] 8/16/78
QA [signature]
CONTR [signature]
REL [signature] 8/16/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CARRIAGE ASSY, PRINTHEAD

SIZE D FSCM NO 96214 DRAWING NO 999913 FILMED

SCALE 2/1 SHEET

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

4 30 LM

TEXAS INSTRUMENTS
INCORPORATED

DATE 07/19/78

LIST OF MATERIAL

PAGE 1 of 1

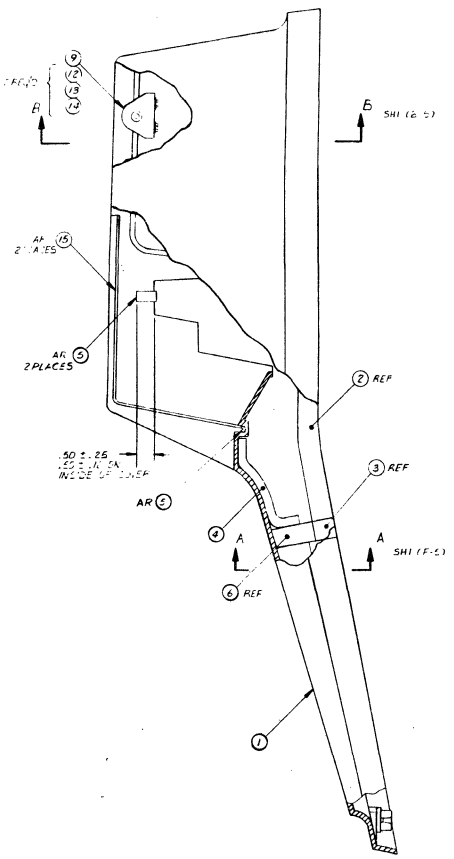
PART NUMBER LM0999913-0001 REV *

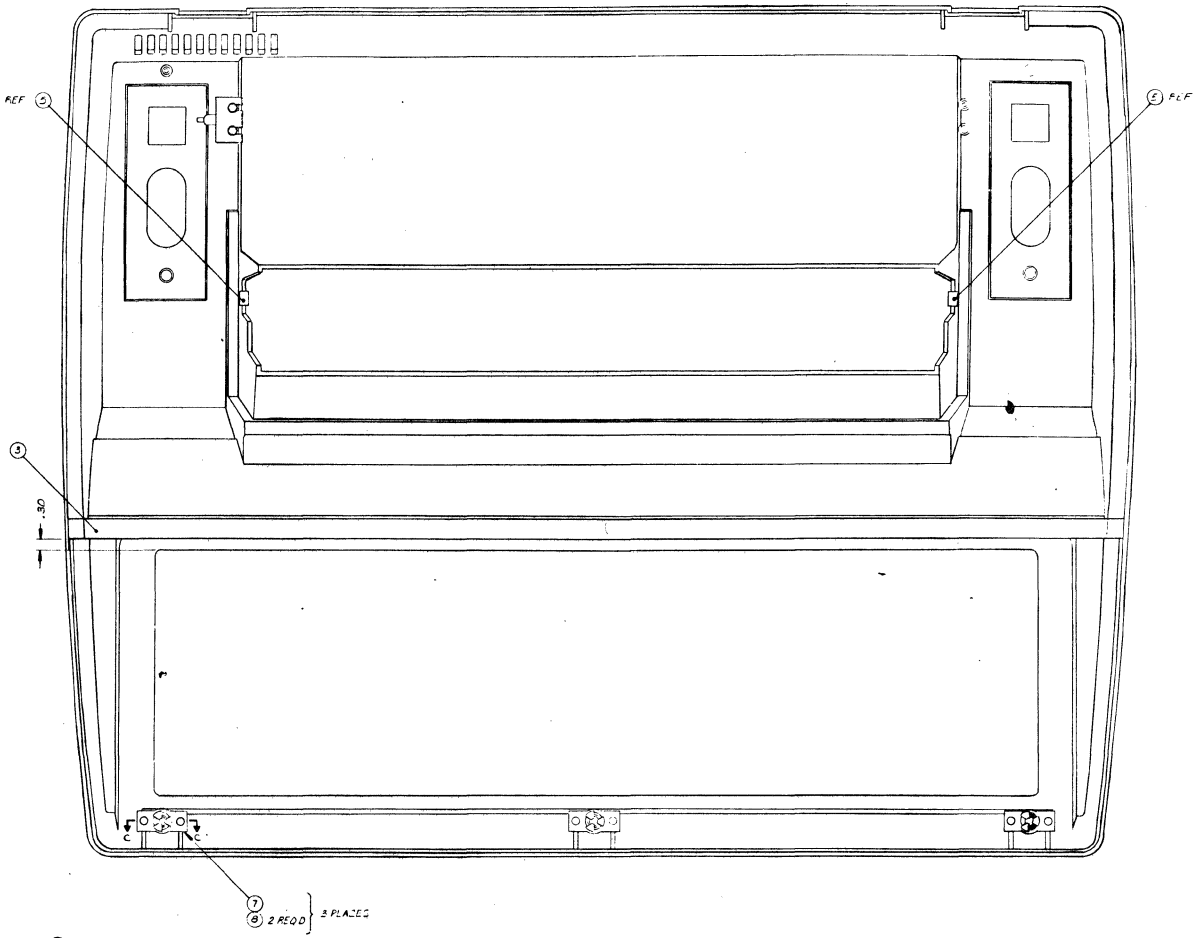
PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0994487-0001	CARRIAGE, PRINTHEAD	
0002	00002.000	EA		0972405-0200	BEARING,.500LG .7530D BRZ OILIMPREGNATED	070417-AA-710-27-T
0003	00002.000	EA		0994484-0001	WIPER, GUIDE ROD	
0004	00002.000	EA		0994488-0001	RETAINER, WIPER	
0005	00001.000	EA		0994489-0001	PLATE, NUT	
0006	00001.000	EA		0972988-0035	SCREW 6-32 X 1.25 PAN HEAD CRES	
0007	00001.000	EA		0999912-0001	BEARING,LOWER-CARRIAGE	

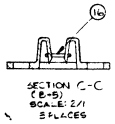
DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE CARRIAGE ASSY, PRINTHEAD		
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO 8740	FILMED	PART NUMBER LM0999913-0001 REV *

TI 13849

NOTES: UNLESS OTHERWISE SPECIFIED







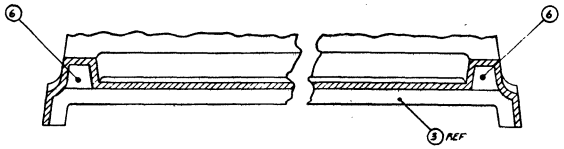
ITEM NO.	QTY	PART OR IDENTIFYING NUMBER	NOMENCLATURE

TEXAS INSTRUMENTS

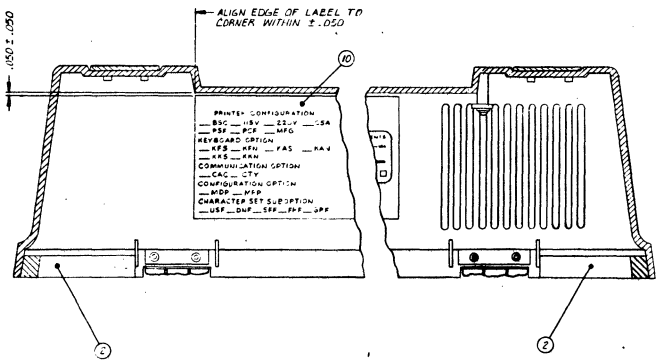
COVER ASSY

E 96214 **999918**

NOTES UNLESS OTHERWISE SPECIFIED



SECTION A-A
SH1 (D-7)
ROTATED 90° CW



SECTION E-E
SH1 (F-7)
ROTATED 90° CW

REV STATUS OF SHEETS	REV			
	SH	1	2	

TEXAS INSTRUMENTS

COVER ASSY

E 96214 999918

6-124

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/07/78

LIST OF MATERIAL

PAGE 1 of

PART NUMBER LM0999918-0001 REV D

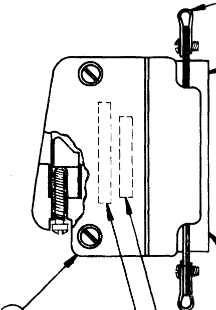
PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999707-0001	COVER, TERMINAL	
0002	00002.000	EA		0999914-0001	INSULATOR,ACOUSTICAL,COVER-SIDE	
0003	00001.000	EA		0999914-0002	INSULATOR,ACOUSTICAL,COVER-CENTER	
0004	00001.000	EA		0999754-0001	INSULATOR, SOUND COVER - TOP	
0005	AR	RL		0972341-0006	TAPE,FOAM,VINYL,.06THK .25WIDE SELF ADH	012624-V542
0006	00002.000	EA		0999908-0001	PLUG, COVER	
0007	00003.000	EA		0999757-0001	CATCH, COVER	
0008	00004.000	EA		0412991-0001	RING .250 ID 3 PRONGS,RETAINING EXTERNAL	079136-5105-9
0009	00001.000	EA		0999751-0001	STAY PLATE, TOP	
0010	00001.000	EA		0999834-0001	LABEL,INSTRUCTION PAPER & RIBBON LOADING	
0012	00002.000	EA		0972988-0001	SCREW 6-32 X .625 PAN HEAD CRES	
0013	00002.000	EA		0416622-0013	WASHER #6 FLAT	QPL - AN960C6L
0014	00002.000	EA		0996797-0002	NUT,6-32,.309-.31500 .116-.12010 SH SPR	077122-NR 632005
0015	AR	FT		0972341-0008	TAPE,FOAM,VINYL,SELF-ADH .25W X .06THK	012624-
0016	00003.000	EA		0983969-0001	O-RING	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
A. Segovia	11/08					COVER ASSY
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO
						8740

PART NUMBER LM0999918-0001 REV D

TI 1384

NOTES, UNLESS OTHERWISE SPECIFIED:
1. CABLE CLAMP SCREW AND RETAINER CLIPS AND SCREWS INCLUDED WITH ITEM 1
2. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME SIDE AS SCREW HEAD
3. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIP



WIRE NO.	DESCRIPTION	TOTAL LENGTH	SIGNATURE	START STA.	FINISH STA.	REMARKS	ITEM NO.
1	22AWG 1 PVC WHITE	3.0	BA/103 TO BB/104	1P1-2	1P1-3	JUMPER	4
2	22AWG 1 PVC WHITE	3.0	CD/108 TO CC/107	1P1-20	1P1-6	JUMPER	4
3	22AWG 1 PVC WHITE	3.0	CA/105 TO CB/106	1P1-4	1P1-5	JUMPER	4
4	22AWG 1 PVC WHITE	3.0	SCA/118 TO CF/109	1P1-11	1P1-8	JUMPER	4

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
1	MARK	100-07	712	COLOR WHT, TYPE 9	

PROCESS / CLASSIFICATION

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

NEXT ASSY	USED ON
999853	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ± 1°, 3 PLACE DECIMALS ± .010, 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE: .013 THRU .125 +.004 -.001; .126 THRU .250 +.005 -.001; .251 THRU .500 +.006 -.001; .501 THRU .750 +.008 -.001; .751 THRU 1.000 +.010 -.001; 1.001 THRU 2.000 +.012 -.001

DWN 7-31-78; CHK 9/21/78; ENGR; APPD 9/21/78; 9/21/78; 9/21/78 (signatures)

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

TEST PLUG, 820 EIA

SIZE C | FSCM NO 96214 | DRAWING NO 999925

SCALE NONE | SHEET

TI-9925H

30

LM

FILMED

DWG NO 999925 | SH 2

6-126

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/08/78

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM0999925-8001 REV *

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0539903-0004	HOOD,CONN 37 PIN	AMP -205731-1
0002	00001.000	EA		0539409-0005	CONNECTOR,PLUG 25 PINS	AMP -205208-1
0002A					IP1	
0003	00108.000	EA		0539430-0003	CONTACT,PIN 24-20AWG .068 INSUL DIA	AMP -205202-2 ST
0004	00001.000	FT		0538347-3999	WIRE HOOKUP 8-22 AWG 19 STR WHITE	JUD - HH0115

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE TEST PLUG, 920 PIN		
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740	FILMED	PART NUMBER LM0999925-8001 REV *

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 09/08/78

LIST OF MATERIAL

PAGE 1 of

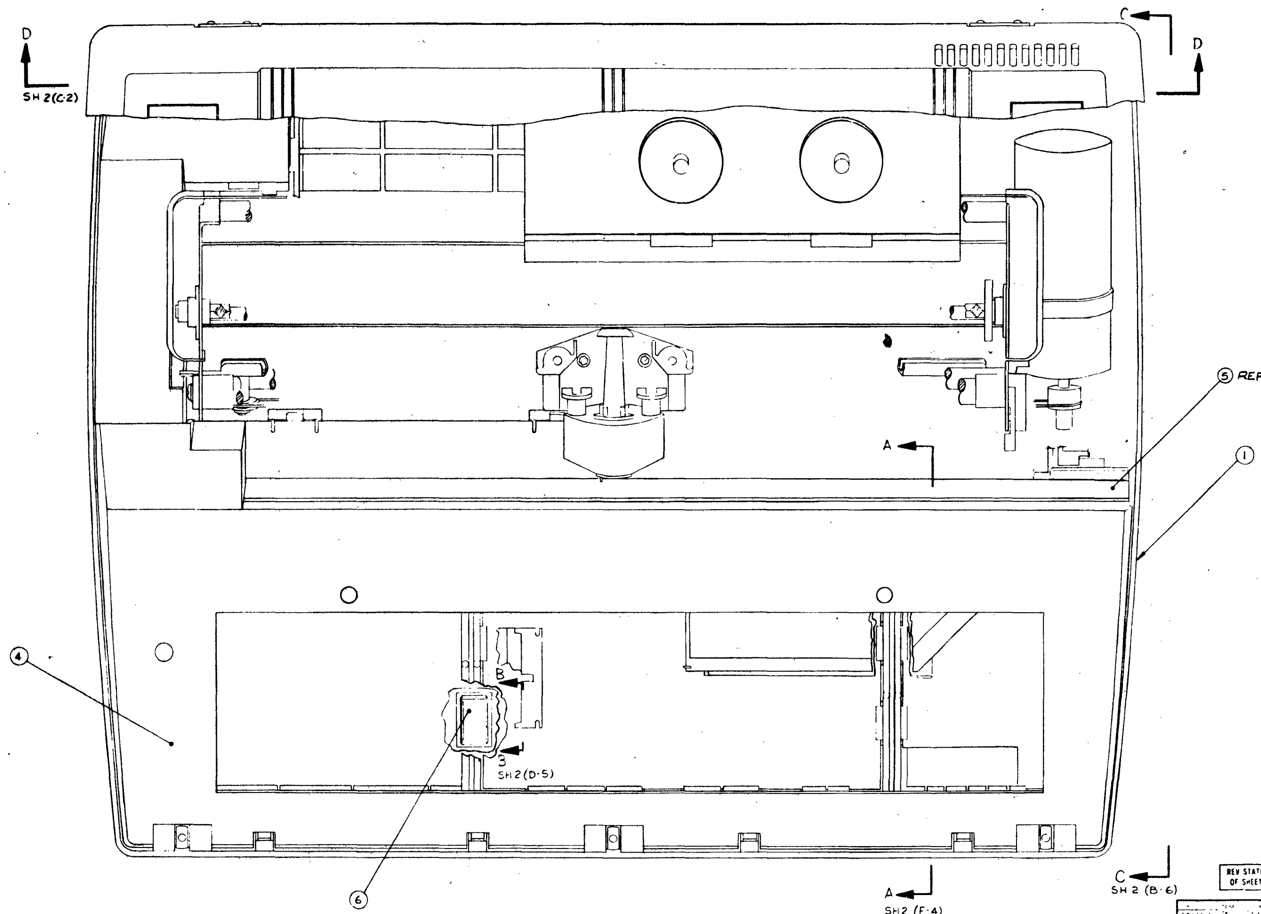
PART NUMBER: LM0994239-0004 REV: H

FIND ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00000.000	EA		0996336-0004	ENCODER,SHAFT FOUR QDRTR,2/288 2/475 PUL	001255-
0001A					ITEM 3 CAN BE USED WITH	
0001B					ITEM 1 AS AN ALTERNATE TO	
0001C					ITEM 7	
0003	00000.000	EA		0994206-0001	MOTOR-D.C. SERVO 25 AMPERES	ELR - 7-1617
0003A					ITEM 3 CAN BE USED WITH	
0003B					ITEM 1 AS AN ALTERNATE TO	
0003C					ITEM 7	
0004	00001.000	EA		0994177-0001	CAPSTAN,MOTOR	
0005	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	
0006	AR	BX		0232208-7000	LABEL 1X3INS RECTL SELF-ADHESIVE	DEN -+3551
0007	00001.000	EA		0994437-0004	ENCODER/MOTOR ASSEMBLY-19.0"CA LG	
0008	00001.000	EA		2210037-0001	FASTENER, PLASTIC BOSS	CAPSYS-GTC204-213

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						CARRIAGE DR MOTOR ASSY 10516.5021(520)
APPD.-MFG.	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO / PART NUMBER / REV
						LM0994239-0004 H

TI 13849

NOTES:
1. THE WINDOW SHALL BE FREE OF ALL OBVIOUS FLAWS AND SCRATCHES WHEN VIEWED FROM A DISTANCE OF 3 FEET AND HAVING A NORMAL VIEWING ANGLE OF 30°. OVERHEAD LIGHTING HAVING 75 TO 100 FOOTCANDLES IS REQUIRED WITH AN INSPECTION TIME PER WINDOW OF 4 SECONDS. WINDOW MUST BE PROPERLY ASSEMBLED IN THE COVER WITH THE BACKGROUND BEING 32 COLUMNS OF PRINTED BARBERPOLE TEXT.



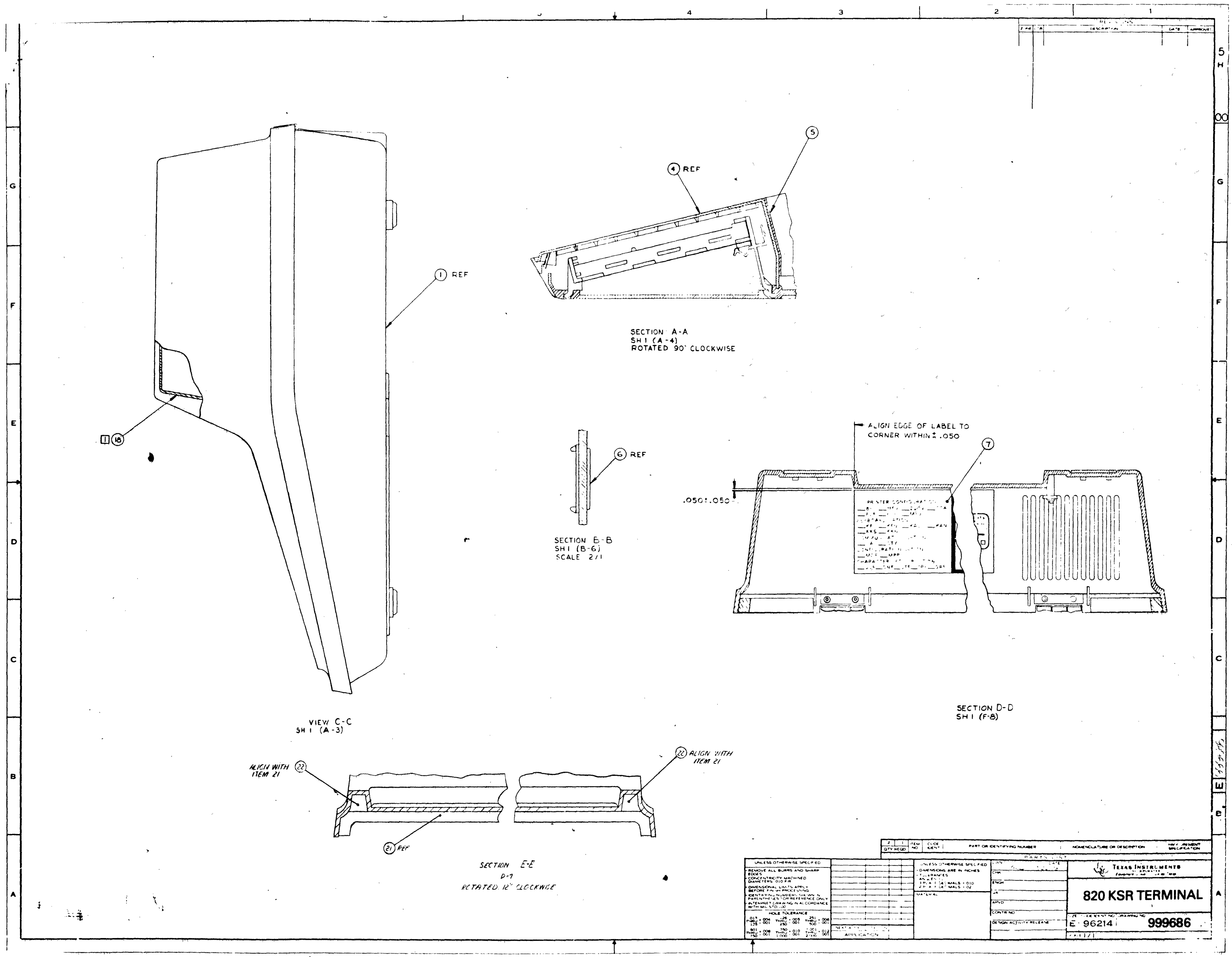
999686-0201	820 KSR TERMINAL 220 V, 10
999686-0101	820 KSR TERMINAL 115 V, 10
PART NUMBER	DESCRIPTION

REV STATUS OF SHEETS — SH 1 2

TEXAS INSTRUMENTS

820 KSR TERMINAL

E 96214 999686


(1) REF
(18)
VIEW C-C
SH 1 (A-3)
(4) REF
(5)
SECTION A-A
SH 1 (A-4)
ROTATED 90° CLOCKWISE
(6) REF
SECTION B-B
SH 1 (B-6)
SCALE 2/1
ALIGN EDGE OF LABEL TO
CORNER WITHIN ±.050
(7)
.050±.050
SECTION D-D
SH 1 (F-8)
ALIGN WITH (22)
ITEM 21
(22) ALIGN WITH
ITEM 21
(21) REF
SECTION E-E
D-7
ROTATED 12° CLOCKWISE
PARTS LIST
TEXAS INSTRUMENTS
820 KSR TERMINAL
E 96214
999686

TEXAS INSTRUMENTS
INCORPORATED

DATE 10/31/78 **LIST OF MATERIAL** PAGE 1 of 2

PART NUMBER LM0999686-0101 REV D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999690-0102	820 TERMINAL,BASIC-115V,10/16CPI	
0004	00001.000	EA		0999746-0001	PLENUM,PWR	
0005	00001.000	EA		0999747-0001	INSULATOR, SOUND AIR PLENUM	
0006	00001.000	EA		0999748-0001	COVER,TEST	
0007	00001.000	EA		0999934-0001	LABEL,INSTRUCTION PAPER & RIBBON LOADING	
0008	00001.000	EA		0994704-0001	RIBBON,BLK MATRIX-SINGLE 60 YARD	000494-
0009	00001.000	EA		0999854-9701	MANUAL, USER GUIDE	
0010	00000.020	EA		0996472-0001	PAPER,CPD-1 PART PREMIUM	093287-1412RH
0012	00001.000	EA		0999456-9701	MANUAL,INFORMATION REQUEST FORM	
0013	REF	EA		0999760-9901	SHIPPING CONTAINER INDEX, 820 TERM	
0014	00001.000	EA		0999457-9701	MANUAL,FIELD SERVICE FLYER	
0016	REF	EA		0999358-9701	INSTRUCTIONS, PACKING	
0017	00001.000	EA		0999869-9701	MANUAL, RIBBON & PAPER RECOMMENDATIONS	
0018	00001.000	EA		0999713-0001	WINDOW, TERMINAL	
0023	00001.000	EA		0994472-0001	SERVICE KIT,MODEL 810 PRINTER	
0024	00001.000	EA		0993205-0001	CABLE ASSY,202/212 DATA SET	
0025	00001.000	EA		0996289-0001	CORD SET,3-PIN PWR-DOMESTIC BLACK	090126-0-7889-008-GY
0025A					ITEM 26 MAY BE USED IN	
0025B					PLACE OF ITEM 25	
0026	00000.000	EA		0996289-0002	CORD SET,3-PIN PWR-DOMESTIC GRAY W/CLIP	090126-0-7919-008-GY

DRAFTSMAN DATE 11-1 | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE 820 KSR TERMINAL,115V 10/16 CPI

APPD MFG. DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999686-0101 REV D

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 10/31/78 **LIST OF MATERIAL** PAGE 2 of 2

PART NUMBER LM0999685-0101 REV D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0026A					ITEM 25 MAY BE USED IN	
0026B					PLACE OF ITEM 26	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE 820 KSR TERMINAL,115V 10/16 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999686-0101 REV D

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 10/31/78 — **LIST OF MATERIAL** — PAGE 1 of 1 — PART NUMBER LM0999636-0201 — REV D

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999690-0202	820 TERMINAL,BASIC-220V,10/16 CPI	
0004	00001.000	EA		0999746-0001	PLENUM,PWB	
0005	00001.000	EA		0999747-0001	INSULATOR, SOUND AIR PLENUM	
0006	00001.000	EA		0999748-0001	COVER,TEST	
0007	00001.000	EA		0999834-0001	LABEL,INSTRUCTION PAPER & RIBBON LOADING	
0008	00001.000	EA		0996704-0001	RIBBON,BLK MATRIX-SINGLE 60 YARD	000494-
0009	00001.000	EA		0999854-9701	MANUAL, USER GUIDE	
0010	00000.020	EA		0996472-0001	PAPER,CPO-1 PART PREMIUM	093287-141284
0012	00001.000	EA		0999456-9701	MANUAL,INFORMATION REQUEST FORM	
0013	REF	EA		0999760-0001	SHIPPING CONTAINER INDEX, 820 TERM	
0014	00001.000	EA		0999457-9701	MANUAL,FIELD SERVICE FLYER	
0016	REF	EA		0999858-9701	INSTRUCTIONS, PACKING	
0017	00001.000	EA		0999860-9701	MANUAL, RIBBON & PAPER RECOMMENDATIONS	
0018	00001.000	EA		0999713-0001	WINDOW, TERMINAL	
0023	00001.000	EA		0994472-0001	SERVICE KIT,MODEL 810 PRINTER	
0024	00001.000	EA		0993205-0001	CABLE ASSY,202/212 DATA SET	
0026	00001.000	EA		0996290-0001	CORD SET,POWER-WEST EUROPEAN	

DRAFTSMAN L. Zepeda DATE — CKD DRAFTSMAN DATE — DESIGN ENGINEER DATE — TITLE: 820 KSR TERMINAL,220V 10/16 CPI

APPD MFG DATE — APPD PROJECT ENGINEER DATE — RELEASED — DATE PRINTED 3720 — LM0999636-0201 D

TI 13849

DWG NO 999687 SH 1

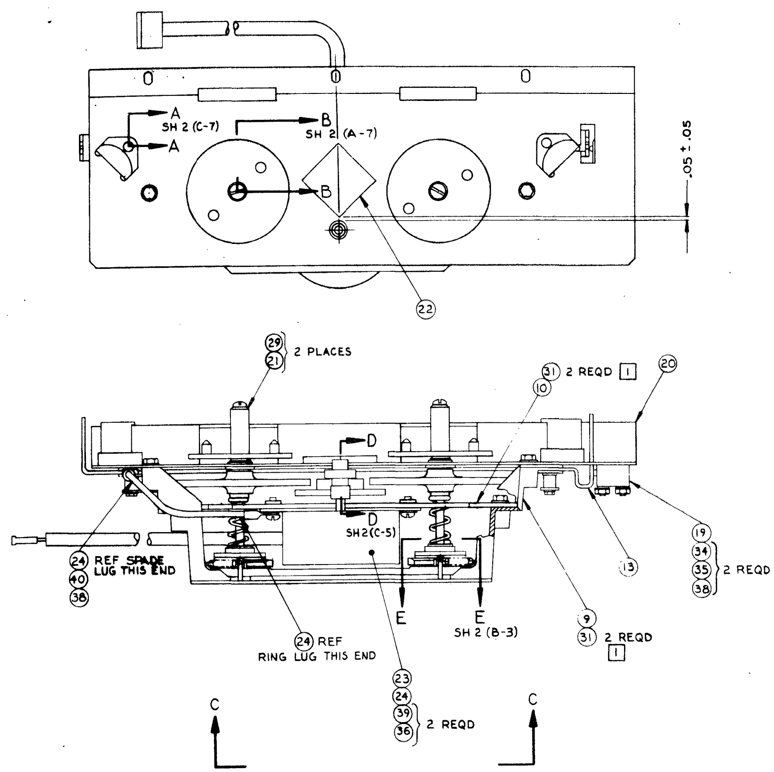
NOTES: UNLESS OTHERWISE SPECIFIED:

1. APPLY 16 ± 1 IN-LBS TORQUE ON ITEM 31 AT ASSY
2. APPLY 8 ± 1 IN-LBS TORQUE ON ITEM 30 AT ASSY
3. MARK ASSY NO, APPROPRIATE REV LETTER, SITE/DATE CODE AND SERIAL NO PER ITEM 44, PARAGRAPH 3 AND MADE IN USA LOCATED APPROX AS SHOWN ON ITEM 43 USING GOTHIC STYLE LETTERS PER PROCESS 1
4. ITEM 28 MAY BE INSTALLED FROM EITHER SIDE OF ITEM 20 (SHOP OPTION)

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	LM UPDATES		
B	428745 10-7-77 E.H. De Leon	10-7-77	[signature]
C	428957 11-3-77 E.H. De Leon	11-3-77	[signature]
D	CN432667 [signature] (1) ROTATED MOTOR (ITEM 23) 180°	4/14/78	[signature]
E	CN440399 P Landry	8/18/78	[signature]

(1) DELETE ITEM 7 QTY 2 P/N 994306-1
(2) ITEM 43 WAS 999811-1
(3) NOTE 3 WAS MARK PART NO, APPROPRIATE REV LTR, SITE DATA CODE SERIAL NO PER ITEM 43 & 44
(4) SH 2 Z B-7 DELETE PICTORIAL OF ITEM 7 MOVED ITEM 27 REF.
(5) REDREW VIEW C-C SH 2 Z B-3 WAS TAKEN FROM OPPOSITE SIDE. FRONT VIEW



REV STATUS OF SHEETS	REV	E	E		
	SH	1	2		

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES
1	MARK	100	HEIGHT .10 COLOR BLK		3
		F-SPEC	ADDITIONAL		
PROCESS		NO	CLASSIFICATION		NOTES

FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

PARTS LIST

NEXT ASSY	USED ON
999689	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°; 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-100C
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 −.001	.126 THRU .250 +.005 −.001	.251 THRU .500 +.006 −.001
.501 THRU .750 +.008 −.001	.751 THRU 1.000 +.010 −.001	1.001 THRU 2.000 +.012 −.001

		DATE
DWN	[signature]	11/2/77
CHK	[signature]	12/20/77
ENGR	[signature]	5 JAN 78
APVD	[signature]	1/6/78
QA	[signature]	1/9/78
CONFIG	[signature]	1/10/78
RLSE	[signature]	1/11/78

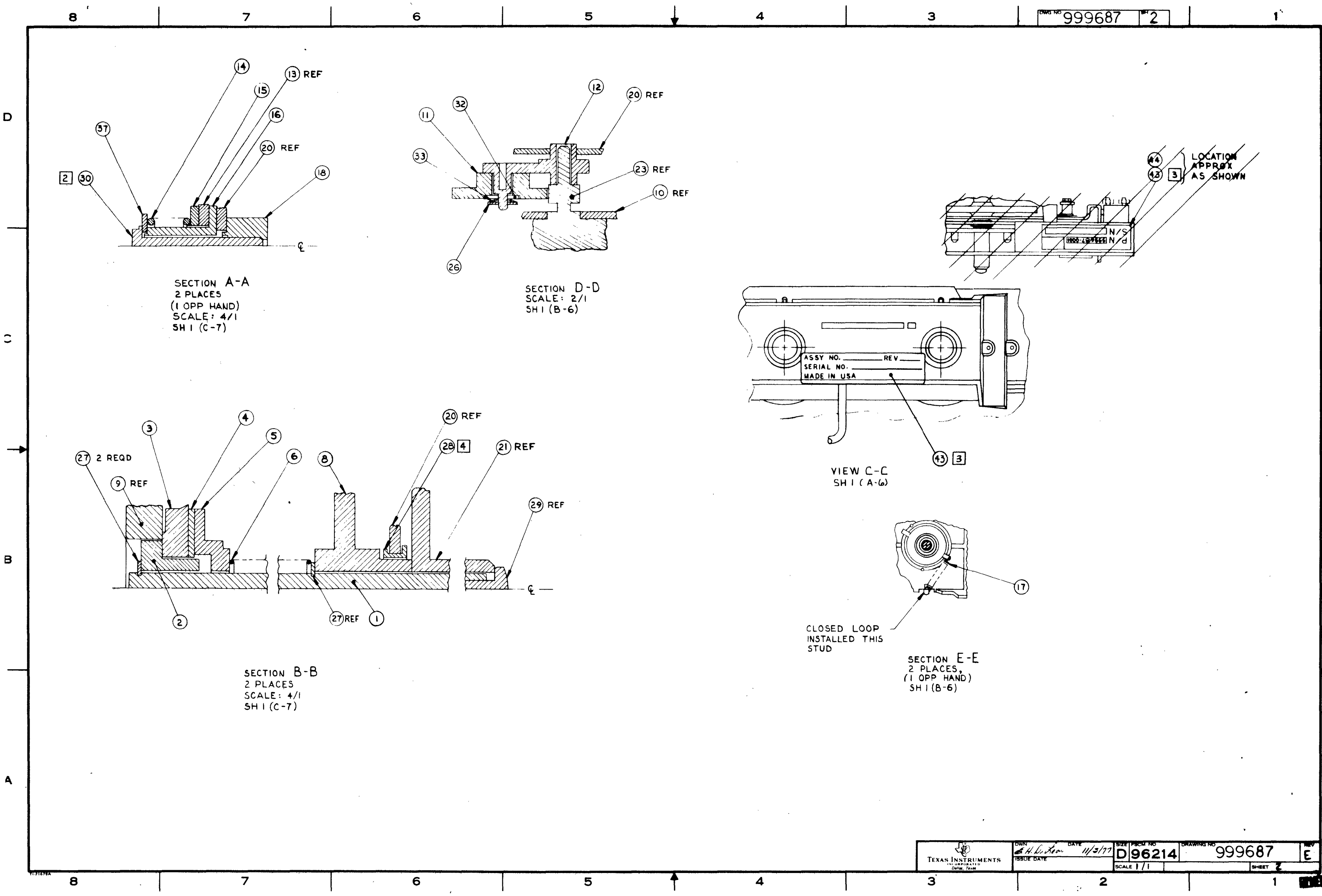
TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

RIBBON DRIVE

SIZE D | FSCM NO 96214 | DRAWING NO 999687

SCALE 1/1 | SHEET 1 OF 2

LM


DWG NO 999687 SH 2
SECTION A-A
2 PLACES
(1 OPP HAND)
SCALE: 4/1
SH 1 (C-7)
SECTION D-D
SCALE: 2/1
SH 1 (B-6)
LOCATION APPROX AS SHOWN
VIEW C-C
SH 1 (A-6)
ASSY NO. REV
SERIAL NO.
MADE IN USA
SECTION B-B
2 PLACES
SCALE: 4/1
SH 1 (C-7)
CLOSED LOOP INSTALLED THIS STUD
SECTION E-E
2 PLACES,
(1 OPP HAND)
SH 1 (B-6)
TEXAS INSTRUMENTS
D 96214
DRAWING NO 999687
REV E
SCALE 1/1
11/3/77

TEXAS INSTRUMENTS INCORPORATED

DATE 06/29/78 **LIST OF MATERIAL** PAGE 1 of 2 PART NUMBER LM 0999687-0001 REV E

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00002.000	EA		0994216-0001	SHAFT,DRIVE-RIBBON	
0002	00002.000	EA		0994217-0001	BEARING,LOWER-RIBBON	
0003	00002.000	EA		0994218-0001	DISK,FRICTION-RIBBON	
0004	00002.000	EA		0994219-0001	PAD,FRICTION-RIBBON	
0005	00002.000	EA		0994220-0001	HUB,PRESSURE-RIBBON	
0006	00002.000	EA		0994221-0001	SPRING,COMPRESSION-GEAR DRIVE	
0008	00002.000	EA		0994222-0001	GEAR,DRIVE RIBBON	
0009	00001.000	EA		0999696-0001	CHASSIS, RIBBON DRIVE	
0010	00001.000	EA		0999699-0001	PLATE, RIBBON MOTOR	
0011	00001.000	EA		0999700-0001	GEAR,IDLER/REVERSE-MTR	
0012	00001.000	EA		0999701-0001	ARM, REVERSE-MTR	
0013	00001.000	EA		0994227-0001	ARM,SHIFT-RIBBON	
0014	00002.000	EA		0994228-0001	SPRING,COMPRESSION-SHIFT ARM	
0015	00002.000	EA		0994230-0001	WASHER,THRUST-SHIFT ARM	
0016	00002.000	EA		0994285-0001	BEARING,SHIFT ARM	
0017	00002.000	EA		0994355-0001	SPRING,EXTENSION-RIBBON TAKEUP	
0018	00002.000	EA		0994377-0001	GUIDE,RIBBON-SPOOL	
0019	00001.000	EA		0996754-0001	SWITCH,1 AMP 30VDC MINI SENSITIVE	001963-
0020	00001.000	EA		0999702-0001	PLATE, TOP	
0021	00002.000	EA		0994290-0001	HUB,DRIVE-RIBBON	

DRAFTSMAN Arthur C. Park DATE 6/30/78 | CKD DRAFTSMAN [signature] DATE | DESIGN ENGINEER DATE | TITLE RIBBON DRIVE

APPD MFG DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | FILMED | PART NUMBER LM 0999687-0001 REV E

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 06/29/78 **LIST OF MATERIAL** PAGE 2 of 2 PART NUMBER LM 0999687-0001 REV E

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0022	00001.000	EA		0994496-0001	PAD, STATIC GROUND- FOAM	
0023	00001.000	EA		0999738-0001	MOTOR ASSY, RIBBON DRIVE	
0024	00001.000	EA		0960967-0003	LEAD,ELECTRICAL-GND	
0026	00001.000	EA		0412991-0003	RING #4 PRONGS RETAINING EXTERNAL	
0027	00004.000	EA		0416402-4018	RING,RETAINING EXTERNAL "E"	MS1 -6633-4018
0028	00002.000	EA		0230033-0001	BEARING SNAP-IN NYLON	THP -6L1-FF
0029	00002.000	EA		0972988-0027	SCREW 6-32 X .312 PAN HEAD CRES	
0030	00002.000	EA		0972679-0026	SCREW THREAD SLOTTING HEX .750	
0031	00004.000	EA		0972679-0013	SCREW # 6-19 X 1/2 SLOTTED HEX	
0032	00001.000	EA		0411027-0806	WASHER .156 X .375 X .049 FLAT CRES	QPL - MS15795-806
0033	00001.000	EA		0996277-0001	WASHER,SPRING,#5	ITW - 3502-05-32S
0034	00002.000	EA		0416622-0011	WASHER #4 FLAT	QPL - AN960C4L
0035	00002.000	EA		0411104-0135	WASHER #4 LOCKSPLIT	QPL - MS35338-135
0036	00002.000	EA		0411101-0058	LOCKWASHER #6 EXTERNAL TOOTH CRES	QPL - MS35335-58
0037	00002.000	EA		0411027-0807	WASHER .188 X .375 X .049 FLAT CRES	QPL - MS15795-807
0038	00003.000	EA		0416453-0021	NUT,PLAIN,4-40 UNC-2B HEX,CRES,SMALL	QPL - NAS671-C4
0039	00002.000	EA		0972988-0028	SCREW 6-32 X .375 PAN HEAD CRES	
0040	00001.000	EA		0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	QPL - MS35335-57
0043	00001.000	BX		0232208-7000	LABEL 1X3INS RECTL SELF-ADHESIVE	DEN -43551
0044	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE RIBBON DRIVE

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | FILMED | PART NUMBER LM 0999687-0001 REV E

