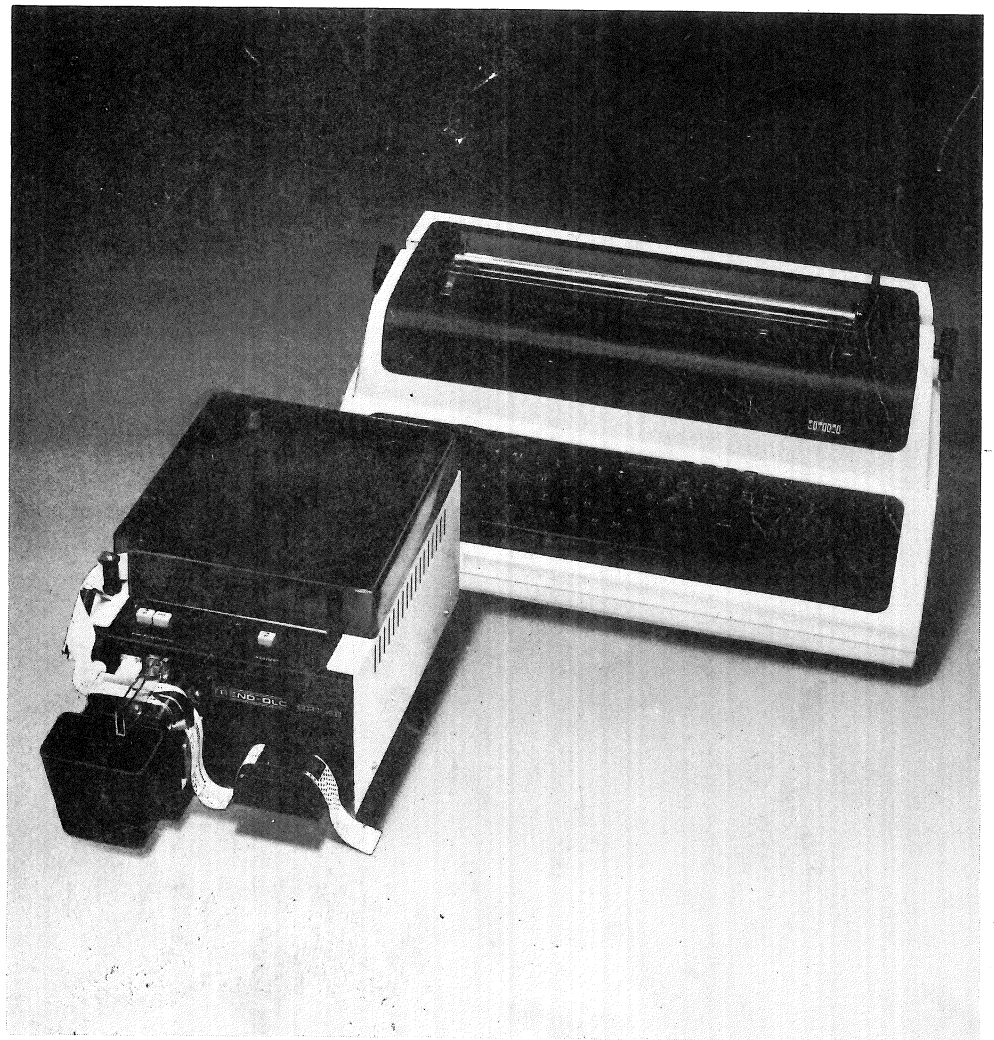


RPT-48

operator's manual



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MAINTENANCE INFORMATION

PREVENTATIVE MAINTENANCE

The continued reliability of this Trend-DLC product can best be assured by adhering to recommended preventative maintenance schedules.

Maintenance information and schedules are included in the Trend-DLC RPT-18 Technical Reference Manual. This manual is applicable to all Trend products and can be ordered from an authorized Trend-DLC distributor or directly from Trend-DLC. For your convenience, a post card is enclosed in the White Envelope which can be used to order your manual.

PROPER CARE AND MAINTENANCE IS HIGHLY RECOMMENDED.

Only experienced technicians should attempt to perform the maintenance operations prescribed.

Beck's Handbook - V.P. Engle

INTRODUCTION/OVERVIEW

The Model RPT-48 is a low-cost self-contained system designed for manual preparation, modification, and communication of NC program tapes. The system consists of a table-top paper tape reader/punch containing a microprocessor-based editor, and a dot matrix printer with a standard typewriter-like keyboard.

The Model RPT-48 may be used off-line to create ASCII or EIA coded program tapes. System utilities are available to permit listing of the program tapes on the printer, copying tapes, code conversion, and verifying tapes. The on-line operation enables the RPT-48 to be used as a communication terminal. Once connected to a time-share computer, program information may be transmitted and received with the host.

The powerful batch editor allows for a substantial number of instructions to be entered into the system memory at any given time. The instruction table or program is then used to modify an existing NC program tape by making a single pass of the program tape on the reader/punch terminal. This simplifies the modification cycle and saves time when major corrections are required.

In the prep mode, the system allows the operator to identify new program tapes with man-readable characters and will automatically generate line and block numbers for each instruction as the program is created. The line buffer permits the operator to make immediate corrections to sensed errors and to sight-verify each instruction before punching the program tape. This gives a significant through-put advantage over other non-buffered preparation devices.

The editor is a very flexible and powerful tool for making modifications to existing programs. Starting and ending line numbers may be entered for each instruction allowing a small portion, a large portion, or the entire program to be modified at one time. Powerful commands such as global replacement and resequencing of block numbers are entered as a single instruction. Insertions, deletions, and other changes are all simple, single line instructions, to the editor.

Code translation from ASCII to EIA or EIA to ASCII is permitted in both off-line and on-line operations. ASCII code entering the system from a communications port, the paper tape reader or the system keyboard may be converted to EIA code and punched or re-transmitted. A number of options are available to the user through a powerful system

command called configuration. "CONF", for short, permits the user to change the operating parameters of the systems with simple key depressions on the teleprinter keyboard. Different configurations may be saved on punched tape and reloaded automatically for use at a later time.

The RPT-48 has four 25 pin input/output interface ports available with the standard system. The user may allocate the system ports depending on his requirement. A typical configuration would be a parallel port for connection to a machine tool controller, two serial ports for connection to the teleprinter and modem, and one current loop port for connection to a local system. Selectable Baud rates enable the user to set up the best possible configuration with each interface device.

The RPT-48 offers a tape verify feature and hardware system diagnostics to assure overall system validity. The system is rated at 4,000 hours mean time between failures.

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SECTION 1

OPERATOR CARE, PACKING AND UNPACKING

This section contains information on external care, unpacking and repacking the RPT-48 READER PUNCH TERMINAL.

For care and packing of the LA-34 Printer, refer to the LA-34 Users' Guide (#EK-01A34-UF-001) provided by the manufacturer.

OPERATOR CARE, PACKING AND UNPACKING

OPERATOR CARE

1. Do not oil any parts of the RPT-48 Paper Tape Terminal.
2. Use only a lint-free cloth or a soft brush when cleaning the reader head, punch or covers. Do not use solvents or harsh cleaning agents to clean the RPT-48. If excessively dirty, a mild detergent solution or rubbing alcohol may be used sparingly.
3. Do not use any RPT-48 surface area to hold pencils, paper clips, staples, etc. If any object accidentally falls into the machine, TURN THE POWER OFF, REMOVE THE POWER CORD FROM THE OUTLET and carefully remove the object.

UNPACKING PROCEDURE

In order to protect your Trend-DLC RPT-48 Reader/Punch Terminal during shipment, certain areas have been taped down or held in place with packing material. These must be removed before the unit can operate. The carton should be opened from the top where the address label appears.

1. Cut the glass tape and open the carton.
2. Remove the RPT-48 with its packing material as a unit.
3. Separate the RPT-48 from its packing material.
4. Open the plastic bag containing the dust cover, chad box, and power cord, and install these on the RPT-48.
5. Remove the tape from the punch chad chute.
6. Remove foam pads from the reader head.
7. Inspect the RPT-48 for shipping damage. Report any damage to the carrier and to Trend-DLC, Inc.
8. Retain carton and packing material in case it becomes necessary to ship the RPT-48 to another location.

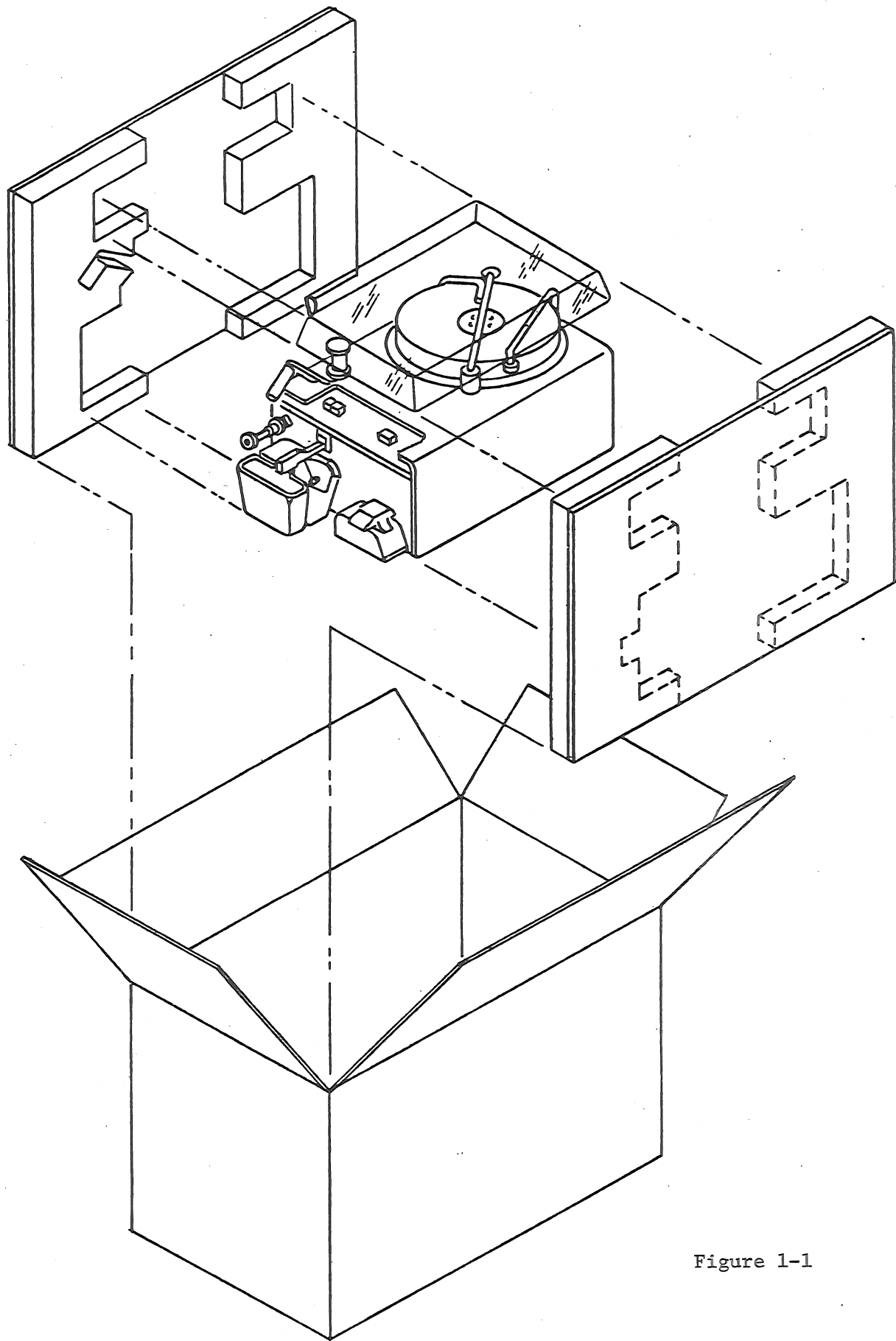


Figure 1-1

PACKING PROCEDURE

If it becomes necessary to ship the RPT-48 to another location, repack it in its original shipping carton according to the following procedure. (See Fig. 1-1.)