TI 13849

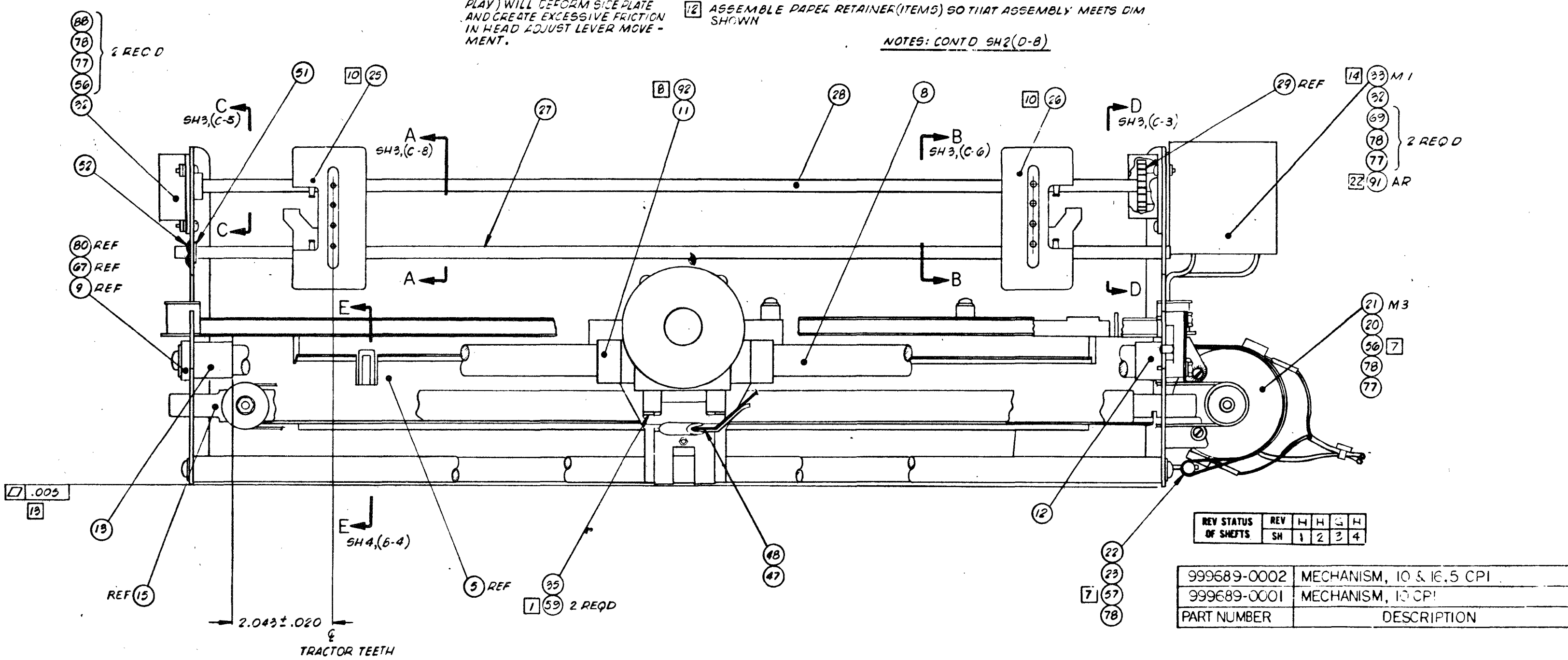
999689 1

REV	DESCRIPTION	DATE	APPROVED
H	CN 445348 1) LM-1&2 ITEM 71 996596-0041 SCREW 1/4-28 .500LG CAP, SOC HD WAS 996596-0043 SCREW 1/4-28 .750LG CAP, SOC HD 2) Z(B-5) DELE SLOTS ON PRINTHEAD COVER 3) Z(C-7) SH4 DELE BALLOON ITEMS 50, 61 & 79 VIEW H-H 4) NOTE 18 WAS .... (ITEM 37) TO RECOMMENDED 5.0±.5 IN-LB 5) CHG TRACTORS (IT 25 & 26) PICTORIALLY TO AGREE WITH DWG CHANGES.	11-17-79	

NOTES UNLESS OTHERWISE SPECIFIED

1. TIGHTEN TO 16±1 IN-LB AFTER POSITIONING CARRIAGE
2. TIGHTEN TO 13±1 FT-LB AFTER POSITIONING PLATEN (ITEM 3) AND BEFORE ASSEMBLING HOUSINGS (ITEM 34) TO SIDE PLATES (ITEMS 1 & 2)
3. TIGHTEN TO 30±1 IN-LB AFTER POSITIONING SIDE PLATES
4. ADJUST SWITCH (ITEM 44) TO DIM SHOWN WHEN SWITCH LEVER (IN CLOSED POSITION) IS IN CONTACT WITH SWITCH CASE
5. WITH HEAD ADJUSTMENT LEVER (ITEM 10) IN INNERMOST POSITION, ADJUST PLATEN TO CARRIAGE HEAD MOUNTING SURFACE A DISTANCE OF 2.210±.002 OVER FULL TRAVEL OF CARRIAGE. CHECK THAT PARALLELISM BETWEEN CARRIAGE TRAVEL AND PLATEN DOES NOT VARY MORE THAN .004 IN MIDDLE AND OUTERMOST POSITIONS OF HEAD ADJUST LEVER.
6. TIGHTEN SCREW (ITEM 67) 1/4 TO 1/2 TURN AFTER ZERO END PLAY IS ACHIEVED IN UPPER CARRIAGE ROD.
   CAUTION! OVERTIGHTENING (GREATER THAN 1/2 TURN PAST ZERO END PLAY) WILL DEFORM SIDE PLATE AND CREATE EXCESSIVE FRICTION IN HEAD ADJUST LEVER MOVEMENT.
7. TIGHTEN TO 4.5± .5 IN-LB
8. USE 10 TO 12 DROPS ON FELT AT EACH END
9. PAPER GUIDE (ITEM 4) SHALL BE ADJUSTED SO THAT THE ASSEMBLY SHALL MEET THE DIM SHOWN
10. PHASING MARKS ON PAPER TRACTOR (ITEMS 25 & 26) SHALL BE ALIGNED TO THE SAME CORNER OF DRIVE SHAFT (ITEM 28)
11. MARK ASSY NO, APPROPRIATE REV LETTER, SERIAL NO (SITE DATE CODE & SERIAL NO) PER ITEM 94 PARAGRAPH 3.0, AND MADE IN USA ON ITEM 93 LOCATED APPROX AS SHOWN USING GOTHIC STYLE LETTERS PER PROCESS 1
12. ASSEMBLE PAPER RETAINER (ITEM 5) SO THAT ASSEMBLY MEETS DIM SHOWN

NOTES: CONT'D SH2 (D-8)



FRONT VIEW

REV STATUS OF SHEETS	REV	H	H	G	H
	SH	1	2	3	4

PART NUMBER	DESCRIPTION
999689-0002	MECHANISM, 10 & 16.5 CPI
999689-0001	MECHANISM, 10 CPI

SEQ NO	IDENT	F SPEC	NO	ADDITIONAL	NOTES
1	MARK	100-00	00	HEIGHT .10 COLOR BLK	11

NEXT ASSY	USED ON
999690	8740

APPLICATION

TEXAS INSTRUMENTS

MECHANISM

D 96214 999689

1 OF 4

NOTES: CONT'D SH 1 (C-4)

13 APPLIES AT LOCATION DIRECTLY BELOW THE TWO BOTTOM SPACER MOUNTING HOLES

14 ORIENT MOTOR (ITEM 32) SO THAT MOTOR CABLE EXITS IN POSITION SHOWN

~~15 TIGHTEN TO 4.0 ± .5 N-LB~~

16 TIGHTEN TO 9 ± 1 IN-LB

17 CENTER RIBBON IN SLOTS ON EACH END OF SHIFT ARM SO THAT RIBBON DOES NOT TOUCH SIDES OF SLOTS BY ADJUSTING RIBBON DRIVE ASSY (ITEM 39)

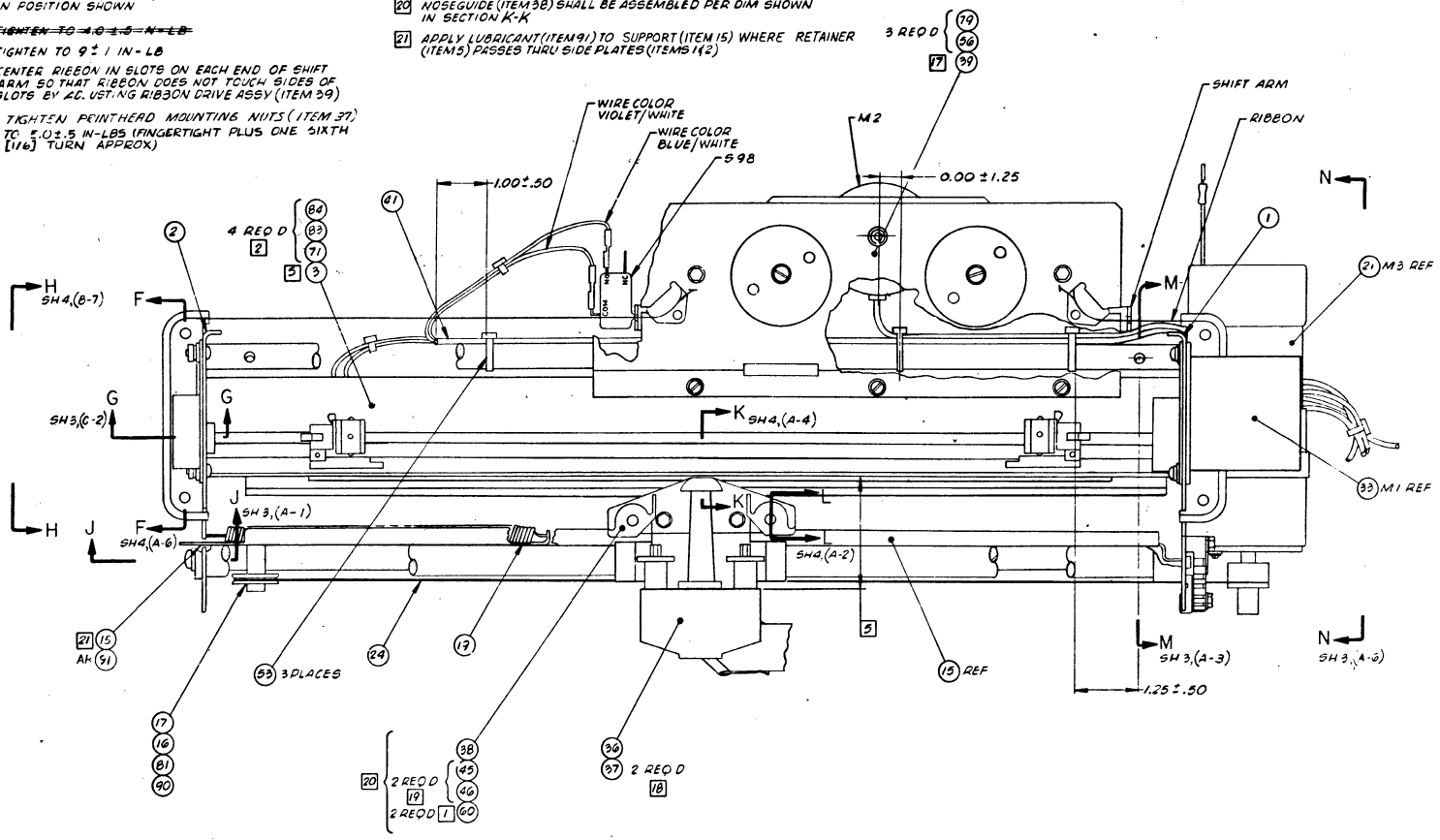
18 TIGHTEN PRINTHEAD MOUNTING NUTS (ITEM 37) TO 5.0 ± .5 IN-LBS (FINGERTIGHT PLUS ONE SIXTH [1/6] TURN APPROX)

19 ROLLER (ITEM 45) SHALL BE ASSEMBLED TO HOUSING (ITEM 34) AND NOSEGUIDE (ITEM 38) WITH RIVETS (ITEM 46). AFTER ASSEMBLY, ROLLERS SHALL ROTATE FREELY ABOUT RIVETS.

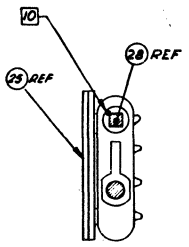
20 NOSEGUIDE (ITEM 38) SHALL BE ASSEMBLED PER DIM SHOWN IN SECTION K-K

21 APPLY LUBRICANT (ITEM 91) TO SUPPORT (ITEM 15) WHERE RETAINER (ITEM 5) PASSES THRU SIDE PLATES (ITEMS 1 & 2)

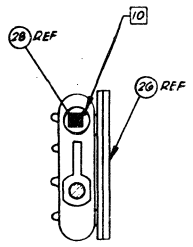
22 APPLY LUBRICANT (ITEM 91) BETWEEN RIVET ON GEAR ASSY (ITEM 29) AND MOTOR ASSY (ITEM 33)



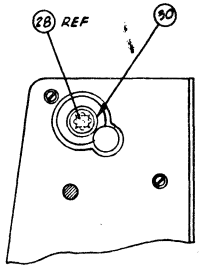
TOP VIEW



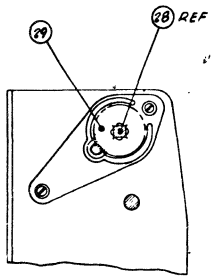
SECTION A-A
SH 1,(C-6)



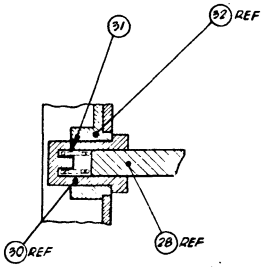
SECTION B-B
SH 1,(C-4)



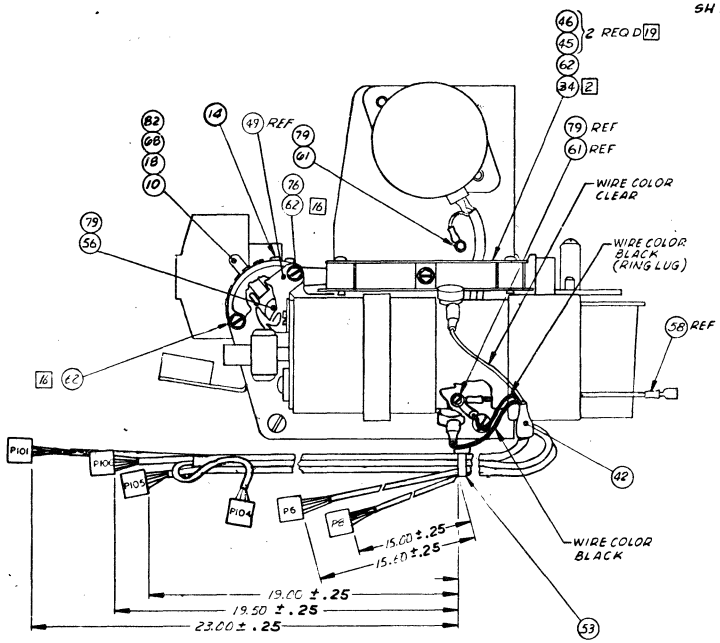
SECTION C-C
SH 1,(C-7)



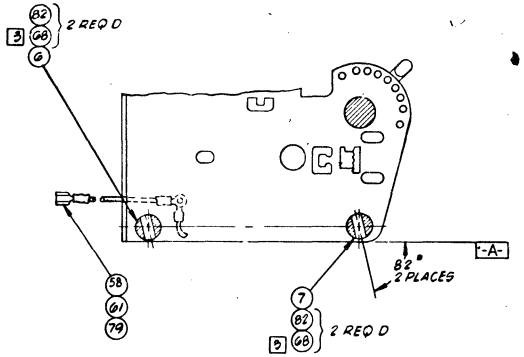
SECTION D-D
SH 1,(C-3)



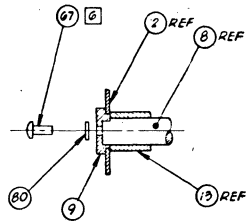
SECTION G-G
SH 2,(C-7)
SCALE: 2/1



VIEW N-N
SH 2 (B-2)
ROTATED 90° CW

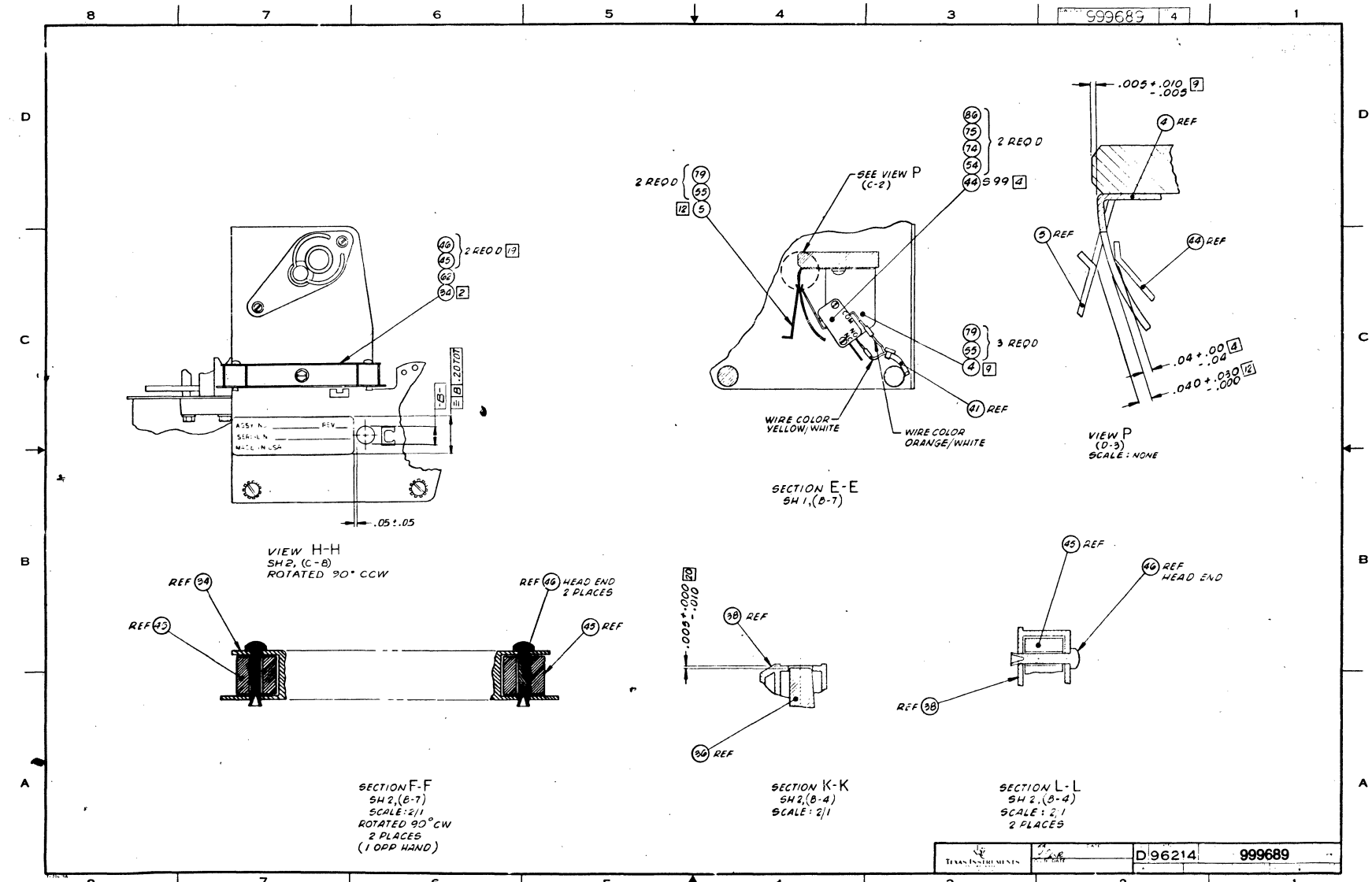


SECTION M-M
SH 2,(B-2)
ROTATED 90° CCW



SECTION J-J
SH 2,(B-7)

TEXAS INSTRUMENTS	5/17/78	D 96214	999689 G 3


999689 4
2 REQ'D
SEE VIEW P (C-2)
3 REQ'D
WIRE COLOR YELLOW/WHITE
WIRE COLOR ORANGE/WHITE
.005 +.010 -.005
.04 +.00 -.04
.040 +.030 -.000
VIEW P (D-3) SCALE: NONE
.05±.05
VIEW H-H SH 2, (C-8) ROTATED 90° CCW
HEAD END 2 PLACES
SECTION E-E SH 1, (B-7)
SECTION F-F SH 2, (B-7) SCALE: 2/1 ROTATED 90° CW 2 PLACES (1 OPP HAND)
SECTION K-K SH 2, (B-4) SCALE: 2/1
SECTION L-L SH 2, (B-4) SCALE: 2/1 2 PLACES
TEXAS INSTRUMENTS
D 96214 999689

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78

LIST OF MATERIAL

PART NUMBER LM 0999689-0001 REV M

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999715-0001	SIDE PLATE,DRIVE MECHANISM-RIGHT SIDE	
0002	00001.000	EA		0999715-0002	SIDE PLATE,DRIVE MECHANISM-LEFT SIDE	
0003	00001.000	EA		0999724-0001	PLATEN, 820 TERMINAL	
0004	00001.000	EA		0994210-0001	PAPER GUIDE,PLATEN	
0005	00001.000	EA		0999725-0001	RETAINER, PAPER-PLATEN	
0006	00001.000	EA		0994186-0002	SPACER,LOWER REAR .250 HOLE DIA 820PRNTR	
0007	00001.000	EA		0999705-0001	ROD,GUIDE-LOWER	
0008	00001.000	EA		0994490-0001	GUIDE ROD, UPPER	
0009	00001.000	EA		0994197-0001	BUSHING,GUIDE ROD	
0010	00001.000	EA		0999726-0001	LEVER, ADJUSTMENT- PRINTHEAD	
0011	00001.000	EA		0999913-0001	CARRIAGE ASSY, PRINTHEAD	
0012	00001.000	EA		0999727-0001	BUMPER,CARRIAGE-RIGHT	
0013	00001.000	EA		0999727-0002	BUMPER,CARRIAGE-LEFT	
0014	00001.000	EA		0994232-0001	SCALE,HEAD GAP	
0015	00001.000	EA		0994196-0001	SUPPORT,IDLER PULLEY	
0016	00001.000	EA		0994195-0001	SPACER,IDLER PULLEY	
0017	00001.000	EA		0994241-0001	PULLEY ASSY,IDLER	
0018	00001.000	EA		0994454-0001	SPRING,GROUNDING	
0019	00001.000	EA		0994263-0001	SPRING,TENSION WIRE ROPE	
0020	00001.000	EA		0999703-0001	CRADLE, MOTOR	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: MECHANISM, 10 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO: 8740 | PART NUMBER LM 0999689-0001 REV M

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78

LIST OF MATERIAL

PART NUMBER LM 0999689-0001 REV M

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0021	00001.000	EA		0994238-0003	CARRIAGE DRIVE MOTOR ASSY-10 CPI (820)	
0021A					M3	
0022	00001.000	EA		0994201-0001	STRAP,MOTOR	
0023	00001.000	EA		0994202-0001	NUT,MOTOR STRAP	
0024	00001.000	EA		0994233-0001	WIRE ROPE,DRIVE MECHANISM	
0025	00001.000	EA		0996158-0001	TRACTOR,PAPER,PRECISION LEFT HAND	PHD - CS400-01
0026	00001.000	EA		0996158-0002	TRACTOR,PAPER,PRECISION RIGHT HAND	PHD - CS400-02
0027	00001.000	EA		0994209-0001	ROD,TRACTOR SUPPORT	
0028	00001.000	EA		0994172-0001	DRIVE SHAFT,TRACTOR	
0029	00001.000	EA		0999780-0001	GEAR ASSY, PAPER ADVANCE	
0030	00001.000	EA		0994173-0001	HUB,PAPER ADVANCE	
0031	00001.000	EA		0994302-0001	SPRING,COMPRESSION-PAPER DRIVE SHAFT	
0032	00002.000	EA		0999729-0001	BEARING, PAPER ADVANCE	
0033	00001.000	EA		0999730-0001	MOTOR ASSEMBLY,PAPER DRIVE	
0033A					M1	
0034	00002.000	EA		0999731-0001	HOUSING,RIBBON GUIDE-SIDE PLATE	
0035	00001.000	EA		0999704-0001	CLAMP, WIRE ROPE	
0036	00001.000	EA		0999732-0001	PRINTHEAD ASSEMBLY,30VOLT	
0037	00002.000	EA		0994199-0001	NUT,PRINTHEAD	
0038	00001.000	EA		0999698-0001	NOSEGUIDE, PRINTHEAD	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: MECHANISM, 10 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO: 8740 | PART NUMBER LM 0999689-0001 REV M

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/10/78 — **LIST OF MATERIAL** — PAGE 3 of 5 — PART NUMBER LM 0999689-0001 REV M

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0039	00001.000	EA		0999687-0001	RIBBON DRIVE	
0041	00001.000	EA		0999735-0001	CABLE ASSY, PAPER OUT	
0042	00001.000	EA		0999736-0001	CABLE ASSY, CARRIAGE DRIVE	
0044	00001.000	EA		0996169-0001	SWITCH,SENSITIVE	
0044A					S99	
0045	00006.000	EA		0999697-0001	ROLLER, RIBBON	
0046	00006.000	EA		0411059-0169	RIVET-TUBULAR,.680LG,.123NOM SZ,OVAL HD	-MS16535-169
0047	00001.000	EA		0983903-0002	CLIP,CABLE	
0048	00001.000	EA		0999791-0001	CABLE ASSY,PRINTHEAD	
0049	00001.000	EA		0999928-0001	GROUND STRAP, CARRIAGE MOTOR	
0051	00001.000	EA		0416402-4031	RING,RETAINING,EXTERNAL "E"	
0052	00001.000	EA		0411778-0005	RING,RETAINING,EXTERNAL BOWED	NAL - 5139-31
0053	00004.000	EA		0418212-0040	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	QPL - MS3367-4-9
0054	00002.000	EA		0972988-0018	SCREW 4-40 X .625 PAN HEAD CRES	
0055	00005.000	EA		0972988-0026	SCREW 6-32 X .250 PAN HEAD CRES	
0056	00006.000	EA		0972988-0028	SCREW 6-32 X .375 PAN HEAD CRES	
0057	00002.000	EA		0972988-0031	SCREW 6-32 X .625 PAN HEAD CRES	
0058	00001.000	EA		0999823-0001	CABLE ASSY, GROUND	
0059	00002.000	EA		0972969-0006	SCREW #6-20 X 1/2 LG THD PL HEX WASHER	
0060	00002.000	EA		0972679-0013	SCREW # 6-19 X 1/2 SLOTTED HEX	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: MECHANISM, 10 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM 0999689-0001 REV M

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/10/78 — **LIST OF MATERIAL** — PAGE 4 of 5 — PART NUMBER LM 0999689-0001 REV M

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0061	00002.000	EA		0972684-0011	SCREW, THREAD FORMING, #6-32	
0062	00002.000	EA		0972684-0013	SCREW,THD FRMG,HEX-WSHR HD,6-32X.625LG	
0067	00001.000	EA		0996300-0003	SCREW #10-32 MACHINE,PAN HEAD	
0068	00005.000	EA		0972986-0008	SCREW 10-32 .375 PAN HEAD CRES	
0069	00002.000	EA		0972988-0030	SCREW 6-32 X .500 PAN HEAD CRES	
0071	00004.000	EA		0996596-0041	SCREW,CAP,SOCKET HEAD, .500	-SEE DRAWING
0074	00002.000	EA		0416622-0011	WASHER #4 FLAT	QPL - AN960C4L
0075	00002.000	EA		0411104-0135	WASHER, LOCK-SPRING, HELICAL, #4	QPL - MS35338-135
0076	00001.000	EA		0411100-0071	LOCKWASHER #6 INTERNAL TOOTH CRES	QPL - MS35333-71
0077	00005.000	EA		0416622-0013	WASHER #6 FLAT	QPL - AN960C6L
0078	00006.000	EA		0411104-0136	WASHER, LOCK-SPRING, HELICAL, #6	QPL - MS35338-136
0079	00011.000	EA		0411101-0058	LOCKWASHER #6 EXTERNAL TOOTH CRES	QPL - MS35335-58
0080	00001.000	EA		0416622-0033	WASHER #10 FLAT	QPL - AN960C10L
0081	00001.000	EA		0411104-0138	WASHER, LOCK-SPRING, HELICAL, #10	QPL - MS35338-138
0082	00005.000	EA		0411101-0060	LOCKWASHER #10 EXTERNAL TOOTH CRES	---
0083	00004.000	EA		0411027-0810	WASHER.281 X .065 FLAT CRES	
0084	00004.000	EA		0411104-0139	WASHER, LOCK-SPRING, HELICAL, 1/4	QPL - MS35338-139
0086	00002.000	EA		0411115-0044	NUT,4-40 HEXAGON CRES STEEL	MS -35649-244
0088	00004.000	EA		0416453-0022	NUT,PLAIN 6-32 UNC-2B HEX CRES,SMALL	QPL - NAS671C6
0090	00001.000	EA		0416453-0024	NUT,#10 HEX SMALL PATTERN	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: MECHANISM, 10 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM 0999689-0001 REV M

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78

LIST OF MATERIAL

PART NUMBER LM 0999689-0001 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0091	AR	TU		0232334-6050	LUBRICANT SILICONE GRS LT GR 2 OZ TUBE	GE -G-322-L 2 OZ.
0092	AR	EA		0996622-0001	OIL, TURBINE-GRADE 32	059595-TEXACO
0093	00001.000	BX		0232208-7000	LABEL 1X3INS RECTL SELF-ADHESIVE	DEN -43551
0094	REF	EA		0994396-9901	PROCEDURE, SITE & DATE CODE SERIALIZATION	

DRAFTSMAN / DATE	CKD DRAFTSMAN / DATE	DESIGN ENGINEER / DATE	TITLE
			MECHANISM, 10 CPI
APPD MFG / DATE	APPD PROJECT ENGINEER / DATE	RELEASED / DATE	PROJECT NO: 8740

PART NUMBER LM 0999689-0001 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78

LIST OF MATERIAL

PART NUMBER LM 0999689-0002 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999715-0001	SIDE PLATE,DRIVE MECHANISM-RIGHT SIDE	
0002	00001.000	EA		0999715-0002	SIDE PLATE,DRIVE MECHANISM-LEFT SIDE	
0003	00001.000	EA		0999724-0001	PLATEN, 820 TERMINAL	
0004	00001.000	EA		0994210-0001	PAPER GUIDE,PLATEN	
0005	00001.000	EA		0999725-0001	RETAINER, PAPER-PLATEN	
0006	00001.000	EA		0994186-0002	SPACER,LOWER REAR .250 HOLE DIA 820PRNTR	
0007	00001.000	EA		0999705-0001	ROD,GUIDE-LOWER	
0008	00001.000	EA		0994490-0001	GUIDE ROD, UPPER	
0009	00001.000	EA		0994197-0001	BUSHING,GUIDE ROD	
0010	00001.000	EA		0999726-0001	LEVER, ADJUSTMENT- PRINTHEAD	
0011	00001.000	EA		0999913-0001	CARRIAGE ASSY, PRINTHEAD	
0012	00001.000	EA		0999727-0001	BUMPER,CARRIAGE-RIGHT	
0013	00001.000	EA		0999727-0002	BUMPER,CARRIAGE-LEFT	
0014	00001.000	EA		0994232-0001	SCALE,HEAD GAP	
0015	00001.000	EA		0994194-0001	SUPPORT,IDLER PULLEY	
0016	00001.000	EA		0994195-0001	SPACER,IDLER PULLEY	
0017	00001.000	EA		0994241-0001	PULLEY ASSY,IDLER	
0018	00001.000	EA		0994454-0001	SPRING,GROUNDING	
0019	00001.000	EA		0994263-0001	SPRING,TENSION WIRE ROPE	
0020	00001.000	EA		0999703-0001	CRADLE, MOTOR	

DRAFTSMAN L. Lynch DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE MECHANISM, 10 & 16.5 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM 0999689-0002 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78

LIST OF MATERIAL

PART NUMBER LM 0999689-0002 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0021	00001.000	EA		0994238-0004	CARRIAGE DR MOTOR ASSY 10&16.5CPI(820)	
0021A					M3	
0022	00001.000	EA		0994201-0001	STRAP,MOTOR	
0023	00001.000	EA		0994202-0001	NUT,MOTOR STRAP	
0024	00001.000	EA		0994233-0001	WIRE ROPE,DRIVE MECHANISM	
0025	00001.000	EA		0996158-0001	TRACTOR,PAPER,PRECISION LEFT HAND	PHD - CS400-01
0026	00001.000	EA		0996158-0002	TRACTOR,PAPER,PRECISION RIGHT HAND	PHD - CS400-02
0027	00001.000	EA		0994209-0001	ROD,TRACTOR SUPPORT	
0028	00001.000	EA		0994172-0001	DRIVE SHAFT,TRACTOR	
0029	00001.000	EA		0999780-0001	GEAR ASSY, PAPER ADVANCE	
0030	00001.000	EA		0994173-0001	HUB,PAPER ADVANCE	
0031	00001.000	EA		0994302-0001	SPRING,COMPRESSION-PAPER DRIVE SHAFT	
0032	00002.000	EA		0999729-0001	BEARING, PAPER ADVANCE	
0033	00001.000	EA		0999730-0001	MOTOR ASSEMBLY,PAPER DRIVE	
0033A					M1	
0034	00002.000	EA		0999731-0001	HOUSING,RIBBON GUIDE-SIDE PLATE	
0035	00001.000	EA		0999704-0001	CLAMP, WIRE ROPE	
0036	00001.000	EA		0999732-0001	PRINTHEAD ASSEMBLY,30VOLT	
0037	00002.000	EA		0994199-0001	NUT,PRINTHEAD	
0038	00001.000	EA		0999698-0001	NOSEGUIDE, PRINTHEAD	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE MECHANISM, 10 & 16.5 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM 0999689-0002 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78 — **LIST OF MATERIAL** — PAGE 3 of 5 — PART NUMBER LM 0999689-0002 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0039	00001.000	EA		0999687-0001	RIBBON DRIVE	
0041	00001.000	EA		0999735-0001	CABLE ASSY, PAPER OUT	
0042	00001.000	EA		0999736-0001	CABLE ASSY, CARRIAGE DRIVE	
0044	00001.000	EA		0996169-0001	SWITCH, SENSITIVE	
0044A					S99	
0045	00006.000	EA		0999697-0001	ROLLER, RIBBON	
0046	00001.000	EA		0411059-0169	RIVET-TUBULAR, .680LG, .123NOM SZ, OVAL HD	-MS16535-169
0047	00001.000	EA		0983903-0002	CLIP, CABLE	
0048	00001.000	EA		0999791-0001	CABLE ASSY, PRINTHEAD	
0049	00001.000	EA		0999928-0001	GROUND STRAP, CARRIAGE MOTOR	
0051	00001.000	EA		0416402-4031	RING, RETAINING, EXTERNAL "E"	
0052	00001.000	EA		0411778-0005	RING, RETAINING, EXTERNAL BOWED	WAL - 5139-31
0053	00004.000	EA		0418212-0040	STRAP, TIEDOWN, ADJUSTABLE, PLASTIC	QPL - MS3367-4-9
0054	00002.000	EA		0972988-0018	SCREW 4-40 X .625 PAN HEAD CRES	
0055	00005.000	EA		0972988-0026	SCREW 6-32 X .250 PAN HEAD CRES	
0056	00006.000	EA		0972988-0028	SCREW 6-32 X .375 PAN HEAD CRES	
0057	00002.000	EA		0972988-0031	SCREW 6-32 X .625 PAN HEAD CRES	
0058	00001.000	EA		0999823-0001	CABLE ASSY, GROUND	
0059	00002.000	EA		0972969-0006	SCREW #6-20 X 1/2 LG THD PL HEX WASHER	
0060	00002.000	EA		0972679-0013	SCREW # 6-19 X 1/2 SLOTTED HEX	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: MECHANISM, 10 & 16.5 CPI

APPD MFG. DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM 0999689-0002 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78 — **LIST OF MATERIAL** — PAGE 4 of 5 — PART NUMBER LM 0999689-0002 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0061	00002.000	EA		0972684-0011	SCREW, THREAD FORMING, #6-32	
0062	00002.000	EA		0972684-0013	SCREW, THD FRMG, HEX-WSHR HD, 6-32X.625LG	
0067	00001.000	EA		0996300-0003	SCREW #10-32 MACHINE, PAN HEAD	
0068	00005.000	EA		0972986-0008	SCREW 10-32 .375 PAN HEAD CRES	
0069	00002.000	EA		0972988-0030	SCREW 6-32 X .500 PAN HEAD CRES	
0071	00004.000	EA		0996596-0041	SCREW, CAP, SOCKET HEAD, .500	-SEE DRAWING
0074	00002.000	EA		0416622-0011	WASHER #4 FLAT	QPL - AN960C4L
0075	00002.000	EA		0411104-0135	WASHER, LOCK-SPRING, HELICAL, #4	QPL - MS35338-135
0076	00001.000	EA		0411100-0071	LOCKWASHER #6 INTERNAL TOOTH CRES	QPL - MS35333-71
0077	00005.000	EA		0416622-0013	WASHER #6 FLAT	QPL - AN960C6L
0078	00006.000	EA		0411104-0136	WASHER, LOCK-SPRING, HELICAL, #6	QPL - MS35338-136
0079	00011.000	EA		0411101-0058	LOCKWASHER #6 EXTERNAL TOOTH CRES	QPL - MS35335-58
0080	00001.000	EA		0416622-0033	WASHER #10 FLAT	QPL - AN960C10L
0081	00001.000	EA		0411104-0138	WASHER, LOCK-SPRING, HELICAL, #10	QPL - MS35338-138
0082	00005.000	EA		0411101-0060	LOCKWASHER #10 EXTERNAL TOOTH CRES	--- ----------
0083	00004.000	EA		0411027-0810	WASHER .281 X .065 FLAT CRES	
0084	00004.000	EA		0411104-0139	WASHER, LOCK-SPRING, HELICAL, 1/4	QPL - MS35338-139
0086	00002.000	EA		0411115-0044	NUT, 4-40 HEXAGON CRES STEEL	MS -35649-244
0088	00004.000	EA		0416453-0022	NUT, PLAIN 6-32 UNC-2B HEX CRES, SMALL	QPL - NAS671C6
0090	00001.000	EA		0416453-0024	NUT, #10 HEX SMALL PATTERN	

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE: MECHANISM, 10 & 16.5 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM 0999689-0002 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/10/78 **LIST OF MATERIAL** PAGE 5 of 5

PART NUMBER LM 0999689-0002 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0091	AR	TU		0232334-6050	LUBRICANT SILICONE GRS LT GR 2 OZ TUBE	GE -G-322-L 2 OZ.
0092	AR	EA		0996622-0001	OIL,TURBINE-GRADE 32	059595-TEXACO
0093	00001.000	BX		0232208-7000	LABEL 1X3INS RECTL SELF-ADHESIVE	DEN -4355L
0094	REF	EA		0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						MECHANISM, 10 & 16.5 CPI
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740

PART NUMBER LM 0999689-0002 REV H

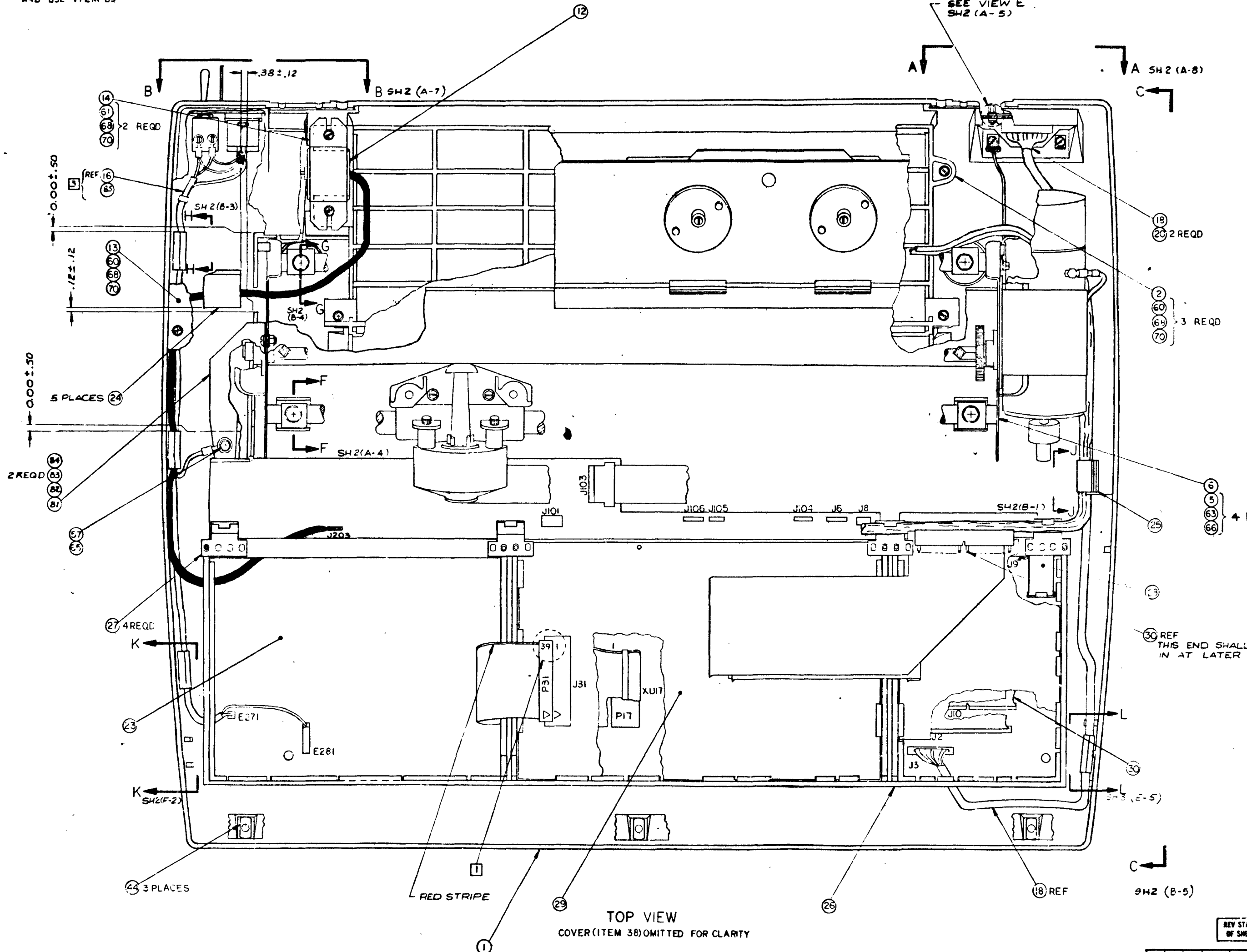
TI 12849

NOTES:

1. PIN NUMBERS ON CABLE CONNECTOR, P31, DO NOT AGREE WITH PIN NUMBERS ON EMULATOR BOARD & ITS CONNECTOR, J31, P31 PIN 39 CONNECTS TO J31 PIN 1.
2. APPLY ADHESIVE (ITEM 80) BETWEEN EDGES OF (ITEM 79) CARD CARRIER SUPPORT AND RIBS ON (ITEM 1) TERMINAL BASE OVER LENGTH INDICATED, USE EPOXY PATCH
3. DISCARD ON/OFF PLATE SUPPLIED WITH ITEM 16 AND USE ITEM 85

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	CN425679 UPDATED LM 9-1-77		
	B	CN425960 UPDATED LM 11-3-77		
	C	CN428727 UPDATED LM 12-8-77 & GENERATED ASSY DWG		
	D	CN 440400 UPDATED LM 5-30-78		
	E	CN439580 UPDATED LM 7-31-78		
	F	CN439530 1) ITEM 47 QTY. WAS 3. ADDED ITEM 79, 80, 81, 82, 83 AND 84 DELETED ITEM 22, QTY 1 P/N 993823-1 2) ADD NOTE 2 3) SH 2 Z (B-5) UPDATED VIEW C-C TO SHOW ITEM 1 AND ITEM 80. ADDED VIEW L-L CUTTING PLANE LINES 4) ADDED NEW SH 3, Z (B-7) ADDED VIEW L-L 5) SH 1 Z (D, E & F-7) REROUTED FAN CABLE. REPOSITION ITEM 24 AND ADDED DIM .12 ± .12		
	G	CN439542 1) L/M ITEM 39 ON PART NOS 999690-0101, 0102, 0201, & 0202 WAS 999740-0001		
	H	CN445351 1) ON LM 101, 102, 201 AND 202 DELETED ITEM 36 QTY 1 PN 999751-1; ITEM 41 QTY 1 PN999754-1; ITEM 45 QTY 3 PN 999757-1; ITEM 47 QTY AR PN972361-6; ITEM 55 PN996797-2 QTY 2 ITEM 64 QTY 2 PN972583-31; ITEM 69 QTY 2 PN 416622-13; ITEM 77 QTY 6 PN 412991-1; 2) ON LM 101-102-201 AND 202 ITEM 38 CHG FROM PN 999707-1 3) ADDED ITEM 85 TO LM 101-102-201 AND 202 QTY 1 PN-999924-1 4) ADDED NOTE 3 5) SH1 Z E-8 & F8 DIM WAS 0.00 ± .25, 6) SH2 Z F-3 SECT K-K DIM WAS 1.50 ± .25 7) SH2 Z B-3 VIEW H-H DIM WAS 1.00 ± .25, 8) ADD SECT L-L SH1 (C-3)	11/28/78	



TOP VIEW
COVER (ITEM 38) OMITTED FOR CLARITY

PART NUMBER	DESCRIPTION
999690-0202	820 TERMINAL, BASIC - 220V, 10/16 CPI
999690-0201	820 TERMINAL, BASIC - 220V, 10 CPI
999690-0102	820 TERMINAL, BASIC - 115V, 10/16 CPI
999690-0101	820 TERMINAL, BASIC - 115V, 10 CPI

REV STATUS OF SHEETS	REV	H	H	
	SH	1	2	3

QTY REQD -2	QTY REQD -1	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

HOLE TOLERANCE

.013 THRU .125 +.004 -.001; .126 THRU .250 +.005 -.001; .251 THRU .500 +.007 -.001; .501 THRU .750 +.008 -.001; .751 THRU 1.000 +.010 -.001; 1.001 THRU 2.000 +.012 -.001

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ±.010 2 PLACE DECIMALS ±.02

MATERIAL

APVD

CONTR

DESIGN ACTIVITY RELEASE

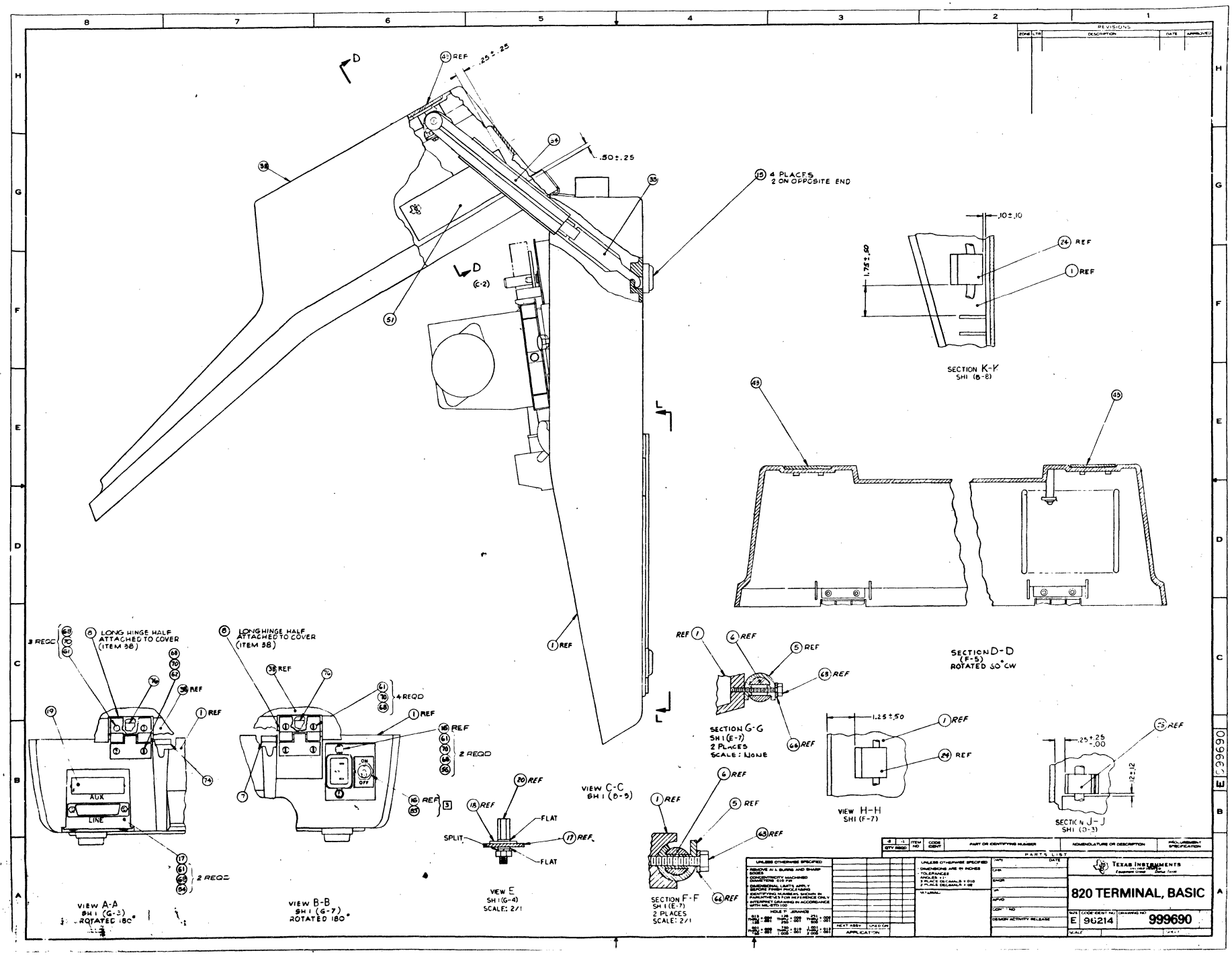
TEXAS INSTRUMENTS INCORPORATED
Equipment Group Dallas Texas

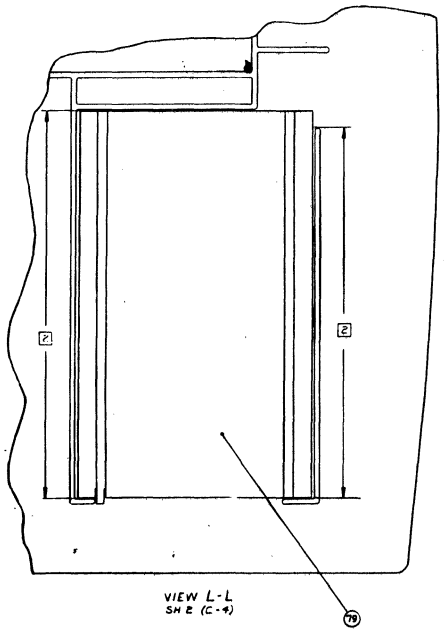
820 TERMINAL, BASIC

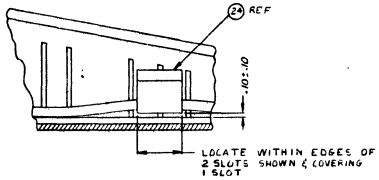
SIZE E | CODE IDENT NO 96214 | DRAWING NO 999690

SCALE 1/1

LM


REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
.25±.25
.50±.25
4 PLACES 2 ON OPPOSITE END
SECTION K-K SH1 (B-8)
SECTION D-D (F-5) ROTATED 90° CW
SECTION G-G SH1 (E-7) 2 PLACES SCALE: NONE
VIEW H-H SH1 (F-7)
SECTION J-J SH1 (D-3)
VIEW A-A SH1 (G-3) ROTATED 180°
VIEW B-B SH1 (G-7) ROTATED 180°
VIEW E SH1 (G-4) SCALE: 2/1
VIEW C-C SH1 (D-5)
SECTION F-F SH1 (E-7) 2 PLACES SCALE: 2/1
LONG HINGE HALF ATTACHED TO COVER (ITEM 38)
LONGHINGE HALF ATTACHED TO COVER (ITEM 38)
AUX
LINE
ON
OFF
SPLIT
FLAT
PARTS LIST
TEXAS INSTRUMENTS
820 TERMINAL, BASIC
CODE IDENT NO 96214
DRAWING NO 999690
SIZE E
SCALE
DESIGN ACTIVITY RELEASE





SECTION L-L
SH 1 (C-3)
(ROTATE 90° CCW)

ITEM NO.	QTY	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

820 TERMINAL, BASIC

E 96214 999690

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78 — **LIST OF MATERIAL** — PAGE 1 of 3 — PART NUMBER LM0999690-0101 — REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999706-0001	BASE, TERMINAL	
0002	00001.000	EA		0999739-0001	COVER, PAPER CHUTE	
0005	00004.000	EA		0999885-0001	SHOCK MOUNT	
0006	00001.000	EA		0999689-0001	MECHANISM, 10 CPI	
0007	00001.000	EA		0999749-0001	NUTPLATE,HINGE-LEFT TERMINAL BASE	
0008	00002.000	EA		0999741-0001	HINGE, TERMINAL COVER	
0012	00001.000	EA		0999819-0001	FAN ASSEMBLY	
0013	00001.000	EA		0999720-0001	PLENUM, FAN	
0014	00001.000	EA		0983863-0001	BRACKET,FAN MOTOR	
0015	00004.000	EA		0994435-0001	FOOT MODIFIED	
0016	00001.000	EA		0999835-0001	CABLE ASSY, POWER DISTRIBUTION	
0017	00001.000	EA		0999743-0001	PANEL, EIA CABLE	
0018	00001.000	EA		0999742-0001	CABLE ASSEMBLY, EIA (INTERNAL)	
0019	00001.000	EA		0999781-0001	COVER, EIA CABLE PANEL	
0020	00002.000	EA		0808129-0001	CONNECTOR,ELECT SCREW-LOCK ASSY FEMALE	081349-M24308/26-1
0023	00001.000	EA		0999820-0101	TERMINAL ELECTRONICS W/GND PLANE-115V	
0024	00005.000	EA		0996086-0001	CLIP,NYLON,FLAT CABLE,MOUNTING	WEK - FCA-15
0025	00001.000	EA		0996729-0001	CLIP,RETAINING,ADHESIVE BACKED	034785-022-0500
0026	00001.000	EA		0999744-0001	CARD FRAME, KEYBOARD/OPTION	
0027	00004.000	EA		0999745-0001	KEEPER, CARD FRAME	

DRAFTSMAN C. Adams DATE 11-22-78 — CKD DRAFTSMAN — DATE — DESIGN ENGINEER — DATE — TITLE: 820 TERMINAL,BASIC-115V,10CPI

APPD MFG. — DATE — APPD PROJECT ENGINEER — DATE — RELEASED — DATE — PROJECT NO 8740 — PART NUMBER LM0999690-0101 — REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78 — **LIST OF MATERIAL** — PAGE 2 of 3 — PART NUMBER LM0999690-0101 — REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0028	00001.000	EA		0999907-0001	KIT,BATTERY PACKAGE	
0029	00001.000	EA		0999903-0001	KIT,EMULATOR-DECREMENTER	
0033	00001.000	FA		0996774-0002	CABLE,ELEC,8.50LG FLAT,FLEXIBLE	000779-88769-1
0034	00001.000	EA		0999749-0001	STAY, EXTERNAL	
0035	00001.000	EA		0999750-0001	STAY, INTERNAL	
0038	00001.000	EA		0999918-0001	COVER ASSY	
0043	00002.000	EA		0999762-0001	COVER, FALSE-ASR TERMINAL	
0044	00003.000	EA		0999756-0001	STRIKE, COVER	
0051	00001.000	EA		0999833-0001	IDENTIFICATION KIT	
0054	00002.000	EA		0972734-0001	TERMINAL,ELECTRICAL,TAB-.250 INCH	AMP --42117-2
0055	00002.000	EA		0411115-0064	NUT,4-40 HEXAGON CRES STEEL	MS -35649-244
0057	00001.000	EA		0411115-0084	NUT,PLAIN 8-32 UNC-2B HEX CRES	OPL - MS35649-284
0060	00004.000	EA		0972988-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0061	00013.000	EA		0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0062	00001.000	EA		0972988-0019	SCREW 4-40 X .625 PAN HEAD CRES	
0063	00004.000	EA		2210071-0024	SCREW,8-32 X 1" MACHINE,HEX HEAD	
0065	00001.000	EA		0411101-0059	LOCKWASHER # 8 EXTERNAL TOOTH CRES	OPL - MS35335-59
0066	00004.000	EA		0416622-0024	WASHER #8 FLAT	OPL - AN960C8L
0068	00018.000	EA		0411104-0135	WASHER, LOCK-SPRING, HELICAL, #4	OPL - MS35338-135
0070	00016.000	EA		0416622-0011	WASHER #4 FLAT	OPL - AN960C4L

DRAFTSMAN — DATE — CKD DRAFTSMAN — DATE — DESIGN ENGINEER — DATE — TITLE: 820 TERMINAL,BASIC-115V,10CPI

APPD MFG — DATE — APPD PROJECT ENGINEER — DATE — RELEASED — DATE — PROJECT NO — PART NUMBER LM0999690-0101 — REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78 **LIST OF MATERIAL** PAGE 3 of 3

PART NUMBER LM0999690-0101 REV M

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0074	00001.000	EA		0999792-0001	NUTPLATE,HINGE-RH TERMINAL BASE	
0076	01002.000	EA		0999793-0031	NUTPLATE,HINGE- TERMINAL COVER	
0078	REF	EA		0999833-9901	INTERCONNECTION DIAG 820 KSR	
0079	00001.000	EA		0999848-0001	SUPPORT, CARD CARRIER	
0080	AR	EA		0417630-0001	ADHESIVE,EPOXY 0151	HYS -EPOXI-PATCH KI
0081	00001.000	EA		0999927-0001	GROUND STRAP MECHANISM	
0082	00001.000	EA		0972988-0026	SCREW 6-32 X .250 PAN HEAD CRES	
0083	00002.000	EA		0411101-0058	LOCKWASHER #6 EXTERNAL TOOTH CRES	OPL - MS35335-58
0084	00001.000	EA		0411115-0064	NUT,PLAIN 6-32 UNC-2B HEX CRES	OPL - MS35649-264
0085	00001.000	EA		0999924-0001	SWITCH GUARD	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE 820 TERMINAL,BASIC-115V,10CPI		
APPD MFG.	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO	PART NUMBER LM0999690-0101	REV M

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/21/78 **LIST OF MATERIAL** PAGE 1 of 3

PART NUMBER LM0999690-0102 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999705-0001	BASE, TERMINAL	
0002	00001.000	EA		0999739-0001	COVER, PAPER CHUTE	
0005	00004.000	EA		0999885-0001	SHOCK MOUNT	
0006	00001.000	EA		0999689-0002	MECHANISM, 10 & 16.5 CPI	
0007	00001.000	EA		0999740-0001	NUTPLATE,HINGE-LEFT TERMINAL BASE	
0008	00002.000	EA		0999741-0001	HINGE, TERMINAL COVER	
0012	00001.000	EA		0999819-0001	FAN ASSEMBLY	
0013	00001.000	EA		0999720-0001	PLENUM, FAN	
0014	00001.000	EA		0983863-0001	BRACKET,FAN MOTOR	
0015	00004.000	EA		0994635-0001	FOOT MODIFIED	
0016	00001.000	EA		0999835-0001	CABLE ASSY, POWER DISTRIBUTION	
0017	00001.000	EA		0999743-0001	PANEL, EIA CABLE	
0018	00001.000	EA		0999742-0001	CABLE ASSEMBLY, EIA (INTERNAL)	
0019	00001.000	EA		0999781-0001	COVER, EIA CABLE PANEL	
0020	00002.000	EA		0808129-0001	CONNECTOR,ELECT SCREW-LOCK ASSY FEMALE	081369-M24308/24-1
0023	00001.000	EA		0999820-0101	TERMINAL ELECTRONICS W/GND PLANE-115V	
0024	00005.000	EA		0996086-0001	CLIP,NYLON,FLAT CABLE,MOUNTING	WEK - ECA-15
0025	00001.000	EA		0996729-0001	CLIP,RETAINING,ADHESIVE BACKED	034785-022-0500
0026	00001.000	EA		0999744-0001	CARD FRAME, KEYBOARD/OPTION	
0027	00006.000	EA		0999745-0001	KEEPER, CARD FRAME	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
C. Dan	11-22-78					820 TERMINAL,BASIC-115V,10/16CPI
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO 8740

PART NUMBER LM0999690-0102 REV H

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/21/78 **LIST OF MATERIAL** PAGE 2 of 3

PART NUMBER LM0999690-0102 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0028	00001.000	EA		0999907-0001	KIT,BATTERY PACKAGE	
0029	00001.000	EA		0999903-0001	KIT,EMULATOR-DECREMENTER	
0033	00001.000	EA		0996774-0002	CABLE,ELEC,8.50LG FLAT,FLEXIBLE	000779-88769-1
0034	00001.000	EA		0999749-0001	STAY, EXTERNAL	
0035	00001.000	EA		0999750-0001	STAY, INTERNAL	
0038	00001.000	EA		0999918-0001	COVER ASSY	
0043	00002.000	EA		0999762-0001	COVER, FALSE-ASR TERMINAL	
0044	00003.000	EA		0999736-0001	STRIKE, COVER	
0051	00001.000	EA		0999833-0001	IDENTIFICATION KIT	
0054	00002.000	EA		0972734-0001	TERMINAL,ELECTRICAL,TAB-.250 INCH	AMP --62117-2
0056	00002.000	EA		0411115-0044	NUT,4-40 HEXAGON CRES STEEL	MS -35649-244
0057	00001.000	EA		0411115-0084	NUT,PLAIN 8-32 UNC-2B HEX CRES	OPL - MS35649-284
0059	00006.000	EA		0972988-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0061	00013.000	EA		0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0062	00001.000	EA		0972988-0018	SCREW 4-40 X .625 PAN HEAD CRES	
0063	00004.000	EA		2210071-0024	SCREW,8-32 X 1" MACHINE,HEX HEAD	
0065	00001.000	EA		0411101-0059	LOCKWASHER # 8 EXTERNAL TOOTH CRES	OPL - MS35335-59
0066	00006.000	EA		0416622-0024	WASHER #8 FLAT	OPL - AN960C8L
0068	00019.000	EA		0411104-0135	WASHER, LOCK-SPRING, HELICAL, #4	OPL - MS35338-135
0070	00016.000	EA		0416622-0011	WASHER #4 FLAT	OPL - AN960C4L

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						820 TERMINAL,BASIC-115V,10/16CPI
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO

PART NUMBER LM0999690-0102 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78 **LIST OF MATERIAL** PAGE 3 of 3

PART NO. REF LM0999690-0102 REV H

REF ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0074	00001.000	EA		0999792-0001	NUTPLATE,HINGE-RH TERMINAL BASE	
0075	00002.000	EA		0999793-0001	NUTPLATE,HINGE- TERMINAL COVER	
0078	REF	EA		0999833-9901	INTERCONNECTION DIAG 820 KSR	
0079	00001.000	EA		0999848-0001	SUPPORT, CARD CARRIER	
0080	AR	EA		0417630-0001	ADHESIVE,EPOXY 0151	HYS -EPOXI-PATCH KI
0081	00001.000	EA		0999927-0001	GROUND STRAP MECHANISM	
0082	00001.000	EA		0972988-0026	SCREW 6-32 X .750 PAN HEAD CRES	
0083	00002.000	EA		0411101-0058	LOCKWASHER #6 EXTERNAL TOOTH CRES	OPL - MS35335-58
0084	00001.000	EA		0411115-0064	NUT,PLAIN 6-32 UNC-2B HEX CRES	OPL - MS35649-264
0085	00001.000	EA		0999924-0001	SWITCH GUARD	

DRAFTSMAN	DATE	CFD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						820 TERMINAL,BASIC-115V,10/165CPI
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO
						LM0999690-0102 H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78 **LIST OF MATERIAL** PAGE 1 of 3

PART NUMBER LM0999690-0201 H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999706-0001	BASE, TERMINAL	
0002	00001.000	EA		0999739-0001	COVER, PAPER CHUTE	
0005	00004.000	EA		0999885-0001	SHOCK MOUNT	
0006	00001.000	EA		0999689-0001	MECHANISM, 10 CPI	
0007	00001.000	EA		0999740-0001	NUTPLATE,HINGE-LEFT TERMINAL BASE	
0008	00002.000	EA		0999741-0001	HINGE, TERMINAL COVER	
0012	00001.000	EA		0999819-0001	FAN ASSEMBLY	
0013	00001.000	EA		0999720-0001	PLENUM, FAN	
0014	00001.000	EA		0983863-0001	BRACKET,FAN MOTOR	
0015	00004.000	EA		0994635-0001	FOOT MODIFIED	
0016	00001.000	EA		0999884-0001	CABLE ASSY, POWER	
0017	00001.000	EA		0999743-0001	PANEL, EIA CABLE	
0018	00001.000	EA		0999742-0001	CABLE ASSEMBLY, EIA (INTERNAL)	
0019	00001.000	EA		0999781-0001	COVER, EIA CABLE PANEL	
0020	00002.000	EA		0808129-0001	CONNECTOR,ELECT SCREW-LOCK ASSY FEMALE	DP1349-M24308/26-1
0023	00001.000	EA		0999820-0201	TERMINAL ELECTRONICS W/GND PLANE-230V	
0024	00005.000	EA		0996086-0001	CLIP,NYLON,FLAT CABLE,MOUNTING	WEK - FCA-15
0025	00001.000	EA		0996729-0001	CLIP,RETAINING,ADHESIVE BACKED	034795-022-0500
0026	00001.000	EA		0999744-0001	CARD FRAME, KEYBOARD/OPTION	
0027	00004.000	EA		0999745-0001	KEEPER, CARD FRAME	

DRAFTSMAN C Evans DATE 11-22-78 | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE 820 TERMINAL,BASIC-220V,10 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | PART NUMBER LM0999690-0201 H

T.I. 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78 **LIST OF MATERIAL** PAGE 2 of 3

PART NUMBER LM0999690-0201 H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0028	00001.000	EA		0999907-0001	KIT,BATTERY PACKAGE	
0029	00001.000	EA		0999903-0001	KIT,EMULATOR-DECREMENTER	
0030	00001.000	EA		0996774-0002	CABLE,ELEC,A.50LG FLAT,FLEXIBLE	000779-88769-1
0034	00001.000	EA		0999749-0001	STAY, EXTERNAL	
0035	00001.000	EA		0999750-0001	STAY, INTERNAL	
0038	00001.000	EA		0999918-0001	COVER ASSY	
0043	00002.000	EA		0999762-0001	COVER, FALSE-ASR TERMINAL	
0044	00003.000	EA		0999756-0001	STRIKE, COVER	
0051	00001.000	EA		0999833-0001	IDENTIFICATION KIT	
0054	00002.000	EA		0972734-0001	TERMINAL,ELECTRICAL,TAB-.250 INCH	AMP --42117-2
0055	00002.000	EA		0411115-0044	NUT,4-40 HEXAGON CRES STEEL	MS -35649-244
0057	00001.000	EA		0411115-0084	NUT,PLAIN 8-32 JNC-28 HEX CRES	OPL - MS35649-284
0060	00004.000	EA		0972988-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0061	00013.000	EA		0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0062	00001.000	EA		0972988-0018	SCREW 4-40 X .625 PAN HEAD CRES	
0063	00004.000	EA		2210071-0024	SCREW,8-32 X 1" MACHINE,HEX HEAD	
0065	00001.000	EA		0411101-0059	LOCKWASHER # 8 EXTERNAL TOOTH CRES	OPL - MS35335-59
0066	00004.000	EA		0416622-0024	WASHER #8 FLAT	OPL - AN960C8
0068	00018.000	EA		0411104-0135	WASHER, LOCK-SPRING, HELICAL, #4	OPL - MS35338-135
0072	00016.000	EA		0416622-0011	WASHER #4 FLAT	OPL - AN960C4L

DRAFTSMAN DATE | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE 820 TERMINAL,BASIC-220V,10 CPI

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO | PART NUMBER LM0999690-0201 H

T.I. 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78 **LIST OF MATERIAL** PAGE 3 of 3

PART NUMBER LM0999690-0201 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0074	00001.000	EA		0999792-0001	MUTPLATE,HINGE-RH TERMINAL BASE	
0075	00002.000	EA		0999791-0001	MUTPLATE,HINGE- TERMINAL COVER	
0078	REF	EA		0999833-9901	INTERCONNECTION DIAG 820 KSR	
0079	00001.000	EA		0999848-0001	SUPPORT, CARD CARRIER	
0080	AR	EA		0417630-0001	ADHESIVE,EPOXY 0151	HYS -EPOXI-PATCH K1
0081	00001.000	EA		0999927-9001	GROUND STRAP MECHANISM	
0082	00001.000	EA		0972988-0026	SCREW 6-32 X .250 PAN HEAD CRES	
0083	00002.000	EA		0411101-0058	LOCKWASHER #6 EXTERNAL TOOTH CRES	OPL - MS35335-58
0084	00001.000	EA		0411115-0064	NUT,PLAIN 6-32 UNC-2B HEX CRES	OPL - MS35649-264
0085	00001.000	EA		0999924-0001	SWITCH GUARD	

DRAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE 820 TERMINAL,BASIC-220V,10 CPI	
APPD MFG DATE	APPD PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO	PART NUMBER LM0999690-0201 REV H

T.I. 12849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/21/78 — **LIST OF MATERIAL** — PAGE 1 of 3 — PART NUMBER LM0999690-0202 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999706-0001	BASE, TERMINAL	
0002	00001.000	EA		0999739-0001	COVER, PAPER CHUTE	
0005	00004.000	EA		0999885-0001	SHOCK MOUNT	
0006	00001.000	EA		0999689-0002	MECHANISM, 10 & 16.5 CPI	
0007	00001.000	EA		0999740-0001	NUTPLATE,HINGE-LEFT TERMINAL BASE	
0008	00002.000	EA		0999741-0001	HINGE, TERMINAL COVER	
0012	00001.000	EA		0999810-0001	FAN ASSEMBLY	
0013	00001.000	EA		0999720-0001	PLENUM, FAN	
0014	00001.000	EA		0983863-0001	BRACKET,FAN MOTOR	
0015	00004.000	EA		0994435-0001	FOOT MODIFIED	
0016	00001.000	EA		0999884-0001	CABLE ASSY, POWER	
0017	00001.000	EA		0999743-0001	PANEL, EIA CABLE	
0018	00001.000	EA		0999742-0001	CABLE ASSEMBLY, EIA (INTERNAL)	
0019	00001.000	EA		0999781-0001	COVER, EIA CABLE PANEL	
0020	00002.000	EA		0808129-0001	CONNECTOR,ELECT SCREW-LOCK ASSY FEMALE	081349-426338/25-1
0023	00001.000	EA		0999820-0201	TERMINAL ELECTRONICS W/GND PLANE-230V	
0024	00005.000	EA		0996086-0001	CLIP,NYLON,FLAT CABLE,MOUNTING	WEK - FCA-15
0025	00001.000	EA		0995729-0001	CLIP,RETAINING,ADHESIVE BACKED	034785-022-0500
0026	00001.000	EA		0999744-0001	CARD FRAME, KEYBOARD/OPTION	
0027	00004.000	EA		0999745-0001	KEEPER, CARD FRAME	

DRAFTSMAN C. Evans DATE 11-22-78 — CKD DRAFTSMAN — DATE — DESIGN ENGINEER — DATE — TITLE: 820 TERMINAL,BASIC-220V,10/16 CPI

APPD MFG — DATE — APPD PROJECT ENGINEER — DATE — RELEASED — DATE — PROJECT NO 8740 — PART NUMBER LM0999690-0202 REV H

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/21/78 — **LIST OF MATERIAL** — PAGE 2 of 3 — PART NUMBER LM0999690-0202 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0029	00001.000	EA		0999907-0001	KIT,BATTERY PACKAGE	
0029	00001.000	EA		0999903-0001	KIT,EMULATOR-DECREMENTER	
0033	00001.000	EA		0996774-0002	CABLE,ELEC,8.50LG FLAT,FLEXIBLE	009779-88769-1
0034	00001.000	EA		0999749-0001	STAY, EXTERNAL	
0035	00001.000	EA		0999750-0001	STAY, INTERNAL	
0038	00001.000	EA		0999918-0001	COVER ASSY	
0043	00002.000	EA		0999762-0001	COVER, FALSE-ASR TERMINAL	
0044	00003.000	EA		0999756-0001	STRIKE, COVER	
0051	00001.000	EA		0999933-0001	IDENTIFICATION KIT	
0054	00032.000	EA		0972734-0001	TERMINAL,ELECTRICAL,TAB-.250 INCH	AMP --42117-2
0056	00002.000	EA		0411115-0044	NUT,4-40 HEXAGON CRES STEEL	MS -35649-244
0057	00001.000	EA		0411115-0084	NUT,PLAIN 8-32 UNC-2B HEX CRES	OPL - MS35649-284
0060	00006.000	EA		0972988-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0061	00013.000	EA		0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0062	00001.000	EA		0972988-0019	SCREW 4-40 X .750 PA, HEAD CRES	
0063	00004.000	EA		2210071-0024	SCREW,6-32 X 1" MACHINE,HEX HEAD	
0065	00001.000	EA		0411101-0059	LOCKWASHER # 8 EXTERNAL TOOTH CRES	OPL - MS35335-59
0066	00004.000	EA		0416622-0024	WASHER #8 FLAT	OPL - AN960C8L
0068	00013.000	EA		0411104-0135	WASHER, LOCK-SPRING, HELICAL, #4	OPL - MS35338-135
0070	00016.000	EA		0416622-0011	WASHER #4 FLAT	OPL - AN960C4L

DRAFTSMAN — DATE — CKD DRAFTSMAN — DATE — DESIGN ENGINEER — DATE — TITLE: 820 TERMINAL,BASIC-220V,10/16 CPI

APPD MFG — DATE — APPD PROJECT ENGINEER — DATE — RELEASED — DATE — PROJECT NO — PART NUMBER LM0999690-0202 REV H

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 11/21/78

LIST OF MATERIAL

PART NUMBER LM 0999690-0202 REV H

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0074	00001.000	EA		0999792-0001	NUTPLATE,HINGE-RH TERMINAL BASE	
0075	00002.000	EA		0999793-0001	NUTPLATE,HINGE- TERMINAL COVER	
0078	REF	EA		0999833-9901	INTERCONNECTION DIAG 820 KSR	
0079	00001.000	EA		0999848-0001	SUPPORT, CARD CARRIER	
0080	AR	EA		0417630-0001	ADHESIVE,EPOXY 0151	HYS -EPOXI-PATCH KI
0081	00001.000	EA		0999927-0001	GROUND STRAP MECHANISM	
0082	00001.000	EA		0972988-0026	SCREW 6-32 X .250 PAN HEAD CRES	
0083	00002.000	EA		0411101-0058	LOCKWASHER #6 EXTERNAL TOOTH CRES	OPL - MS35335-58
0084	00001.000	EA		0411115-0064	NUT,PLAIN 6-32 UNC-2B HEX CRES	OPL - MS35649-264
0085	00001.000	EA		0999924-0001	SWITCH GUARD	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE 820 TERMINAL,BASIC-220V,10/16 CPI	
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO	PART NUMBER LM 0999690-0202 REV H

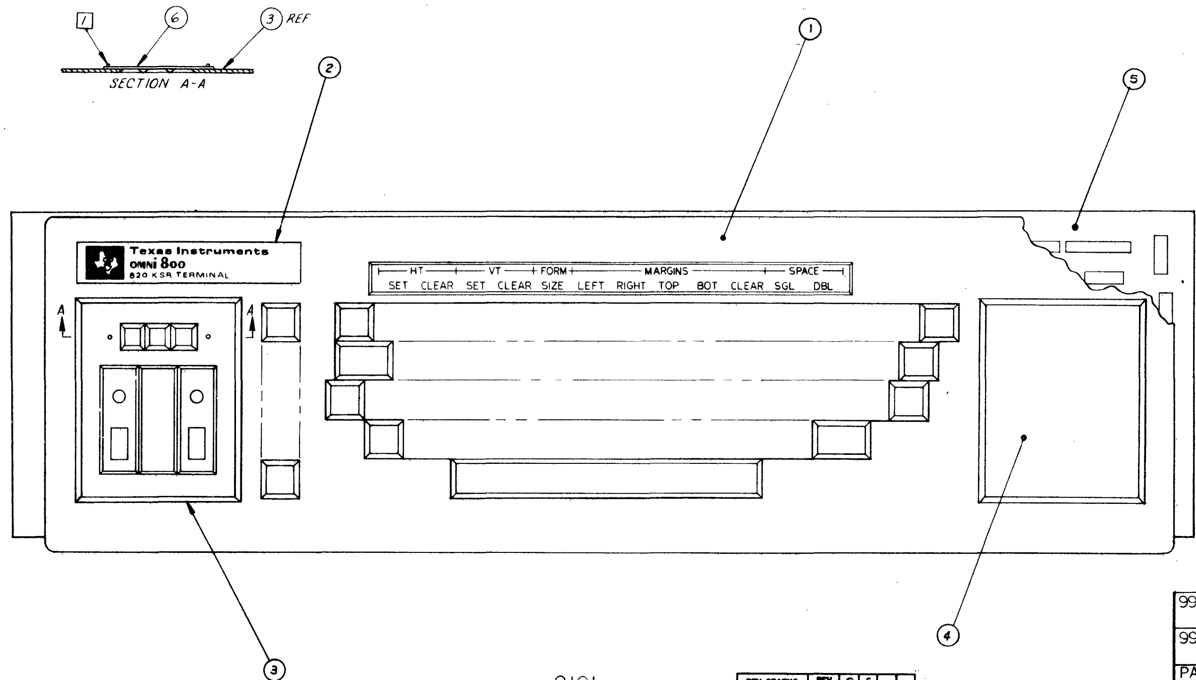
TI 13849

DWG NO 999691 SH 1

REV	DESCRIPTION	DATE	APPROVED
A	CN 440308 7/1/78 D. STARNES LM UP DATE	7/8/78	D. STARNES
B	CN 439870	8/26/78	D. Starnes

1. LM UPDATE ITEM 6 ADDED 2. 1C-8 & 2C-8 ADDED SECTION A-A 3. ADDED NOTE [1]

NOTES: UNLESS OTHERWISE SPECIFIED.
[1] INSTALL ITEM 6 TO ITEM 3 BY HEAT SWAGING POST - 2 PLACES



-0101

REV STATUS OF SHEETS	REV	B	B		
	SH	1	2		

PART NUMBER	DESCRIPTION
999691-0102	KEYBOARD ASSY, FULL ASCII W/NUMERIC PAD
999691-0101	KEYBOARD ASSY, FULL ASCII

QTY (-1)	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999683	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
  3 PLACE DECIMALS ± 010
  2 PLACE DECIMALS ± 02
- INTERPRET DRAWING PER MIL D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS 010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

013 THRU 125: +004 -001	126 THRU 250: +005 -001	251 THRU 500: +006 -001
501 THRU 750: +008 -001	751 THRU 1 000: +010 -001	1 001 THRU 2 000: +012 -001

DWN Arthur L. Clark DATE 12-16-77
CHK Mike Wolf 3/30/78
ENGR 7/8/78
APVD Jim Davis 7/8/78
QA Bill Cushman 7/8/78
CONTR 7/8/78
RLSE 7-8-78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

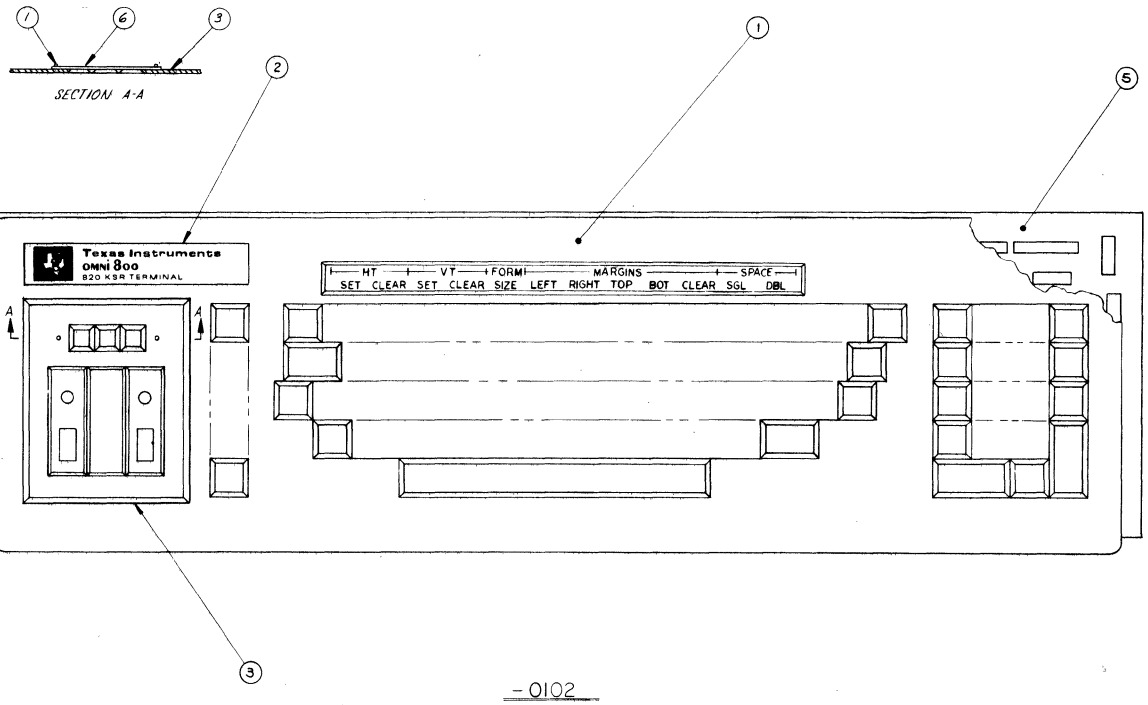
KIT, KEYBOARD ASSY, FULL ASCII

SIZE D FSCM NO 96214 DRAWING NO 999691 FILMED
SCALE 1/1 SHEET 1 OF 2

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS			CLASSIFICATION	

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

LM



-0102

DWG NO 999691 SH 2
TEXAS INSTRUMENTS
DATE 12-16-77
SIZE D PSCM NO 96214
DRAWING NO 999691 REV B
SCALE 1/1
SHEET 2

TEXAS INSTRUMENTS
INCORPORATED

DATE 08/01/78

LIST OF MATERIAL

PAGE 1 of 1

PART NUMBER LM 0999691-0101 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999766-0001	BEZEL, KEYBOARD	
0002	00001.000	EA		0999758-0001	NAMEPLATE, 820 TERMINAL	
0003	00001.000	EA		0999767-0002	PLATE, KEYBOARD, US ASCII	
0004	00001.000	EA		0999767-0001	PLATE, KEYBOARD, BLANK	
0005	00001.000	EA		0999712-0101	KYBD, 820 KSR- STD ASCII	
0006	00001.000	EA		0999733-0001	FILTER, KEYBOARD PLATE	

DRAFTSMAN Wilbur Clark DATE 8/3/78 | CKD DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE KIT,KYBD ASSY, FULL ASCII

APPD MFG DATE | APPD PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO 8740 | FILMED | PART NUMBER LM 0999691-0101 REV B