1. Tape the chad chute opening so that any remaining chad cannot spill out.
2. Insert a piece of foam or bubble pack between the glass plates in the Reader. Lower Reader Lid and secure with tape.
3. Pack chad box and power cord in the dust cover.
4. Lay one of the packing pieces on a flat surface and engage the RPT-48 with the packing. Notice that the two packing pieces are not the same. The features that engage the front of the RPT-48 are different. One side has a cut-out for the reader and the other side has a cut-out for the slanted roller.
5. Install the dust cover in its cut-out.
6. Install the remaining packing pieces.
7. Install the RPT-48 with its packing into the shipping carton and seal the carton.

SECTION 2

OPERATOR CONTROLS

RPT-48 PAPER TAPE PREP & EDITING SYSTEM

This section describes the features and operator controls for the paper tape punch and reader only and includes tape loading procedures for the punch and reader.

SECTION 2

RPT-48 EDITING TERMINAL

GENERAL

To operate the RPT-48, a KSR Terminal with RS232C interface (DEC LA-34, or TTY M-43, etc.) is required. This terminal must be set for 110, 300, 600, 1200, 4800 or 9600 Baud, Full Duplex, On-line operation and be connected to the RPT-48 port marked Printer (See Figure 2-1). Connection to the power mains is via a 3-wire cord set which mates to an international power receptacle. Units adapted for 115v 60Hz or 230v 50Hz operation are provided. A 115v U-Ground convenience outlet is provided to supply power to the connected teleprinter. This receptacle is not provided on 230v machines.

REAR PANEL CONTROLS

POWER ON/OFF SWITCH

The POWER ON/OFF SWITCH connects and causes the disconnect of the line voltage (Mains) to the RPT-48. A rocker-type toggle switch located on the rear panel (Figure 2-1) of the unit is used. Pushing the upper half of the rocker connects the power to the RPT-48. Pushing the lower portion of the switch starts the power disconnect sequence.

Applying the power causes the microprocessor to begin its initialization routine. As part of this routine the processor switches on a relay which bridges across the mains, keeping the power applied to the unit and effectively removing the switch from the mains circuit. The microprocessor then periodically "reads" the POWER ON/OFF SWITCH, searching for a change of state. When this change is detected, indicating that an operator has put the power switch in the OFF position, the processor begins a five-second delay period after which it turns off the relay, thus removing power from the RPT-48.

RPT-48 REAR PANEL

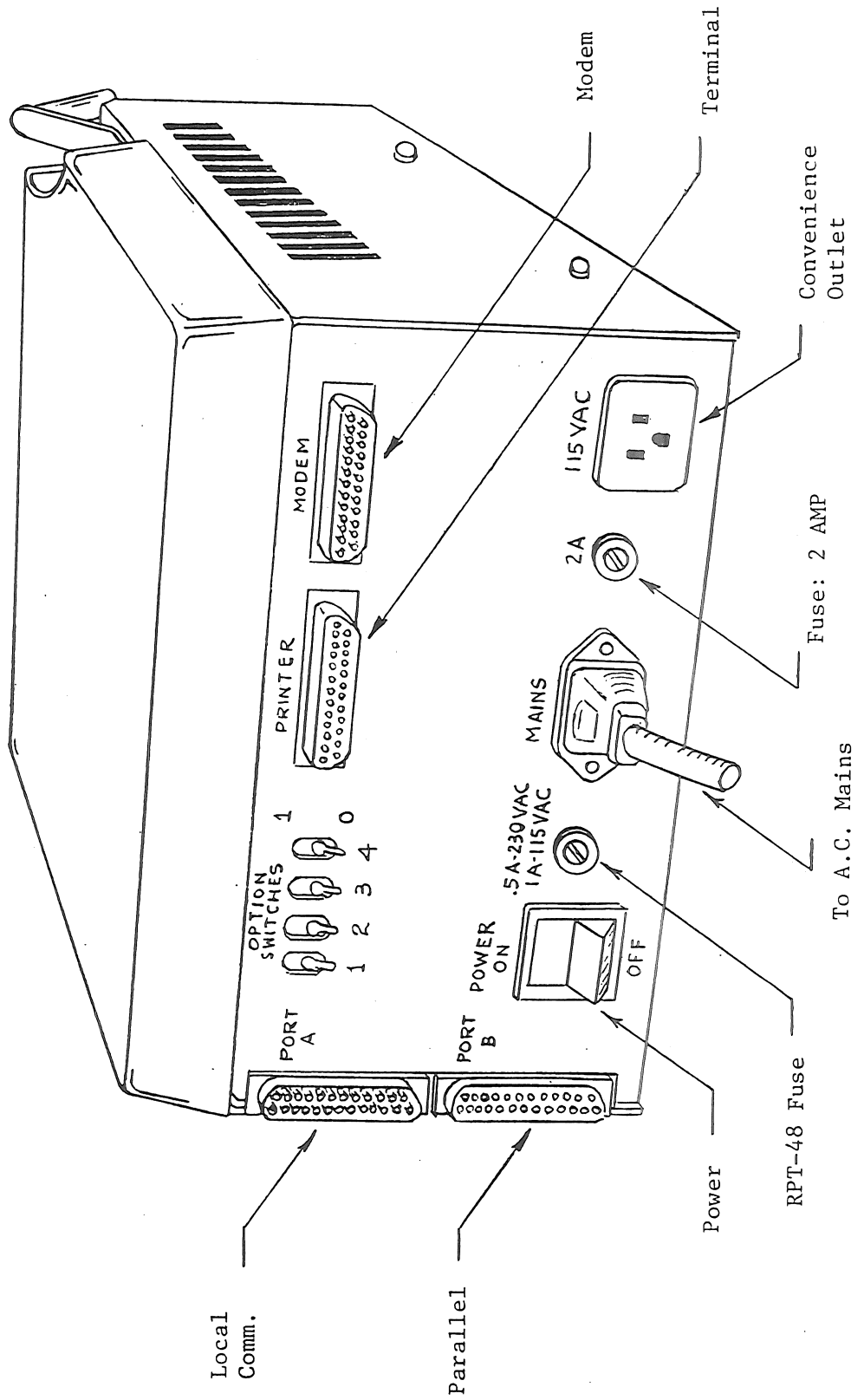


Figure 2-1

This delay period is introduced to allow the motor to stop and the mechanism to come to rest, thus avoiding any inadvertent punching or moving of tape. The 115 volt convenience outlet located on the rear panel (Figure 2-1) is powered only when the RPT-48 is on. This outlet is separately fused as indicated in Figure 2-1.

OPTION SWITCH #1

Switch #1 is used to activate the parallel interface (Port B) without a KSR Terminal connected to the Printer Port. This allows the RPT-48 to be moved to the machine floor without the terminal and connected directly to the NC machine to produce tapes.

With Switch #1 in the "0" or down position when power is applied, Port B must be activated via the terminal keyboard (see Communication, Section 8) with Switch #1 in the "1" or up position when power is applied, the RPT-48 is conditioned to punch tape in a code transparent mode from data presented to the parallel interface (Port B) (See Interface, Section 3).

OPTION SWITCH #2

Switch #2 is used to introduce a 300 msec. turnaround delay when communicating via the modem port or port A. (See Section 8) The delay is omitted when the switch is in the "0" or down position.

OPTION SWITCH #3

Switch #3 is used to condition to RPT-48 Printer Port to the type of KSR terminal to be used.

Switch #3 is placed in the "0" or down position if the KSR terminal is a LA-34.

Switch #3 is placed in the "1" or up position if the KSR terminal is not a LA-34. (See Interface, Section 3).

OPTION SWITCH #4

Switch #4 controls the mode of communication for the Modem Port.

Switch #4 is placed in the "0" or down position for Full Duplex (FDX) operation and in the "1" or up position for Half Duplex (HDX) operation.

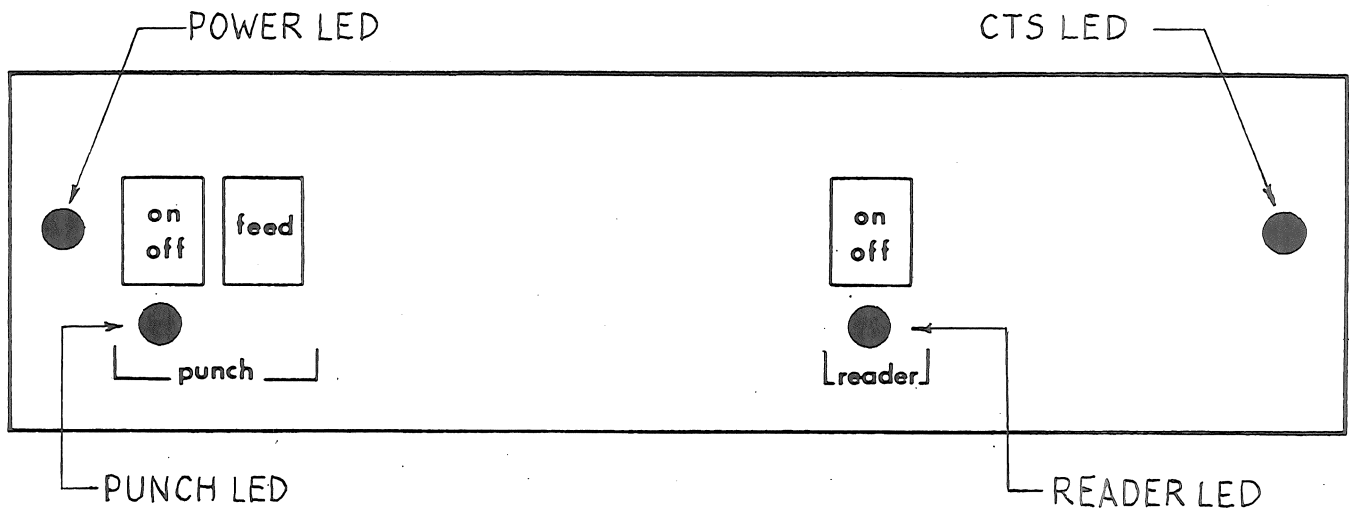


Figure 2-2

FRONT PANEL CONTROLS

PUNCH ON/OFF SWITCH

The PUNCH ON/OFF SWITCH is a momentary operator control switch. When the punch logic is in the off state, depressing the switch places the logic in the on state causing the punch LIGHT EMITTING DIODE (LED) to be illuminated. When the punch logic is in the on state, depressing the switch places the punch logic in the off state causing the punch LED to go out.

Data presented to the punch, when the punch logic is in the off state, will not be perforated. If the punch has been turned on, but no data is presented to the punch logic, the RPT-48 motor will remain idle. When the first character arrives to be punched, the RPT-48 motor will turn on.