TI 13849

TEXAS INSTRUMENTS
INCORPORATED

DATE 08/01/78

LIST OF MATERIAL

PAGE 1 of /

PART NUMBER LM 0999691-0102 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0999766-0001	BEZEL, KEYBOARD	
0002	00001.000	EA		0999758-0001	NAMEPLATE, 820 TERMINAL	
0003	00001.000	EA		0999767-0002	PLATE, KEYBOARD, US ASCII	
0005	00001.000	EA		0999712-0102	KYBD,820KSR,STD. ASCII,W/NUM CLST OPTION	
0006	00001.000	EA		0999733-0001	FILTER, KEYBOARD PLATE	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						KIT,KYBD ASSY,FULL ASCII W/NUMERIC PAD
APPD MFG	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO
						FILMED

PART NUMBER LM 0999691-0102 REV B

TI 13849

DWG NO 999694 SH 1

NOTES: UNLESS OTHERWISE SPECIFIED:

1. MOUNT DISC (ITEM 232) CONCENTRICALLY TO SUPPORT (ITEM 233) USING SILICONE RTV (ITEM 262)
2. MARK SITE/DATE CODE ON ASSEMBLY IN LOCATION INDICATED PER 994396 PARAGRAPH 4.0 AND PROCESS 1
3. MARK APPROPRIATE DASH NUMBER AND REVISION LETTER PER PROCESS 1
4. INSTALL SELF-CLINCHING STUDS (ITEM 269) BEFORE PROCESS 2
5. R124 IS TO BE SELECTED TO A TOLERANCE OF +.5% -.2% AND MARKED WITH A YELLOW DOT
6. ▨ INDICATES COMPONENTS NOT USED
7. ORIENTATE BOTH CONNECTORS (ITEM 245) USING VENDOR IDENTIFICATION MOLDED INTO PART AND POSITION AS SHOWN
8. ITEM 252 MAY BE SUBSTITUTED FOR ITEM 251 FOR REWORK NEED ONLY
9. INSTALL TEST JUMPER PLUGS (ITEM 254) AFTER ASSEMBLY FINAL TEST (E264 & E265)(E262 & E263)(E205 & E206)(E209 & E210)(E211 & E212)(E213 & E214)(E215 & E216)(E217 & E218)(E219 & E220)(E10 & E11)(E12 & E13)(E30 & E31)(E32 & E33)
10. INSTALL TEST SOCKET (ITEM 226) FROM CONDUCTOR SIDE OF BOARD
11. SEE VIEW L SH6 (C-2) FOR SINGLE TRANSISTOR TO HEATSINK HARDWARE STACK DETAIL AND VIEW M SH6 (A-2) FOR DOUBLE TRANSISTOR TO HEATSINK HARDWARE STACK DETAIL
12. TORQUE TO BE 3.5 ±.5 IN-LBS
13. APPLY THERMAL COMPOUND (ITEM 264) BETWEEN NETWORK (ITEM 44) AND HEATSINK (ITEM 260)(3 PLACES) AFTER PROCESS 2 AND RETORQUE HARDWARE
14. RESISTOR (ITEM 154) OMITTED FROM PLAN VIEW FOR CLARITY
15. SECURE TOROID (ITEM 99) AND COMPLETE ELECTRICAL CONNECTIONS USING BUS WIRE (ITEM 287) BETWEEN TERMINALS E250 TO E251, E252 TO E253, E254 TO E255, E256 TO E257, E258 TO E259 AND E260 TO E261
16. FOR 115 VOLT ASSEMBLY (-0101) CONNECT E275 TO E276 AND E279 TO E280 USING BUS WIRE (ITEM 287). FOR 230 VOLT ASSEMBLY (-0201) CONNECT E273 TO E274, E277 TO E278 AND E285 TO E286 USING BUS WIRE (ITEM 287).
17. ITEMS 144, 155, 156, 187, 191 AND 193 TO BE INSTALLED WITH A CLEARANCE OF .020 (MIN) AND .120 (MAX) BETWEEN COMPONENT BODY AND PWB (ITEM 1)
18. MAX LEAD LENGTH BELOW SURFACE OF BOARD .07
19. TIGHTEN TRANSISTOR MOUNTING HARDWARE ON HEATSINKS (ITEMS 257, 258 & 259) TO 2.0 ±.5 IN-LBS AND OTHER HARDWARE ON HEATSINKS TO 6.0 ±.5 IN-LBS
20. SOLDER GROUND WIRES (ITEMS 248 & 249) TO PWB PER PROCESS 3 AND REF DESIGNATOR INDICATED
21. SECURE CAPACITORS (ITEMS 209, 221, 224 & 225) TO PWB WITH A 1-INCH MINIMUM BEAD OF RTV (ITEM 262) ALONG EACH ACCESSABLE SIDE AND BETWEEN ADJACENT CAPACITORS
22. INSTALL SIG/CHASSIS GND OPTION CABLE (ITEM 250) BETWEEN E221 AND E222 AFTER PROCESS 2 [REF ONLY: CUSTOMER COMMUNICATIONS OPTION CONNECTION (SIG GND TO PROTECTIVE GND - E221 TO E223)]

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
L	CN439854 6/15/78 LM UP DATE D STARNES	[illegible]	[illegible]
M	CN440307 6/22/78 LM UP DATE D STARNES	[illegible]	[illegible]
N	CN439858 6/22/78 LM UP DATE D STARNES	6/22/78	[illegible]
P	CN 439857 6/26/78 LM UP DATE	6/26/78	[illegible]
R	CN 439877 6/27/78 LM UP DATE	6/27/78	[illegible]
T	CN439869 ARTHUR CLARK 1. UPDATED REV LEVEL BLOCK 2. DIM. .05 +.07 -.00 WAS .05 MIN IN VIEWS C-C (SH3), G-G (SH5) & H-H (SH6)	7/29/78	[signature]
U	CN439509 PAT EDWARDS (1) ITEM 216 WAS 0972926-0020, -0101 & -0201 LM	8-18-78	[signature]
V	CN439507 Pat Edwards 1.) ITEM 16 WAS PN 972666-1; 2.) ITEM 28 WAS PN 972464-2; 3.) ITEM 87A ADD Q254; 4.) ITEM 128 QTY WAS 1, 128A ADDED R217; 5.) ITEM 165A & B DELETED R217, ADDED R230; 6.) ITEM 228 QTY WAS 2, 228A ADDED XU40 & XU50.	11-22-78	[signature]

PART NUMBER	DESCRIPTION	REMARKS
999694-0201	TERMINAL ELECTRONICS, 230VCLT	EUROPEAN
999694-0101	TERMINAL ELECTRONICS, 115VOLT	DOMESTIC

REV STATUS OF SHEETS	REV	V	V	T	R	T	T
	SH	1	2	3	4	5	6

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

SEQ NO	IDENT	PROCESS	NO.	ADDITIONAL CLASSIFICATION
3	SLDR	127-02	CC	
2	SLDR	124-02	CC	
1	MARK	10-02	2	HEIGHT: .06; COLOR: BLACK

PROCESSES — FOR CORRELATION TO GOVT-IND SPECIFICATIONS SEE TI DRAWING 721457

NOTES: 20, 4, 2, 3 — REVISION LEVEL

PWB 999693	C	C	D	E
SCHEMATIC 999692	*	*	C	D
ASSEMBLY 999694	R	T	U	V

NEXT ASSY	USED ON
999820	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1° 3 PLACE DECIMALS ±.010 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE: .013 THRU .125 +.004 -.001; .126 THRU .250 +.005 -.001; .251 THRU .500 +.005 -.001; .501 THRU .750 +.008 -.001; .751 THRU 1.000 +.010 -.001; 1.001 THRU 2.000 +.012 -.001

DRAWN 6/15/78 · CHECKED 6/21/78 · 11/3/78 · 7-8-78

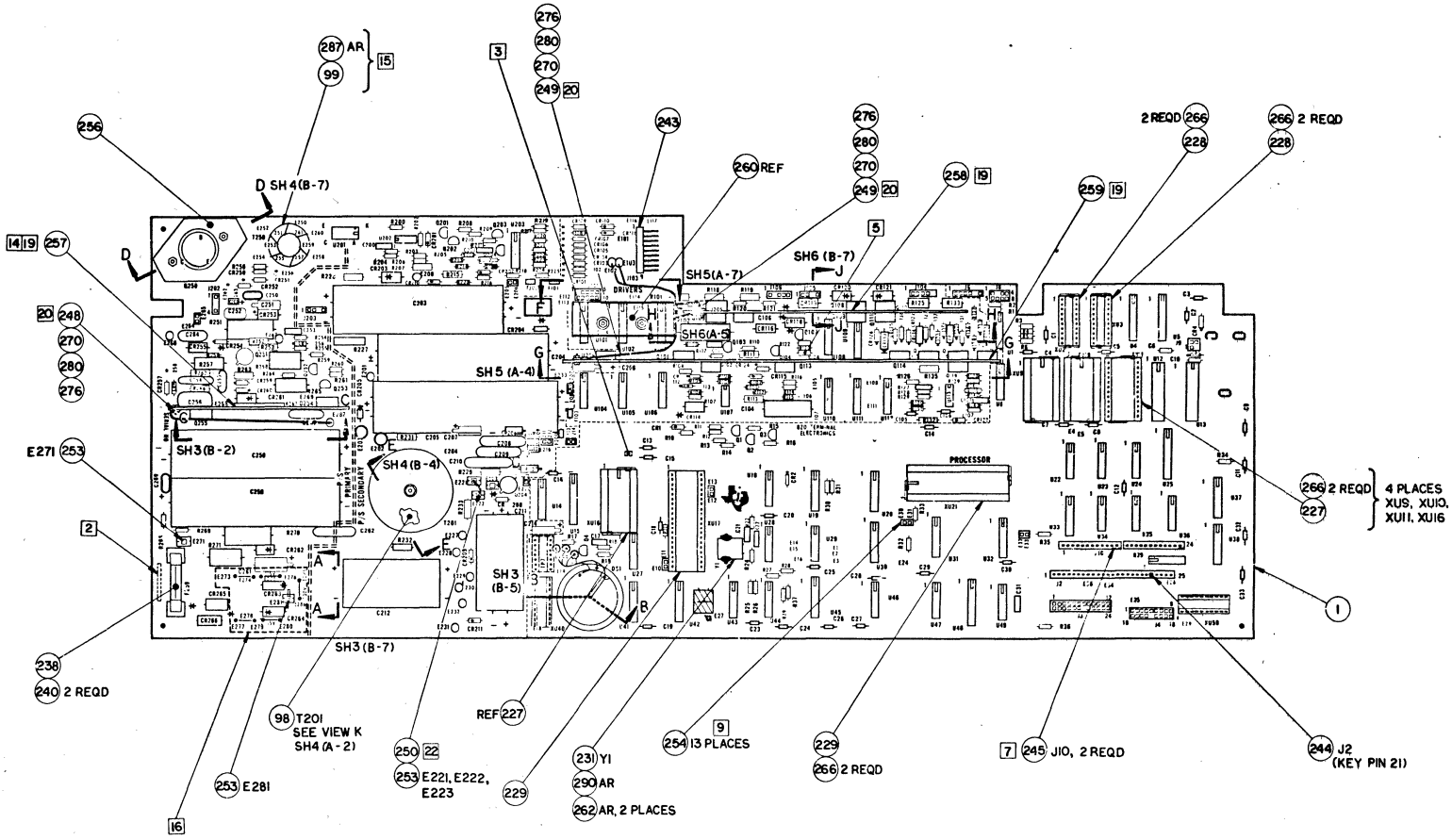
TEXAS INSTRUMENTS INCORPORATED Dallas Texas

TERMINAL ELECTRONICS

D 96214 999694

SCALE 1/1 · SHEET 1 OF 6

FINAL 1 LM


287 AR
99
15
276
280
270
249 20
3
243
256
260 REF
D SH4(B-7)
276
280
270
249 20
258 19
259 19
2 REQD 266
228
266 2 REQD
228
14 19 257
D
SH6 (B-7)
5
SH5(A-7)
DRIVERS
SH6(A-5)
20 248
270
280
276
SH5 (A-4)
SH3(B-2)
SH4 (B-4)
E271 253
2
SH3 (B-5)
SH3(B-7)
PROCESSOR
266 2 REQD
227
4 PLACES
XU5, XU10,
XU11, XU16
1
238
240 2 REQD
98 T201
SEE VIEW K
SH4 (A-2)
REF 227
250 22
253 E221, E222,
E223
231 Y1
290 AR
262 AR, 2 PLACES
229
254 9
13 PLACES
229
266 2 REQD
7 245 J10, 2 REQD
244 J2
(KEY PIN 21)
253 E281
16

PLAN VIEW

SECTION VII

DIAGRAMS

This section contains the logic diagrams for the Model 820 KSR major assemblies.

999692	1

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
E	CN 445460 C J Milne	10-24-78	D. Starnes

NOTES UNLESS OTHERWISE SPECIFIED

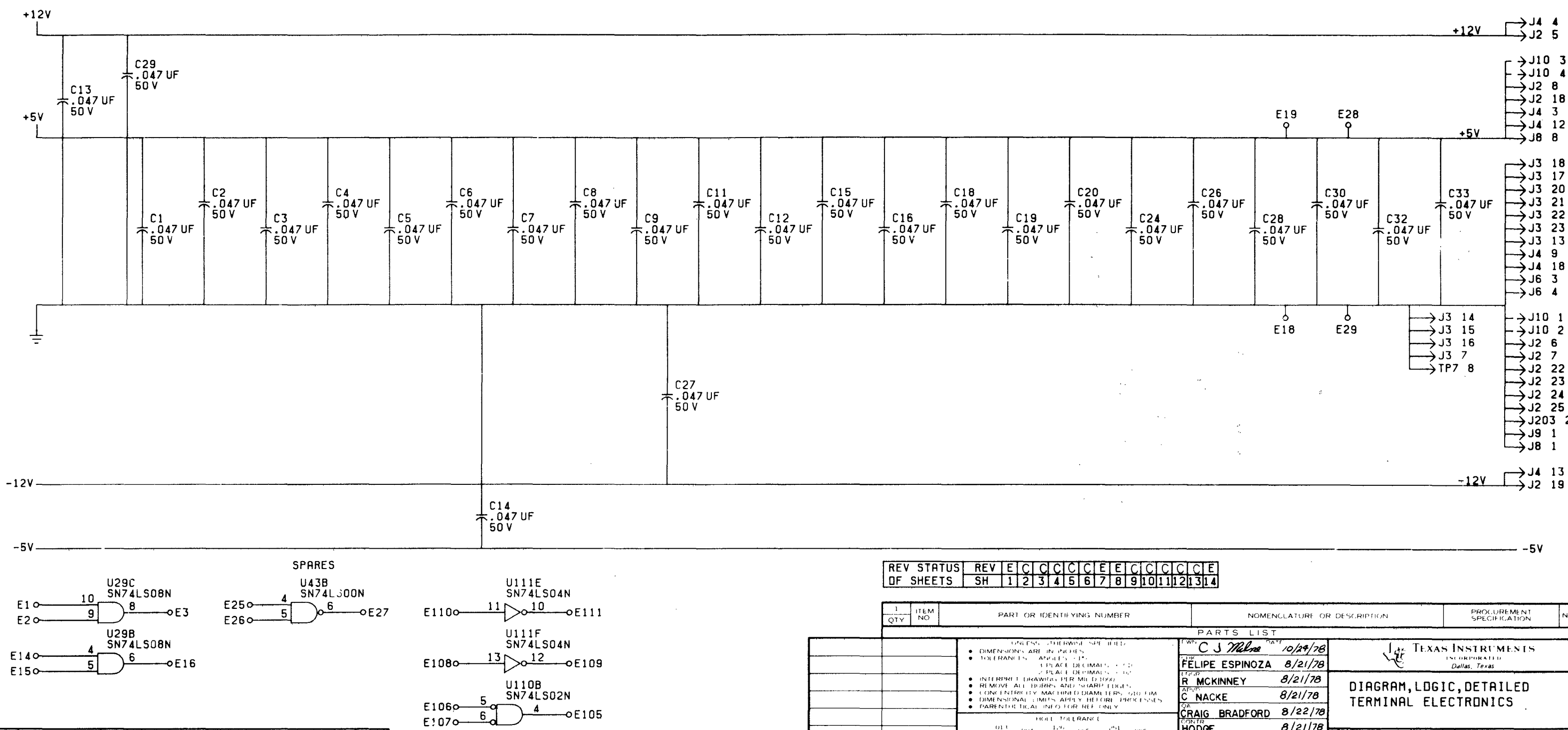
1. RESISTANCE VALUES ARE IN OHMS
2. RESISTORS ARE .25 W, 5 PCT
3. CAPACITORS ARE +80-20 PCT
4. DIODES ARE 1N4002
5. FOR POWER AND GROUND PINS SEE TABLE ON SHEET 11

LOGIC REFERENCE DESIGNATORS		
FIRST USED	LAST USED	UNUSED
E1	E36	E4 - E6, E17, E20 - E23
R1	R37	R7 - R9, R20, R23
C1	C33	
CR1	CR4	
Q1	Q4	
U1	U49	U6, U7, U26, U40

PRIMARY PWR SUPPLY REFERENCE DESIGNATORS		
FIRST USED	LAST USED	UNUSED
E250	E286	E270, E272, E283, E284
R250	R271	
C250	C264	C263
CR250	CR266	
Q250	Q255	

DRIVER REFERENCE DESIGNATORS		
FIRST USED	LAST USED	UNUSED
E101	E117	
R101	R143	R134, R136
C101	C108	
CR101	CR139	
Q101	Q119	Q112, Q118
U101	U113	

SECONDARY PWR SUPPLY REFERENCE DESIGNATORS		
FIRST USED	LAST USED	UNUSED
E200	E233	E224, E225, E226
R200	R233	R201, R230
C200	C215	
CR201	CR211	
Q201	Q204	
U201	U206	



REV STATUS	REV	E	C	C	C	C	C	E	E	C	C	C	C	C	E
OF SHEETS	SH	1	2	3	4	5	6	7	8	9	10	11	12	13	14

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999694	8740

APPLICATION

DWN	C J Milne	10/24/78
	FELIPE ESPINOZA	8/21/78
	R MCKINNEY	8/21/78
	C NACKE	8/21/78
	CRAIG BRADFORD	8/22/78
	HODGE	8/21/78
	D STARNES	8/22/78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

DIAGRAM, LOGIC, DETAILED TERMINAL ELECTRONICS

SIZE D · CODE IDENT NO 96214 · DRAWING NO 999692

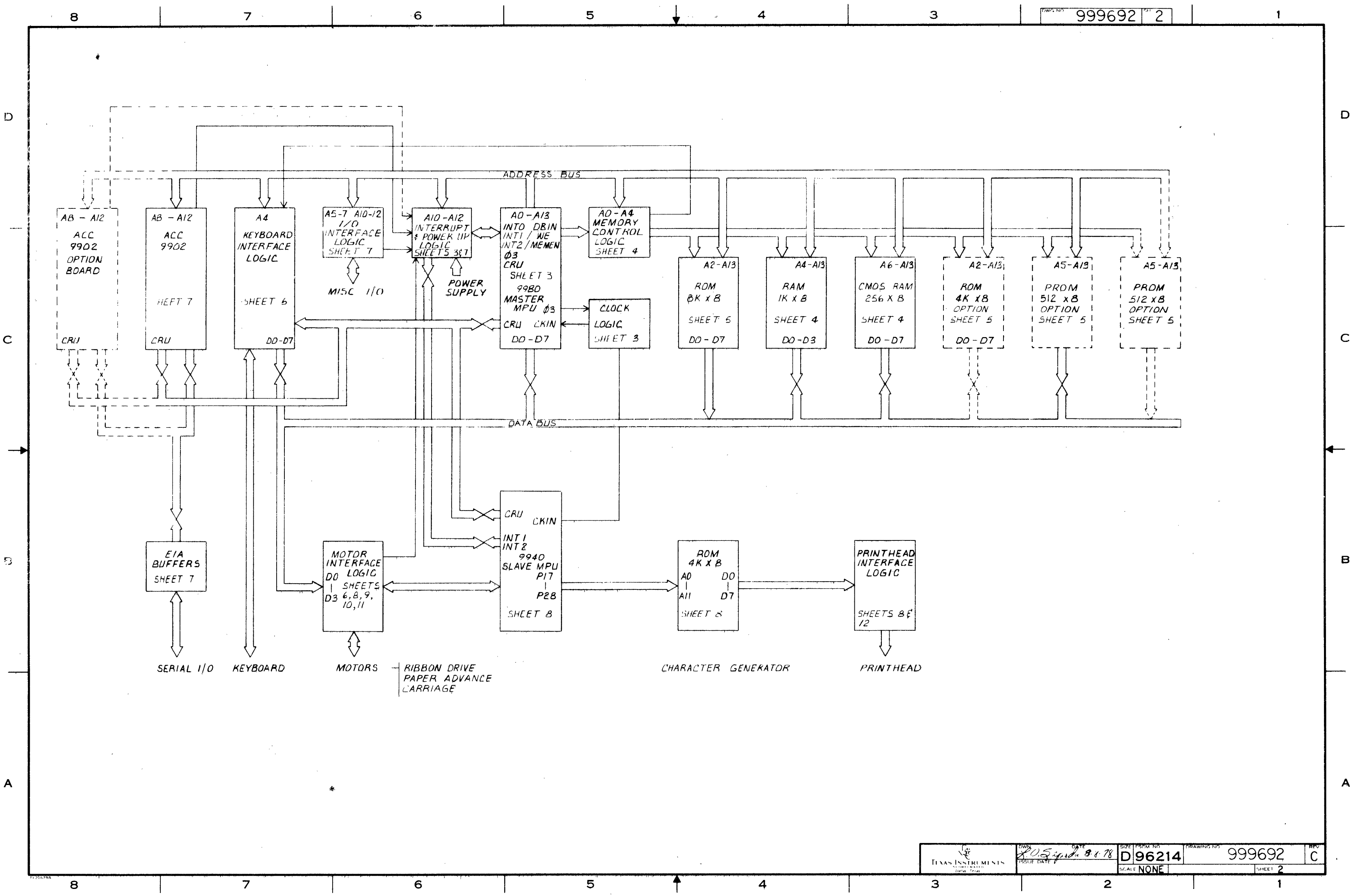
SCALE NONE · SHEET 1 OF 14

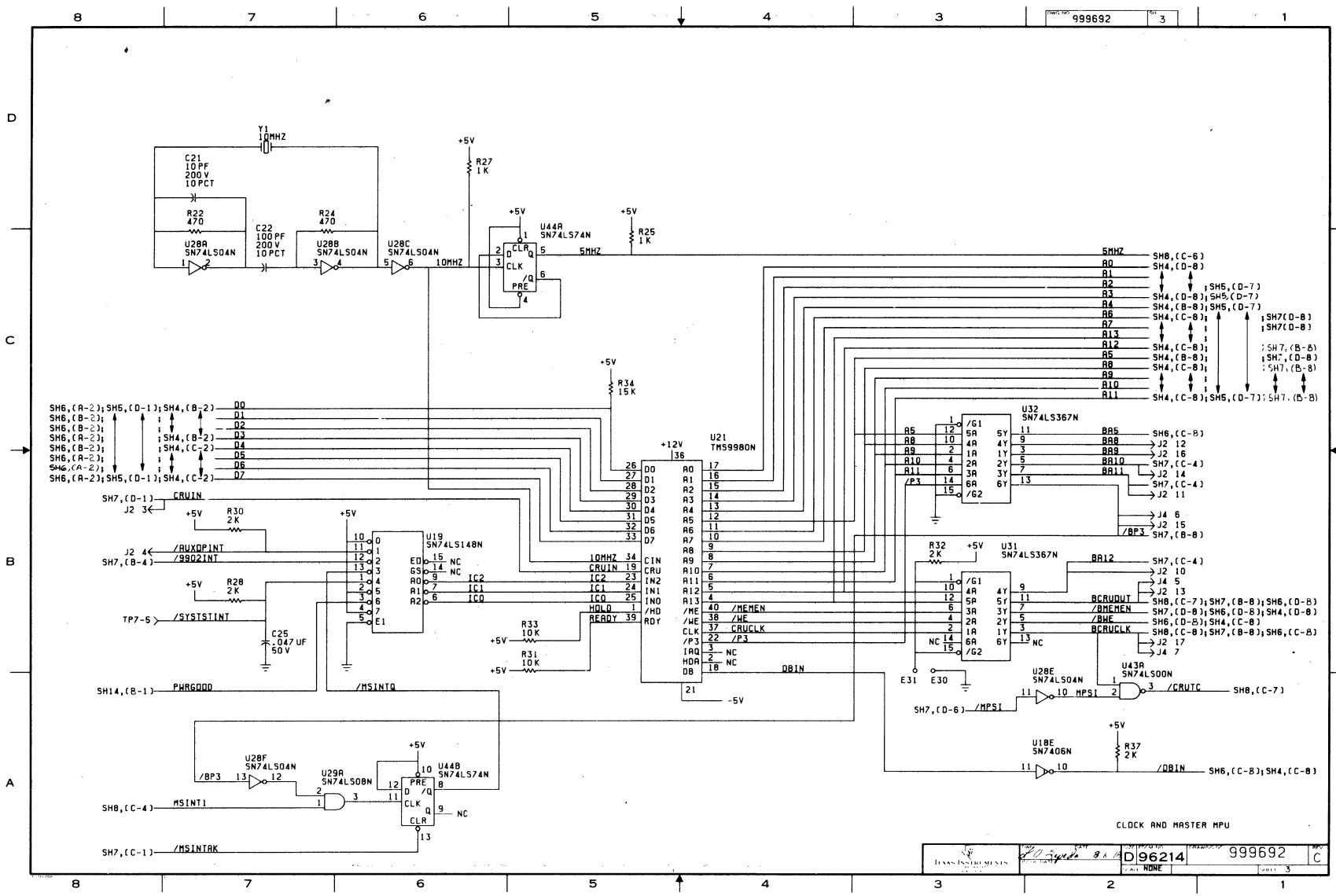
SEQ NO	IDENT	F SPEC	NO	ADDITIONAL	NOTES
	PROCESS			CLASSIFICATION	

PROCESSES - FOR CORRELATION TO GOVT-IND SPECIFICATIONS SEE TI DRAWING

H-MT

43

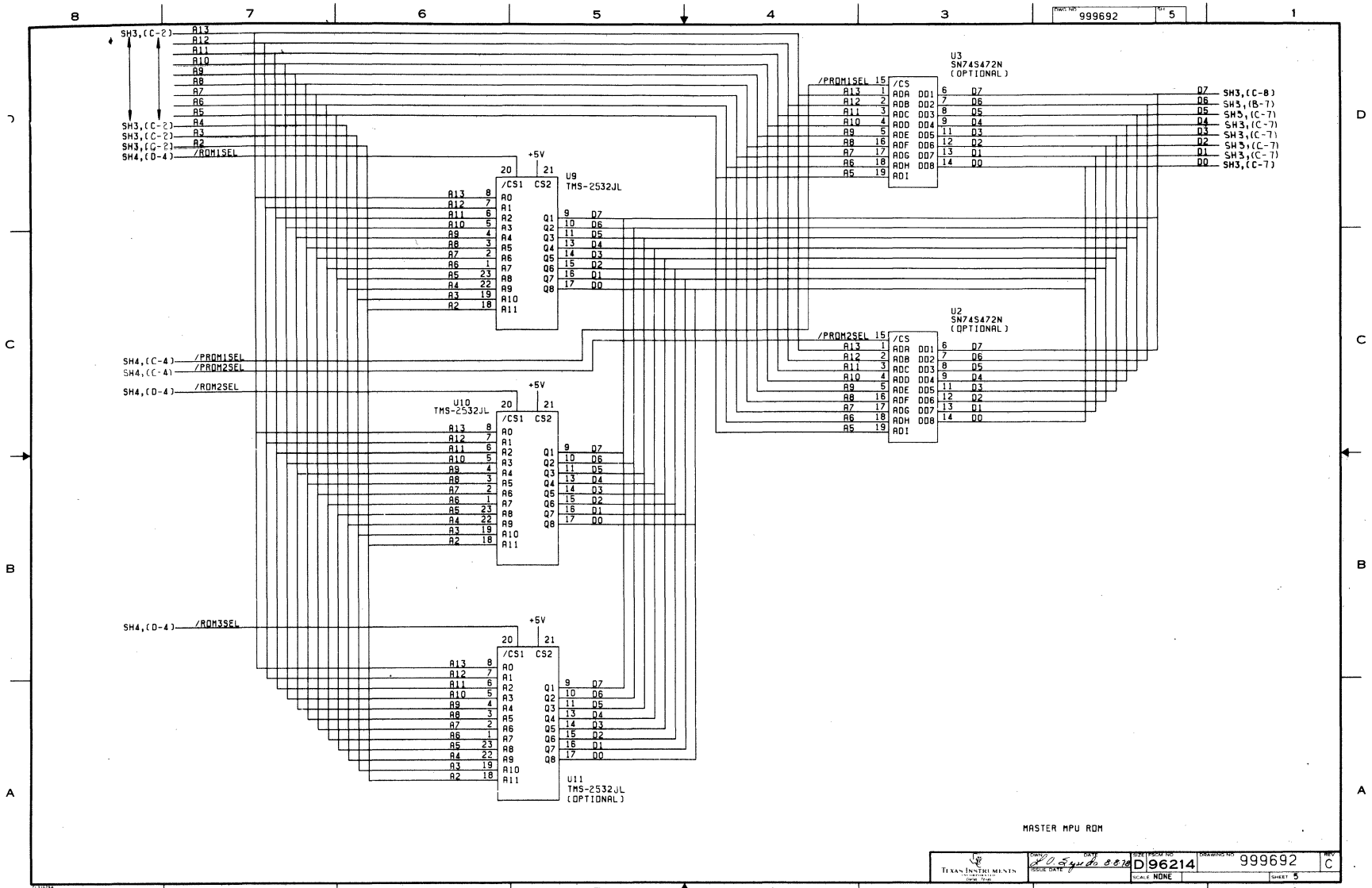

999692 2
ADDRESS BUS
DATA BUS
A8 - A12
ACC
9902
OPTION
BOARD
CRU
A8 - A12
ACC
9902
SHEET 7
CRU
A4
KEYBOARD
INTERFACE
LOGIC
SHEET 6
D0-D7
A5-7 A10-12
I/O
INTERFACE
LOGIC
SHEET 7
MISC I/O
A10-A12
INTERRUPT
& POWER UP
LOGIC
SHEETS 3&7
POWER
SUPPLY
A0-A13
INTO DBIN
INT1 / WE
INT2 / MEMEN
Ø3
CRU
SHEET 3
9980
MASTER
MPU Ø3
CRU CKIN
D0-D7
A0-A4
MEMORY
CONTROL
LOGIC
SHEET 4
CLOCK
LOGIC
SHEET 3
A2-A13
ROM
8K x 8
SHEET 5
D0-D7
A4-A13
RAM
1K x 8
SHEET 4
D0-D3
A6-A13
CMOS RAM
256 x 8
SHEET 4
D0-D7
A2-A13
ROM
4K x8
OPTION
SHEET 5
D0-D7
A5-A13
PROM
512 x8
OPTION
SHEET 5
A5-A13
PROM
512 x8
OPTION
SHEET 5
E/A
BUFFERS
SHEET 7
MOTOR
INTERFACE
LOGIC
D0
D3
SHEETS
6,8,9,
10,11
CRU
CKIN
INT1
INT2
9940
SLAVE MPU
P17
P28
SHEET 8
ROM
4K x 8
A0
A11
D0
D7
SHEET 8
PRINTHEAD
INTERFACE
LOGIC
SHEETS 8 &
12
SERIAL I/O
KEYBOARD
MOTORS
RIBBON DRIVE
PAPER ADVANCE
CARRIAGE
CHARACTER GENERATOR
PRINTHEAD
TEXAS INSTRUMENTS
D 96214
999692
C
SCALE NONE
SHEET 2

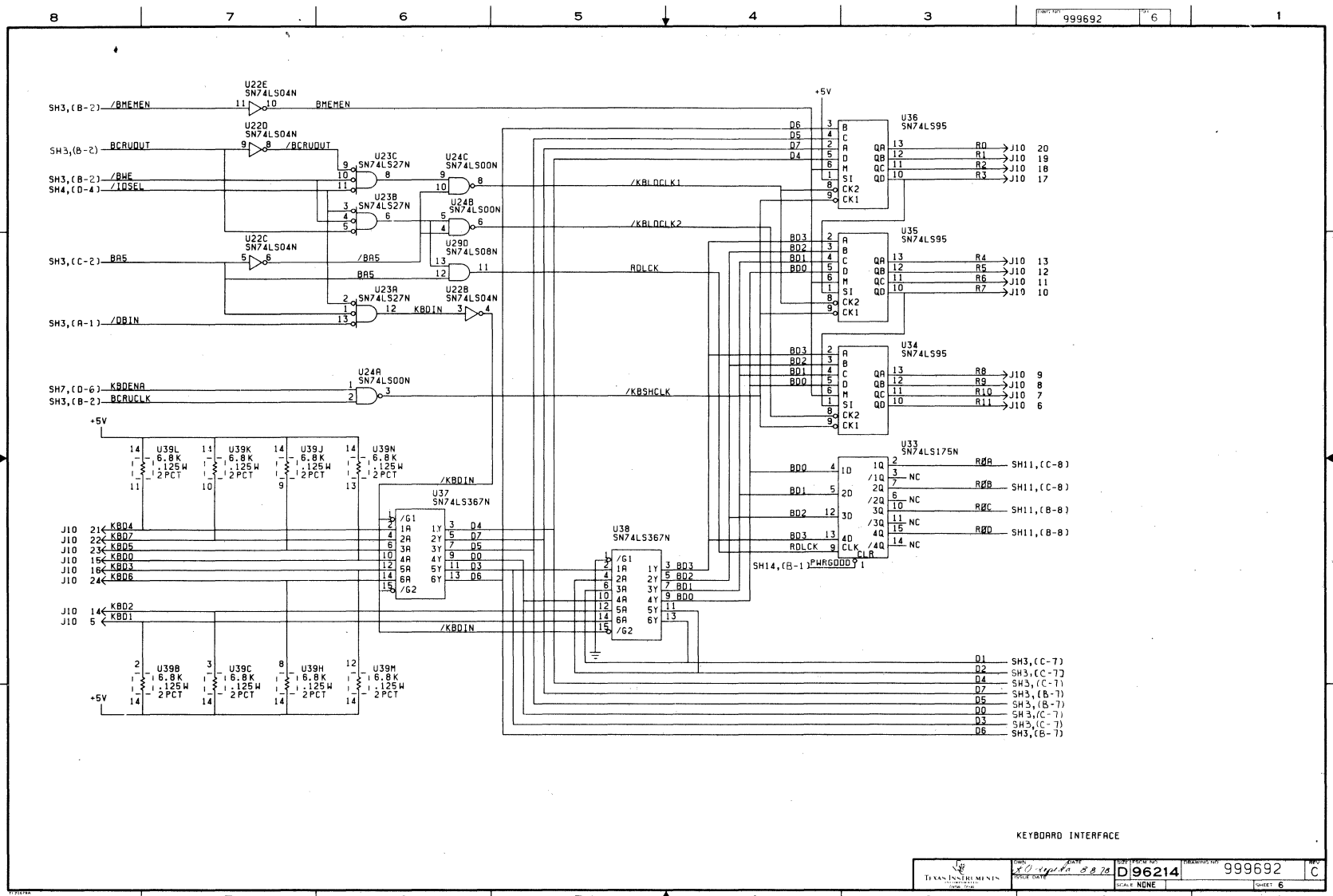

999692
3
Y1
10MHZ
C21
10 PF
200 V
10 PCT
C22
100 PF
200 V
10 PCT
R22
470
R24
470
U28A
SN74LS04N
U28B
SN74LS04N
U28C
SN74LS04N
10MHZ
R27
1 K
+5V
U44A
SN74LS74N
5MHZ
R25
1 K
R34
15 K
U21
TMS9980N
+12V
CRUIN
SH7,(D-1)
J2 3
R30
2 K
/AUXOPINT
/9902INT
J2 4
SH7,(B-4)
R28
2 K
TP7-5
/SYSTSTINT
C25
.047 UF
50 V
U19
SN74LS148N
IC2
IC1
IC0
R33
10 K
R31
10 K
HOLD
READY
DBIN
-5V
PWRGOOD
SH14,(B-1)
/MSINTQ
U28F
SN74LS04N
/BP3
U29A
SN74LS08N
U44B
SN74LS74N
MSINT1
SH8,(C-4)
/MSINTAK
SH7,(C-1)
U32
SN74LS367N
U31
SN74LS367N
/MEMEN
/WE
CRUCLK
/P3
R32
2 K
BA12
BCRUDUT
/BMEMEN
/BWE
BCRUCLK
E31
E30
U28E
SN74LS04N
MPSI
SH7,(D-6)
/MPSI
U43A
SN74LS00N
/CRUTC
SH8,(C-7)
U18E
SN7406N
R37
2 K
/DBIN
SH6,(C-8);SH4,(C-8)
CLOCK AND MASTER MPU
TEXAS INSTRUMENTS
D96214
999692
C
NONE
3

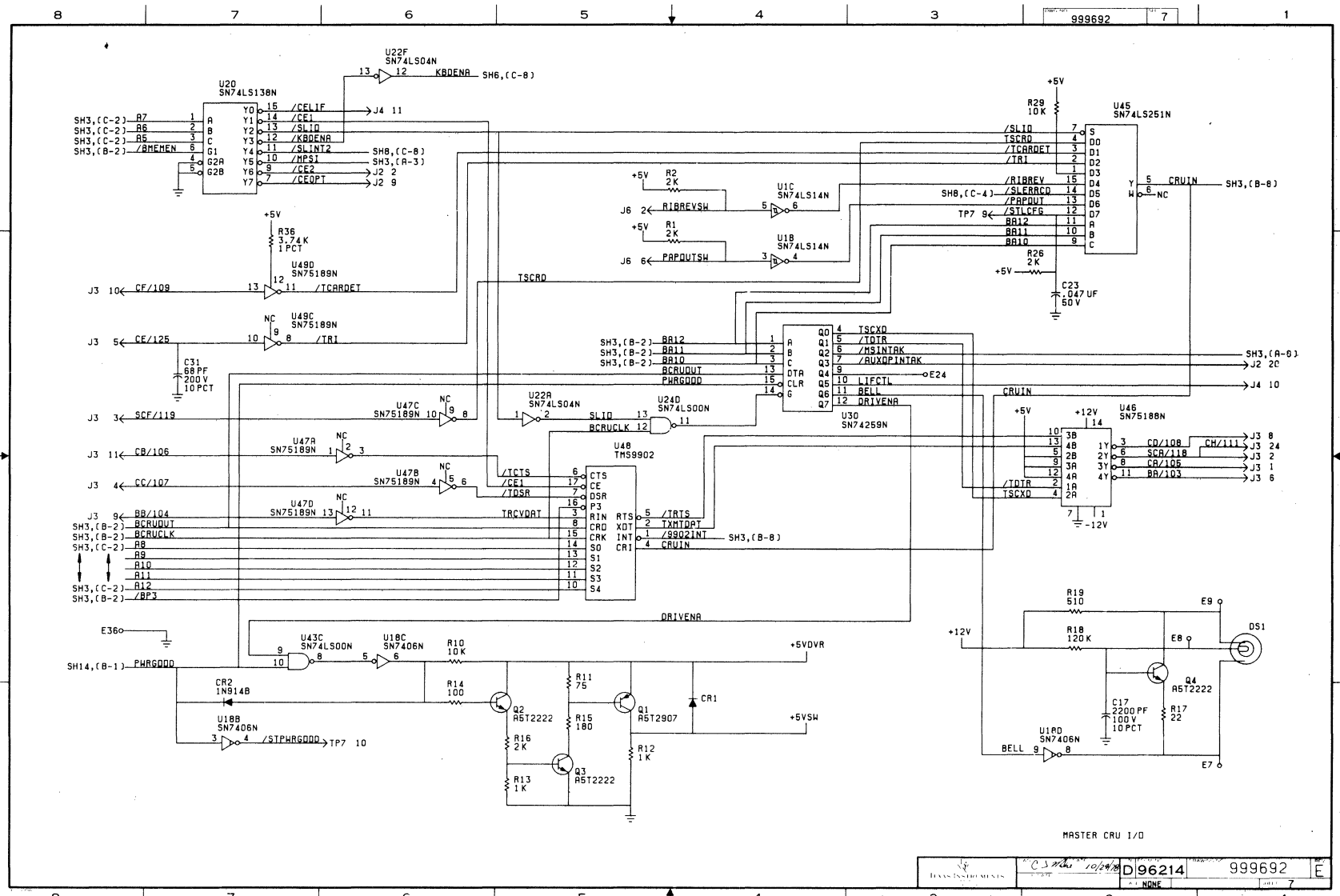
BYTES	OUTPUT-ACTIVE LOW	A0	A1	A2	A3	A4	/BWE	/DBIN	/BMEMEN
4K	/ROM1SEL	0	0	X	X	X	1	0	0
4K	/ROM2SEL	0	1	X	X	X	1	0	0
4K	/ROM3SEL	1	0	X	X	X	1	0	0
512	/PROM1SEL	1	1	0	1	1	1	0	0
512	/PROM2SEL	1	1	1	0	0	1	0	0
1K	/RAMSEL	1	1	0	0	X	0	1	0
							1	0	
256	/CMRAMSEL	1	1	0	1	0	X	X	0
4	/IOSEL	1	1	1	1	0	0	1	0
							1	0	
-	ALL OUTPUTS HIGH	X	X	X	X	X	X	X	1

RAMS AND MEMORY ADDRESS DECODE

TEXAS INSTRUMENTS		6-8-78	D 96214	999692	C
			NONE	SHEET 4	


DWG NO 999692
REV 5
SH3,(C-2)
SH3,(C-2)
SH3,(C-2)
SH3,(C-2)
SH4,(D-4) /ROM1SEL
SH4,(C-4) /PROM1SEL
SH4,(C-4) /PROM2SEL
SH4,(D-4) /ROM2SEL
SH4,(D-4) /ROM3SEL
+5V
U9
TMS-2532JL
U10
TMS-2532JL
U11
TMS-2532JL
(OPTIONAL)
U3
SN74S472N
(OPTIONAL)
U2
SN74S472N
(OPTIONAL)
/PROM1SEL
/PROM2SEL
SH3,(C-8)
SH3,(B-7)
SH3,(C-7)
SH3,(C-7)
SH3,(C-7)
SH3,(C-7)
SH3,(C-7)
SH3,(C-7)
MASTER MPU ROM
TEXAS INSTRUMENTS
SIZE D
FSCM NO 96214
DRAWING NO 999692
REV C
SCALE NONE
SHEET 5


999692
6
U22E SN74LS04N
SH3,(B-2) /BMEMEN
BMEMEN
U22D SN74LS04N
SH3,(B-2) BCRUOUT
/BCRUOUT
U23C SN74LS27N
U24C SN74LSOON
SH3,(B-2) /BWE
SH4,(D-4) /IOSEL
U23B SN74LS27N
U24B SN74LSOON
U22C SN74LS04N
SH3,(C-2) BA5
/BA5
U29D SN74LS08N
BA5
U23A SN74LS27N
U22B SN74LS04N
KBDIN
SH3,(A-1) /DBIN
U24A SN74LSOON
SH7,(D-6) KBDENA
SH3,(B-2) BCRUCLK
+5V
U39L 6.8K .125W 2PCT
U39K 6.8K .125W 2PCT
U39J 6.8K .125W 2PCT
U39N 6.8K .125W 2PCT
/KBDIN
U37 SN74LS367N
J10 21 KBD4
J10 22 KBD7
J10 23 KBD5
J10 15 KBD0
J10 16 KBD3
J10 24 KBD6
J10 14 KBD2
J10 5 KBD1
U39B 6.8K .125W 2PCT
U39C 6.8K .125W 2PCT
U39H 6.8K .125W 2PCT
U39M 6.8K .125W 2PCT
U38 SN74LS367N
/KBLOCLK1
/KBLOCLK2
RDLCK
/KBSHCLK
U36 SN74LS95
U35 SN74LS95
U34 SN74LS95
U33 SN74LS175N
SH14,(B-1) PWRGOOD
RØA SH11,(C-8)
RØB SH11,(C-8)
RØC SH11,(B-8)
RØD SH11,(B-8)
D1 SH3,(C-7)
D2 SH3,(C-7)
D4 SH3,(C-7)
D7 SH3,(B-7)
D5 SH3,(B-7)
D0 SH3,(C-7)
D3 SH3,(C-7)
D6 SH3,(B-7)
KEYBOARD INTERFACE
TEXAS INSTRUMENTS
D 96214
999692
C
SCALE NONE
SHEET 6


999692
U22F SN74LS04N
KBDENA
SH6,(C-8)
U20 SN74LS138N
/CELIF
/CE1
/SLID
/KBDENA
/SLINT2
/MPSI
/CE2
/CEOPT
J4 11
J2 2
J2 9
SH8,(C-8)
SH3,(A-3)
R36 3.74K 1 PCT
U49D SN75189N
CF/109
/TCARDET
TSCRD
U49C SN75189N
CE/125
/TRI
C31 68 PF 200 V 10 PCT
U47C SN75189N
SCF/119
U47A SN75189N
CB/106
U47B SN75189N
CC/107
U47D SN75189N
BB/104
BCRUDUT
BCRUCLK
A8
A9
A10
A11
A12
/BP3
U22A SN74LS04N
SLID
BCRUCLK
U24D SN74LS00N
DRIVENA
U48 TMS9902
/TCTS
/CE1
/TDSR
TRCVDAT
/TRTS
TXMTDAT
/9902INT
CRUIN
SH3,(B-8)
U30 SN74259N
BA12
BA11
BA10
BCRUDUT
PWRGDDD
TSCXD
/TDTR
/MSINTAK
/AUXDPINTAK
LIFCTL
BELL
DRIVENA
E24
SH3,(A-8)
J2 20
J4 10
U45 SN74LS251N
/SLID
TSCRD
/TCARDET
/TRI
/RIBREV
/SLERRCD
/PAPOUT
/STLCFG
BA12
BA11
BA10
CRUIN
NC
R29 10K
R26 2K
C23 .047 UF 50 V
U46 SN75188N
CD/108
SCA/110
CA/105
BA/103
CH/111
J3 8
J3 24
J3 2
J3 1
J3 6
-12V
R2 2K
R1 2K
U1C SN74LS14N
U1B SN74LS14N
RIBREVSW
PAPOUTSW
J6 2
J6 6
E36
SH14,(B-1)
PWRGDDD
U43C SN74LS00N
U18C SN7406N
R10 10K
+5VDVR
CR2 1N914B
R14 100
U18B SN7406N
/STPWRGDDD
TP7 10
Q2 A5T2222
Q1 A5T2907
Q3 A5T2222
R11 75
R15 180
R16 2K
R12 1K
R13 1K
CR1
+5VSW
R19 510
R18 120K
E9
E8
DS1
Q4 A5T2222
C17 2200 PF 100 V 10 PCT
R17 22
U18D SN7406N
E7
MASTER CRU I/O
D 96214
999692
NONE

NOTES:

[6] EMULATOR ASSEMBLY (999787-0001) IS USED AS A SUBSTITUTE FOR TMS 9940

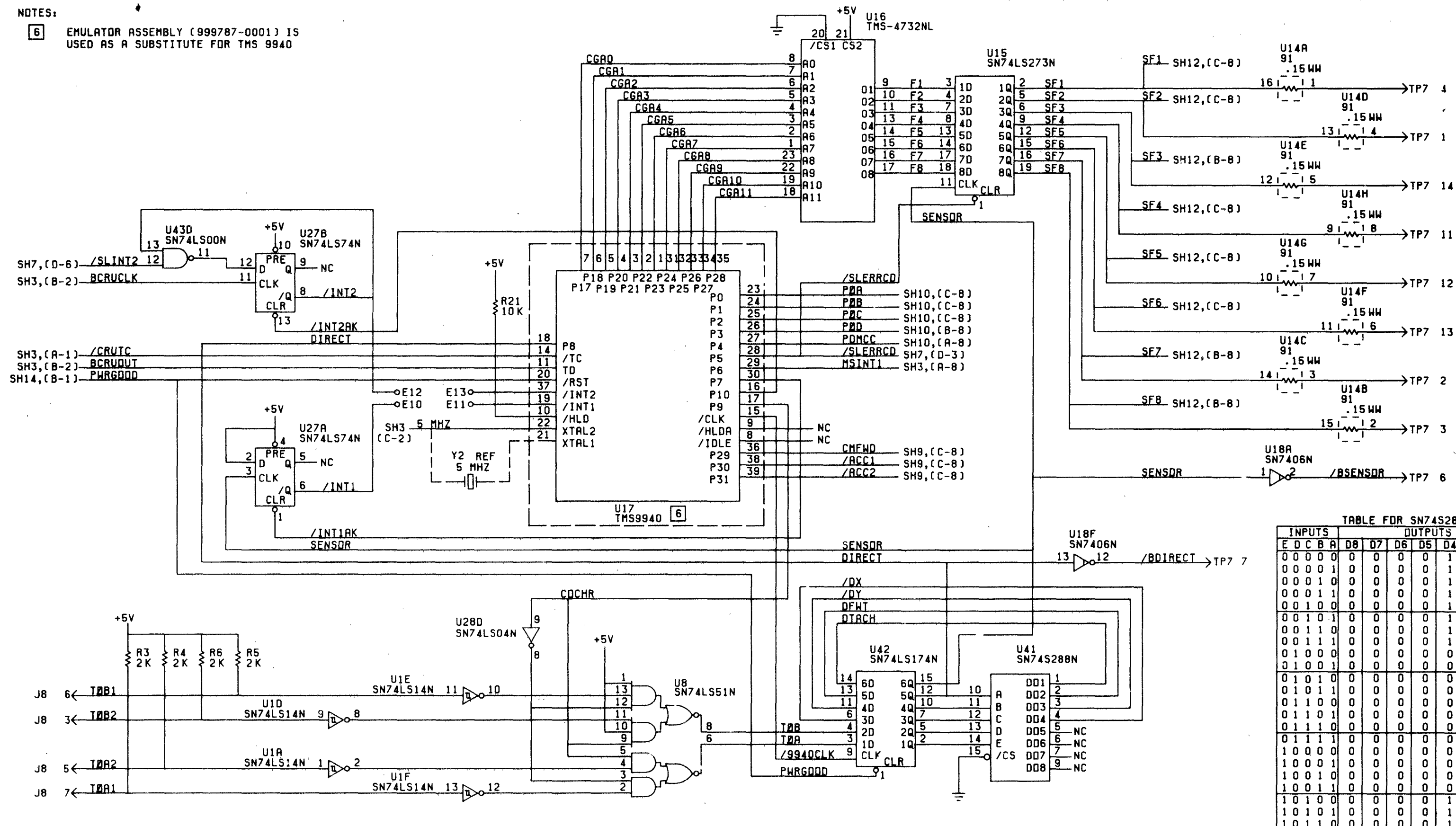
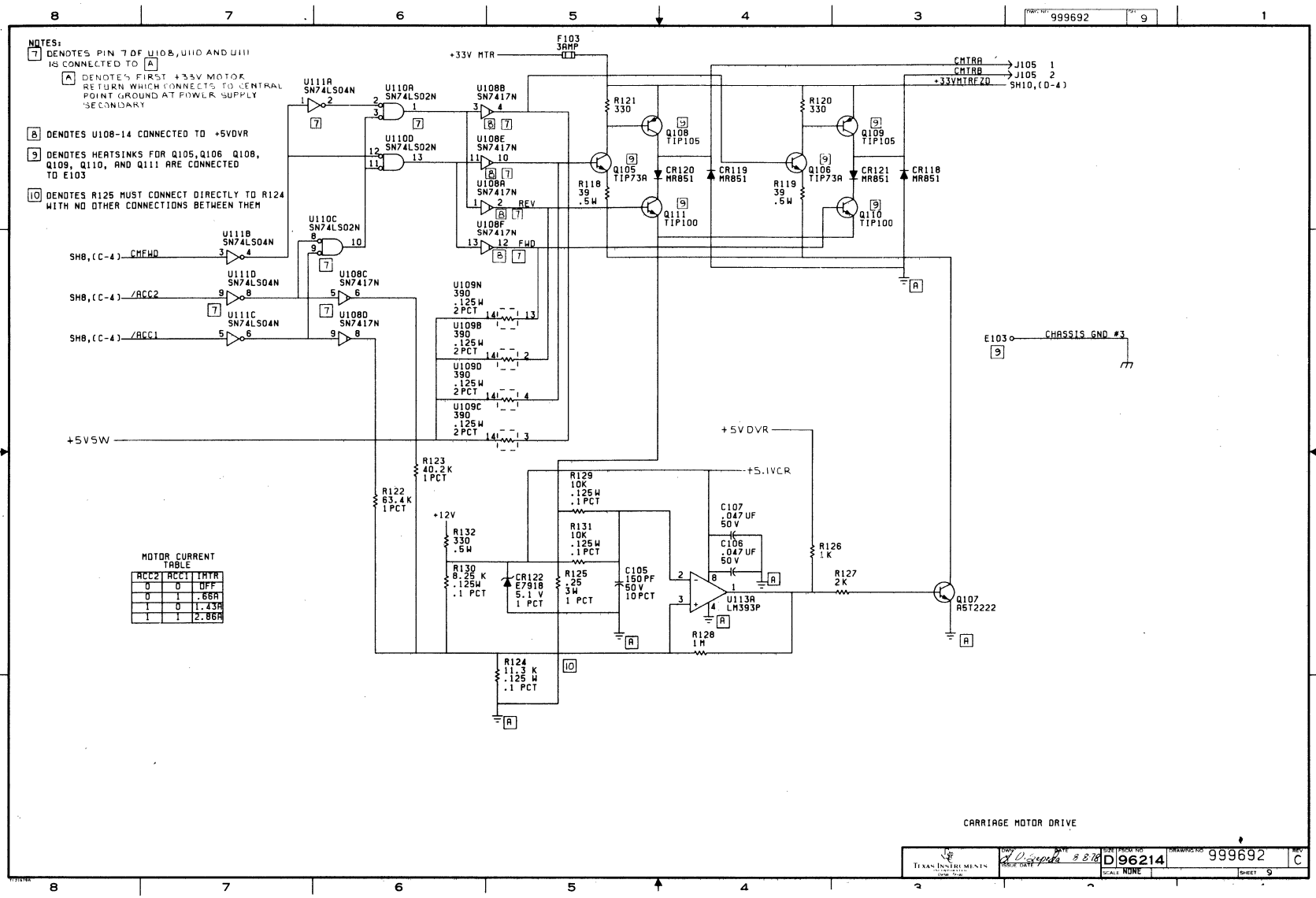


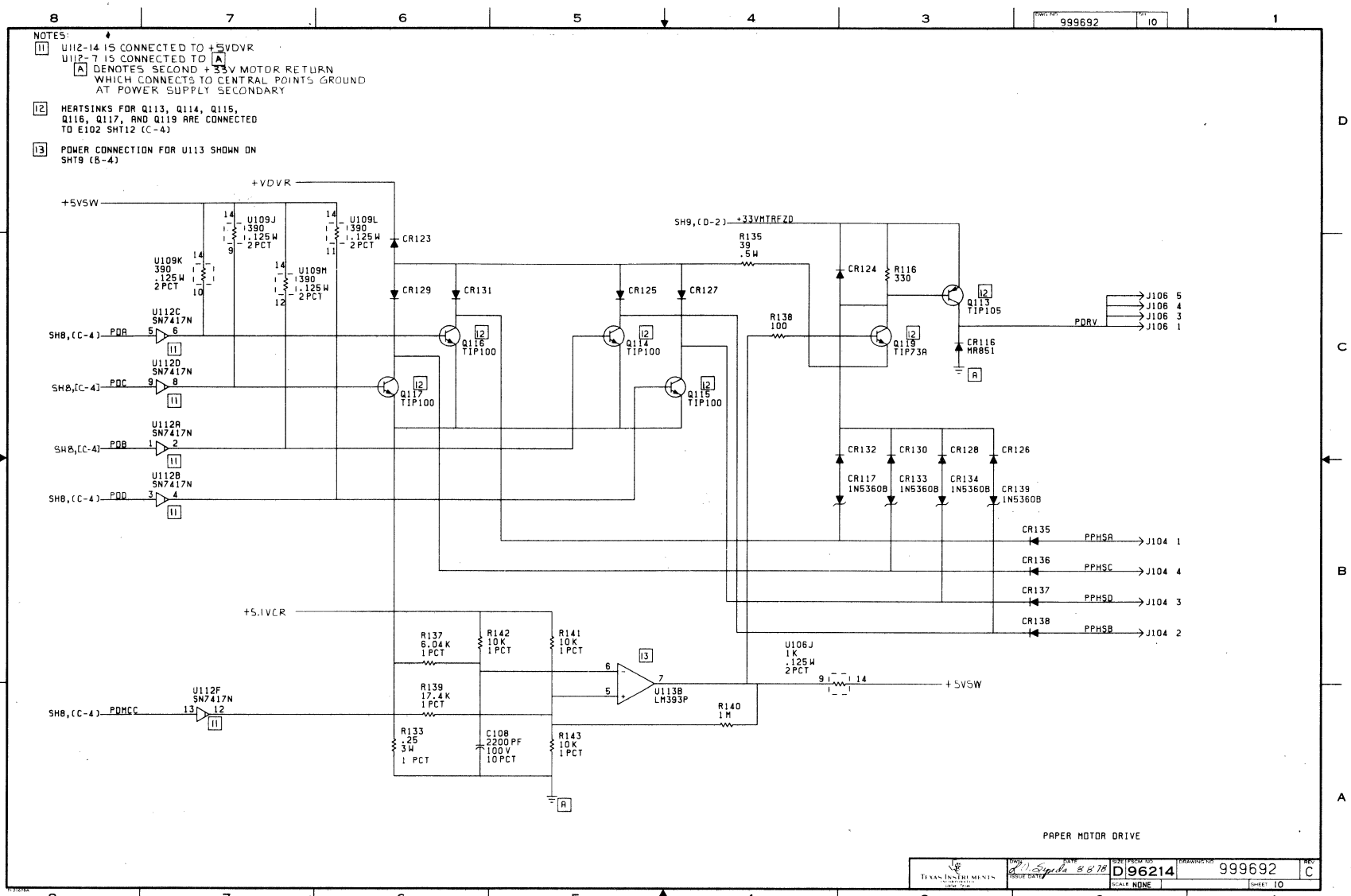
TABLE FOR SN74S288N

INPUTS E D C B A	OUTPUTS D8	D7	D6	D5	D4	D3	D2	D1
0 0 0 0 0	0	0	0	0	1	0	0	1
0 0 0 0 1	0	0	0	0	1	0	0	1
0 0 0 1 0	0	0	0	0	1	0	0	0
0 0 0 1 1	0	0	0	0	1	0	1	0
0 0 1 0 0	0	0	0	0	1	0	0	0
0 0 1 0 1	0	0	0	0	1	0	1	0
0 0 1 1 0	0	0	0	0	1	0	0	0
0 0 1 1 1	0	0	0	0	1	0	1	0
0 1 0 0 0	0	0	0	0	0	1	0	0
0 1 0 0 1	0	0	0	0	0	1	1	0
0 1 0 1 0	0	0	0	0	0	1	0	0
0 1 0 1 1	0	0	0	0	0	1	1	0
0 1 1 0 0	0	0	0	0	0	1	0	0
0 1 1 0 1	0	0	0	0	0	1	1	0
0 1 1 1 0	0	0	0	0	0	1	1	1
0 1 1 1 1	0	0	0	0	0	1	1	1
1 0 0 0 0	0	0	0	0	0	0	0	0
1 0 0 0 1	0	0	0	0	0	0	1	0
1 0 0 1 0	0	0	0	0	0	0	0	0
1 0 0 1 1	0	0	0	0	0	0	1	0
1 0 1 0 0	0	0	0	0	1	1	0	0
1 0 1 0 1	0	0	0	0	1	1	1	0
1 0 1 1 0	0	0	0	0	1	1	0	0
1 0 1 1 1	0	0	0	0	1	1	1	0
1 1 0 0 0	0	0	0	0	0	0	0	0
1 1 0 0 1	0	0	0	0	0	0	1	0
1 1 0 1 0	0	0	0	0	0	0	0	0
1 1 0 1 1	0	0	0	0	0	0	1	0
1 1 1 0 0	0	0	0	0	1	1	0	0
1 1 1 0 1	0	0	0	0	1	1	1	0
1 1 1 1 0	0	0	0	0	1	1	0	0
1 1 1 1 1	0	0	0	0	1	1	1	0

SLAVE MPU

TEXAS INSTRUMENTS | C Smilie 10/29/78 | D 96214 | 999692 | E | SCALE NONE | SHEET 8


NOTES:
7 DENOTES PIN 7 OF U108, U110 AND U111 IS CONNECTED TO A
A DENOTES FIRST +33V MOTOR RETURN WHICH CONNECTS TO CENTRAL POINT GROUND AT POWER SUPPLY SECONDARY
8 DENOTES U108-14 CONNECTED TO +5VDVR
9 DENOTES HEATSINKS FOR Q105, Q106 Q108, Q109, Q110, AND Q111 ARE CONNECTED TO E103
10 DENOTES R125 MUST CONNECT DIRECTLY TO R124 WITH NO OTHER CONNECTIONS BETWEEN THEM
MOTOR CURRENT TABLE
ACC2 ACC1 IMTR
0 0 OFF
0 1 .66A
1 0 1.43A
1 1 2.86A
+33V MTR
F103 3AMP
CMTRA
CMTRB
+33VMTREZD
J105 1
J105 2
SH10,(D-4)
U111A SN74LS04N
U110A SN74LS02N
U108B SN7417N
U110D SN74LS02N
U108E SN7417N
U108A SN7417N
U108F SN7417N
U111B SN74LS04N
U110C SN74LS02N
U111D SN74LS04N
U108C SN7417N
U111C SN74LS04N
U108D SN7417N
SH8,(C-4) CMFWD
SH8,(C-4) /ACC2
SH8,(C-4) /ACC1
REV
FWD
R121 330
R120 330
Q108 TIP105
Q109 TIP105
Q105 TIP73A
Q106 TIP73A
Q111 TIP100
Q110 TIP100
CR120 MR851
CR119 MR851
CR121 MR851
CR118 MR851
R118 39 .5W
R119 39 .5W
U109N 390 .125W 2PCT
U109B 390 .125W 2PCT
U109D 390 .125W 2PCT
U109C 390 .125W 2PCT
E103 CHASSIS GND #3
+5VSW
+5VDVR
+5.1VCR
R123 40.2K 1PCT
R122 63.4K 1PCT
R129 10K .125W .1PCT
R131 10K .125W .1PCT
C107 .047UF 50V
C106 .047UF 50V
+12V
R132 330 .5W
R130 8.25K .125W .1PCT
CR122 E7818 5.1V 1PCT
R125 .25 3W 1PCT
C105 150PF 50V 10PCT
U113A LM393P
R126 1K
R127 2K
Q107 A5T2222
R128 1M
R124 11.3K .125W .1PCT
CARRIAGE MOTOR DRIVE
TEXAS INSTRUMENTS
DRAWN
DATE 8 8 78
ISSUE DATE
SIZE D
PGM NO 96214
DRAWING NO 999692
REV C
SCALE NONE
SHEET 9


NOTES:
11 U112-14 IS CONNECTED TO +5VDVR
U112-7 IS CONNECTED TO A
A DENOTES SECOND +33V MOTOR RETURN WHICH CONNECTS TO CENTRAL POINTS GROUND AT POWER SUPPLY SECONDARY
12 HEATSINKS FOR Q113, Q114, Q115, Q116, Q117, AND Q119 ARE CONNECTED TO E102 SHT12 (C-4)
13 POWER CONNECTION FOR U113 SHOWN ON SHT9 (B-4)
+VDVR
+5VSW
U109K 390 .125W 2PCT
U109J 390 .125W 2PCT
U109M 390 .125W 2PCT
U109L 390 .125W 2PCT
CR123
CR129
CR131
CR125
CR127
SH9,(D-2) +33VMTRFZD
R135 39 .5W
CR124
R116 330
Q113 TIP105
PDRV
J106 5
J106 4
J106 3
J106 1
R138 100
Q116 TIP100
Q114 TIP100
Q119 TIP73A
CR116 MR851
U112C SN7417N
U112D SN7417N
U112A SN7417N
U112B SN7417N
SH8,(C-4) PDA
SH8,(C-4) PDC
SH8,(C-4) PDB
SH8,(C-4) PDD
Q117 TIP100
Q115 TIP100
CR132
CR130
CR128
CR126
CR117 1N5360B
CR133 1N5360B
CR134 1N5360B
CR139 1N5360B
CR135
CR136
CR137
CR138
PPHSA
PPHSC
PPHSD
PPHSB
J104 1
J104 4
J104 3
J104 2
+5.1VCR
R137 6.04K 1PCT
R142 10K 1PCT
R141 10K 1PCT
R139 17.4K 1PCT
R133 .25 3W 1 PCT
C108 2200PF 100V 10PCT
R143 10K 1PCT
U113B LM393P
R140 1M
U106J 1K .125W 2PCT
+5VSW
U112F SN7417N
SH8,(C-4) PDMCC
PAPER MOTOR DRIVE
TEXAS INSTRUMENTS
DRWN
DATE 8 6 78
ISSUE DATE
SIZE D
FSCM NO 96214
DRAWING NO 999692
REV C
SCALE NONE
SHEET 10

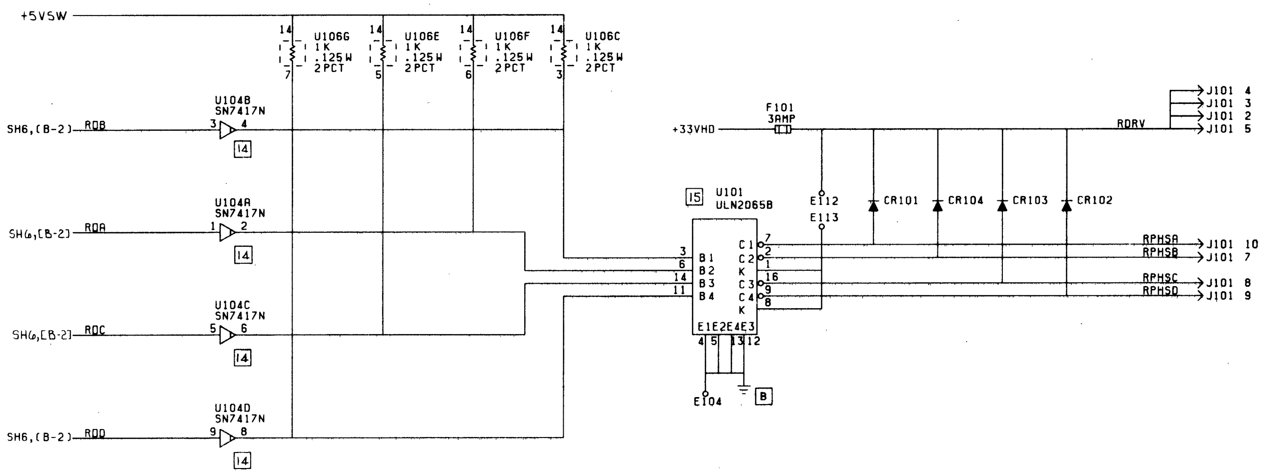
999692 SH 11

NOTES:

[14] DENOTES U104-14 IS CONNECTED TO +5VDVR
U104-7 IS CONNECTED TO [B]

[B] DENOTES SECOND +33V MOTOR RETURN
WHICH CONNECTS TO CENTRAL POINT GROUND
AT POWER SUPPLY SECONDARY

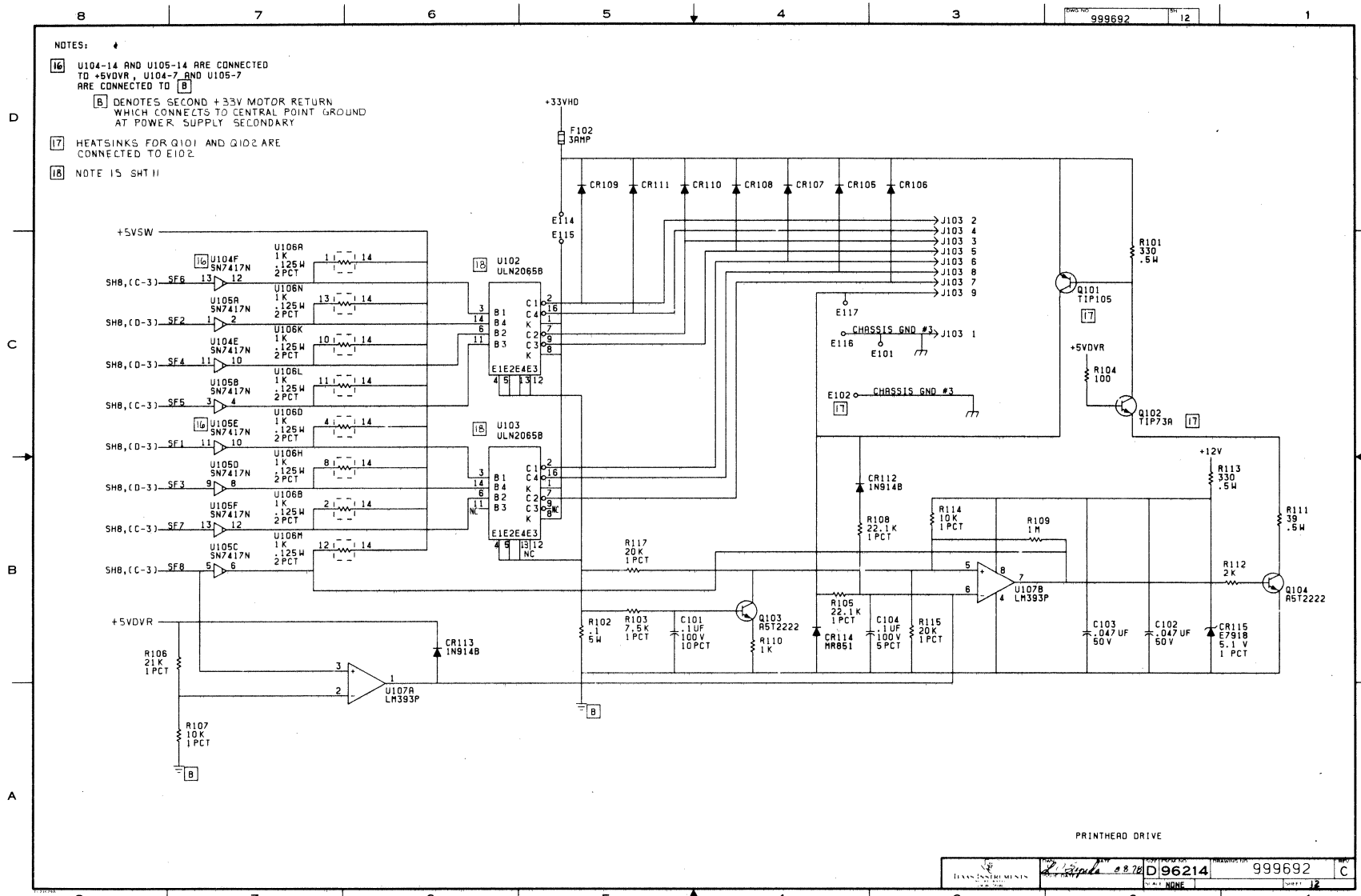
[15] DENOTES HEATSINKS ON U101, U102, AND
U103 ARE CONNECTED TO E104

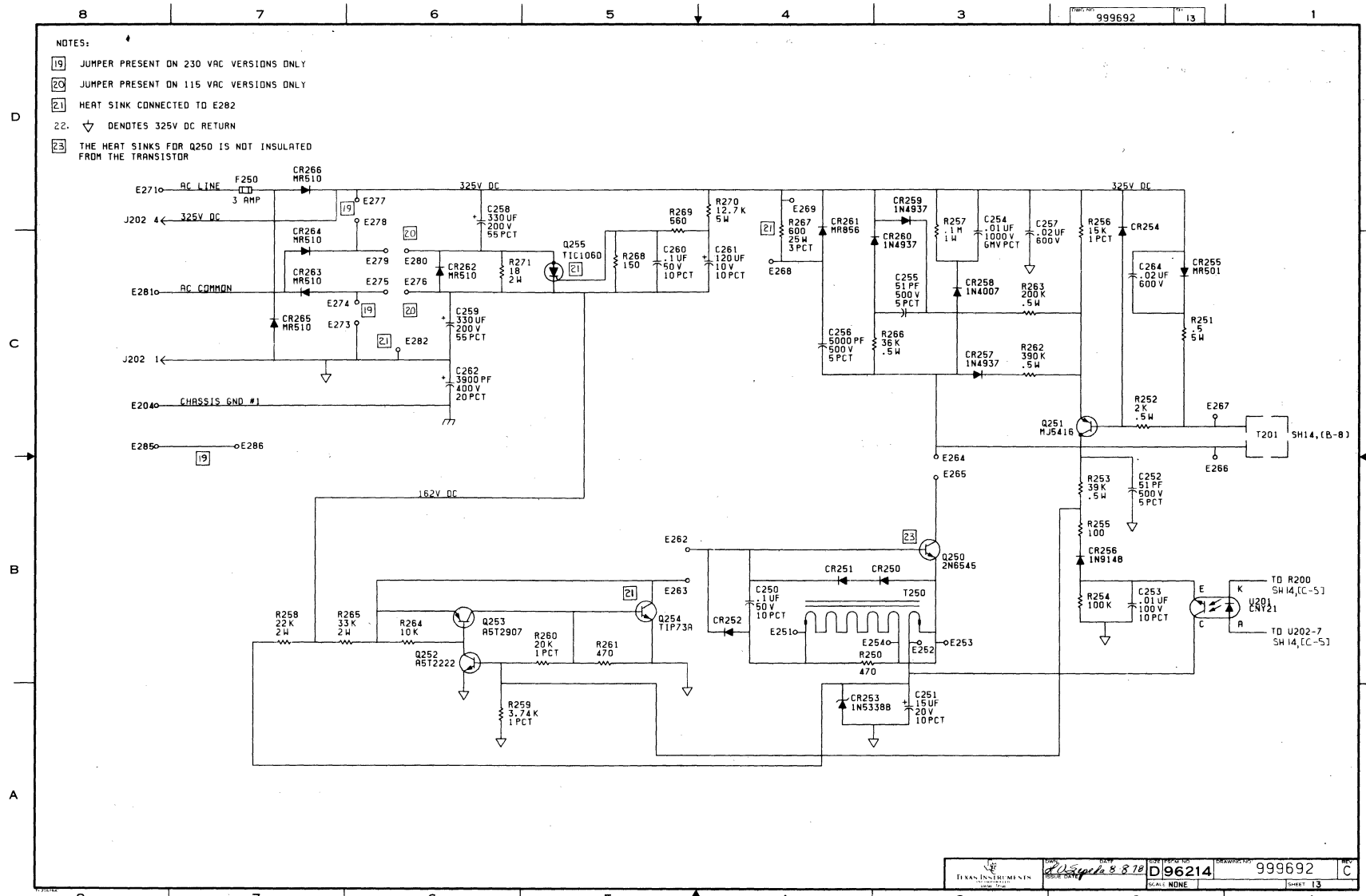


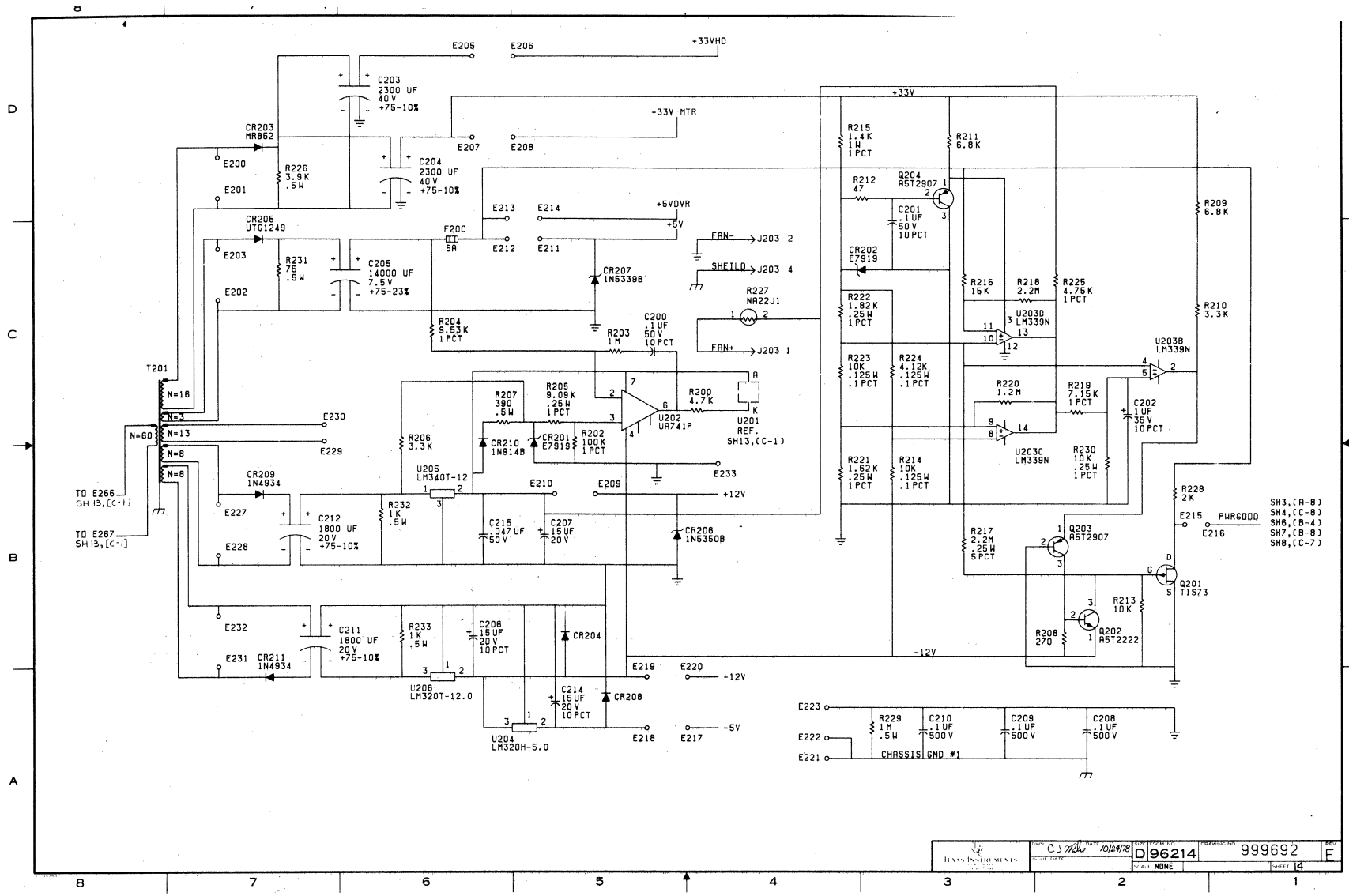
POWER AND GROUND PINS					
DEVICE	VCC	GND	DEVICE	VCC	GND
SN74LS14N	14	7	SN74LS74N	14	7
SN74S472N	20	10	SN74LS08N	14	7
TM4045	18	9	SN74259N	16	8
SN74LS51N	14	7	SN74LS367N	16	8
TMS4732NL	24	12	SN74LS175N	16	8
SN74LS273N	20	10	SN74LS95	14	7
TMS9940	12,13	40	SN74S288N	16	8
SN7406N	14	7	SN74LS174N	16	8
SN74LS148N	16	8	SN74LS251N	16	8
SN74LS138N	16	8	SN75189AN	14	7
TMS9980N	20	35	TMS9902	18	9
SN74LS04N	14	7	SN7417N	14	7
SN74LS27N	14	7	SN74LS02N	14	7
SN74LS00N	14	7			
SN74S471N	20	10			