When the motor is up to speed the punch will begin perforating tape. A 32-character buffer is included in the controller to hold data while the motor is coming up to speed. If an interval of 30 seconds passes with no data to be punched, the motor will automatically shut down, but the punch logic will remain in the on state until an operator intervenes. If an operator should turn the power off while the RPT-48 is in the process of punching data, all data in the buffer will be lost.

PUNCH FEED SWITCH

The PUNCH FEED switch is a momentary operator control switch which causes the punch to feed blank tape as long as it is depressed. The punch logic need not be in the on state to feed blank tape. If the switch is depressed when the motor is not running, there will be a slight delay while the motor comes up to speed before feeding begins. The PUNCH FEED switch should not be used when data is being punched to avoid interspersing blank codes with the data.

READER ON/OFF SWITCH

The READER ON/OFF switch is a momentary operator control switch. If the reader logic is in the off state, depressing this READER ON/OFF SWITCH places the reader logic in the on state, except as follows:

- 1.) If the tape lid is open, the reader logic immediately reverts to the off state.
- 2.) If there is no tape in the reader, the reader transport takes one step, to detect the lack of tape, and reverts to the off state. No data is read.
- 3.) If the tight tape lever is operated, the reader logic goes to the on state, but reading does not start until the tight tape condition is cleared.

- 4.) If the RPT-48 is on (Communication Mode) and the Clear to Send (CTS) signal at selected communication port is not high, the reader logic will go to the on state, but reading does not start until the CTS signal goes high.

Depressing the READER ON/OFF switch when the reader logic is in the on state will cause the reader logic to go to the off state.

INDICATORS AND ALARMS

POWER ON INDICATOR

When illuminated, the POWER ON LED gives a visual indication that the RPT-48 is connected to the mains and the power is on. When the power switch is turned on, the LED lights immediately. When the power switch is turned off the LED goes out after a five-second delay.

PUNCH ON INDICATOR

The PUNCH ON LED is illuminated continuously whenever the punch logic is activated to perforate tape.

The PUNCH ON LED blinks and an audible alarm is sounded when the punch paper supply is low and the punch logic is in the on state.

The PUNCH ON LED blinks, together with the READER ON LED, immediately following the application of power to indicate the need to establish the Baud rate of the printer port. This is done by entering a carriage return on the terminal attached to the Printer port after the terminal has initialized itself. When the carriage return is entered, the Baud rate of the Printer port is automatically set to match the terminal Baud rate and the blinking stops.

The PUNCH ON LED blinks, together with the READER ON LED, when the RPT-48 is On Line and the control signals for the selected communication port are not in a condition to allow data transmission. (See Interface, Section 3.)

READER ON INDICATOR

The READER ON LED is illuminated continuously when the reader logic is activated to read tape.

The READER ON LED blinks, together with the PUNCH ON LED (see PUNCH ON INDICATOR above).

CLEAR TO SEND (CTS) INDICATOR

The CTS LED is illuminated whenever the RPT-48 is On Line and the CTS signal in the selected communication port is high, indicating the port is available to send data.

LINE BUFFER ALARM

The RPT-48 is provided with a 32-character line buffer to store data waiting to be transmitted. A fast operator, keying data from a teleprinter through the RPT-48 to a low-speed line, can exceed the speed of the communication line causing data to be stored in the line buffer. When the stored data exceeds 23 characters, a beeping tone is sounded to warn the operator. When the buffer becomes full, a continuous tone is sounded to indicate that any additional characters will be lost.

RPT-48 SELF-TEST FEATURE

The RPT-48 is equipped with a self-test program to facilitate field testing and alignment of the reader and punch mechanism.

To enter into the diagnostic/alignment mode, move the rear power switch to the OFF position. Hold either the punch or reader ON/OFF switches down and return the power switch to the ON position.

If the Punch ON/OFF switch was used, the RPT-48 will come on and start punching a binary pattern and stop when the pattern is completed. Turning the punch on again will cause another binary pattern to be punched. The punching cycle can be stopped, at any time, by turning the punch off. The punch feed switch works in the normal way.

If the Reader ON/OFF switch was used, the RPT-48 will come on and start transporting even if the lid is up. Use the Reader ON/OFF switch to turn the reader transport on or off.

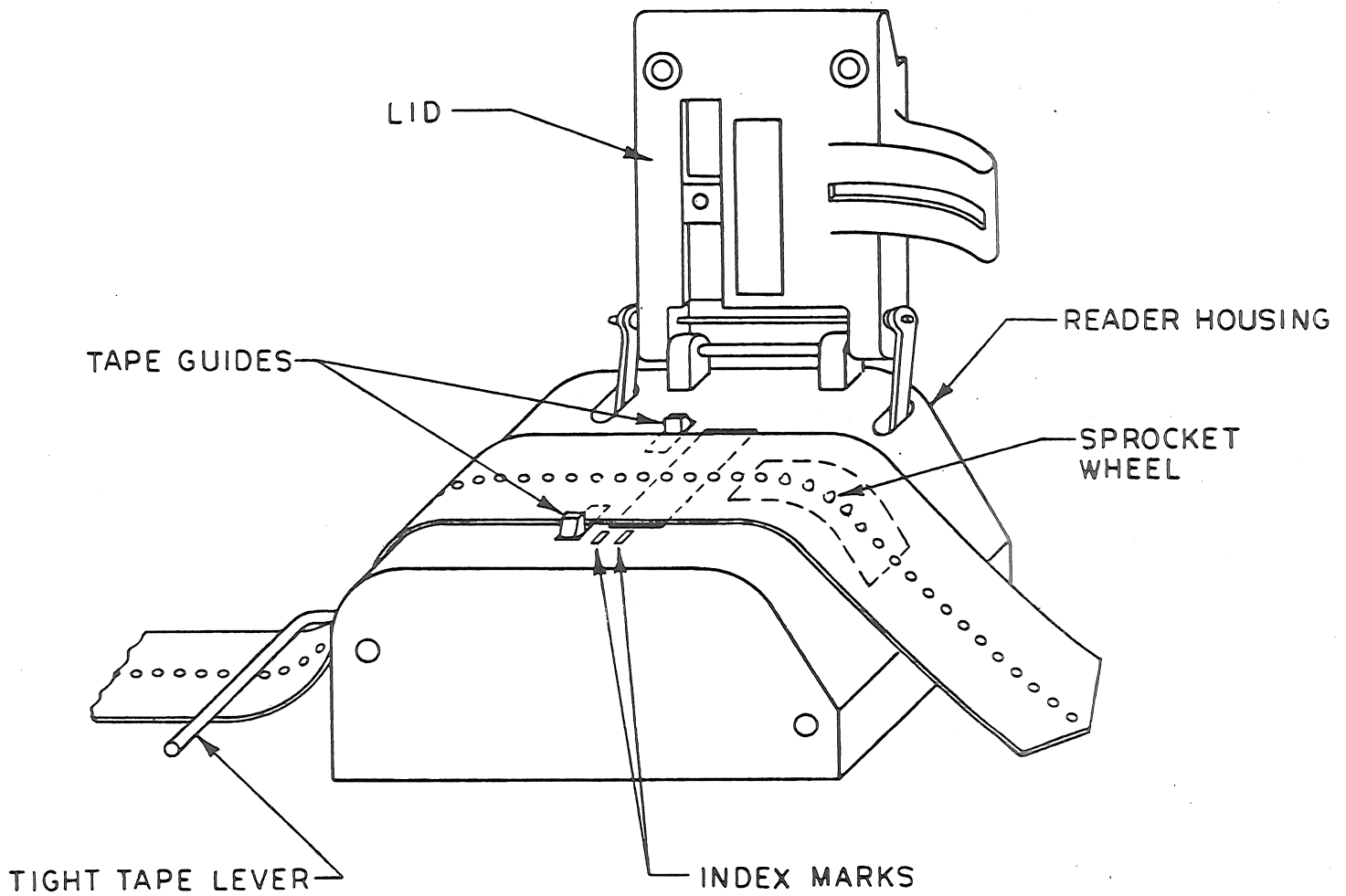


FIG. 2-3

LOADING THE READER

To load the tape in the reader, open the lid, place the tape between the tape guides and engage the sprocket holes in the sprocket wheel teeth. Align the first character to be read with the left index mark and close the lid. Thread the supply end of the tape between the tight tape lever and the reader housing.

Notes:

- 1) The reader lid is not latched. Spring tension holds it in either the open or closed position.
- 2) The right index mark aligns with the last character read.
- 3) The edge of the tape closest to the sprocket holes should be towards the operator.

LOADING THE PUNCH

- 1.) Connect the RPT-48 to a suitable power outlet and turn the power on.
- 2.) Remove the paper supply cover.
- 3.) Swing the tape dancer arm clockwise as far as it will go.
- 4.) Swing the low tape sensor arm counter-clockwise as far as it will go.
- 5.) Mount the new roll of tape on the turn-table so that the end of the tape pays out to the right at the front of the RPT-48.
- 6.) Tear or cut a clean end on the tape.
- 7.) Pass the tape under the keeper on the vertical idler and towards the front of the RPT-48.
- 8.) Pass the tape over the slanted idler and down under the horizontal idler towards the punch die block.
- 9.) With the tape laying on the punch cover, push it under the horizontal keeper plate and through the slot in the die block until it limits on the sprocket wheel teeth. Continue pushing while pressing the TAPE FEED switch to start the tape feeding.

If any difficulty is experienced in starting the feed with the above method, open the punch lid by loosening the thumb screw and swinging it open. Push the tape through the slot in the die block far enough to cover the sprocket wheel and close the punch lid. Press the FEED switch to start the feed.
- 10.) Return the dancer and the low tape sensor to their normal positions.
- 11.) Replace the tape supply cover.

CHAD BOX INSTALLATION/REMOVAL

The chad box is held in place by Velcro fasteners. To remove it, simply pull it off. To install it, place the top of the chad box in contact with the lower edge of the chad chute and press the chad box against the punch mechanism cover.

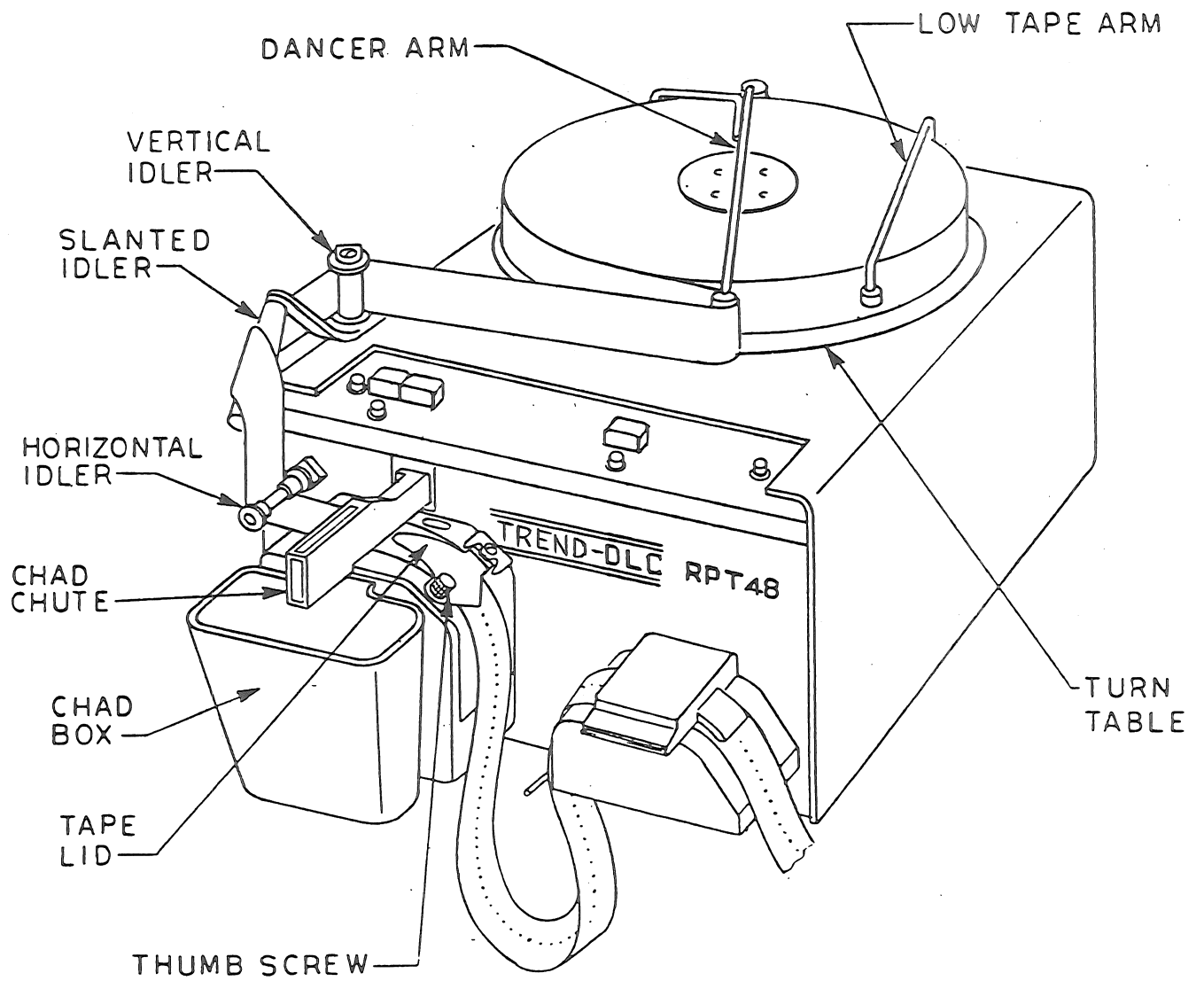
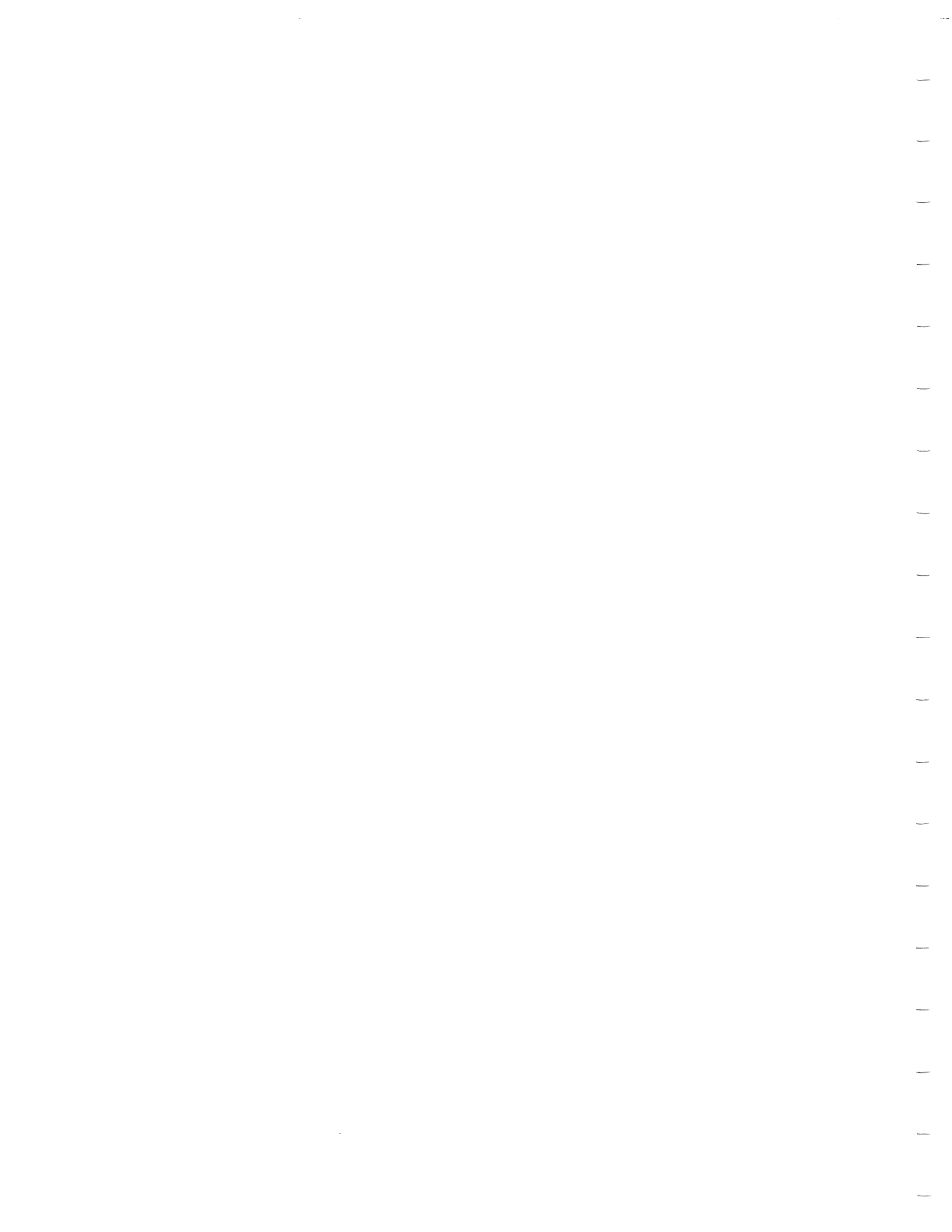


FIGURE 2-4 FRONT VIEW OF A RPT-48 WITH PAPER TAPE



SECTION 3

TREND-DLC, INC. RPT-48 INTERFACE INFORMATION

This section describes the interface specifications,
signal requirements and operation of the TREND-DLC, INC.
RPT-48 Tape Preparation and Editing System.

GENERAL

The RPT-48 is a self-contained editing paper tape terminal with four ports. When connected to a suitable KSR printer, the combination is capable of general purpose preparation, duplication, verification, editing and communication of tapes for NC machine tools.

Connectors for all the ports are located on the rear panel of the RPT-48 (see Figure 2-1). A detailed description of each of the ports is given below.

PRINTER PORT

This port is an RS232 asynchronous port operation in full duplex with auto bauding at 110, 300, 600 1200, 2400 4800 or 9600 Baud and it is used for the connection of a KSR terminal such as a DEC LA-34 or TTY-43. The LA-34 is the preferred terminal since it is capable of high speed tabulation. Configuration switch #3 also located on the rear panel (Figure 2-1) is used to specify the type of terminal connected to the printer port. Switch #3 is placed in the "0" position (down) when a LA-34 is used and in the "1" position for all others.

The interface connector is a female 25-position "D" type as required by EIA with the following signals:

Pin 1: Protective Ground

The protective ground is connected to the chassis of the RPT-48 and the external grounds through the third wire of the power cord.

Pin 2: Transmitted Data (TXD)

Direction: To RPT-48

Serial data transmitted from the KSR terminal keyboard to the RPT-48.

Pin 3: Received Data (RXD)

Direction: From RPT-48

Serial data transmitted from the RPT-48 to the connected KSR terminal.

Pin 4: Request to Send (RTS)

Direction: To RPT-48

Ignored at all times.

Pin 5: Clear to Send (CTS)

Direction: From RPT-48

Asserted at all times when the RPT-48 is powered up.

Pin 6: Data Set Ready (DSR)

Direction: From RPT-48

Asserted at all times when the RPT-48 is powered up.

Pin 7: Signal Ground

The signal ground establishes a common reference potential for all interface circuits except protective ground. The signal ground and protective ground are not connected together in the RPT-48 but may be connected together in an attached device.

Pin 8: Carrier Detect (DC)

Direction: From RPT-48

Asserted at all times when the RPT-48 is powered up.

Pin 20: Data Terminal Ready (DTR)

Direction: To RPT-48

Ignored at all times.

NOTE: The Printer port may be configured for current loop operation by the addition of an extra-cost option printed circuit board. (see CURRENT LOOP OPTION at the end of this section).

MODEM PORT

The modem port is an asynchronous RS232 communication port operating in either the half duplex or full duplex mode. The communication speed is operator-programmable via the terminal keyboard (see section 8) and the HDX/FDX mode is selected via option switch #4 (see section 2).

This port is provided for communication with a remote computer or time-share service via a modem or acoustic coupler and it is selected via commands from the terminal keyboard.

The modem port interface is a male 25-pin "D" type connector located on the rear panel of the RPT-48 (see Figure 2-1).

The following signals are active:

Pin 1: Protective Ground

The protective ground is connected to the chassis of the RPT-48 and the external grounds through the third wire of the power cord.

Pin 2: Transmitted Data (TXD)

Direction: From RPT-48

Serial data transmitted from the RPT-48 to the modem.

Pin 3: Received Data (RXD)

Direction: To RPT-48

Serial data transmitted from the modem to the RPT-48.

Pin 4: Request to Send (RTS)

Direction: From RPT-48

With wire jumper option W-27 in place (see Figure 3-3), asserted whenever the RPT-48 is powered up.

With wire jumper option W-26 in place, same as DTR.

Pin 5: Clear to Send (CTS)

Direction: To RPT-48

Must be asserted to enable transmission of data from the RPT-48 to the modem. If CTS is de-asserted during the transmission of a character, the character being sent will be completed before transmission is stopped. CTS can be used to control the operation of the reader. Presence of the CTS signal is indicated by the CTS LED (see section 2 - Indicators and Alarms)

Pin 6: Data Set Ready (DSR)

Direction: To RPT-48

DSR must be asserted by the modem before communication can begin.

Pin 7: Signal Ground

The signal ground establishes a common reference potential for all interface circuits except protective ground. The signal ground and protective ground are not connected together in the RPT-48 but may be connected together in an attached device.

Pin 8: Carrier Detect (CD)

Direction: To RPT-48

CD must be asserted by the modem before communication can begin.

Pin 20: Data Terminal Ready (DTR)

Direction: From RPT-48

DTR is asserted whenever the modem port is selected.

NOTE: The modem port may be configured for current loop operation by the addition of an extra-cost option printed circuit board. (see page 3-13 CURRENT LOOP OPTION at the end of this section.)

PORT A

This port is an asynchronous RS232/current loop communication port operating in the Full Duplex mode. The communication speed is operator-programmable via the terminal keyboard (See Section 8).

The current loop alternative is established by moving wire jumpers located on the NC Edit printed circuit board. Therefore, it is not operator switchable.

When Port A is configured for current loop operation, it is always passive. That is, the current source, battery and current regulating resistor are located in the external interface. The maximum allowable battery is 50 volts and the current may be either 20ma or 60ma.