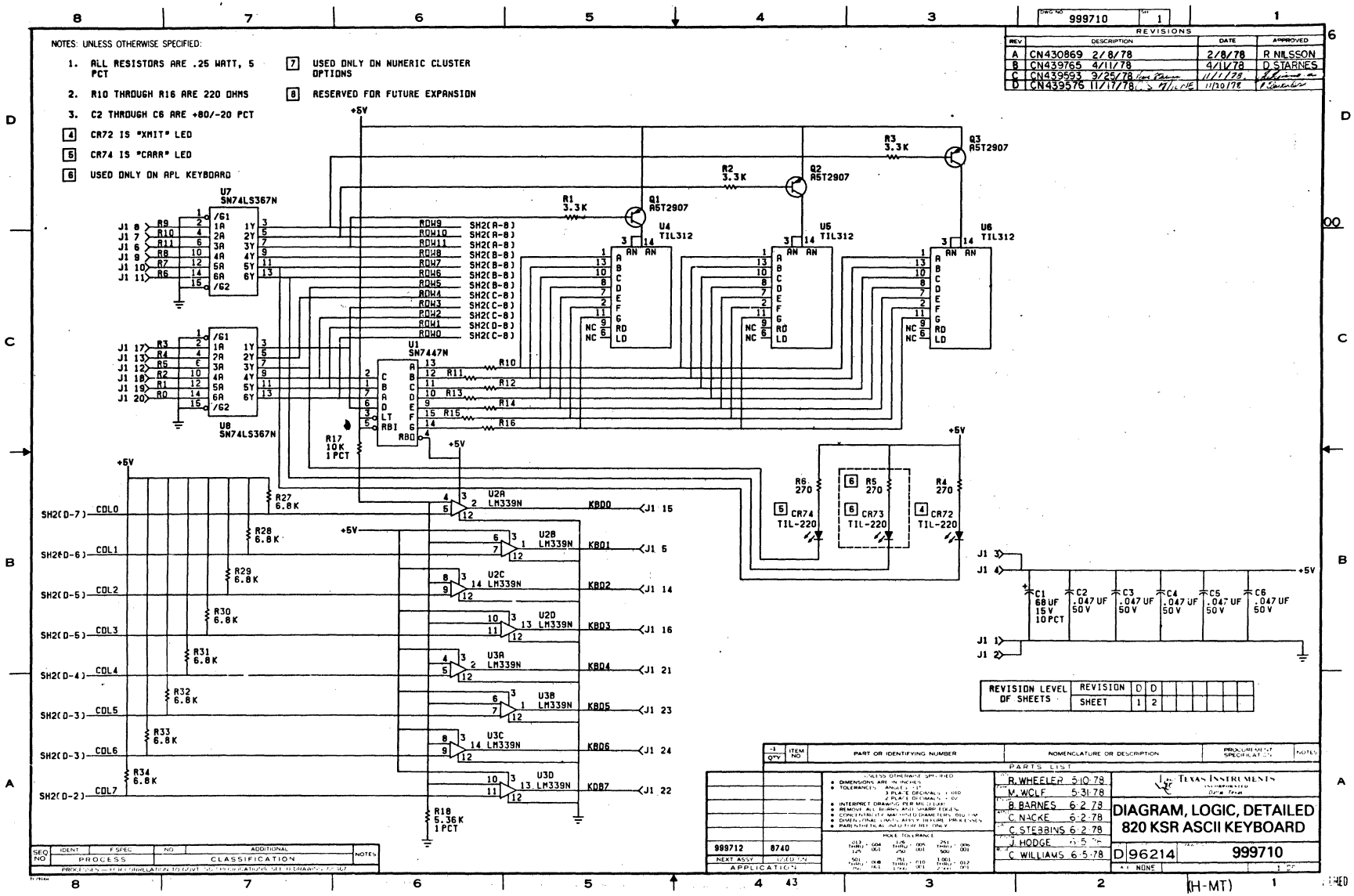
RIBBON MOTOR DRIVE

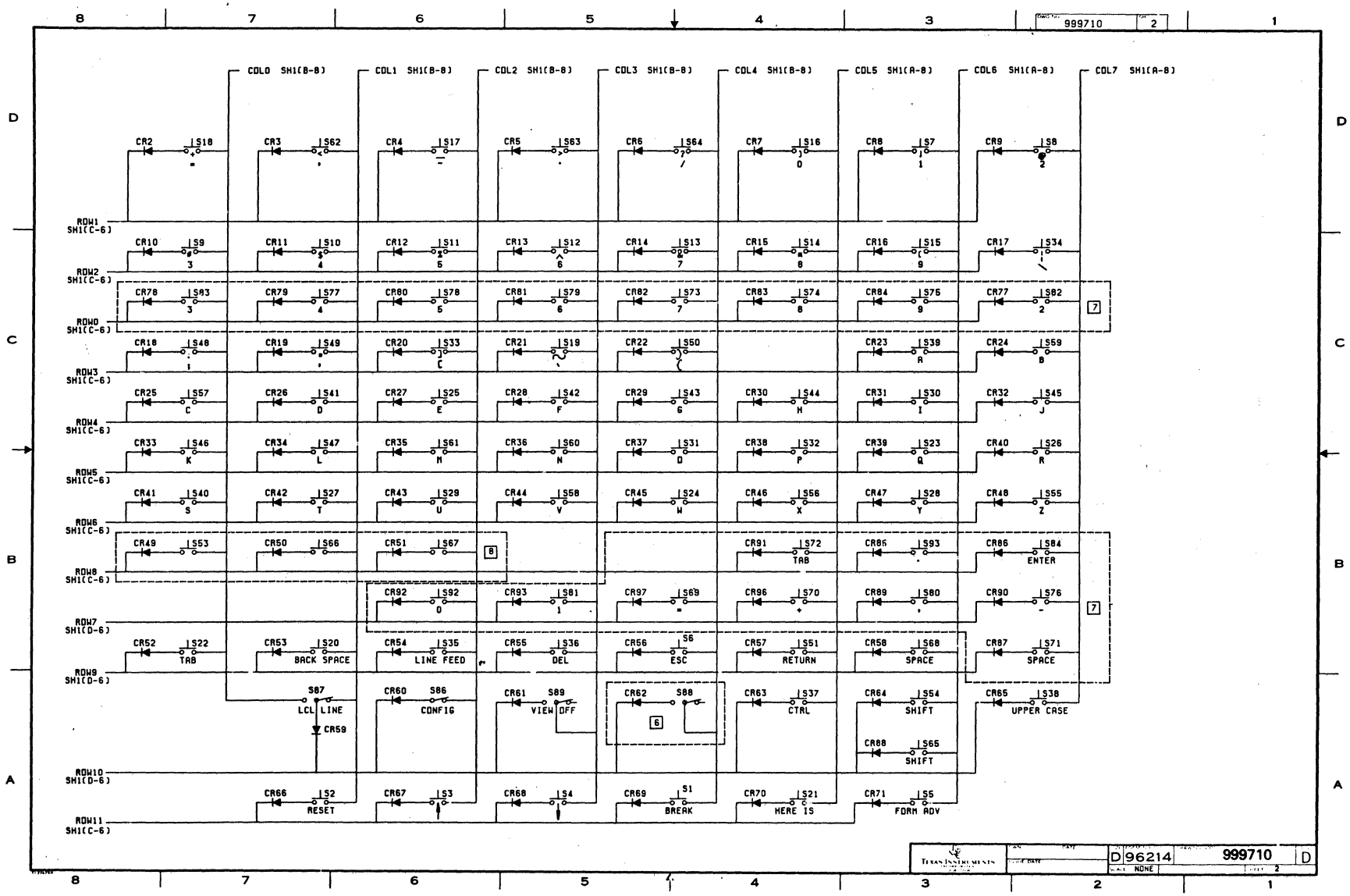
TEXAS INSTRUMENTS — D 96214 — 999692 — REV C — SCALE NONE — SHEET 11

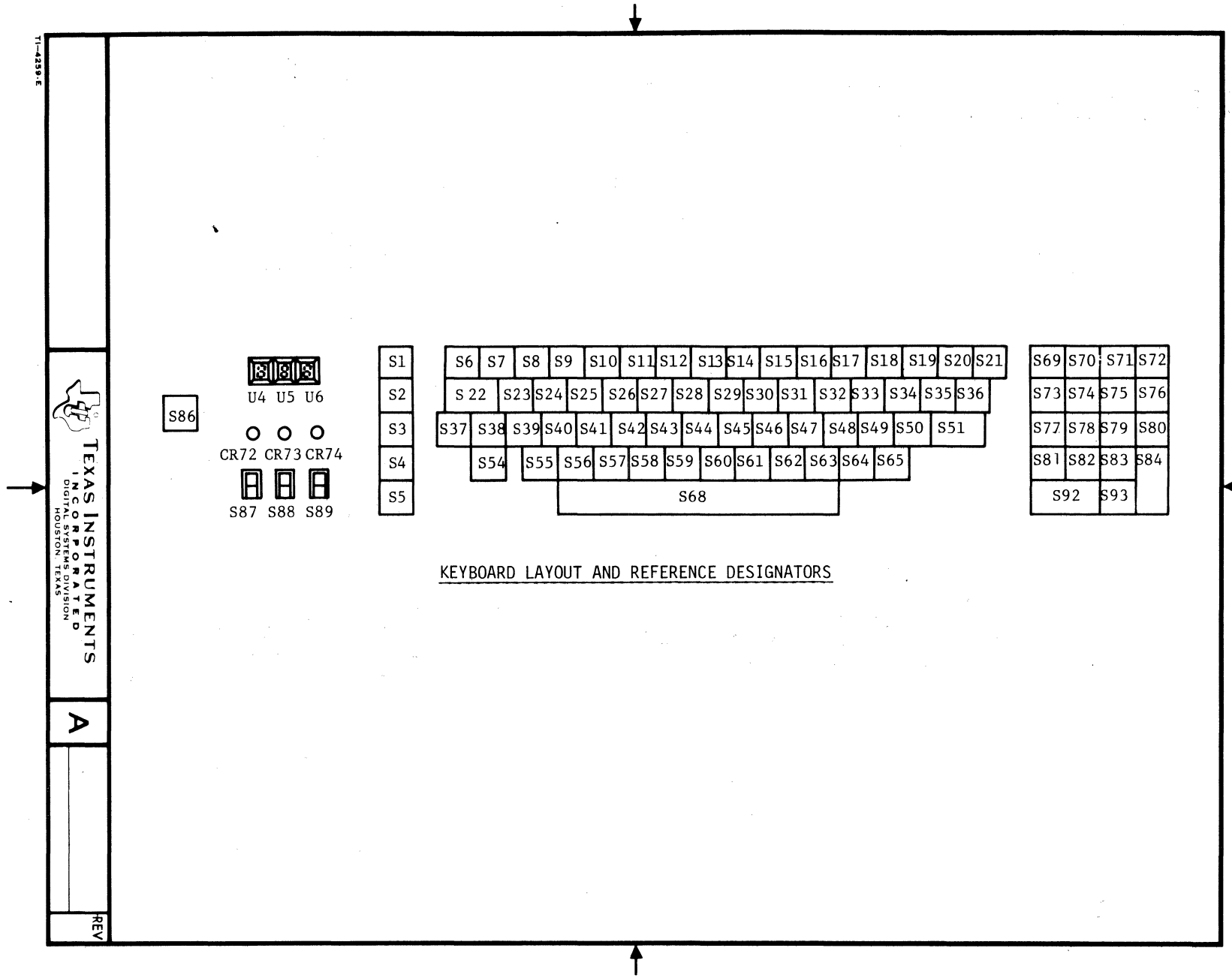

NOTES:
16 U104-14 AND U105-14 ARE CONNECTED TO +5VDVR, U104-7 AND U105-7 ARE CONNECTED TO B
B DENOTES SECOND +33V MOTOR RETURN WHICH CONNECTS TO CENTRAL POINT GROUND AT POWER SUPPLY SECONDARY
17 HEATSINKS FOR Q101 AND Q102 ARE CONNECTED TO E102.
18 NOTE IS SHT 11
999692
+33VHD
F102 3AMP
CR109 CR111 CR110 CR108 CR107 CR105 CR106
E114 E115
J103 2 J103 4 J103 3 J103 5 J103 6 J103 8 J103 7 J103 9
E117
CHASSIS GND #3
E116 E101 J103 1
E102 CHASSIS GND #3
+5VSW
U104F SN7417N
U105A SN7417N
U104E SN7417N
U105B SN7417N
U104E SN7417N
U105D SN7417N
U105F SN7417N
U105C SN7417N
SH8,(C-3) SF6
SH8,(D-3) SF2
SH8,(D-3) SF4
SH8,(C-3) SF5
SH8,(D-3) SF1
SH8,(D-3) SF3
SH8,(C-3) SF7
SH8,(C-3) SF8
U106A 1K .125W 2PCT
U106N 1K .125W 2PCT
U106K 1K .125W 2PCT
U106L 1K .125W 2PCT
U106D 1K .125W 2PCT
U106H 1K .125W 2PCT
U106B 1K .125W 2PCT
U106M 1K .125W 2PCT
U102 ULN2065B
U103 ULN2065B
E1E2E4E3
NC
+5VDVR
R106 21K 1PCT
R107 10K 1PCT
U107A LM393P
CR113 1N914B
R117 20K 1PCT
R102 .1 5W
R103 7.5K 1PCT
C101 .1UF 100V 10PCT
Q103 A5T2222
R110 1K
CR114 MR851
C104 .1UF 100V 5PCT
R115 20K 1PCT
R105 22.1K 1PCT
CR112 1N914B
R108 22.1K 1PCT
R114 10K 1PCT
R109 1M
U107B LM393P
C103 .047UF 50V
C102 .047UF 50V
CR115 E7918 5.1V 1PCT
Q101 TIP105
R101 330 .5W
R104 100
Q102 TIP73A
+12V
R113 330 .5W
R111 39 .5W
R112 2K
Q104 A5T2222
PRINTHEAD DRIVE
D 96214
999692
C
NONE
12


NOTES:
19 JUMPER PRESENT ON 230 VAC VERSIONS ONLY
20 JUMPER PRESENT ON 115 VAC VERSIONS ONLY
21 HEAT SINK CONNECTED TO E282
22. DENOTES 325V DC RETURN
23 THE HEAT SINKS FOR Q250 IS NOT INSULATED FROM THE TRANSISTOR
AC LINE
F250
3 AMP
CR266 MR510
325V DC
E271
E277
J202 4
E278
CR264 MR510
E279
E280
CR263 MR510
E275
E276
E281
AC COMMON
E274
E273
CR265 MR510
E282
J202 1
E204
CHASSIS GND #1
E285
E286
C258 330 UF 200 V 55 PCT
CR262 MR510
R271 18 2W
Q255 TIC106D
R268 150
R269 560
R270 12.7K 5W
C260 .1 UF 50 V 10 PCT
C261 120 UF 10 V 10 PCT
C259 330 UF 200 V 55 PCT
C262 3900 PF 400 V 20 PCT
E269
R267 600 25W 3 PCT
E268
CR261 MR856
CR259 1N4937
CR260 1N4937
C255 51 PF 500 V 5 PCT
C256 5000 PF 500 V 5 PCT
R266 36K .5W
CR258 1N4007
CR257 1N4937
R263 200K .5W
R262 390K .5W
R257 .1M 1W
C254 .01 UF 1000 V GMV PCT
C257 .02 UF 600 V
R256 15K 1 PCT
CR254
C264 .02 UF 600 V
CR255 MR501
R251 .5 5W
R252 2K .5W
E267
Q251 MJ5416
T201
SH14,(B-8)
E266
E264
E265
162V DC
R253 39K .5W
C252 51 PF 500 V 5 PCT
R255 100
CR256 1N914B
R254 100K
C253 .01 UF 100 V 10 PCT
U201 CNY21
TO R200 SH14,(C-5)
TO U202-7 SH14,(C-5)
E262
Q250 2N6545
CR251
CR250
T250
C250 .1 UF 50 V 10 PCT
CR252
E251
E254
E252
E253
R250 470
R258 22K 2W
R265 33K 2W
R264 10K
Q253 A5T2907
Q252 A5T2222
R260 20K 1 PCT
R261 470
E263
Q254 T1P73A
R259 3.74K 1 PCT
CR253 1N5338B
C251 15UF 20V 10PCT
TEXAS INSTRUMENTS
DRWN
DATE 8 8 78
ISSUE DATE
SIZE D
PROJ NO 96214
DRAWING NO 999692
REV C
SCALE NONE
SHEET 13


E205
E206
+33VHD
C203
2300 UF
40V
+75-10%
+33V MTR
+33V
CR203
MR852
E207
E208
E200
R226
3.9K
.5W
C204
2300 UF
40V
+75-10%
E201
CR205
UTG1249
E213
E214
+5VDVR
+5V
F200
5A
E212
E211
FAN-
J203 2
SHIELD
J203 4
E203
R231
75
.5W
C205
14000 UF
7.5V
+75-23%
CR207
1N5339B
R227
NA22J1
FAN+
J203 1
E202
R204
9.53K
1PCT
R203
1M
C200
.1UF
50V
10PCT
T201
N=16
N=3
N=60
N=13
N=8
N=8
E230
E229
R207
390
.5W
R205
9.09K
.25W
1PCT
R200
4.7K
U202
UA741P
U201
REF.
SH13,(C-1)
R206
3.3K
CR210
1N914B
CR201
E7919
R202
100K
1PCT
E233
TO E266
SH 13,(C-1)
TO E267
SH 13,(C-1)
CR209
1N4934
U205
LM340T-12
E210
E209
+12V
E227
C212
1800 UF
20V
+75-10%
R232
1K
.5W
C215
.047 UF
50V
C207
15UF
20V
CR206
1N5350B
E228
E232
C211
1800 UF
20V
+75-10%
R233
1K
.5W
C206
15UF
20V
10PCT
CR204
E231
CR211
1N4934
E219
E220
-12V
U206
LM320T-12.0
C214
15UF
20V
10PCT
CR208
U204
LM320H-5.0
E218
E217
-5V
R215
1.4K
1W
1PCT
R211
6.8K
R212
47
Q204
A5T2907
C201
.1UF
50V
10PCT
CR202
E7919
R209
6.8K
R216
15K
R218
2.2M
R225
4.75K
1PCT
R222
1.82K
.25W
1PCT
U203D
LM339N
R210
3.3K
U203B
LM339N
R223
10K
.125W
.1PCT
R224
4.12K
.125W
.1PCT
R220
1.2M
R219
7.15K
1PCT
C202
1UF
35V
10PCT
U203C
LM339N
R221
1.62K
.25W
1PCT
R214
10K
.125W
.1PCT
R230
10K
.25W
1PCT
R228
2K
E215
PWRGOOD
E216
SH3,(A-8)
SH4,(C-8)
SH6,(B-4)
SH7,(B-8)
SH8,(C-7)
R217
2.2M
.25W
5PCT
Q203
A5T2907
Q201
TIS73
R213
10K
Q202
A5T2222
R208
270
-12V
E223
E222
E221
R229
1M
.5W
C210
.1UF
500V
C209
.1UF
500V
C208
.1UF
500V
CHASSIS GND #1
TEXAS INSTRUMENTS
CJM 10/24/78
D 96214
999692
E
NONE
SHEET 14


DWG NO 999710
REVISIONS
NOTES: UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTORS ARE .25 WATT, 5 PCT
2. R10 THROUGH R16 ARE 220 OHMS
3. C2 THROUGH C6 ARE +80/-20 PCT
4 CR72 IS "XMIT" LED
5 CR74 IS "CARR" LED
6 USED ONLY ON APL KEYBOARD
7 USED ONLY ON NUMERIC CLUSTER OPTIONS
8 RESERVED FOR FUTURE EXPANSION
U7 SN74LS367N
U8 SN74LS367N
U1 SN7447N
U2A LM339N
U2B LM339N
U2C LM339N
U2D LM339N
U3A LM339N
U3B LM339N
U3C LM339N
U3D LM339N
Q1 A5T2907
Q2 A5T2907
Q3 A5T2907
U4 TIL312
U5 TIL312
U6 TIL312
CR74 TIL-220
CR73 TIL-220
CR72 TIL-220
C1 68 UF 15 V 10 PCT
C2 .047 UF 50 V
C3 .047 UF 50 V
C4 .047 UF 50 V
C5 .047 UF 50 V
C6 .047 UF 50 V
R. WHEELER 5-10-78
M. WOLF 5-31-78
B. BARNES 6-2-78
C. NACKE 6-2-78
C. STEBBINS 6-2-78
J. HODGE
C. WILLIAMS 6-5-78
DIAGRAM, LOGIC, DETAILED
820 KSR ASCII KEYBOARD
D 96214
999710


999710 2
COL0 SH1(B-8)
COL1 SH1(B-8)
COL2 SH1(B-8)
COL3 SH1(B-8)
COL4 SH1(B-8)
COL5 SH1(A-8)
COL6 SH1(A-8)
COL7 SH1(A-8)
ROW1 SH1(C-6)
ROW2 SH1(C-6)
ROW0 SH1(C-6)
ROW3 SH1(C-6)
ROW4 SH1(C-6)
ROW5 SH1(C-6)
ROW6 SH1(C-6)
ROW8 SH1(C-6)
ROW7 SH1(D-6)
ROW9 SH1(D-6)
ROW10 SH1(D-6)
ROW11 SH1(C-6)
CR2 S18 =
CR3 S62 '
CR4 S17 -
CR5 S63 .
CR6 S64 /
CR7 S16 0
CR8 S7 1
CR9 S8 2
CR10 S9 3
CR11 S10 4
CR12 S11 5
CR13 S12 6
CR14 S13 7
CR15 S14 8
CR16 S15 9
CR17 S34 ;
CR78 S83 3
CR79 S77 4
CR80 S78 5
CR81 S79 6
CR82 S73 7
CR83 S74 8
CR84 S75 9
CR77 S82 2
CR18 S48 ;
CR19 S49 ,
CR20 S33 [
CR21 S19 `
CR22 S50]
CR23 S39 R
CR24 S59 B
CR25 S57 C
CR26 S41 D
CR27 S25 E
CR28 S42 F
CR29 S43 G
CR30 S44 H
CR31 S30 I
CR32 S45 J
CR33 S46 K
CR34 S47 L
CR35 S61 M
CR36 S60 N
CR37 S31 O
CR38 S32 P
CR39 S23 Q
CR40 S26 R
CR41 S40 S
CR42 S27 T
CR43 S29 U
CR44 S58 V
CR45 S24 W
CR46 S56 X
CR47 S28 Y
CR48 S55 Z
CR49 S53
CR50 S66
CR51 S67
CR91 S72 TAB
CR85 S93 .
CR86 S84 ENTER
CR92 S92 0
CR93 S81 1
CR97 S69 =
CR96 S70 +
CR89 S80 ,
CR90 S76 -
CR52 S22 TAB
CR53 S20 BACK SPACE
CR54 S35 LINE FEED
CR55 S36 DEL
CR56 S6 ESC
CR57 S51 RETURN
CR58 S68 SPACE
CR87 S71 SPACE
S67 LCL LINE
CR59
CR60 S86 CONFIG
CR61 S89 VIEW OFF
CR62 S88
CR63 S37 CTRL
CR64 S54 SHIFT
CR65 S38 UPPER CASE
CR88 S65 SHIFT
CR66 S2 RESET
CR67 S3
CR68 S4
CR69 S1 BREAK
CR70 S21 HERE IS
CR71 S5 FORM ADV
7
8
6
TEXAS INSTRUMENTS
D 96214
999710 D
SCALE NONE
SHEET 2



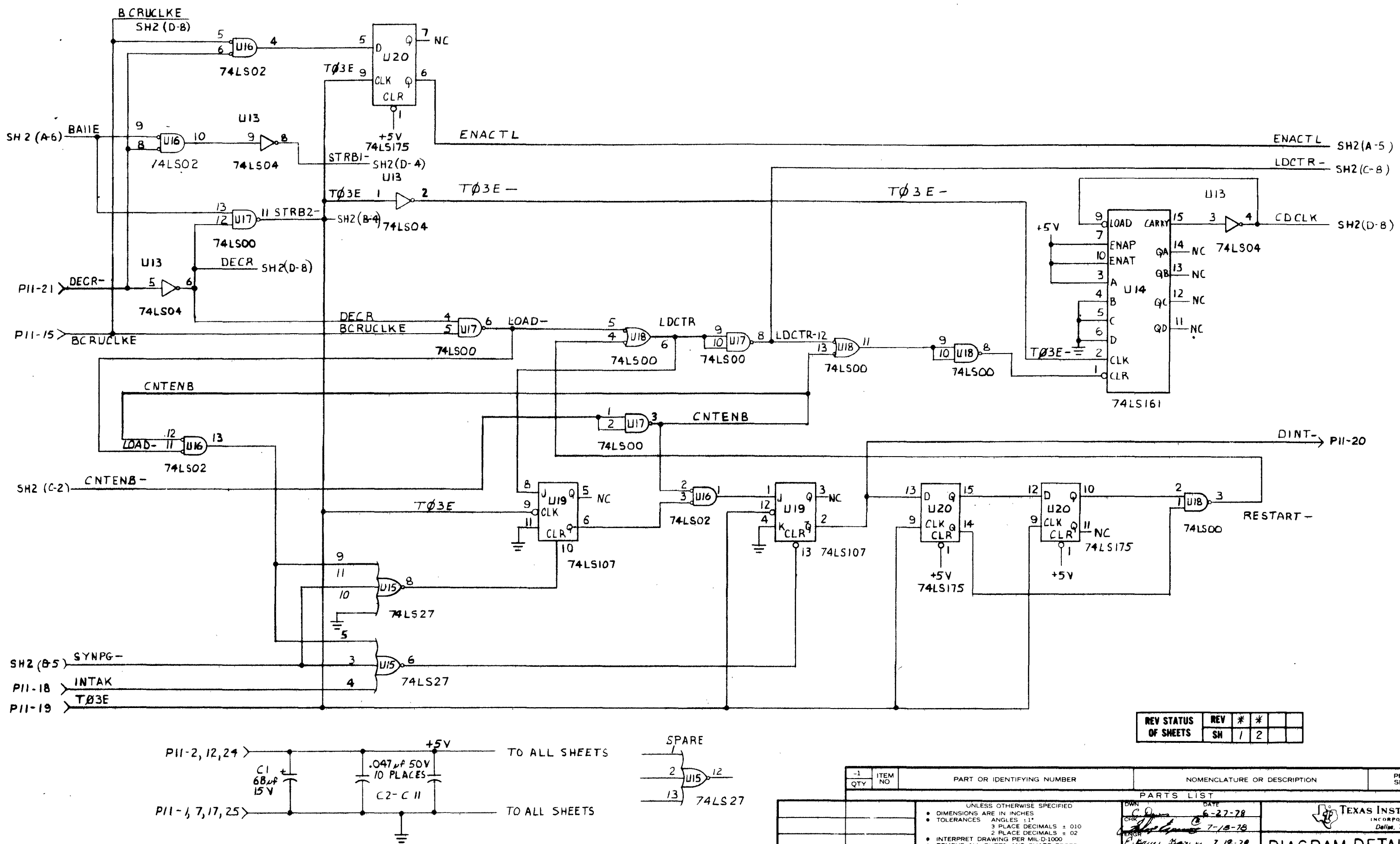
KEYBOARD LAYOUT AND REFERENCE DESIGNATORS

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

NOTES: UNLESS OTHERWISE SPECIFIED:

1. +5V IS APPLIED TO PIN 14 OF 14 PIN PACKAGES AND PIN 16 OF 16 PIN PACKAGES.
2. GND IS APPLIED TO PIN 7 OF 14 PIN PACKAGES AND PIN 8 OF 16 PIN PACKAGES.



REV STATUS OF SHEETS	REV	*	*		
	SH	1	2		

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ± .010 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

NEXT ASSY	USED ON
999778	8740

APPLICATION

DWN 6-27-78; CHK 7-18-78; ENGR 7-18-78; APVD 7-18-78

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

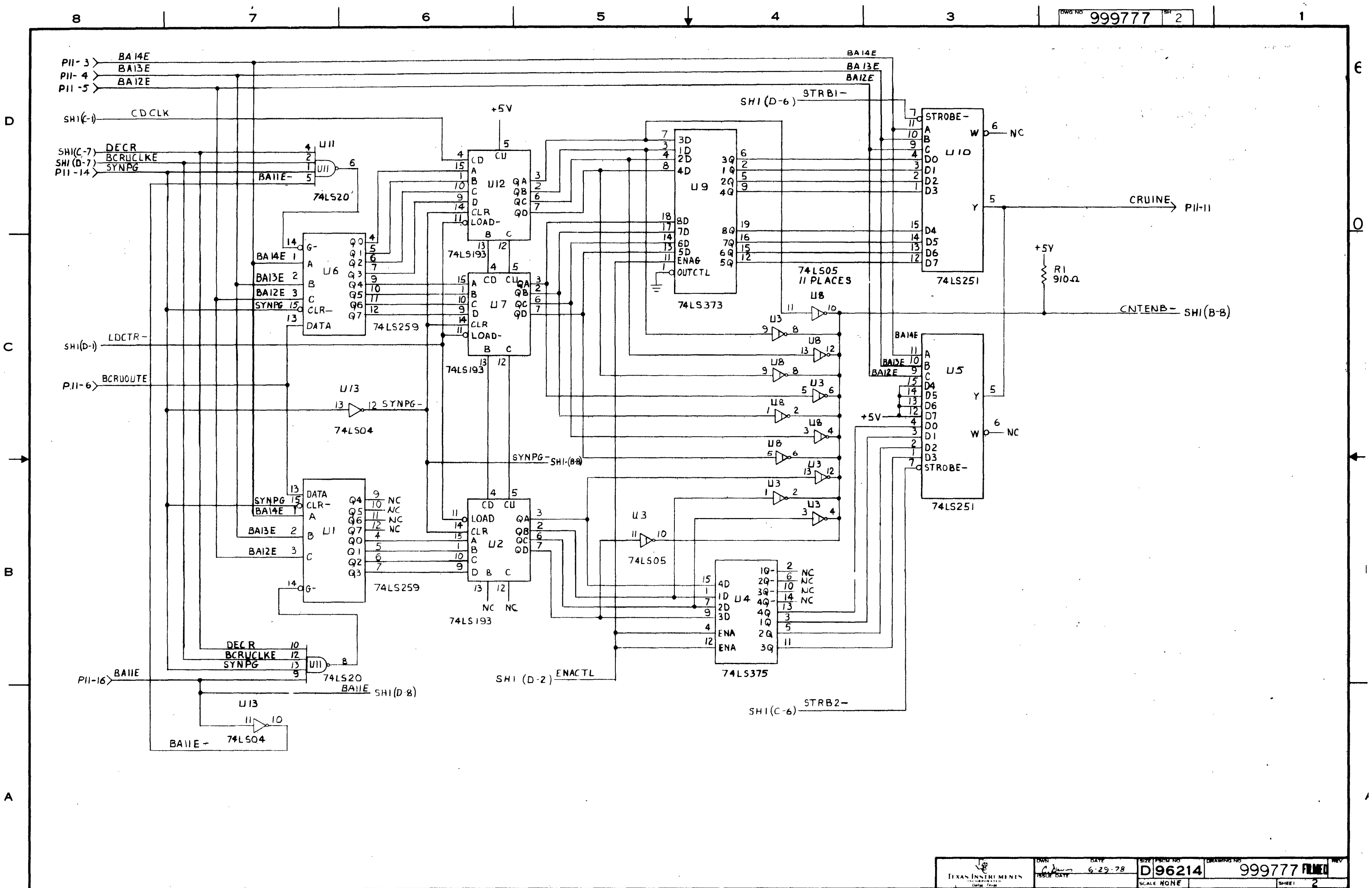
DIAGRAM, DETAILED, LOGIC, DECREMETER

SIZE D FSCM NO 96214 DRAWING NO 999777 FILMED

SCALE NONE SHEET 1 OF 2

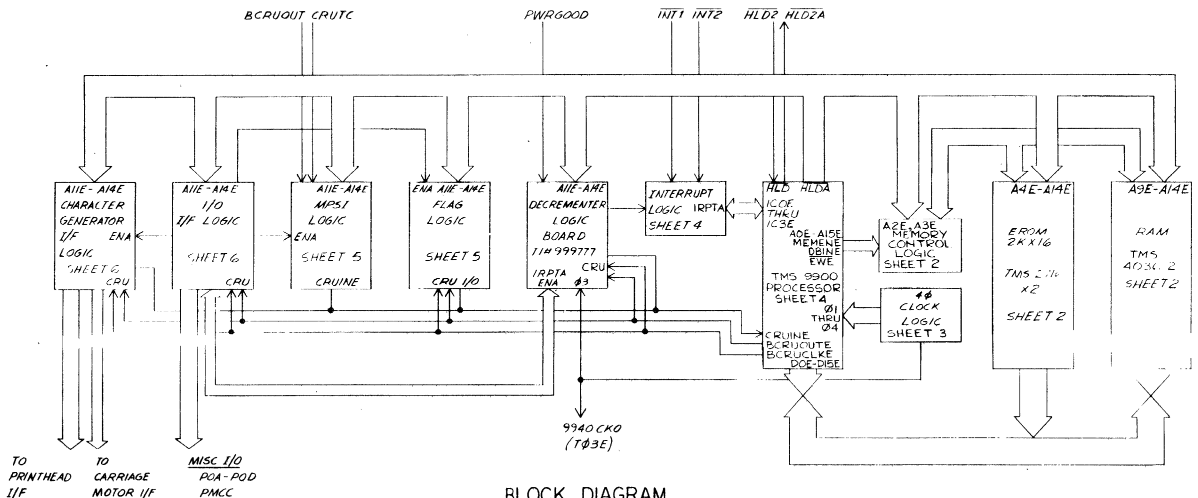
SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS			CLASSIFICATION	

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467


999777 SH 2
BA14E
BA13E
BA12E
P11-3
P11-4
P11-5
SH1(C-1) CDCLK
SH1(C-7) DECR
SH1(D-7) BCRUCLKE
P11-14 SYNPG
BA11E-
U11 74LS20
U12 74LS193
+5V
U9 74LS373
SH1(D-6) STRB1-
U10 74LS251
STROBE-
CRUINE P11-11
U6 74LS259
U7 74LS193
74LS05 11 PLACES
+5V R1 910Ω
CNTENB- SH1(B-8)
SH1(D-1) LDCTR-
P11-6 BCRUOUTE
U13 74LS04
SYNPG-
U5 74LS251
SYNPG- SH1-(B8)
U1 74LS259
U2 74LS193
U4 74LS375
NC
P11-16 BA11E
BA11E SH1(D-8)
SH1 (D-2) ENACTL
SH1(C-6) STRB2-
BA11E-
TEXAS INSTRUMENTS
6-29-78
D 96214
999777
SCALE NONE
SHEET 2
FILMED

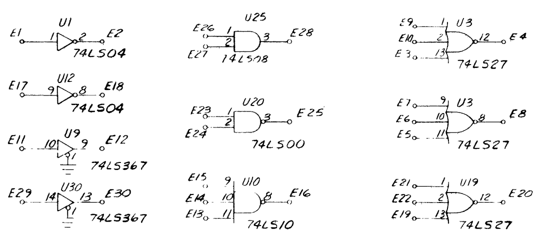
NOTES: UNLESS OTHERWISE SPECIFIED:
1. RESISTANCE VALUES ARE IN OHMS
2. RESISTORS ARE 25W, 5%
3. DIODES ARE 1N914B
4. CAPACITORS ARE .047uf, +80%, -20%

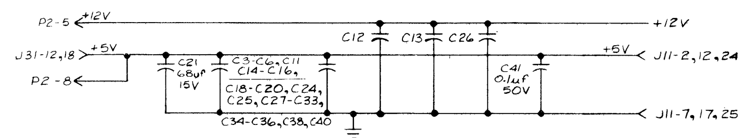
REV	DESCRIPTION	DATE	APPROVED
A	CN 445455	10/21/78	



BLOCK DIAGRAM

SPARES





POWER AND GROUND PINS		
DEVICE	+5	GND
TMS4036-2	15	6
SN7400	14	7
SN74LS00	14	7
SN74LS04	14	7
SN74LS08	14	7
SN74LS10	14	7
SN74LS27	14	7
SN74LS32	14	7
SN74LS138	16	8
SN74LS174	16	8
SN74LS175	16	8
SN74LS251	16	8
SN74LS259	16	8
SN74LS367	16	8

REV STATUS OF SHEETS						
REV	A	A	A	A	A	A
SH	1	2	3	4	5	6

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999787	8740

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY: MACHINED DIAMETERS .005 TIR
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

DWN 6-27-78
9/5/78
9/5/78
9/5/78

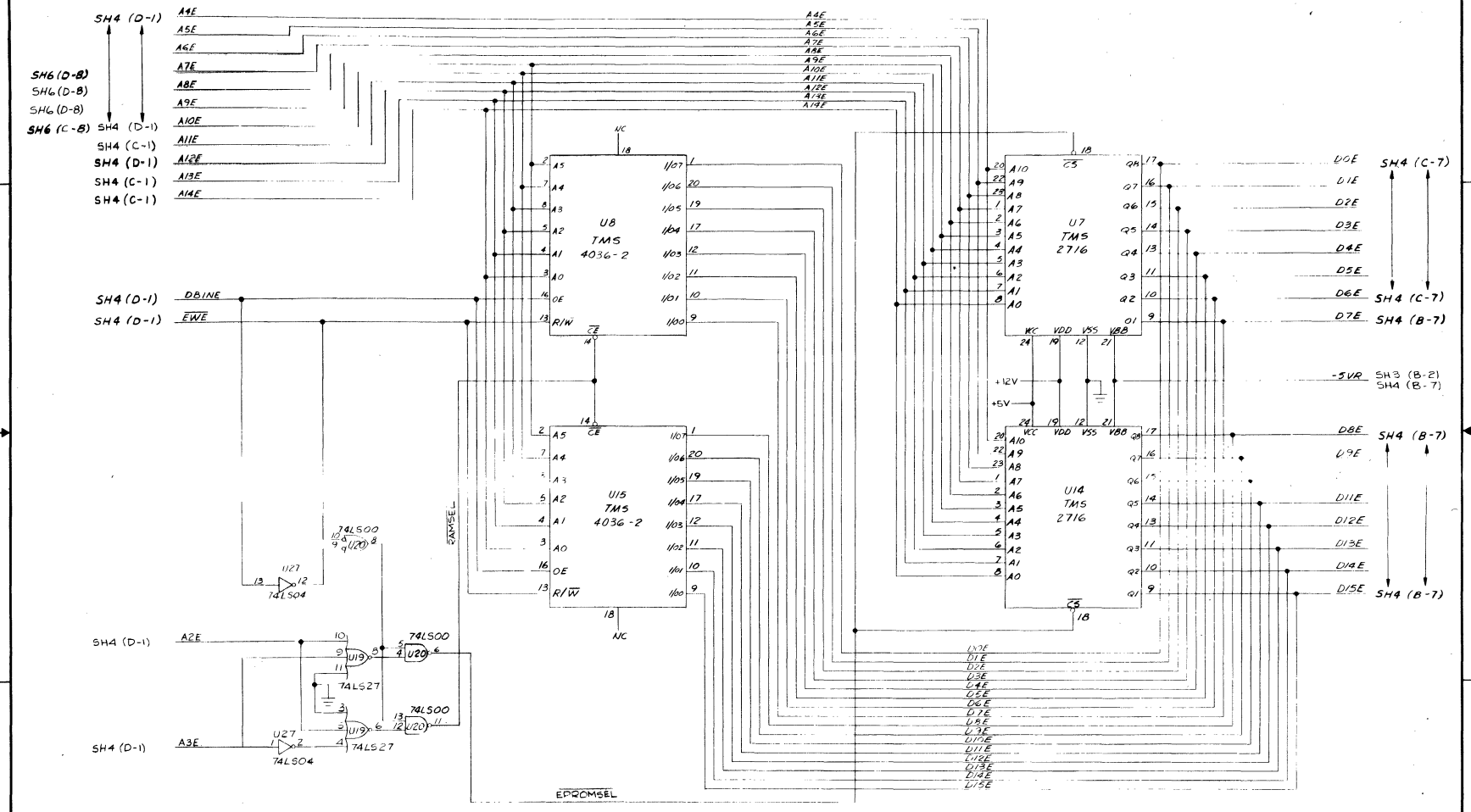
TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

DIAGRAM, LOGIC 9940 EMULATOR

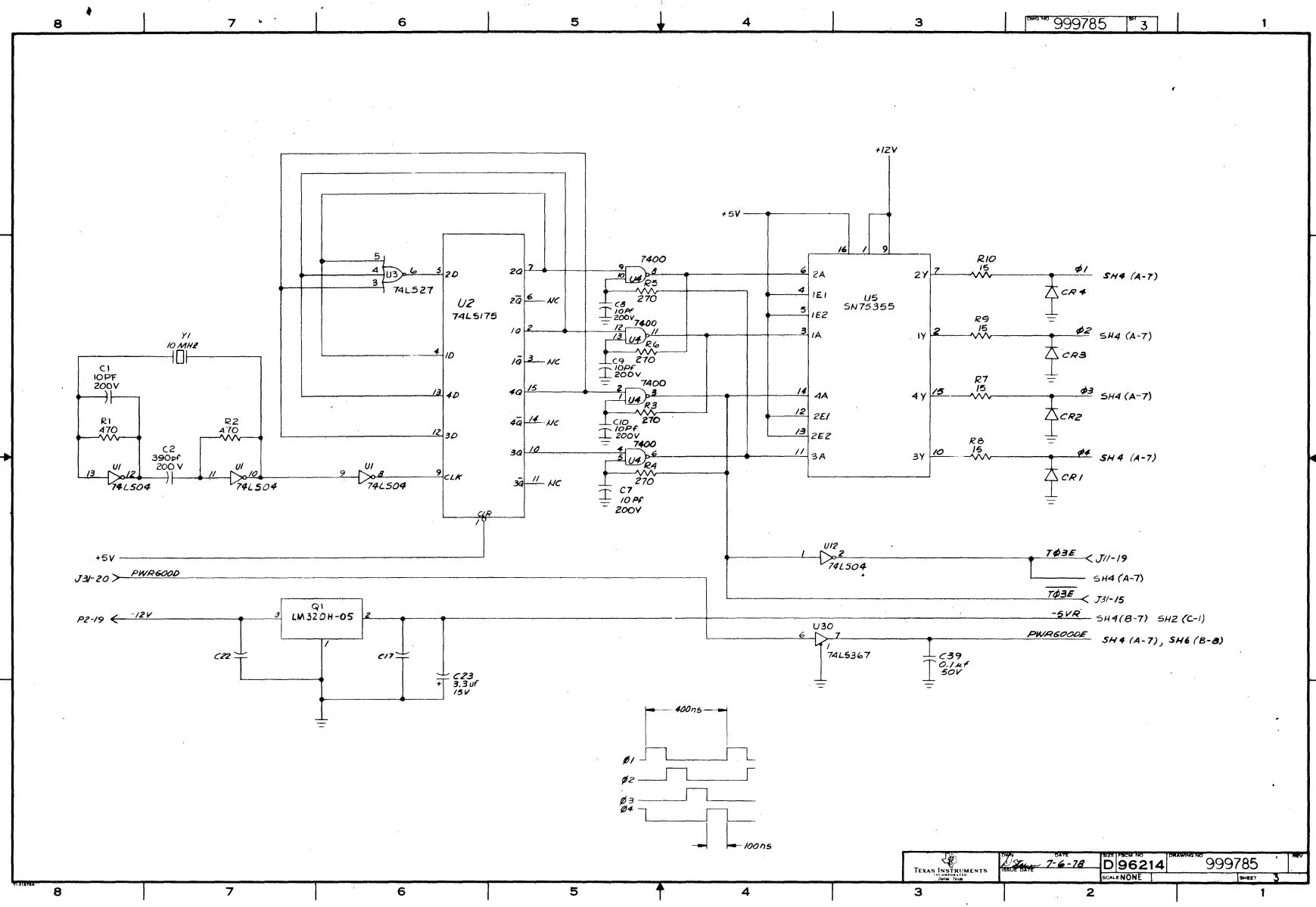
SIZE D FSCM NO 96214 DRAWING NO 999785
SCALE NONE SHEET 1 OF 6

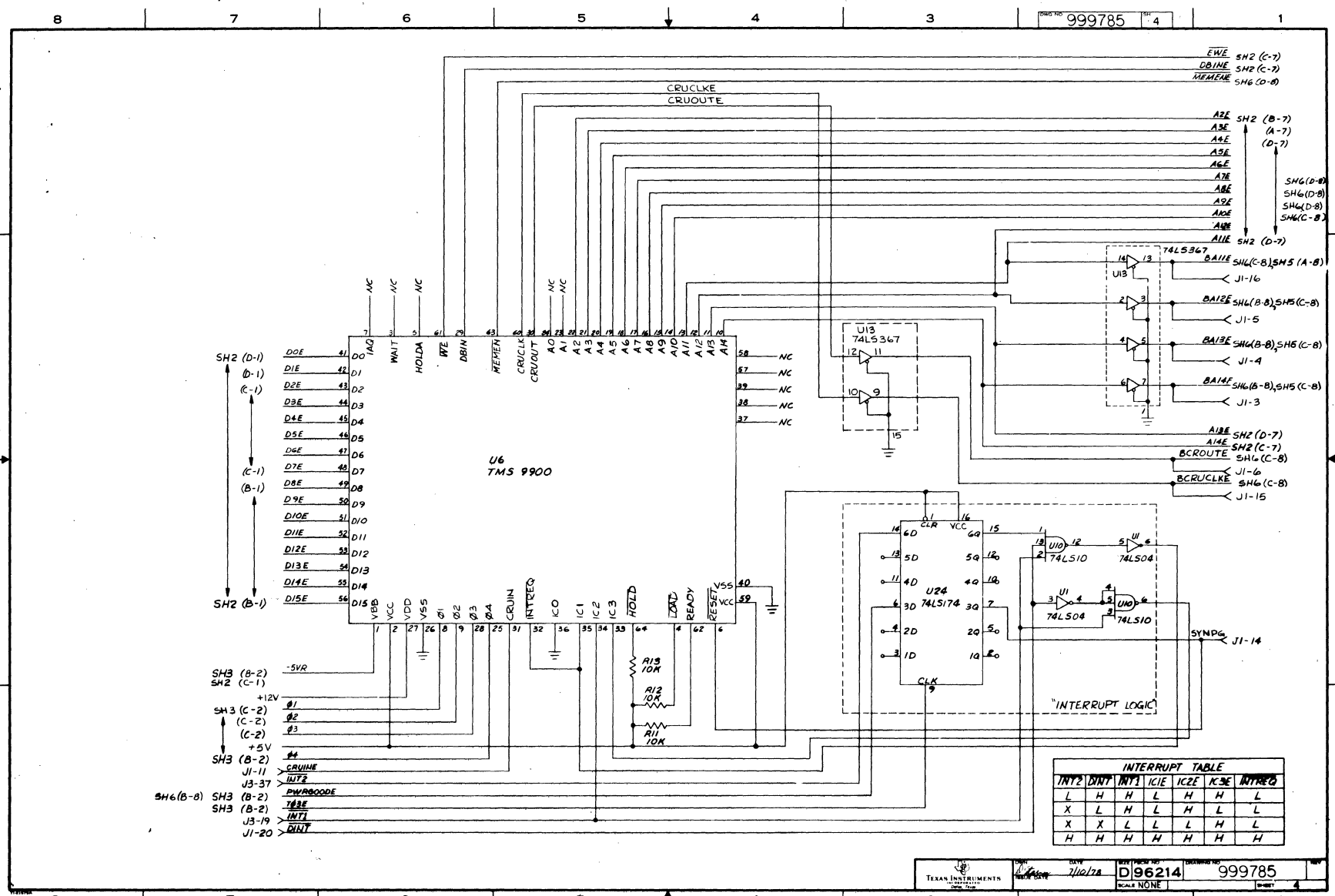
SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS			CLASSIFICATION	

PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467



TEXAS INSTRUMENTS	DWN	DATE	SIZE	FSCM NO.	DRAWING NO.	REV
	ISSUE DATE 1-5-78		D	96214	999785	
			SCALE NONE		SHEET 2	


DWG NO 999785 SH 3
U2 74LS175
U3 74LS27
U5 SN75355
Y1 10 MHZ
C1 10PF 200V
C2 390pf 200 V
R1 470
R2 470
U1 74LS04
U12 74LS04
U30 74LS367
Q1 LM320H-05
C22
C17
C23 3.3 uf 15V
C39 0.1uf 50V
C7 10 PF 200V
C8 10 PF 200V
C9 10PF 200V
C10 10PF 200V
R5 270
R6 270
R3 270
R4 270
7400
+12V
+5V
-12V
R10 15
R9 15
R7 15
R8 15
CR4
CR3
CR2
CR1
SH4 (A-7)
PWR600D
PWR600DE
SH4 (A-7), SH6 (B-8)
SH4(B-7) SH2 (C-1)
400ns
100ns
Texas Instruments
DATE 7-6-78
SIZE D
FSCM NO 96214
DRAWING NO 999785
SCALE NONE
SHEET 3



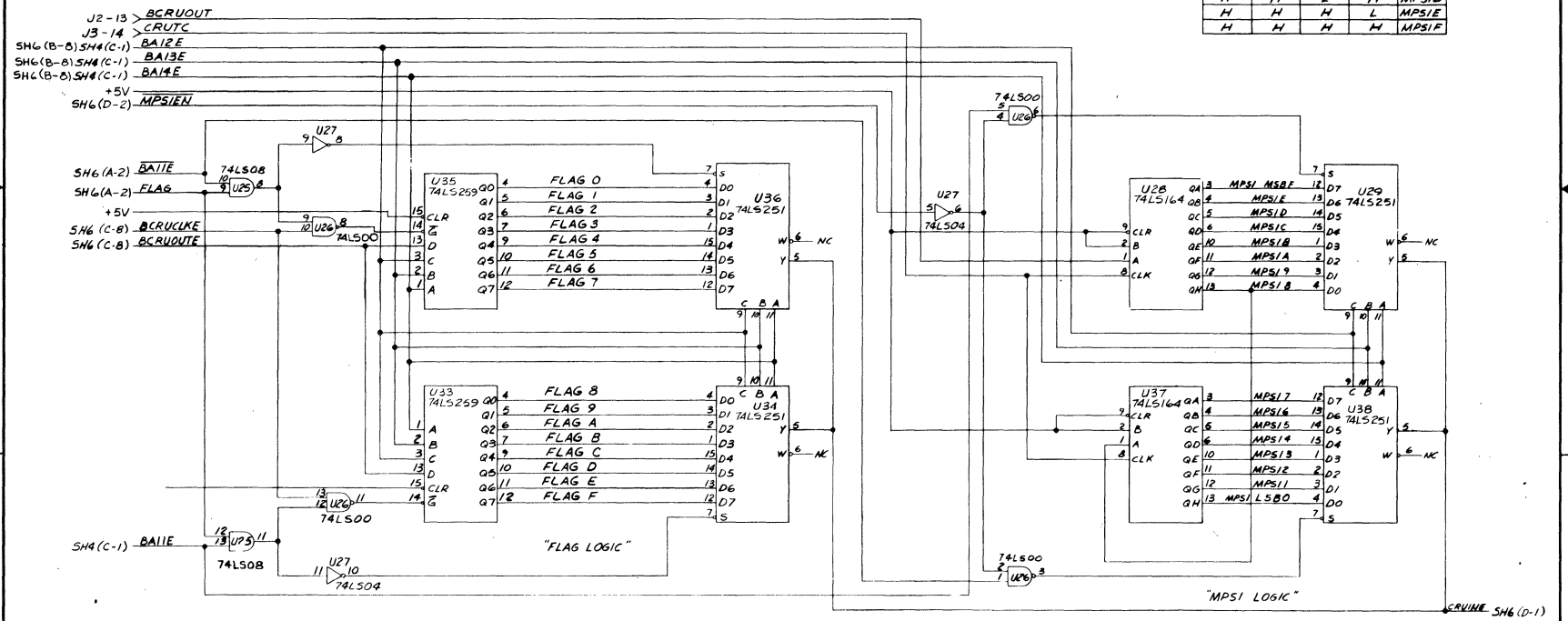
INTERRUPT TABLE

INT2	DINT	INT1	IC1E	IC2E	IC3E	INTREQ
L	H	H	L	H	H	L
X	L	H	L	H	L	L
X	X	L	L	L	H	L
H	H	H	H	H	H	H

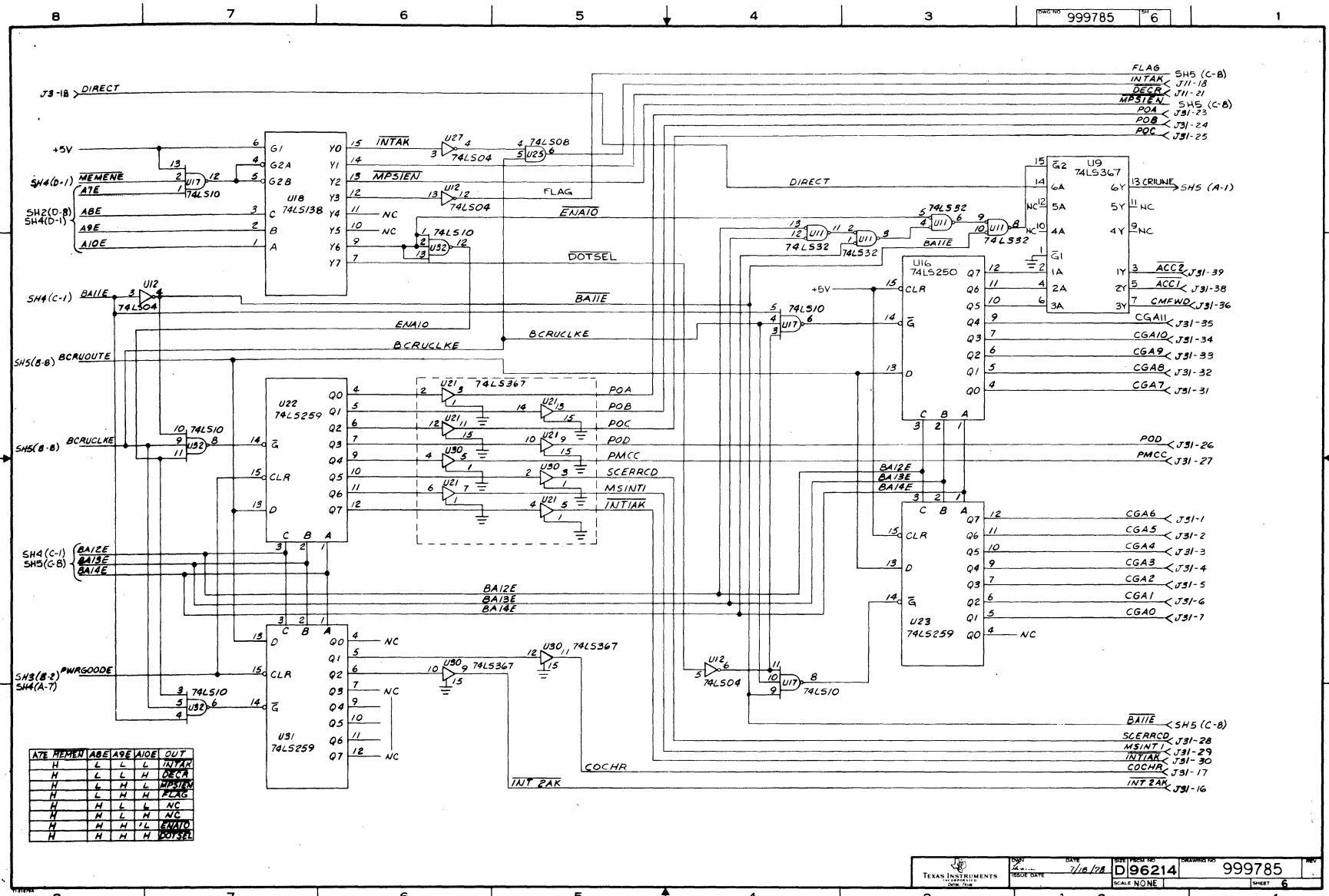
TEXAS INSTRUMENTS
DRWN DATE 7/10/78
SIZE D PROJ NO 96214
DRAWING NO 999785
SCALE NONE
SHEET 4

BA11E	BA12E	BA13E	BA14E	FLAG
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	L	L	L	8
H	L	L	H	9
H	L	H	L	A
H	L	H	H	B
H	H	L	L	C
H	H	L	H	D
H	H	H	L	E
H	H	H	H	F

BA11E MPSIEN	BA12E	BA13E	BA14E	OUT
L	L	L	L	MPS10
L	L	L	H	MPS11
L	L	H	L	MPS12
L	L	H	H	MPS13
L	H	L	L	MPS14
L	H	L	H	MPS15
L	H	H	L	MPS16
L	H	H	H	MPS17
H	L	L	L	MPS18
H	L	L	H	MPS19
H	L	H	L	MPS1A
H	L	H	H	MPS1B
H	H	L	L	MPS1C
H	H	L	H	MPS1D
H	H	H	L	MPS1E
H	H	H	H	MPS1F



	DWN	DATE	SIZE	PSCM NO	DRAWING NO	REV
TEXAS INSTRUMENTS	CHK'D	3/22/88	D	96214	999785	
	TRUTH DATE		SCALE NONE		SHEET 5	

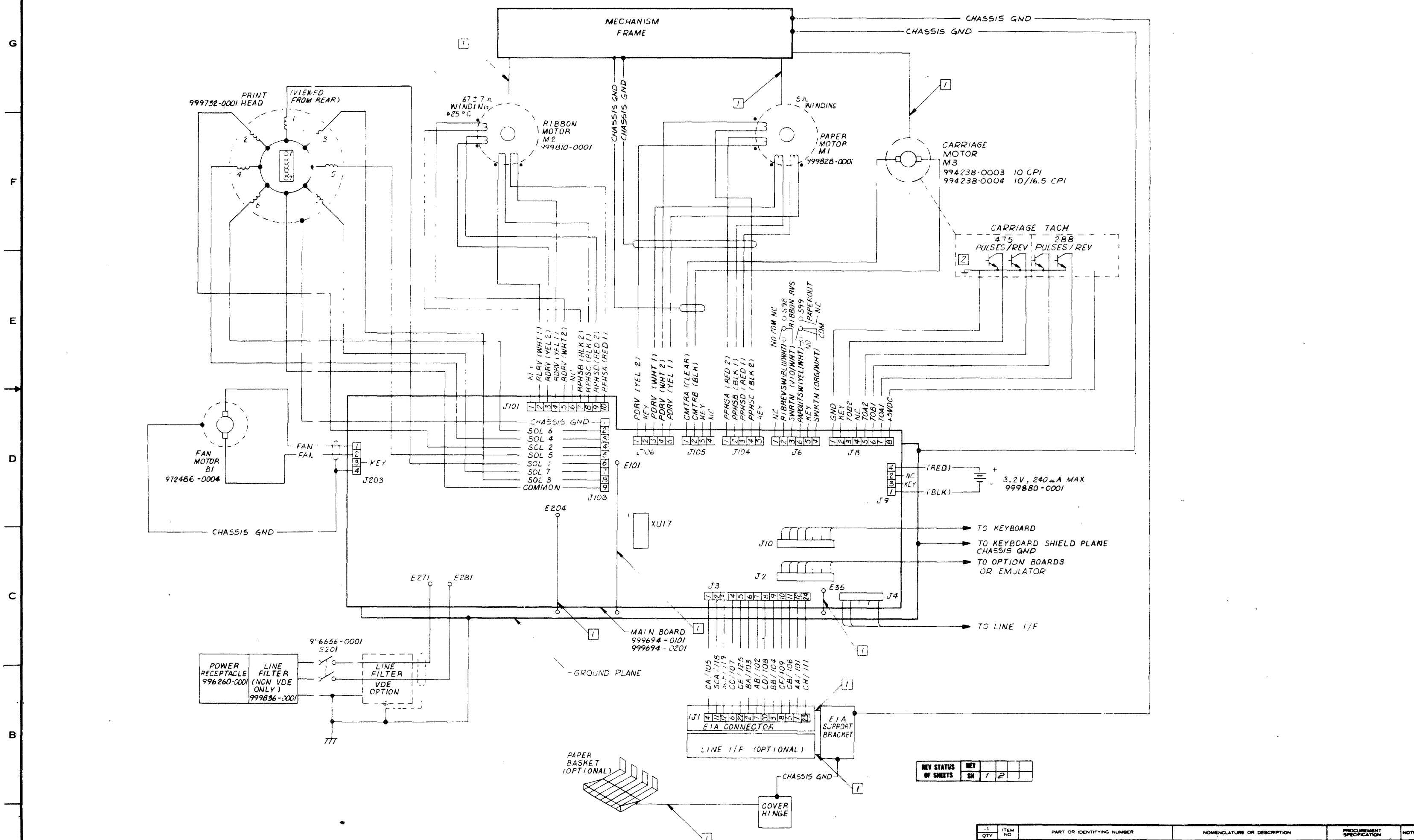


ATE	MEMEN	ABE	A9E	AIOE	OUT
H		L	L	L	INTAK
H		L	L	H	DECR
H		L	H	L	MPSIEN
H		L	H	H	FLAG
H		H	L	L	NC
H		H	L	H	NC
H		H	H	L	ENAIO
H		H	H	H	DOTSEL

TEXAS INSTRUMENTS	DWN	DATE 7/18/78	SIZE D	PSCO NO 96214
	ISSUE DATE		SCALE NONE	DRAWING NO 999785 REV
				SHEET 6

NOTES: UNLESS OTHERWISE SPECIFIED.

1. DENOTES MECHANICAL CONNECTION WHICH CONNECTS THE DEVICE ELECTRICALLY TO CHASSIS GROUND
2. THE 10 CPI CARRIAGE MOTOR TACH 994238-0003 DOES NOT HAVE THE 475 PPR TACH. TOB2 IS CONNECTED TO TOB1 AND TOA2 IS CONNECTED TO TOA1 INTERNAL TO THE TACH FOR THIS DASH NUMBER
3. UNUSED CONNECTION
4. NOT CONNECTED ON EMULATOR



REV STATUS OF SHEETS	REV		
	SH	1	2

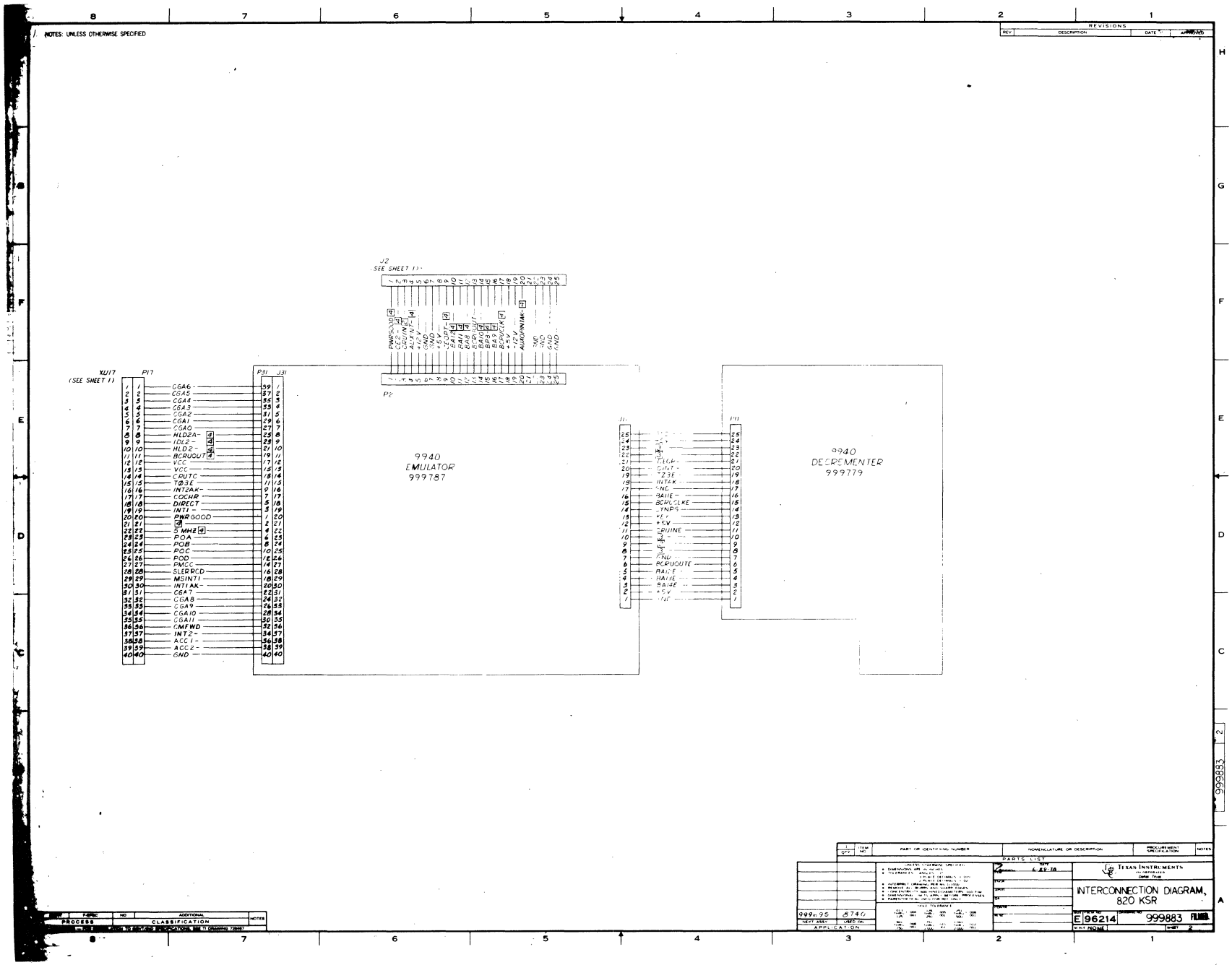
NEXT ASSY	USED ON
999695	8740

APPLICATION

TEXAS INSTRUMENTS INCORPORATED

INTERCONNECTION DIAGRAM, 820 KSR

E 96214 999883


NOTES: UNLESS OTHERWISE SPECIFIED
REVISIONS
REV
DESCRIPTION
DATE
APPROVED
J2
(SEE SHEET 1)
P2
XU17
(SEE SHEET 1)
P17
P31
J31
9940
EMULATOR
999787
9940
DECREMENTER
999779
PARTS LIST
ITEM NO
QTY
PART OR IDENTIFYING NUMBER
NOMENCLATURE OR DESCRIPTION
PROCUREMENT SPECIFICATION
NOTES
TEXAS INSTRUMENTS
INCORPORATED
DALLAS, TEXAS
INTERCONNECTION DIAGRAM,
820 KSR
E96214
999883
REV
NONE
SHEET 2
PROCESS
CLASSIFICATION
ADDITIONAL
NEXT ASSY
APPLICATION
USED ON

APPENDIX A

CHARACTER SET DOT MATRIX

Included in this appendix are the dot matrices of available character sets as printed by the Model 820 KSR terminal. Ordering information for the various character sets is contained in Appendix C.