Port A is intended for direct communication with NC/CNC machine tools.

The Port A interface is a male 25-pin "D" type connector located on the rear panel of (See Figure 2-1).

The following signals are provided:

Pin 1: Protective Ground
Same as Modem Port.

Pin 2: Transmitted Data (TXD)
Direction: From RPT-48
Serial Data to the NC/CNC machine tool.

Pin 3: Received Data (RXD)
Direction: To RPT-48
Serial Data from the NC/CNC machine tool.

Pin 4: Request to Send (RTS)
Direction: From RPT-48
Asserted when the RPT-48 has data to be transmitted on Pin 2.

Pin 5: Clear to Send (CTS)
Direction: To RPT-48
Must be asserted to enable transmission of data from Pin 2.

Pin 6: Data Set Ready (DSR)
Direction: To RPT-48
Must be asserted by NC/CNC machine tool before communications can begin.

Pin 7: Signal Ground
Same as Modem Port.

Pin 20: Data Terminal Ready (DTR)
Direction: From RPT-48
DTR is asserted whenever Port A is selected.

Pin 13: -Transmit
Direction: From RPT-48
This pin is active when Port A is strapped for current loop operation. It is the negative terminal connection of the serial data transmit loop. 20/60ma passive operation only.

Pin 14: +Transmit
Direction: From RPT-48
Positive return for Pin 13.

Pin 15: -Receive
Direction: To RPT-48
This pin is active when Port A is strapped for current loop operation. It is the negative terminal connection of the serial data loop from the NC/CNC machine tool 20/60ma passive operation only.

Pin 16: + Receive
Direction: To RPT-48
Positive return for Pin 15

Pin 23: + Reader Control
Direction: To RPT-48
This pin is active when Port A is strapped for current loop operation and reader control. It is the positive terminal connection of the reader control loop. 20/60ma passive operation only. When current flows, the reader (transmission) is enabled (see CTS above). This signal is normally strapped in the active or run position and does not need to be driven.

Pin 24: - Reader Control
Direction: To RPT-48
Negative return for Pin 23.

Table 3-1 gives the various jumper configurations for Port A. These jumpers are located on the NC EDIT printed circuit board located on the right side of the RPT-48. See Figure 3-1 for the location of the jumpers on the NC EDIT PCB. Figure 3-2 shows in schematic form a typical Full Duplex current loop connection on Port A.

PORT A CURRENT LOOP/RS232 CONFIGURATION JUMPERS

Port A	Reader Control	NC Edit PCB Jumpers					Port A Jumpers	Notes
		W1	W2	W3	W4	W5		
RS232	CTS	1	0	0	1	0	None	1
Current Loop	YES	0	1	0	0	1	Pin 4 to Pin 6	3
Current Loop	NO	0	1	1	0	0	Pin 4 to Pin 6	2,3

1 = Jumper installed

0 = Jumper not installed

NOTES:

- (1) Factory Configuration - RS232
- (2) Factory Configuration - Current Loop
- (3) Port A jumper is installed in the customer's Port A connector.

Table 3-1

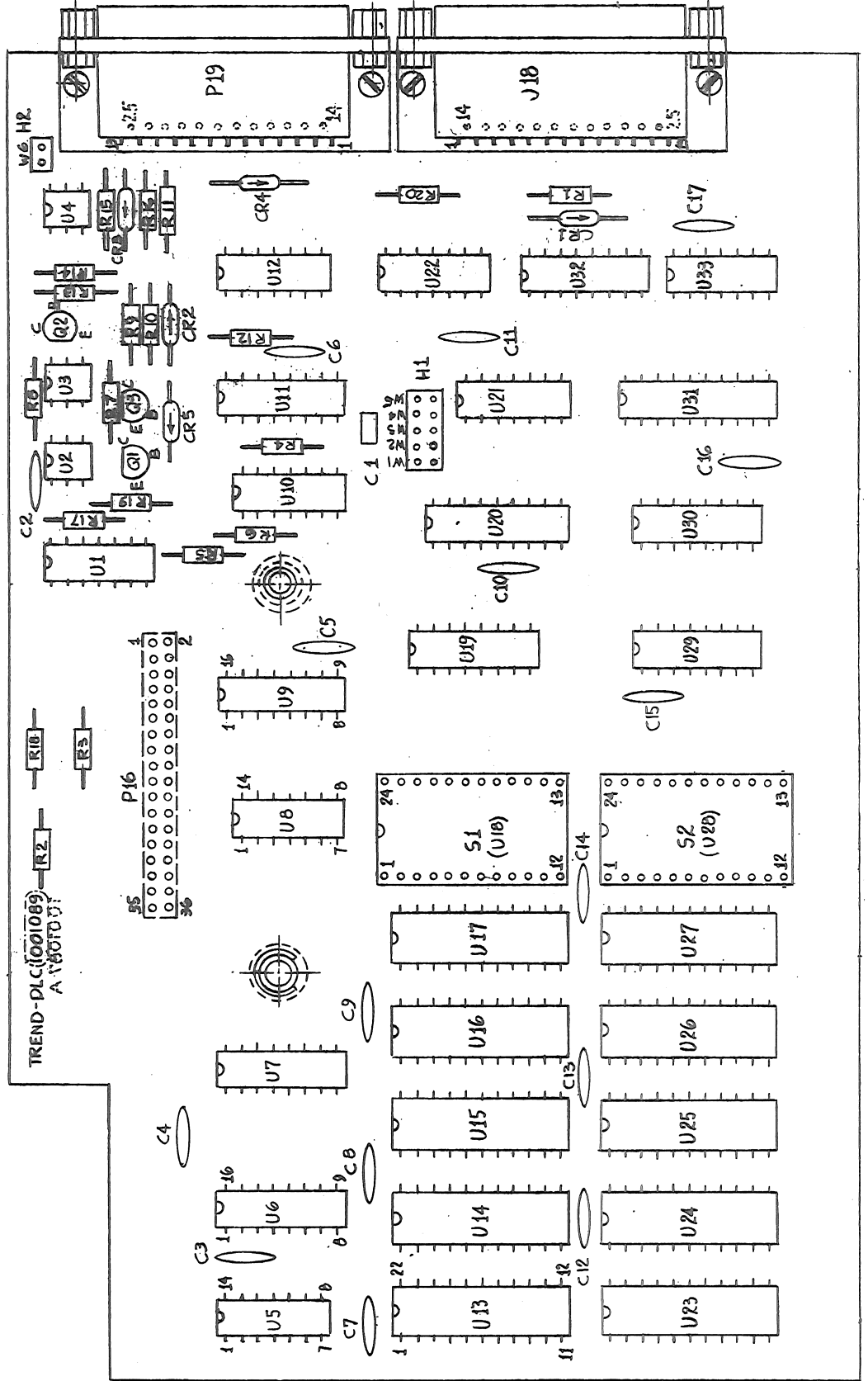
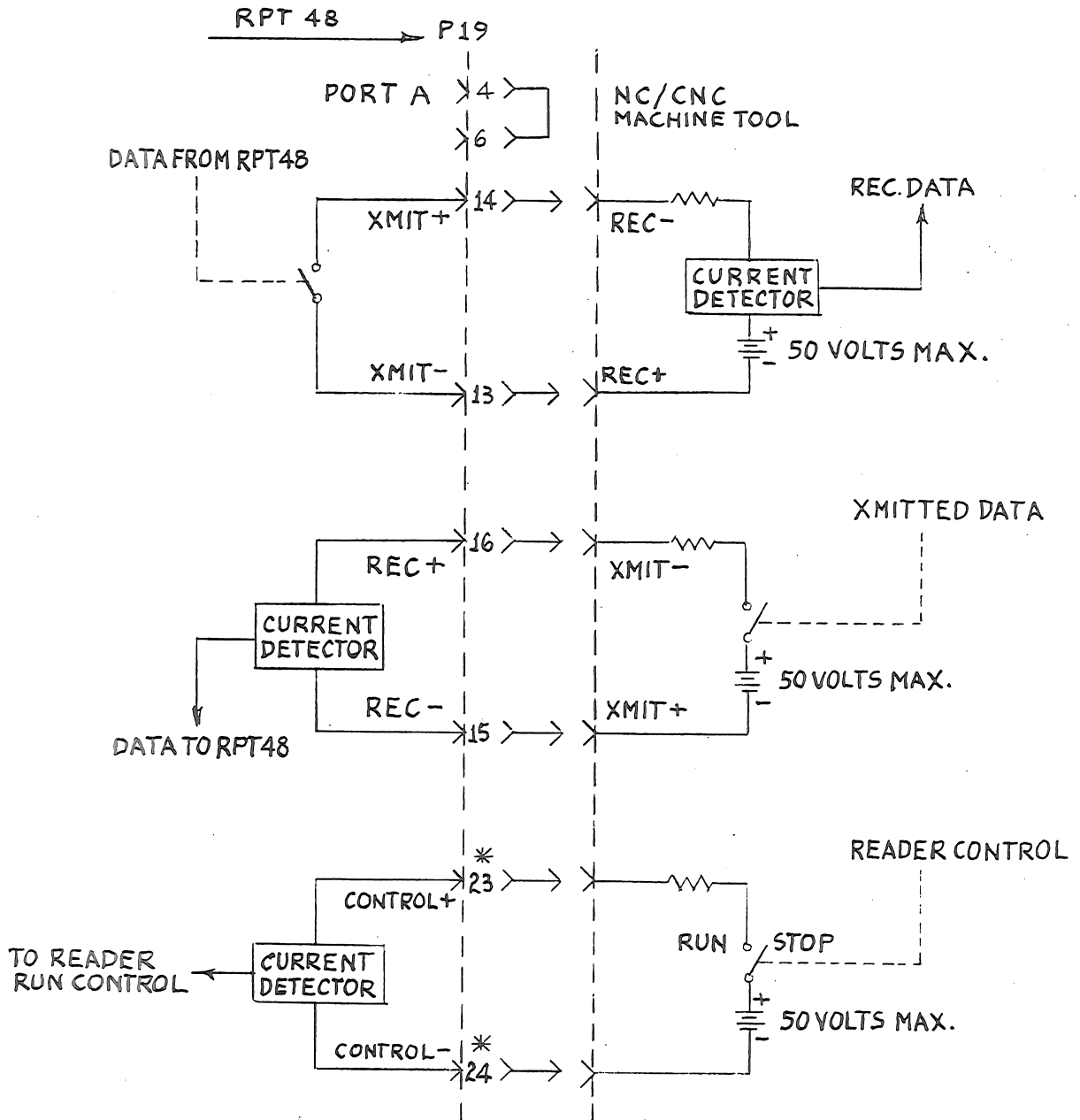


Figure 3-1



* READER CONTROL STRAPPED IN THE RUN CONDITION AS SHIPPED.

PORT A CURRENT LOOP CONFIGURATION

Figure 3-2

PORT B

This port is a Facit compatible receive only interface. This interface is commonly found in NC/CNC controllers and is used to make tape copies of programs which have been developed or modified in the controllers.

The RPT-48 will produce a punched tape copy of the parallel data presented at Port B without the use of a KSR terminal to control operations. Rear panel switch #1 (see Page 2-3) determines the method of operation. When this switch is down, the RPT-48 is under program control via the KSR terminal (see section 8). When this switch is up, all other ports are made inactive, the punch is turned on, and the RPT-48 is ready to receive data through the parallel interface.

Port B is located on the RPT-48 rear panel (see Figure 2-1), and it uses a 25-pin, female, "D" type connector. A summary of connector signals is given below, while the following paragraphs explain each signal in detail.

PARALLEL INTERFACE CONNECTOR SIGNALS

PIN #	DESCRIPTION
1	Channel 1 Data
2	Channel 2 Data
3	Channel 3 Data
4	Channel 4 Data
5	Channel 5 Data
6	Channel 6 Data
7	Channel 7 Data
8	Channel 8 Data
10	No Connection
11	Punch Instruction (PI)
12	Punch Ready (PR)
13 thru 19	No Connection
20	Signal Ground
21	Tape Low (TL)
22 thru 24	No Connection
25	Signal Ground

Data CH1-8 - Pins 1 - 8

Direction: To RPT-48

These signals represent parallel encoded data from the controller.

Logical 1 (Tape Hole)	+ 3.5v to + 12v
Logical 0 (No Hole)	+ 1.5v to - 12v
Duration	100 us min
Rise Time	10 us min
Input Impedance	3K min

Punch Instruction (PI) - Pin 11

Direction: To RPT-48

This signal indicates that the data on Pins 1 - 8 is valid. PI and data must be held until Punch Ready (PR) goes low (logical 0 State) indicating to the controller that the data has been latched.

Logical 1 (Data Valid)	+ 3.5v to + 12v
Logical 0 (No Data)	+ 1.5v to - 12v
Duration	100 us min
Rise Time	10 us min
Input Impedance	3K min

Punch Ready (PR) - Pin 12

Direction: From RPT-48

This signal indicates when the terminal is ready to accept a new character for punching. PI should not be taken to the logical 1 state unless PR is in the logical 1 state. PR goes from the logical 1 state to the logical 0 state when data is latched.

Logical 1 (Ready)	+ 5v Output Imped. 1K
Logical 0 (Busy)	+ .4v 10ma Max.

Tape Low (TL) - Pin 21

Direction: From RPT-48

This signal indicates a low tape condition, and causes PR to go to the logical 0 or busy state.

Logical 1 (Tape Low)	+ 5v Output Imped. 1K
Logical 0 (Tape Not Low)	+ .4v 10ma Max.

Signal Ground - Pins 20 and 25.

OPTIONAL CURRENT LOOP INTERFACE

CURRENT LOOP OPTION

This option provides current loop operation on either the terminal interface or the modem interface or both. A current loop communication circuit will operate wherever the current source or battery is located. A device is said to be ACTIVE if it supplies the current and PASSIVE if it receives current from another device.

TERMINAL INTERFACE

This interface is intended for local (short haul) operation with a communication terminal or computer. Therefore, it is configured for 20ma, Full Duplex, Active operation with no provision for other variations. The ACTIVE connection defeats the isolation of the signal lines and local circuits. Therefore, protective measures to avoid exposure to high potentials is required and care must be taken to ensure that protective (frame) ground is connected.

MODEM INTERFACE

The modem interface is configured to 20ma or 60ma, FULL DUPLEX, PASSIVE operation. It is fully isolated. In addition to the send and receive data lines, a READER CONTROL line is provided. The reader control line is functionally equivalent to the CTS (Clear to Send) signal in the RS232 interface and is used in some systems to restrain operation of the reader. The READER CONTROL line is configured to 20ma or 60ma Passive operation, and two wire jumper options are provided. One disables this signal for systems which do not require it and the other converts it to a voltage signal for use with DEC mini-computers. The maximum battery voltage on the modem interface is 50 volts.

INSTALLATION

The current loop option PCB is mounted vertically on the left side of the terminal and plugs into J12 on the main logic PCB. The lower edge of the option PCB engages a card guide and two 6-32 screws secure it in place. One or two IC's located in DIP sockets on the main logic PCB (Figure 3-3) must be removed and various wire jumpers installed or removed on the main logic PCB and the current loop PCB (Figure 3-4) according to Table 3-2.

CURRENT LOOP CONFIGURATION JUMPERS AND IC'S

TERMINAL INTERFACE	MODEM INTERFACE	READER CONTROL	MAIN LOGIC PCB			CURRENT LOOP PCB						
			W9	U1	U3	W1-2	W3-4	W5-6	W7-8	W9-10	W11-12	W13-14
RS232	RS232	CTS	1	1	1	0	0	X	0	0	0	0
Curr Loop	RS232	CTS	1	1	0	1	1	X	0	0	0	0
RS232	Curr Loop	NO	0	0	1	0	0	X	1	1	1	0
RS232	Curr Loop	YES	0	0	1	0	0	1	1	1	0	1
RS232	Curr Loop	DEC	0	0	1	0	0	0	1	1	0	1
(1) Curr Loop	Curr Loop	NO	0	0	0	1	1	X	1	1	1	0
Curr Loop	Curr Loop	YES	0	0	0	1	1	1	1	1	0	1
Curr Loop	Curr Loop	DEC	0	0	0	1	1	0	1	1	0	1

NOTES: (1) Factory configuration

1 = Jumper or IC inserted
 0 = Jumper or IC not inserted
 X = Don't care

Table 3-2

The current loop option is normally shipped with both TERMINAL and MODEM interfaces strapped for current loop operations. The READER CONTROL (modem interface only) is strapped in the run condition.

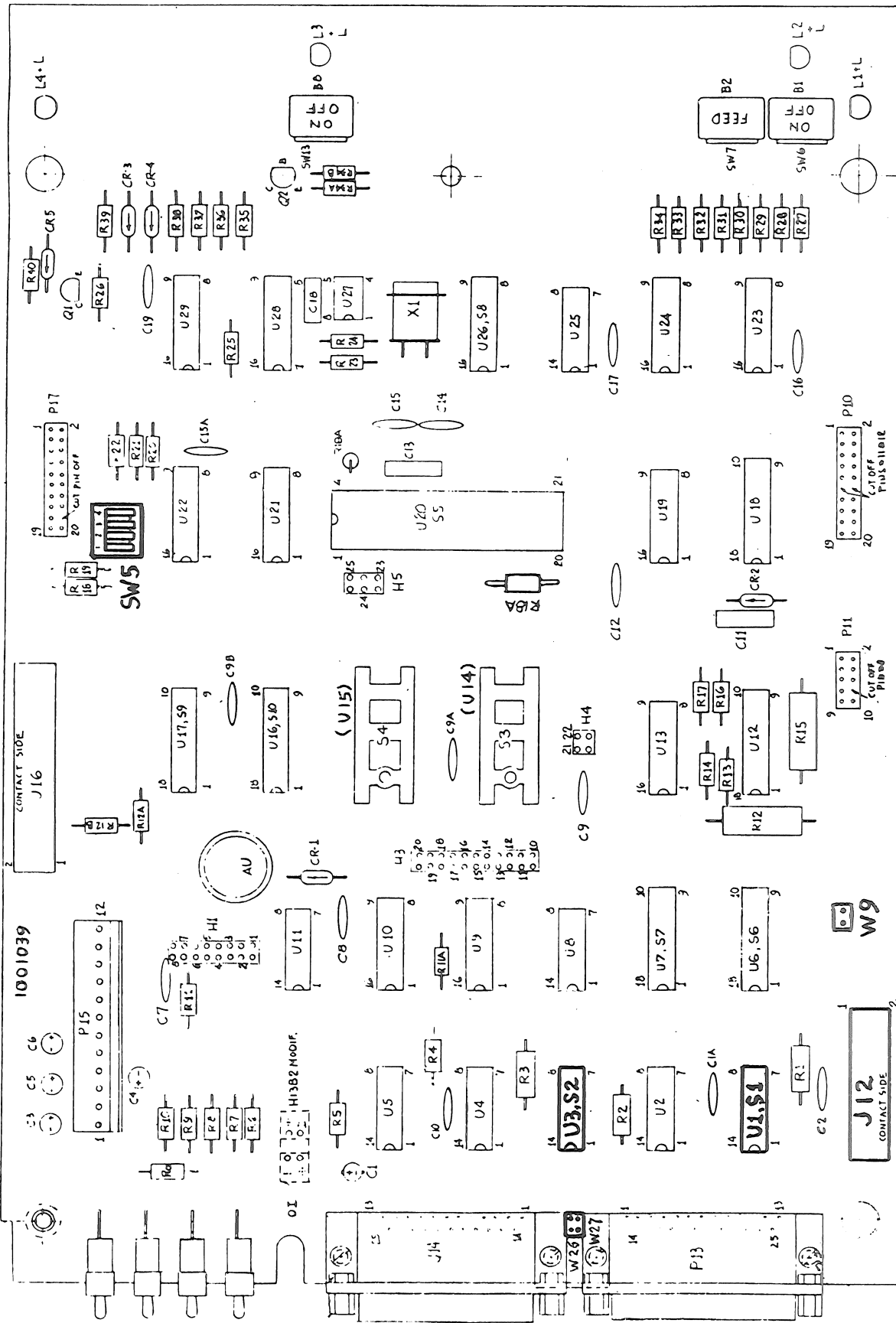
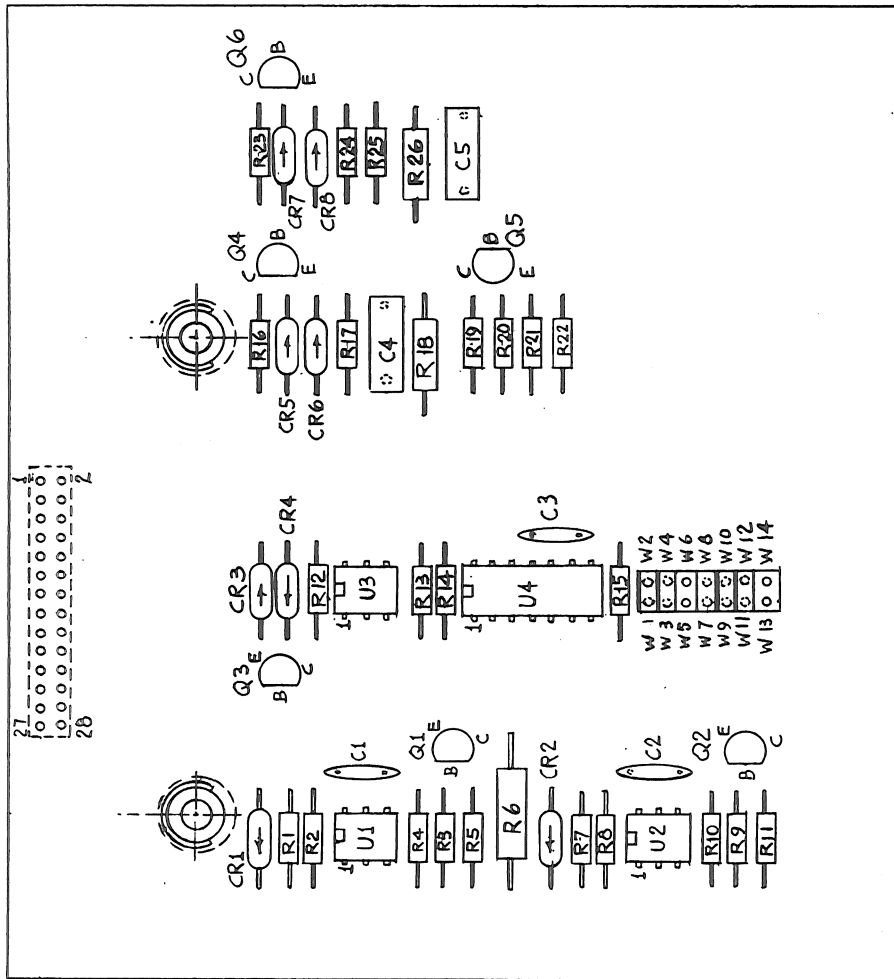