USASCII
Control Characters
European Characters
APL
Katakana

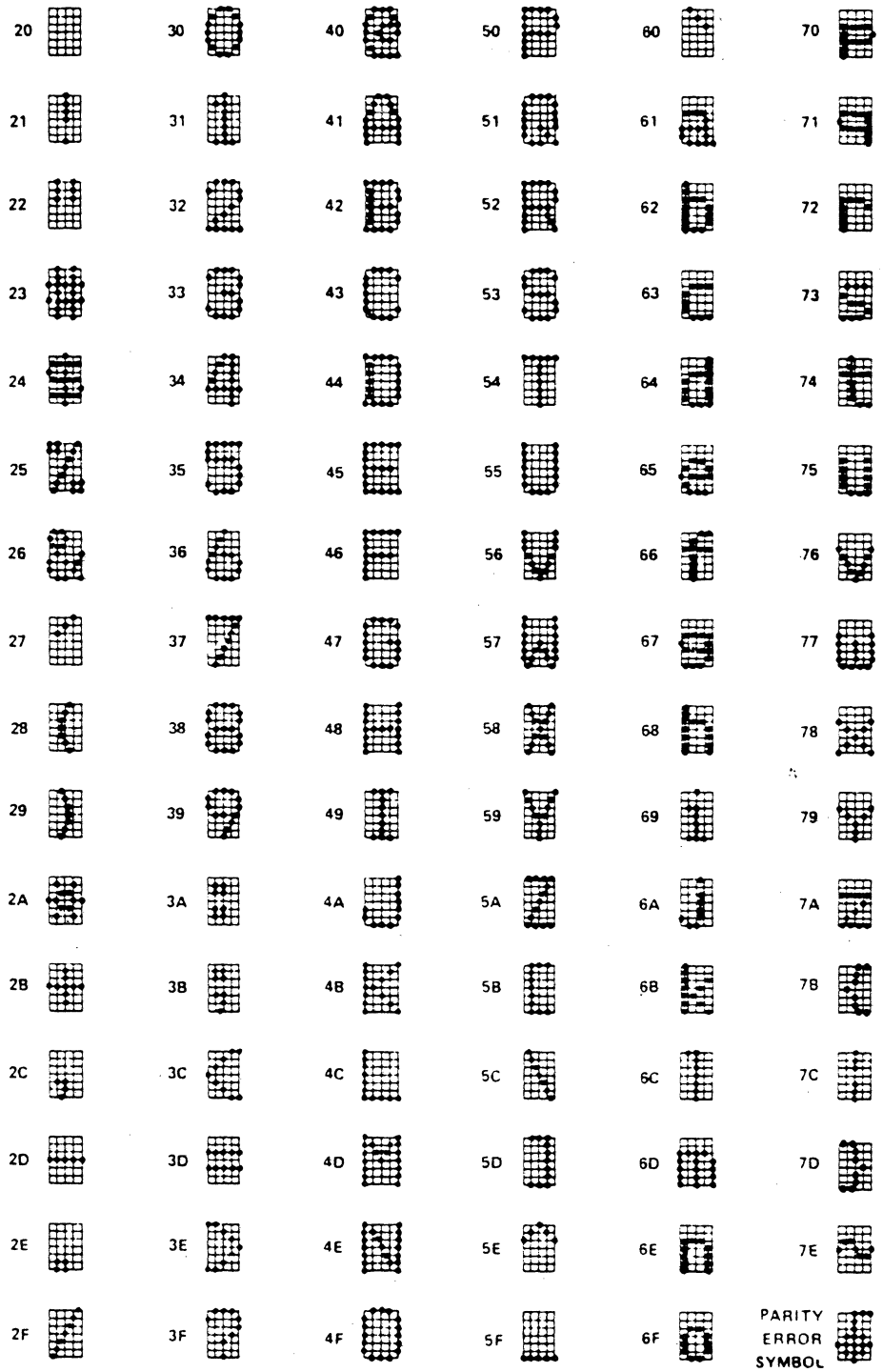


Figure A-1. Standard USASCII Character Font

Figure A-2. Control Character Font

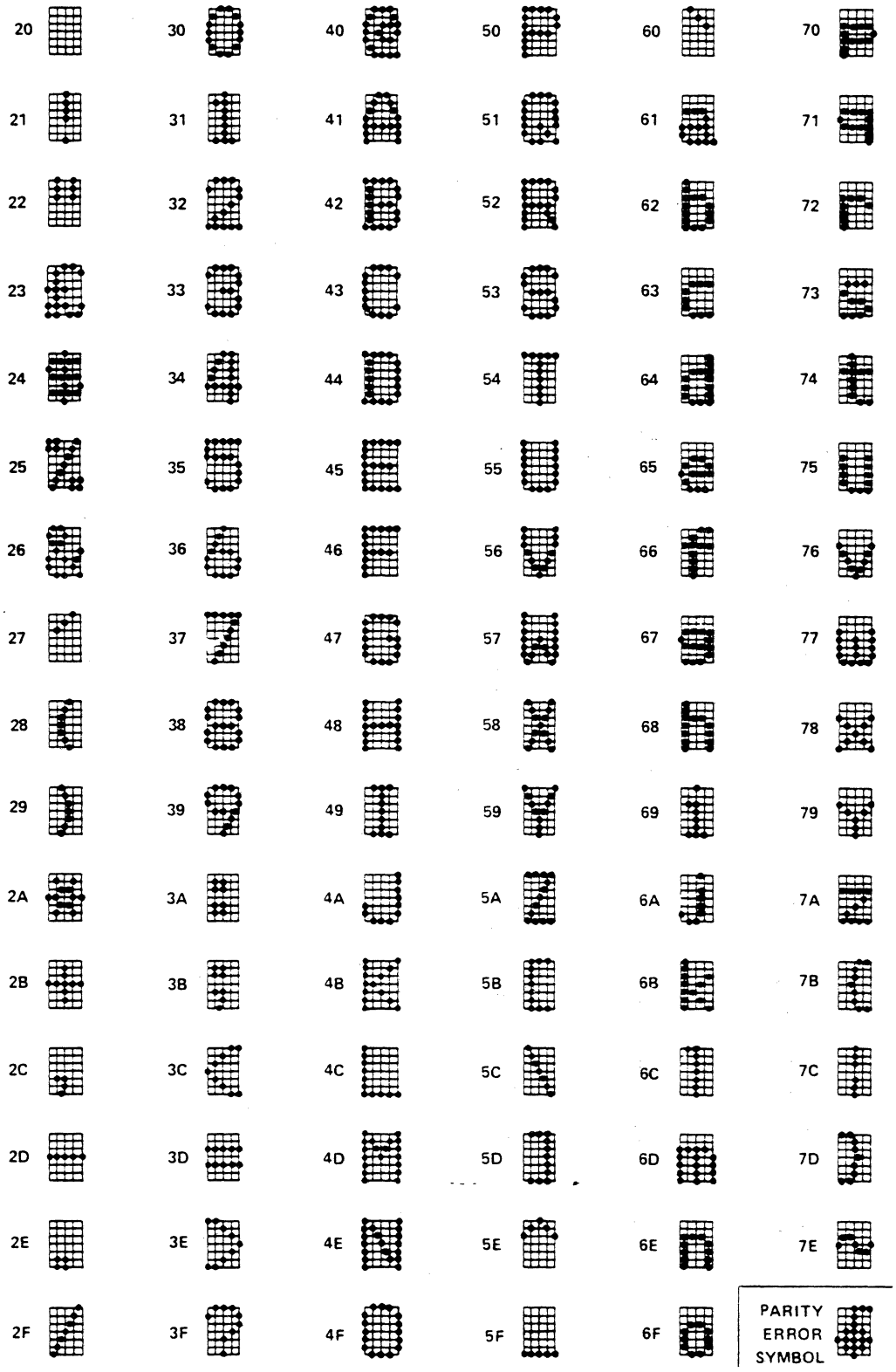


Figure A-3. United Kingdom Character Font

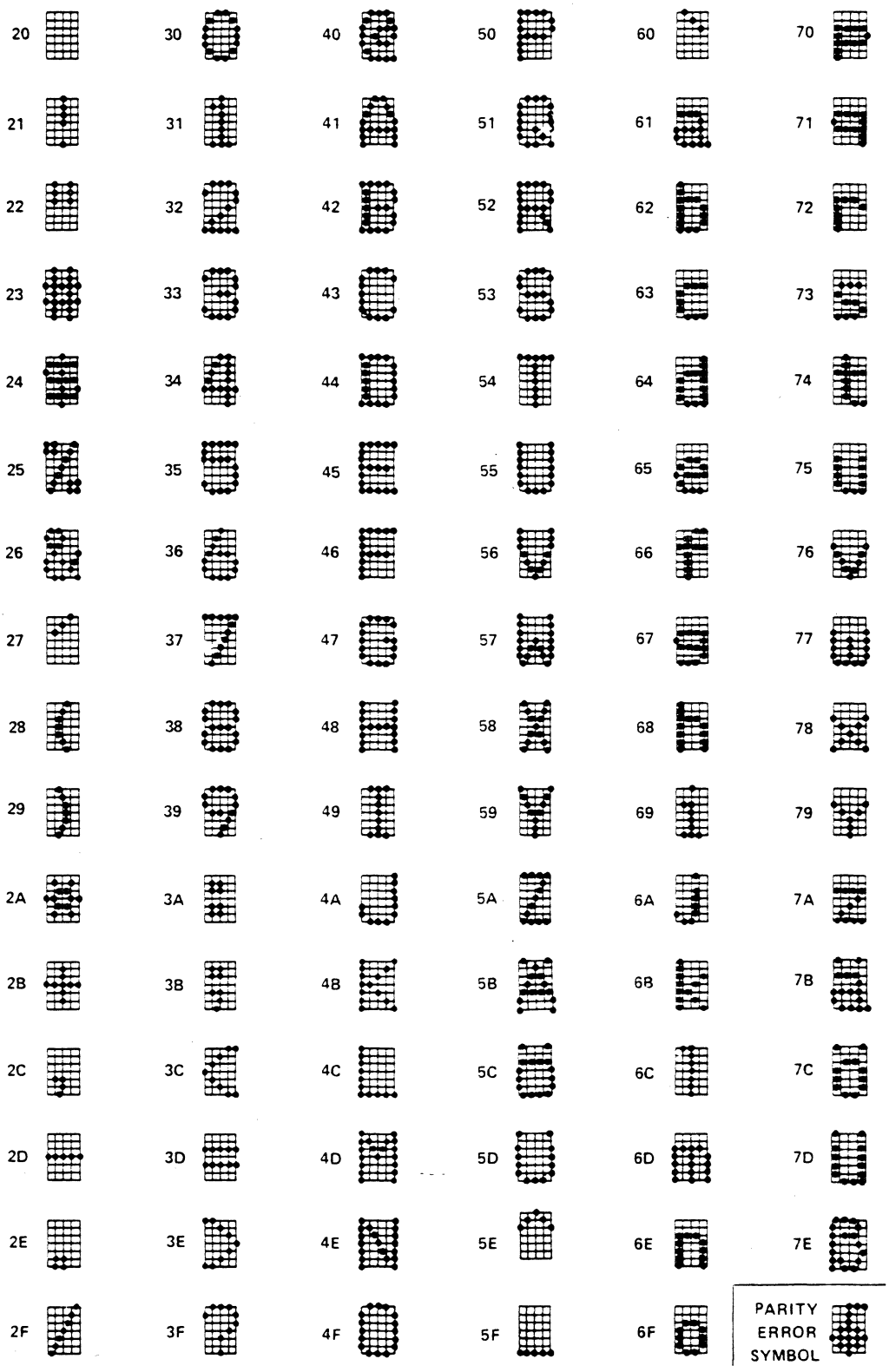


Figure A-4. German Character Font

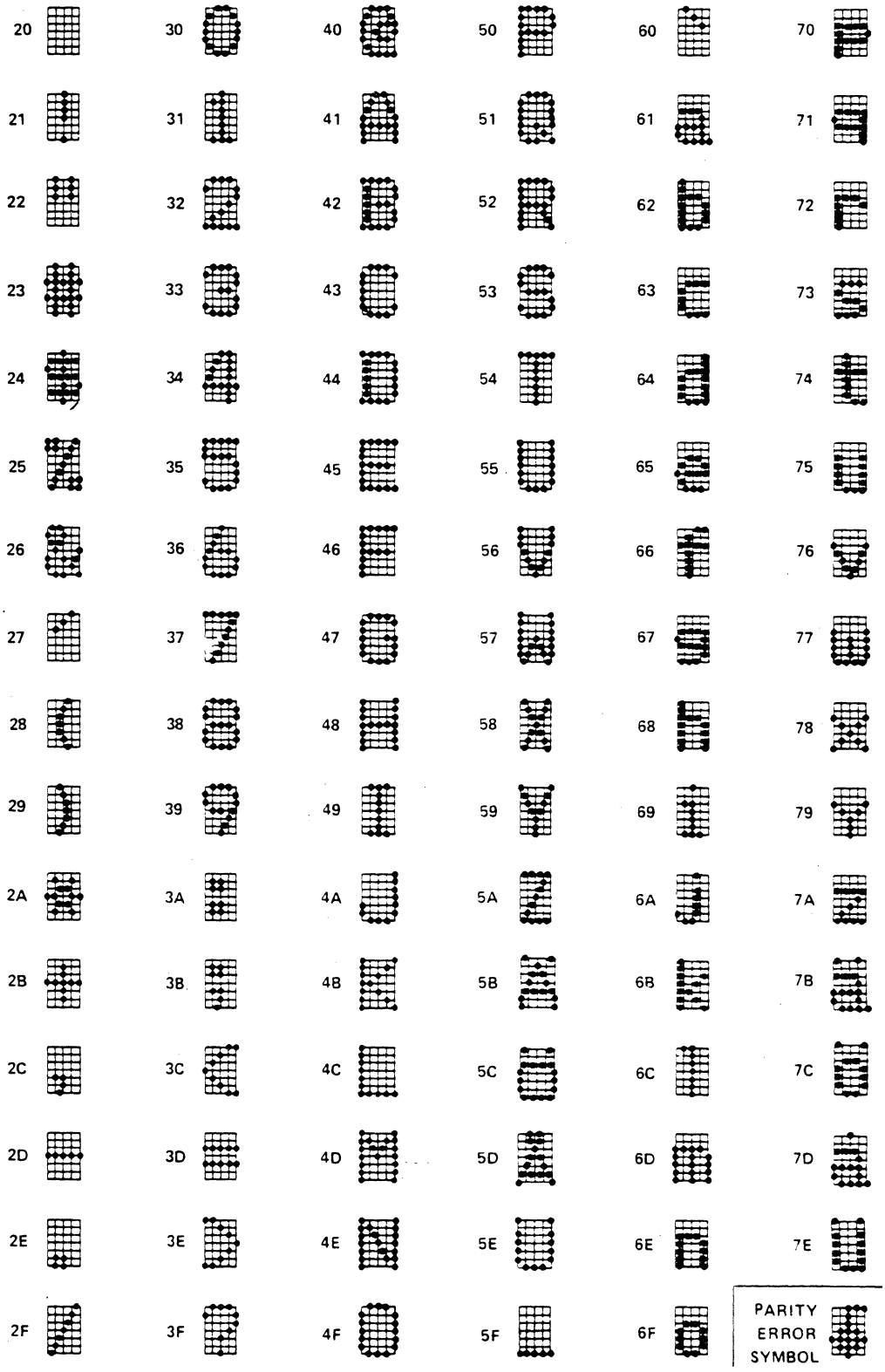


Figure A-5. Swedish/Finnish Character Font

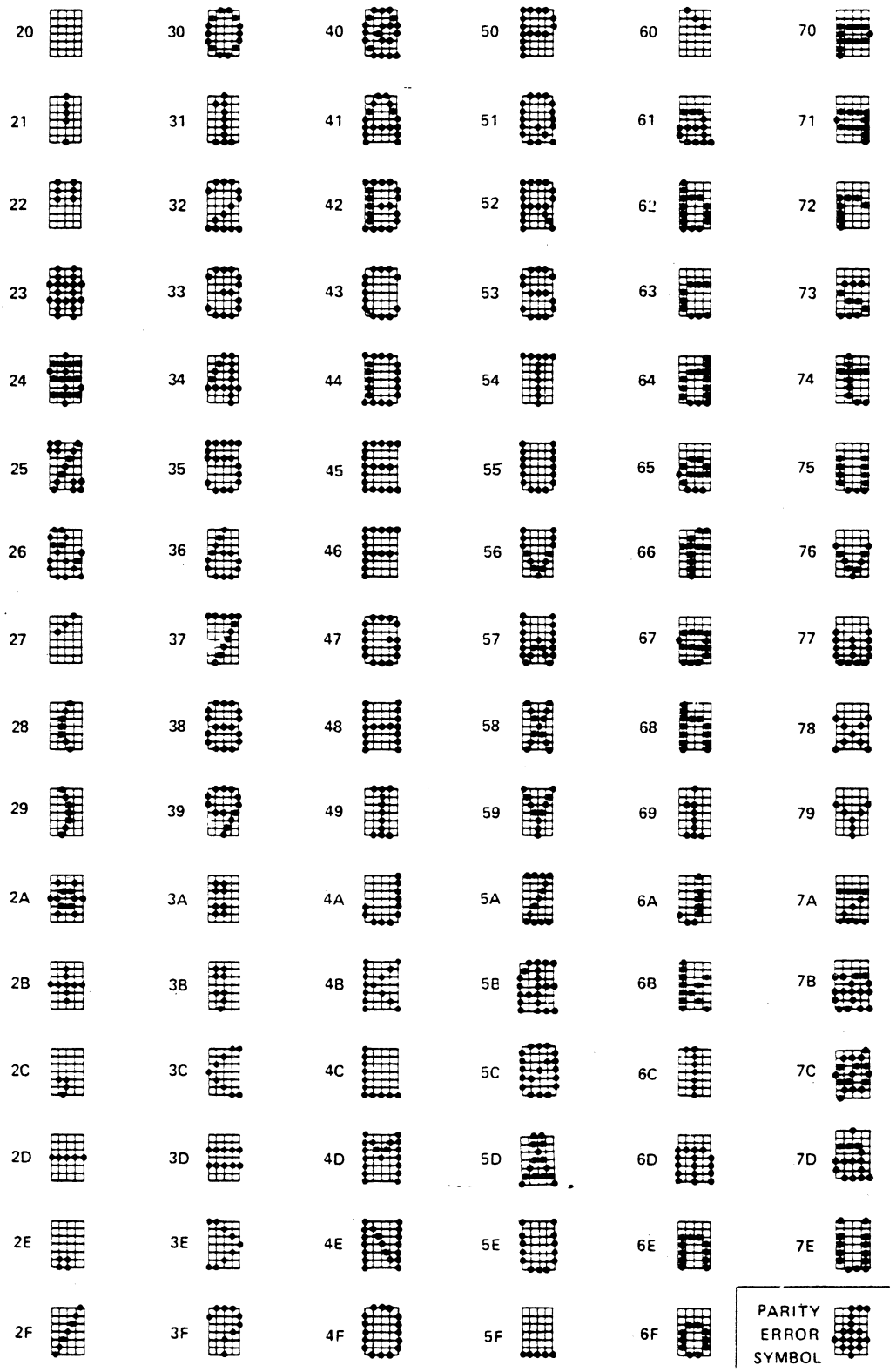


Figure A-6. Denmark/Norway Character Set

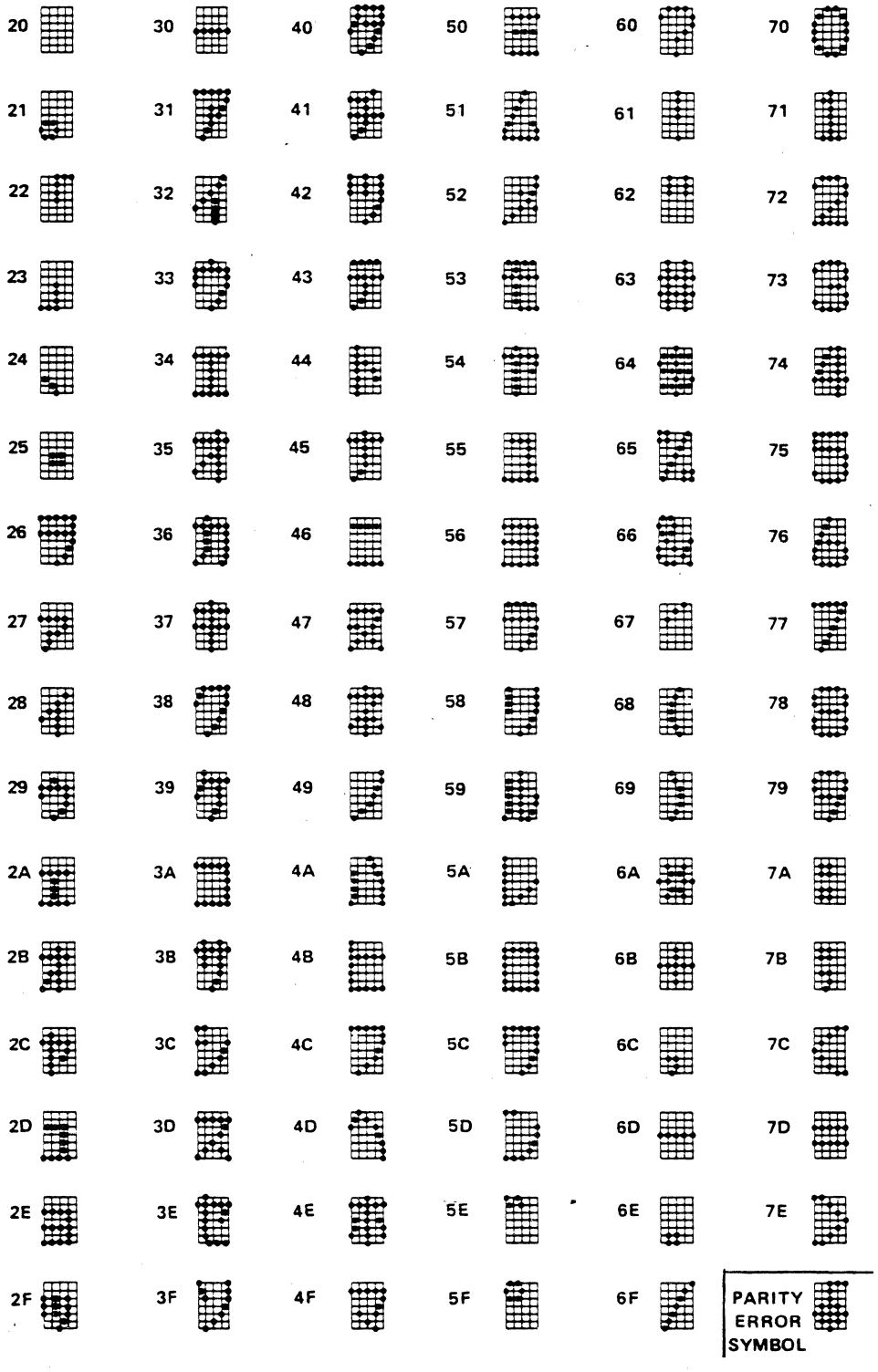


Figure A-7. Standard Katakana Character Font

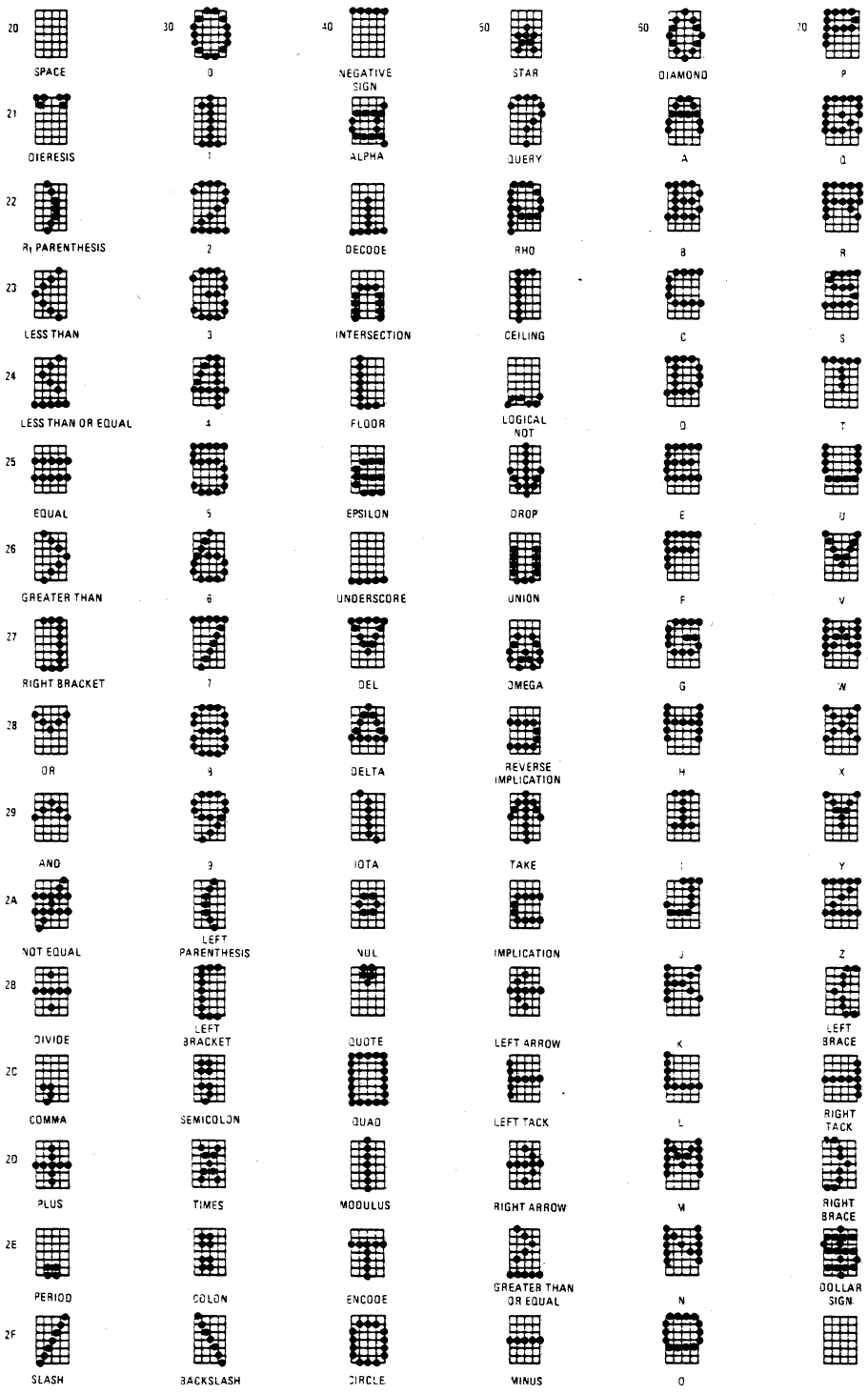


Figure A-8. APL Character Font

APPENDIX B

USASCII/APL CODES

The following codes are recognized by the Model 820 KSR terminal.

ASCII/APL CHARACTER Set. The USASCII/APL character set is shown in Table B-1. Tables B-2 through B-6 list and define the optional character set codes.

Table B-1. USASCII/APL Character Set

	CONTROL CODE		ASCII						APL					
	ASCII or APL													
COLUMN	0	1	2	3	4	5	6	7	2	3	4	5	6	7
ROW 0	NUL	DLE	SP	0	@	P	`	p	SPACE	0	–	*	◇	P
1	SOH	DC1	!	1	A	Q	a	q	..	⌊	∝	?	A	Q
2	STX	DC2	"	2	B	R	b	r	)	2	⊥	⍴	B	R
3	ETX	DC3	#	3	C	S	c	s	<	3	∩	⌈	C	S
4	EOT	DC4	$	4	D	T	d	t	≤	4	⌊	~	D	T
5	ENQ	NAK	%	5	E	U	e	u	=	5	∈	↓	E	U
6	ACK	SYN	&	6	F	V	f	v	>	6	—	∪	F	V
7	BEL	ETB	'	7	G	W	g	w	⌋	7	▽	⍵	G	W
8	BS	CAN	(	8	H	X	h	x	V	8	△	⊃	H	X
9	HT	EM	)	9	I	Y	i	y	∧	9		↑	I	Y
A	LF	SUB	*	:	J	Z	j	z	≠	(	°	⊂	J	Z
B	VT	ESC	+	;	K	[	k	{	÷	[	⍎	←	K	{
C	FF	FS	,	<	L	\	l	¦	,	;	⍁	⌐	L	⊣
D	CR	GS	—	=	M	]	m	}	+	×	|	→	M	}
E	SO	RS	.	>	N	^	n	~	.	:	⍑	≥	N	$
F	SI	US	/	?	O	—	o	DEL	/	\	O	-	O	DEL

NOTE: Row and column designators are base 16 (hexadecimal) and a character is defined by a two-digit (Column/Row) hex number (e.g., ASCII M=4D)

The ASCII control characters are generated by simultaneously depressing CTRL and the keys shown in Figure B-1.

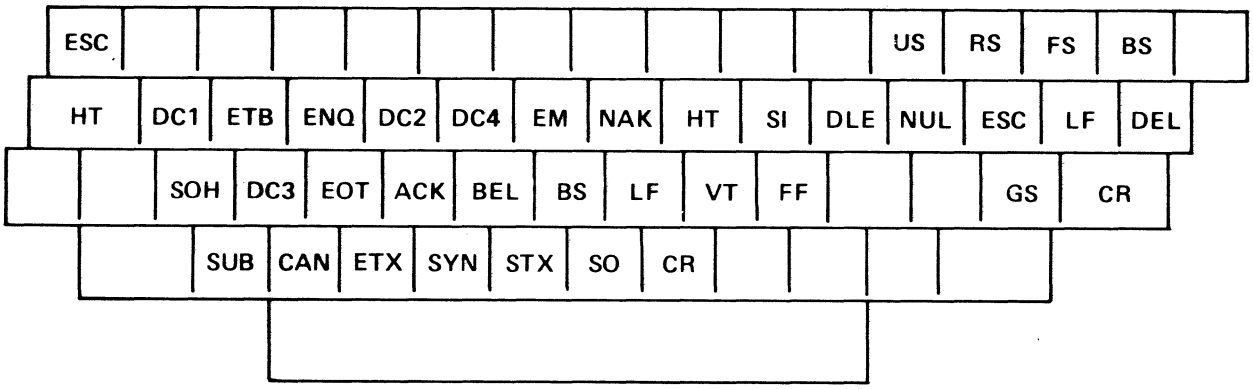


Figure B-1. Model 820 KSR Control Character Keyboard Layout

Table B-2. UKASCII Code Chart

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

Tables B-2 thru B-6 list and define optional character set codes.

Table B-3. German ASCII Code Chart

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

Table B-4. Swedish/Finnish ASCII Code Chart

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

Table B-5. Danish/Norwegian Code Chart

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

Table B-6. Standard Katakana Code Chart

	CONTROL FOR BOTH KANA & ASCII		U.S. ASCII MODE						KATAKANA MODE					
COLUMN / ROW	0	1	2	3	4	5	6	7	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	/	p	SPACE	—	タ TA	ミ MI	?	0
1	SOH	DC1	!	1	A	Q	a	q	。	ア A	チ CHI	ム MU	!	1
2	STX	DC2	"	2	B	R	b	r	「	イ I	ツ TSU	メ ME	"	2
3	ETX	DC3	#	3	C	S	c	s	」	ウ U	テ TE	モ MO	#	3
4	EOT	DC4	$	4	D	T	d	t	、	エ E	ト TO	ヤ YA	$	4
5	ENQ	NAK	%	5	E	U	e	u	・	オ O	ナ NA	ユ YU	%	5
6	ACK	SYN	&	6	F	V	f	v		カ KA	ニ NI	ヨ YO	&	6
7	BEL	ETB	/	7	G	W	g	w	ァ A	キ KI	ヌ NU	ラ RA	'	7
8	BS	CAN	(	8	H	X	h	x	ィ I	ク KU	ネ NE	リ RI	(	8
9	HT	EM	)	9	I	Y	i	y	ゥ U	ケ KE	ノ NO	ル RU	)	9
A	LF	SUB	*	:	J	Z	j	z	ェ E	コ KO	ハ HA	レ RE	*	:
B	VT	ESC	+	;	K	[	k	{	ォ O	サ SA	ヒ HI	ロ RO	+	;
C	FF	FS	,	<	L	¥ YEN	l	¦	ャ YA	シ SHI	フ FU	ワ WA	,	<
D	CR	GS	-	=	M	]	m	}	ュ YU	ス SU	ヘ HE	ン N	—	=
E	SO	RS	.	>	N	^	n	~	ョ YO	セ SE	ホ HO	"	•	>
F	SI	US	/	?	O	—	o	DEL	ッ TSU	ソ SO	マ MA	°	／	DEL

APPENDIX C

MODEL 820 KSR TERMINAL OPTIONS AND ACCESSORIES

Tables C1 and C2 list available options, accessories, and their part numbers and their configuration abbreviations.

TABLE C-1. MODEL 820 KSR TERMINAL OPTIONS

Description	TI Part Number	Configuration Abbreviation
KEYBOARD ASSEMBLY OPTIONS (One Only)		
Keyboard Assembly, Full ASCII	0999691-0101	KFS
Keyboard Assembly, Full ASCII, with Numeric Pad	0999691-0102	KFN
Keyboard Assembly, APL	0999691-0201	KAS
Keyboard Assembly, APL, with Numeric Pad	0999691-0202	KAN
Keyboard Kit, Katakana	0999859-0001	KKS
Keyboard Kit, Katakana, with Numeric Pad	0999859-0002	KKN
Configuration PROM Option Kit, Configuration PROM	0999761-0001	MDP/MPP
Printer Control Option Kit,		
Device/Forms Control Kit,	0999845-0001	MFG
Device/Forms Control (Katakana)	0999906-0001	MFG
Character Set Suboptions (One Only)		
Kit, Character Set, United Kingdom, ASCII	0999849-0001	UKF
Kit, Character Set, Denmark/Norway, Full ASCII	0999850-0001	DNF
Kit, Character Set, Sweden/Finland, Full ASCII	0999851-0001	SFF
Kit, Character Set, France, ASCII	0999852-0001	FRF
Kit, Character Set, Germany, Full ASCII	0999866-0001	GRF
Stand Options		
Stand, w/o Top	0999841-0001	
Basket Kit, Paper-Stand	0999839-0001	
Keyboard Assembly Options (Field-Installed Only)		
Kit, Keyboard Assembly, Full ASCII	0999691-8101	KFS
Kit, Keyboard Assembly, Full ASCII, with Numeric Pad	0999691-8102	KFN
Keyboard Kit, Katakana	0999859-8001	KKS
Keyboard Kit, Katakana, with Numeric Pad	0999859-8002	KKN
Configuration PROM Option (Field-Installed Only)		
Kit, Configuration PROM	0999761-8001	MDP/MPP
Kit, Printer Control Option		
Kit, Device/Forms Control	0999845-8001	MFG
Kit, Device/Forms Control, Katakana	0999906-8001	MFG
Printer Compressed Print Option (Field-Installed Only)		
Kit, Compressed Print	0999867-0001	
Character Set Suboptions (Field-Installed Only)		
Kit, Character Set, United Kingdom, Full ASCII	0999849-8001	UKF
Kit, Character Set, Denmark/Norway, Full ASCII	0999850-8001	DNF
Kit, Character Set, Sweden/Finland, Full ASCII	0999851-8001	SFF
Kit, Character Set, France, Full ASCII	0999852-8001	FRF
Kit, Character Set, Germany, Full ASCII	0999866-8001	GRF
Emulator Kit	0999903-8001	

TABLE C-2. MODEL 820 KSR TERMINAL ACCESSORIES

Base Description	Part Number
Basket, Kit, Paper	0999838-0001
Ribbon, Black Nylon Matrix 60 yd. (single)	0996704-0001
Ribbon, Black Nylon Matrix 60 yd. (6 pack)	0996704-0002
Ribbon, Black Nylon Matrix 40 yd. (single)	0996241-0001
Ribbon, Black Nylon Matrix 40 yd. (6 pack)	0996241-0002
Manual, Maintenance	0999853-9701
Manual, Operator's	0999854-9701
Kit, Acoustic Enhancement	0999886-0001
Window, Terminal	0999713-0001
Accessory Cables	
Cable Assembly, EIA Extension	0993211-0001
Cable Assembly, Data Terminal	0993210-0001
Cable Assembly, 990 Computer	2262093-0001
Cable Assembly, Auxiliary EIA Device	0999891-0001
Cord Set, Power, Domestic	0996289-0001
Cord Set, Power, Western Europe	0996290-0001
Cord Set, Power, w/o Connector	0996348-0001
Cable Assembly, 202/212	0993205-0001
Cable Assembly, Power, Electrical (Australian)	0996688-0001

APPENDIX D

OMNI 800 MODEL 820 PRINTER
RIBBON AND PAPER RECOMMENDATIONS

RIBBON

The Omni 800* Model 820 Printer is furnished with a black nylon matrix, impact printer ribbon wound on dual spools. Replacement ribbons may be purchased from Texas Instruments in packs of six under part number 0996704-0002.

To prolong the life of your printhead, use only the above print ribbon or an equivalent available from Addressograph Multigraph Corporation under part number 116-2800-163.

PAPER

The Model 820 Printer will accept standard, dual-sprocket-punched, continuous, business form paper in any width from 3 to 15 inches (76.2 to 38.1 mm).

Multiple-part business forms, one original and up to five copies, can be printed on paper with the following weight specifications:

Single Part Forms	—15 to 20 pounds
Multiple Part Forms	—Original: 12 to 15 pounds Copies: 9 to 12 pounds Last Copy: 15 pounds
Carbon Paper	—7.5 pounds with medium hardness.

NOTE

Total form thickness should not exceed 0.021 inch (0.53 mm).

*Trademark of Texas Instruments Incorporated

APPENDIX E

INSTALLATION OF OPTIONAL KITS

This appendix contains installation instructions for the following accessory and option kits:

Terminal Stand Kit (999841-0001)
Acoustic Enhancement Kit (999886-0001)
Terminal Paper Basket (999938-0001)

TI Publication 99910-9701
Issued 1 August 1978

INSTALLATION INSTRUCTIONS

Omni 800 TERMINAL STAND KIT

Kit Part Number 0999841-0001

1. GENERAL

The *Omni 800** Terminal Stand kit consists of a specially designed table and all necessary hardware for attachment of a Texas Instruments Model 810 or Model 820 to the stand.

2. INSTALLATION INSTRUCTIONS

The following instructions explain how to attach an *Omni 800* printer. The procedure varies from the Model 810 to the Model 820, so choose the appropriate instruction for your model.

2.1 MODEL 810 PRINTER INSTALLATION

a. Disconnect the ac power cable and the communications cable (if installed).

b. Install levelling screws in each corner of the legs as shown in Figure 1.

c. Install the modesty panel with four 6-32 screws and lockwashers as shown, and be sure the lockwashers are next to the screw heads.

d. Install the spacer panel and ring lug end of the ground cable with four 6-32 screws and lockwashers as shown. Be sure the lockwashers are next to the screw heads and the ground cable is at the rear of the left leg.

e. Mount the Model 810 printer on the stand with four 10-12 self-tapping screws as shown in the figure.

f. Remove the right rear screw and lockwasher from the printer rear paper chute.

g. Attach the ground cable lug to the printer with the screw and lockwasher removed in step f. Be sure the lockwasher is installed between the paper chute and the ground cable lug.

h. Place the printer and stand in the desired operating location and adjust the leg levelers as required to level the printer.

i. Reconnect the ac power cable and communications cable as required.

2.2 MODEL 820 PRINTER INSTALLATION

a. Disconnect the ac power cable and the communications cable (if installed).

b. Install levelling screws in each corner of the legs as shown in Figure 2.

c. Install the modesty panel with four 6-32 screws and lockwashers as shown, and be sure the lockwashers are next to the screwheads.

d. Install the spacer panel with four 6-32 screws and lockwashers as shown, and be sure the lockwashers are next to the screwheads.

e. Mount the Model 820 printer on the stand with four 10-32 UNC × 1¼ panhead screws and No. 10 external tooth washers.

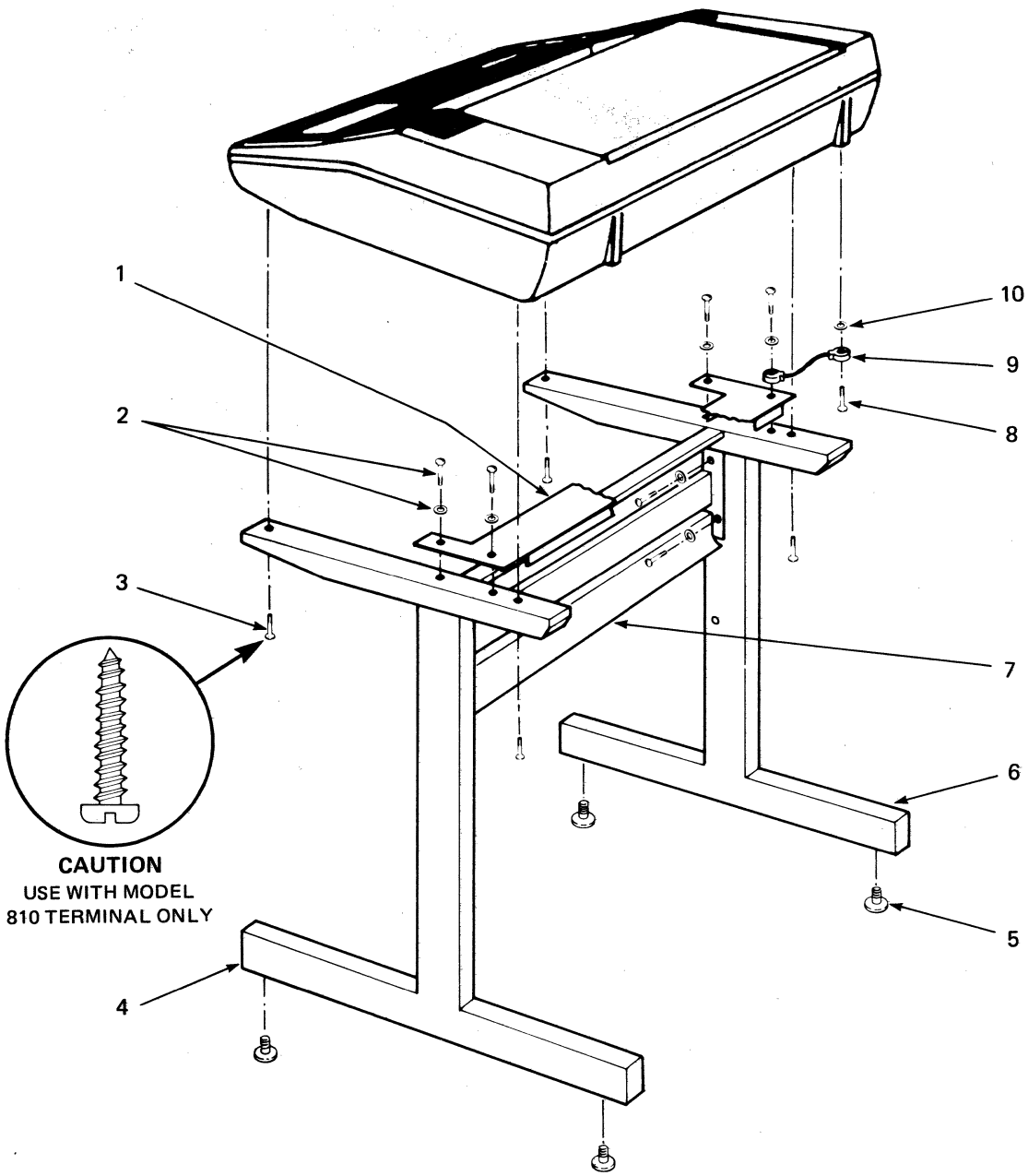
CAUTION

Do not substitute longer screws; damage to the machine may result.

f. Place the printer and stand in the desired operating location and adjust the leg levelers as required to level the printer.

g. Reconnect the ac power cable and communications cable as required.

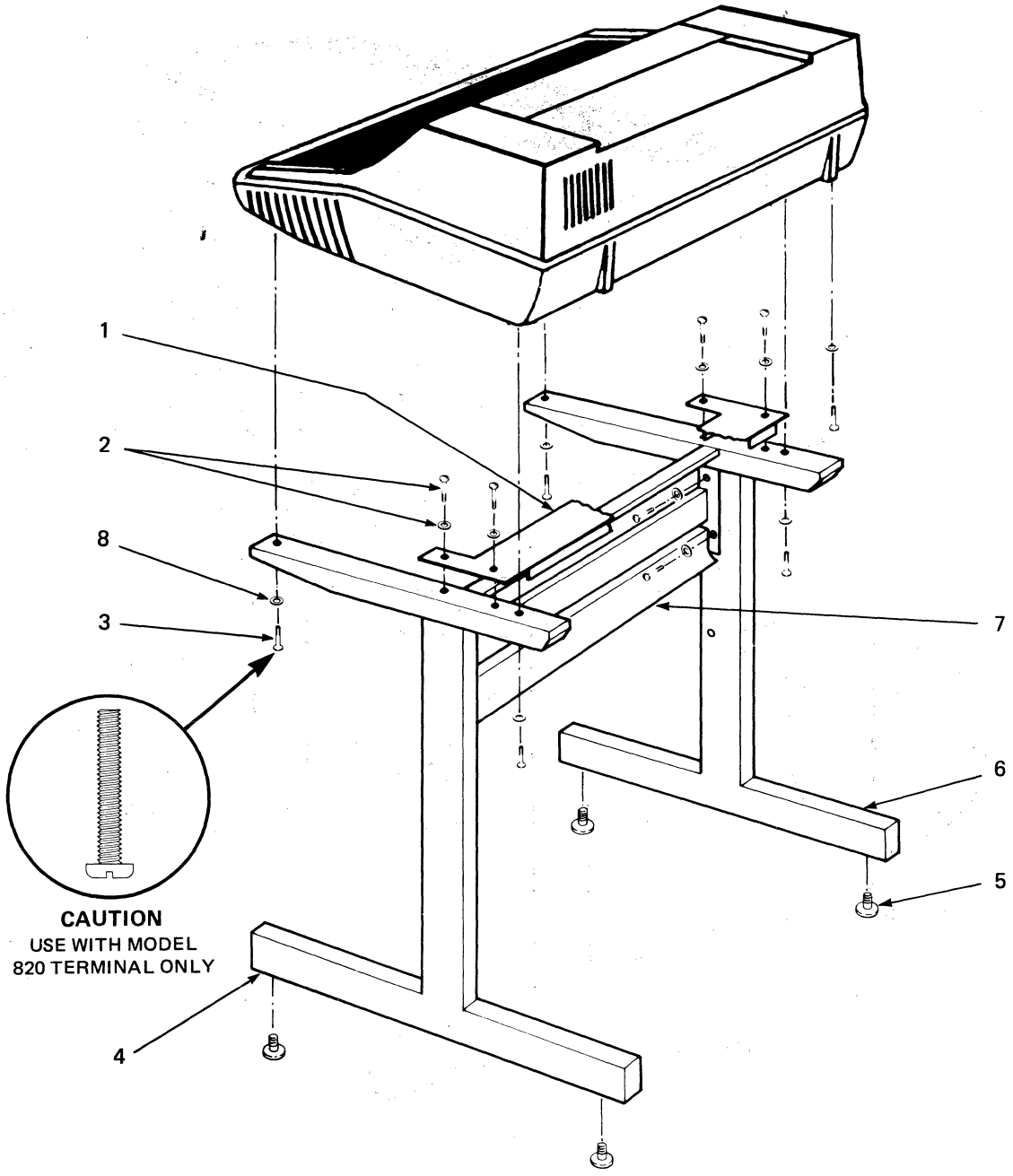
*Trademark of Texas Instruments Incorporated



1. Spacer panel
2. 6-32 x ½ self tapping screw and external tooth washer (8 places)
3. 10-12 self tapping x 1 lg screw (4 places)
4. Right leg
5. Leveler (4 places)
6. Left leg
7. Modesty panel
8. Existing printer screw*
9. Ground cable
10. External tooth washer

* Not supplied in Kit

Figure 1. Model 810 Terminal Stand Kit



1. Spacer panel
2. 6-32 x ½ self tapping screw and external tooth washer (8 places)
3. 10-32 UNC x 1¼ panhead screw (4 places)
4. Right leg
5. Leveler (4 places)
6. Left leg
7. Modesty panel
8. No. 10 external tooth washer (4 places)

Figure 2. Model 820 Terminal Stand Kit

TI Publication 999900-9701
Issued 25 September 1978

INSTALLATION INSTRUCTIONS MODEL 820 KSR ACOUSTIC ENHANCEMENT KIT INSTALLATION

Kit Part Number 999886-0001

INSTALLATION INSTRUCTIONS

The following instructions explain how to attach the Model 820 KSR Acoustic Enhancement Kit to the Model 820 KSR Terminal.

999721-0001 PAD INSULATOR

1. Remove release paper from pad.
2. Making sure slot in pad is lined up with opening in base-stick pad to base.

999899-0001 COVER ASSEMBLY AIR EXHAUST

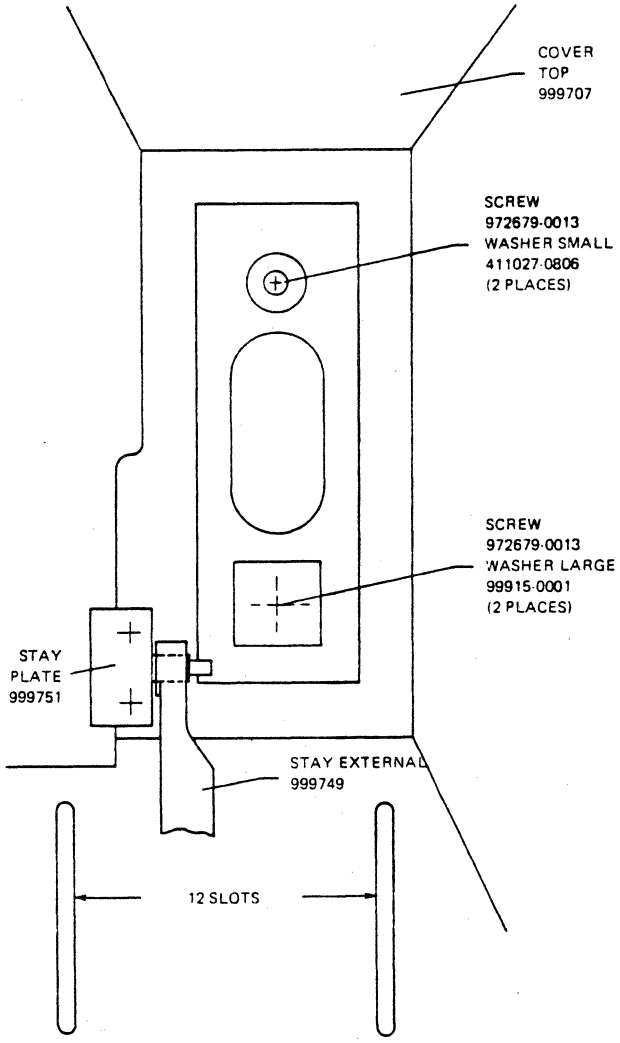
Locating the cover hooks into the first and last air exhaust slots, snap cover into place.

999898-0001 DAMPER ASSEMBLY

1. Open cover and remove stay external 999749 from stay plate 999751.
2. Remove cover, false 999762 (2).
3. Placing Damper Assembly 999898 on cover top 999707 mount assembly using the following hardware:

   972679-0013 (4) screw
   411027-0806 (2) washer small
   999915-0001 (2) washer large

Using the large washer over the square hole tighten all 4 screws compressing the rubber seal, leaving a .03/.06 gap between Damper Assembly and cover.



TEXAS INSTRUMENTS
INCORPORATED
DIGITAL SYSTEMS DIVISION
P.O. BOX 1444 HOUSTON, TEXAS 77001

TI Publication 0999937-9701
Issued 1 September 1978

INSTALLATION INSTRUCTIONS
Omni 800* MODEL 820 KSR DATA TERMINAL
TERMINAL PAPER BASKET

Part No. 0999838-0001

1. GENERAL

The Terminal Basket Kit consists of the basket and all necessary hardware to attach the paper basket to the Model 820 KSR terminal.

2. INSTALLATION

1. Lift the cover of Model 820 KSR and disconnect the cover stay (located in right rear of printer) by moving top of stay to right and off of pivot pin attached to cover (see Figure 1). DO NOT let cover open more than 90° to base.

2. Attach ground cable (location: inside right rear of printer) by faston connection on one end and using lockwasher and nut on other end as shown (see Figure 2).

3. Attach stay (which was disconnected in Step 1) to cover and close printer.

4. Insert basket hooks into slotted holes in rear of printer and rotate down into rest position (see Figure 3).

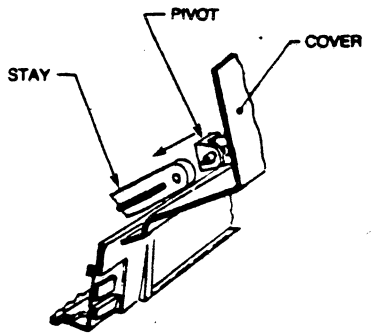


Figure 1

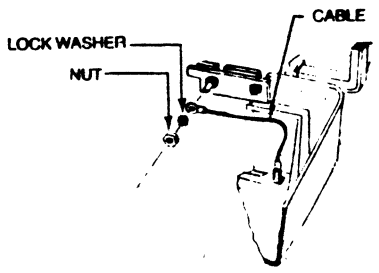


Figure 2

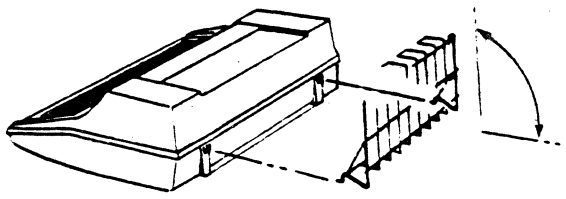


Figure 3

*Trademark of Texas Instruments Incorporated

APPENDIX F

GLOSSARY OF MODEL 820 KSR LOGIC SIGNALS

A0 through A12	9980 address bus
A13	9980 address line/CRUOUT
/Acc1	Acceleration 1
/Acc2	Acceleration 2
/AUXOPINT	auxiliary option interrupt
/AUXOPINTAK	auxiliary option interrupt acknowledge
/BA5, BA5, BA8, BA9 through BA12	buffered address line (9980)
BCRUCLK	buffered communication register unit clock (9980)
BCRUOUT	buffered communication register unit output (9980)
/BDIRECT	buffer carriage motor direction indicator
BD0 through BD3	buffered data lines (9980)
BELL	bell enable
/BMEMEN	buffered memory enable
/BP3	buffered phase 3 clock (9980)
/BSENSOR	buffered sensor
/BWE	buffered write enable
/CE1	chip enable 1 (9902 enable)
CE2	chip enable 2
CELIF	chip enable line interface
CEOPT	chip enable option
CGA0 through CGA11	character generator address bus
CMFWD	carriage motor forward direction
/CMRAMSEL	CMOS RAM select
CMTRA	Carriage Motor Termination A
CMTRB	Carriage Motor Termination B
COCHR	compressed character
CRUIN	communication register unit input
/CRUTC	9940 MPSI clock
D0 through D7	9980 data bus
DBIN	data bus in
DIRECT	carriage motor direction indicator
DFWT	
DRIVENA	driver enable
DTACH	
DX	
DY	
F1 — F8	character generator data lines
FWD	Carriage motor forward
HLD2	9940 hold
HOL2A	9940 hold acknowledge

HOLD	9980 hold
IC0 through IC2	9980 interrupt codes
INT1	interrupt 1 (9940)
INT2	interrupt 2 (9940)
/INT1AK	interrupt acknowledge (9940)
INT2AK	interrupt 2 acknowledge (9940)
/IOSEL	I/O select
KBD0 through KBD7	keyboard data bus
KBDENA	keyboard enable
/KBDIN	keyboard input enable
/KBLDCLK 1	keyboard load clock 1
KBLDCLK 2	keyboard load clock 2
/KBSHCLK	keyboard shift clock
LIFCTL	line interface control
/MPSI	9980 CRU I/O select line (multi-processor system interface)
MSINT1	master/slave interrupt 1
/MSINTAK	master/slave interrupt acknowledge
MSINTQ	printer controller to terminal
/P3	9980 phase 3 clock
/PAPOUT	paper out
PAPOUTSW	paper-out switch
PDMCC	paper drive motor current control
PDRV	paper drive
POA through POD	phase A, B, C, D (paper drive)
PPHSA	paper motor phase A
PPHSB	paper motor phase B
PPHSC	paper motor phase C
PPHSD	paper motor phase D
/PROM1SEL	programmable ROM 1 select
/PROM2SEL	programmable ROM 2 select
PWRGOOD	power good
R0-R11	keyboard row select lines
/RAMSEL	RAM select
RDRV	ribbon drive
READY	9980 ready
REV	carriage motor reverse
ROA through ROD	Ribbon motor phase A through D
RDLCK	ribbon drive latch clock
/ROM1SEL	ROM chip 1 enable
/ROM2SEL	ROM chip 2 enable
/ROM3SEL	ROM chip 3 enable
RPHSA	ribbon motor phase A
RPHSB	ribbon motor phase B
RPHSC	ribbon motor phase C
RPHSD	ribbon motor phase D

SENSOR	sensor
/RIBREV	ribbon reverse
RIBREVSW	ribbon reverse switch
SF1 through SF8	solenoid drive signals (printhead drive)
/SLERRCD	slave error code
/SLINT2	master to slave interrupt (see MSINT1)
/SLI0	select I/O (CRU)
/STLCFG	system test line configure
/STPWRGOOD	system test power good
/SYSTSTINT	system test interrupt
/TCARDET	terminal carrier detect
TC	
/TCTS	terminal clear to send
TD	
/TDSR	terminal data set ready
/TDTR	terminal data terminal ready
/TRI	terminal ring indicator
TRTS	terminal request to send
TSCRD	terminal secondary channel receive data
TSCXD	terminal secondary channel transmit data
TXMTDAT	terminal transmit data
TRCVDAT	terminal receive data
TOA1,TOB1,TOA2,TOB2	tach phase A/B normal/compressed
5 MHz	5 MHz (9940 clock)
10 MHz	10 MHz (9980 clock)
/9902INT	9902 interrupt
/9940CLK	9940 clock
+5VDVR	+5 volt drivers
+5VSW	+5 volt switched
+33VHD	+33 volt printhead
+33MTR	+33 volt motor
+33VMTRFZD	+33 volt motor fuzed

INDEX

INDEX (Concluded)

USER'S RESPONSE SHEET

Manual Title: Model 820 KSR Terminal Maintenance Manual

Manual Date: 7 December 1978 Date of This Letter: _____

User's Name: _____ Telephone: _____

Company: _____ Office/Department: _____

Street Address: _____

City/State/Zip Code: _____

Please list any discrepancy found in this manual by page, paragraph, figure, or table number in the following space. If there are any other suggestions that you wish to make, feel free to include them. Thank you.

Location in Manual	Comment/Suggestion
_____	_____
	_____
	_____
	_____
_____	_____
	_____
	_____
	_____
_____	_____
	_____
	_____
	_____

CUT ALONG LINE

NO POSTAGE NECESSARY IF MAILED IN U.S.A.
FOLD ON TWO LINES (LOCATED ON REVERSE SIDE), STAPLE AND MAIL

FOLD

FIRST CLASS
Permit No. 6189
Houston, Texas

BUSINESS REPLY MAIL
No postage necessary if mailed in the United States

Postage will be paid by

TEXAS INSTRUMENTS INCORPORATED
DIGITAL SYSTEMS DIVISION
P.O. BOX 1444 HOUSTON, TEXAS 77001

ATTENTION: TECHNICAL PUBLICATIONS
M/S 670

FOLD

Sales and Service Offices of Texas Instruments are located throughout the United States and in major countries overseas. Contact the Digital Systems Division, Texas Instruments Incorporated, P.O. Box 1444, Houston, Texas 77001, or call (713) 491-5115, for the location of the office nearest to you.

TEXAS INSTRUMENTS
INCORPORATED

Printed in U.S.A.