Figure 3-3



CURRENT LOOP OPTION BOARD

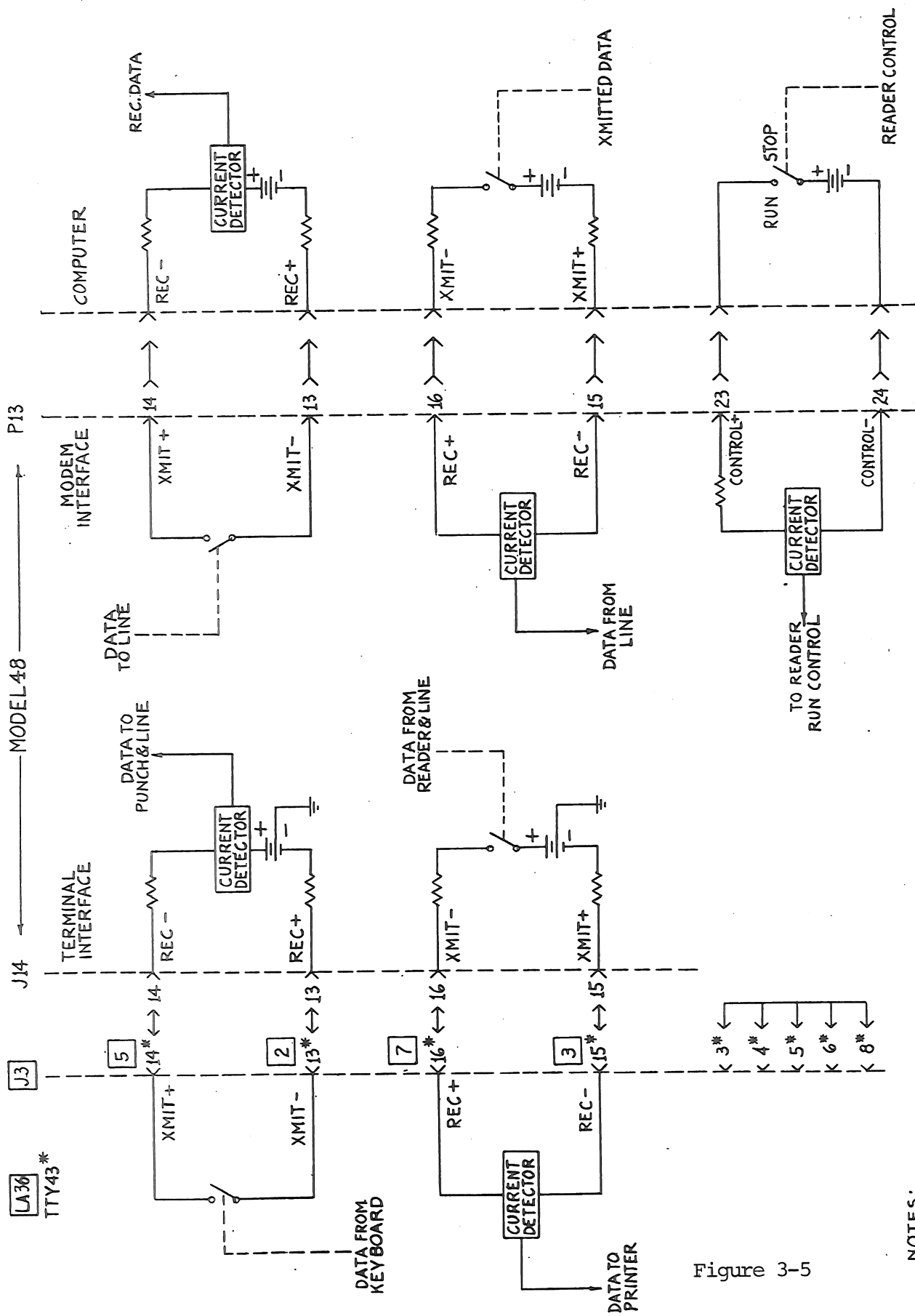
FIGURE 3-4

The interface connectors are the same 25-pin "D" type connectors used for the RS232 interfaces. The terminal interface is a female and the modem interface is a male. The cable and connector pin connections are shown in Table 3-3 for the standard configurations. (Polarities denote current flow from + to -.)

STANDARD FULL DUPLEX CURRENT LOOP CONNECTIONS

CONNECTOR PIN NO.	INTERFACE	CIRCUIT	DESCRIPTION
J14 - 14	Terminal	Receive (-)	Negative side of line
J14 - 13	Terminal	Reedive (+)	Positive side of line
J14 - 16	Terminal	Transmit (-)	Negative side of line
J14 - 15	Terminal	Transmit (+)	Positive side of line
J12 - 16	Modem	Receive (+)	Positive side of line
J12 - 15	Modem	Receive (-)	Negative side of line
J12 - 14	Modem	Transmit (+)	Positive side of line
J12 - 13	Modem	Transmit (-)	Negative side of line
J12 - 23	Modem	Reader Control (+)	Positive side of line
J12 - 24	Modem	Reader Control (-)	Negative side of line

TABLE 3-3



NOTES:
 □ BOXED FIGURES APPLY TO LA36 DECRYPTER.
 * ASTERISK FIGURES APPLY TO TTY 43.
 POLARITIES INDICATE DIRECTION OF CURRENT FLOW.

Figure 3-5

STANDARD CURRENT LOOP CONFIGURATION

SECTION 4

CODE CONVERSION

This section contains detailed information on converting between the ASCII and EIA RS244B codes using the RPT-48 TAPE PREP & EDITING SYSTEM.

GENERAL

The RPT-48 provides a means for converting between the ASCII code and the EIA RS244B code. Tape in either code can be converted to the other. Also, tapes in either code can be prepared, edited, copied, listed, and verified. In addition, tapes in either code can be transmitted in ASCII via the modem port or port A, or tape can be punched in either code from ASCII data received through the modem port or port A.

Because of the following:

1. There is not a one-to-one correspondence between the characters in the ASCII code and the EIA code.
2. The EIA "EOB" code (End of Block) is often a sequence of codes in ASCII which vary depending on the machine tool controller or the communication protocol.
3. Codes such as EIA "EOR" (End of Record), "%," etc. are translated differently depending on the controller, and
4. The feed code used for tape leader and trailer differs from system to system.

Provisions have been made in the RPT-48 for the operator to:

1. Program the special translation of up to four characters.
2. Program an individual sequence of up to four characters for the ASCII End of Block for each device in the system (Punch, Reader, Modem Port, and Port A).
3. Program individual feed codes for the punch and reader.
4. Program the ASCII parity.

DEFAULT CONVERSION

When the RPT-48 is first powered-up, a default condition is automatically assumed and the following conditions prevail:

1. The upper case ASCII alphabet is translated the same as the lower case. Therefore, the EIA "UC" (upper case) and "LC" (lower case) codes are not used.

DEFAULT CONVERSION (Continued)

2. The ASCII "EM" (End of Media) is translated to the EIA "EOR" (End of Record) and vice versa.
3. All other ASCII codes which do not have an EIA counterpart are omitted, including "LF" (Line Feed) and NULL.
4. The ASCII feed code is NULL.
5. The EIA feed code is NULL.
6. The ASCII parity is even.
7. The EIA parity is odd.

PROGRAMMING TRANSLATION

Programming the various aspects of the code translation is done through the use of the Configuration (CONF) command, which is described in detail in section 5.

In order to use the CONF command, it is necessary to identify the codes involved. Tables 4-1 (ASCII) and 4-2 (EIA) are used for this purpose. Notice that these tables have the same format. Columns marked b1 through b4 and rows marked b5 through b8 relate to Figure 4-1 which shows the physical location of holes on the tape. A "1" under b1-b8 in Tables 4-1 or 4-2 corresponds to a hole in the tape. The parity bits b8 in Table 4-1 and b5 in Table 4-2 are left blank, and are understood to contain a 1 or 0 as required to produce the correct parity.

Now, notice the heavily bordered areas marked Column (0 through 7), and Row (0 through F). A code is identified in the CONF command by its Col/Row designation. For example, the ASCII "EM" code is 1/9 from Table 4-1 and the EIA "%" is 4/B from Table 4-2.

When translating, the RPT-48 first looks for the character to be translated in the programmable four-position sub-table. If the character is there, its companion entry is used as the translation, otherwise the translation is found in the permanent (default) table.

The RPT-48 processes all data in ASCII. In editing an EIA tape, it is first translated to ASCII, processed, and then translated back to EIA. This does not cause any ambiguities as long as the data being translated does not contain both the character and its translation, i.e., two different EIA characters translating to the same ASCII characters. For

PROGRAMMING TRANSLATION (Continued)

example, if the sub-table calls for an EIA "EOR" to be translated to an ASCII "%" (EOR = %), and these are both "EOR" characters and "%" characters on the EIA tape being processed, then the ASCII data will contain ASCII "%" characters which were EIA "EOR" characters and other ASCII "%" characters which were EIA "%" characters. Now translating the ASCII data back to EIA will cause all the ASCII "%" characters to become EIA "EOR" characters.

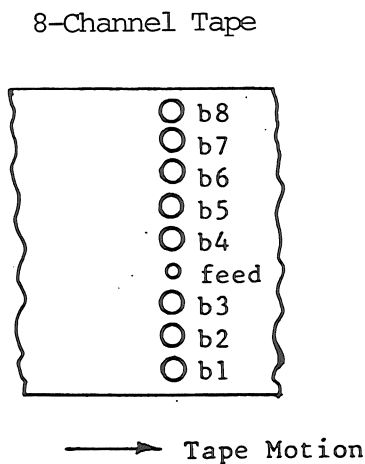


Figure 4-1

USA STANDARD CODE

FOR INFORMATION INTERCHANGE

ASCII

BITS					PARITY BIT (EVEN)								
					0	0	0	0	1	1	1	1	
b8	b7	b6	b5	row	col	0	1	2	3	4	5	6	7
b4	b3	b2	b1			0	1	2	3	4	5	6	7
0	0	0	0	0	0	NUL	DLE	SP	0	@	P		p
0	0	0	1	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	4	EOT	DC4	\$	4	D	T	d	t
0	1	0	1	5	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	A	A	LF	SUB	*	:	J	Z	j	z
1	0	1	1	B	B	VT	ESC	+	;	K	[	k	{
1	1	0	0	C	C	FF	FS	,	<	L	\	l	|
1	1	0	1	D	D	CR	GS	-	=	M	]	m	}
1	1	1	0	E	E	SO	RS	.	>	N	^	n	~
1	1	1	1	F	F	SI	US	/	?	O	_	o	DEL

"1" signifies a hole; "0" signifies no hole

Table 4-1

EIA RS244B

CODE FOR NC PERFORATED TAPE

b8	0	0	0	0	1	1	1	1					
b7	0	0	1	1	0	0	1	1					
b6	0	1	0	1	0	1	0	1					
b5	PARITY BIT (ODD)												
BITS					col	0	2	4	6	8	A	C	E
b4	b3	b2	b1	row									
0	0	0	0	0	SPACE	0	-	+	EOB				
0	0	0	1	1	1	/	j	a					
0	0	1	0	2	2	s	k	b					
0	0	1	1	3	3	t	l	c					
0	1	0	0	4	4	u	m	d					
0	1	0	1	5	5	v	n	e					
0	1	1	0	6	6	w	o	f					
0	1	1	1	7	7	x	p	g					
1	0	0	0	8	8	y	g	h					
1	0	0	1	9	9	z	r	i					
1	0	1	0	A		BS		LC					
1	0	1	1	B	EOR	,	%	.					
1	1	0	0	C				UC					
1	1	0	1	D									
1	1	1	0	E	&	TAB							
1	1	1	1	F				DEL					

"1" signifies a hole; "0" signifies no hole

Table 4-2

SECTION 5

MODES OF OPERATION

The operation of the Model RPT-48 may be divided into two major categories of off-line, stand alone and on-line, terminal. The following is a brief description of the utility of the Model RPT-48 as used in the off-line, stand alone mode. The on-line mode will be discussed in Section 8.

GENERAL

When power is applied to the RPT-48, the machine will initialize its internal memory and blink the Punch and Reader LED's. The blinking indicates that the RPT-48 is waiting for the entry of a CARRIAGE RETURN so that it can automatically set the Baud rate of the printer port. The CARRIAGE RETURN should be entered after the terminal device has initialized itself (carriage has stopped moving). When the Baud rate is set, the LED's will stop blinking and if the terminal device is an LA-34 printer, the RPT-48 will transmit the necessary control data to establish the line length and tab stop positions in the memory of the printer. This operation may take as long as 4 seconds and no action should be attempted until it is complete.

If the Punch and Reader LED's fail to blink as indicated above, check to see that rear panel switch #1 is down. When this switch is up, the RPT-48 is conditioned to operate its parallel interface without a terminal connected to the printer port. Therefore, the automatic Baud setting is not performed.

The completion of the initialization procedure is indicated by the printing of the word COMMAND? on the terminal. This indicates that the RPT-48 is ready to accept one of the major commands shown in the following list:

PREP	EDIT
LIST	CONF
PRNT	DUMP
VERFY	LOAD
COPY	

Each of these commands will be described in detail in the following pages.

KEYBOARD ENTRY

The entry of data through the terminal is basic to operation of the RPT-48 and follows certain rules regardless of the operation being performed. All entries made will be terminated with the RETURN key. Line feeds, if required, will be automatically inserted by the RPT-48.

The data entered via the terminal keyboard is displayed at the terminal and held in a 132-character line buffer until the RETURN key is depressed. This allows the operator to "sight-verify" each line prior to entry into the system or punching into tape. The backspace and escape (ESC) keys may be used during entry of data to perform special functions that will facilitate the correct entry of data.

Backspace The backspace key may be used to remove the last entered character during the entry of data. The character removed will be printed each time the backspace key is depressed to indicate to the operator the number of characters that have been removed. If a TAB code is encountered during backspacing, the RPT-48 will print the contents of the line to the left of the present position and will leave the head positioned at the proper point for continuing entry.

On terminals which do not have a backspace key which transmits the backspace code to the RPT-48, use "CONIL H".

Escape V The depression of the escape (ESC) key followed by the letter V will cause the present contents of the RPT-48 line buffer to be printed. This function is useful if the backspace key has been used several times and the operator wishes to view the corrected line before terminating it with the RETURN key.

Escape D The depression of the escape (ESC) key followed by the letter D will cause the present contents of the line buffer to be deleted and will allow re-entry of the line.

Escape/
Escape The depression of the escape (ESC) key twice will abort the present command or sub-command and return the program to the prior command entry level.

The escape key (ESC) will be discussed more completely in the following pages since it performs special functions in the different commands in the RPT-48's repertoire.

SYSTEMS COMMANDS

PREP This command allows the operator to prepare tapes. Upon entry of the word PREP followed by a RETURN, the RPT-48 will prompt with the question TAPE ID? The operator may then type up to 100 characters to identify the tape and these characters will be punched in man-readable form in the tape. If no identification is desired, depress the RETURN key only.

The RPT-48 will punch the man-readables if required and then prompt with the question LEADER? The operator may now enter a number indicating the number of inches of tape leader desired prior to the punching of data. If no leader is desired, simply depress the RETURN key. After the leader has been punched, the RPT-48 will prompt with the question AUTO BLOCKS? The operator may enter the RETURN only if auto-block numbers are not required. If auto-block numbers are desired, the operator should enter the starting block number followed by a comma, then the increment followed by a comma, and finally the block number identifier consisting of a single letter followed by the RETURN key.

For example:

AUTO BLOCKS? 00100,10,N

would cause a five-digit number preceded by the letter N to be inserted automatically into each line containing data typed by the operator. This number would be incremented for each line. If a line has no data entered, i.e., only the RETURN key is entered, the block number will not be incremented.

NOTE: When the starting block number is entered leading and trailing zeros should be entered to provide the full size of number used by the controller that will read the tape.

If the data entered for the auto-block message is not exactly as described above, the RPT-48 will return to prompt for re-entry. Check the sequence of the three items that must be entered and for commas following the first and second numbers.

When the auto-block query has been successfully answered, the RPT-48 will print a four-digit line reference number followed by the auto-block number if required. The operator may now enter the desired data for the line. When the data has been typed and the line sight-verified, the RETURN key may be depressed to cause the line to punch into tape. Only the data following the line reference number will be punched. This operation will then continue until all data for a given tape has been entered. The operator may then depress the escape (ESC) key followed by the letter E to terminate the tape. This will punch a group of 30 null codes representing end of tape, followed by a checksum value formed during the creation of the tape to be punched in man-readable characters at the end of the tape. If no checksum is desired on this tape, the operator may depress the FEED control button on the punch to produce some trailer and then depress two ESC keys to return to the COMMAND? prompt.

It is possible to change the values associated with the generation of auto-blocks at any time during the preparation of a tape. This is accomplished by depressing the ESC key followed by the letter Q which will return the program to the AUTO BLOCK? prompt. The new block number sequence may then be entered and preparation will continue with the new sequence.

~~LIST~~
L STA

This command should be used to produce a hard copy of any tape that is going to be edited. A four-digit line refer-

ence number will be printed prior to the data for each line. This number is required by the EDIT command to select the lines that are to be changed.

When the word LIST is entered in response to the COMMAND? query, the RPT-48 will respond with the query VISIBLES NO/YES? If the tape has been produced by the RPT-48 system and contains a man-readable identification, type a Y followed by the RETURN key. The tape should be mounted in the reader such that the first character read is within the area of man-readable characters. The RPT-48 will then read through the man-readable area, print the data contained there on the terminal, and then proceed to list the tape until the EOT block of 30 nulls is found. At this time, the checksum of the data read will be printed at the terminal and can be compared to that punched into the tape.

If there are no man-readables on the tape or the man-readables were generated by a system other than the RPT-48, the tape should be mounted in the reader just before the first data character and the letter N typed in response to the VISIBLES NO/YES? prompt.

If it is necessary to temporarily halt the LIST command, the reader ON/OFF button may be depressed to stop the reader. The listing will resume when the button is depressed again.

During the listing operation, the reader may stop for short periods and then continue. This is caused by the fact that the LA-34 printer may fall slightly behind the reader if the tape contains a number of TAB codes.

PRNT This command is the same as the LIST command except the line reference numbers are not printed.

VRFY This command operates in a similar fashion to the LIST or PRNT commands but no hard copy will be produced. The tape will be read and the checksum printed when complete. The purpose of this command is to allow a tape to be verified for accuracy more quickly than possible if printing is performed.

COPY

This command is used to produce copies of existing tapes, change the code in which the tape is punched, and convert tapes produced by other systems to the format required by the RPT-48 system.

The tape to be copied should be mounted in the reader as described under the LIST command. If man-readables are present, the tape should be mounted over a character within the man-readable field. If no man-readables or if the tape was not produced on the RPT-48, place the tape immediately before the first data character of the tape. When the word COPY is entered at the COMMAND? query, the RPT-48 will respond with:

VISIBLES? ^{or} NONE/COPY/MODIFY/ENTER

The operator should respond with the first letter of the desired option; N,C,M, or E. If no man-readables are present and none are required, type N. If man-readables are present and should be duplicated, type C. If man-readables are present but must be modified for the new tape, type M. If man-readables are not present but are desired on the new tape, type E. If either M or E is entered, the RPT-48 will respond with the query TAPE ID? as described under the PREP command.

When the man-readable section of the original type has been processed, the R-48 will prompt LEADER? and the operator should enter the number of inches of leader required. It should be understood that no leader will be copied from the original tape.

When the leader has been punched, the RPT-48 will continue to read the original tape and copy it to the punch until the EOT block of 30 nulls is read or the reader physically runs out of tape. If the reader runs out of tape, the operator should enter ESC followed by E on the keyboard to terminate the tape with a checksum as under the PREP command.

During the copying of the tape, the EOB codes may be changed or the entire tape may be converted from ASCII to EIA or vice versa. Refer to the CONF command for further information.

EDITING

The editing capability of the RPT-48 allows the operator to modify existing data tapes in either ASCII or EIA code and produce a new tape in either code. The editing procedure is controlled by a table of commands that are stored in the memory of the RPT-48 by the operator before the actual editing of tapes begins. These commands will provide the following functions:

CHANGE	Change single characters or strings of characters.
DELETE	Delete entire lines from the input tape.
INSERT	Insert new lines into the output tape automatically.
STOP	Suspend the editing procedure and allow entry of lines manually by the operator.
RESEQUENCE	Resequence the block numbers on the input tape.
PRINT	Enable printing while editing.
BLIND	Disable printing.

Each of these commands are described in detail below, and it will be seen that each command contains one or more line numbers. These numbers are the line reference numbers that are printed during the execution of the LIST command. Therefore, the operator should always have a hard copy of the tape, prepared by the LIST command, available before starting the EDIT process.

During the editing of a tape, a complete line of the input tape is read into the input buffer. The command table is then searched to determine if any stored command has been specified for this line number. If so, the command is analyzed to determine if it applies to this particular line. For example, if the input line contains data that is to be changed or if the block number requires resequencing. When all commands that may affect the line have been processed, the line will be output from the buffer to the punch and the next input line will be processed. This operation will continue until the end-of-tape is reached or until a STOP command is encountered.

EDIT COMMANDS

The following commands are to be entered into the edit command table as described in the following section, EDIT TABLE SUB-COMMANDS. These commands may not be entered directly at the COMMAND? prompt like the system commands, such as PREP, are entered.

CHANGE C min,max 'present value','new value'
Example: C 10,20 'X1.25','X2.50'

This example would only affect lines 10 through 20 inclusive. The FIRST OCCURRENCE of the string 'X1.25' found on each line will be changed to the string 'X2.50'.

Example: C 25 #GO2#,##

This command would affect only line 25 and would remove the field GO2 from that line and replace it with the empty string defined by the two apostrophes following the comma.

DELETE D min,max

Example: D 15,21

This command would delete lines 15 through 21 inclusive from the input tape. The new tape would have original line 22 immediately following original line number 14 when the process is complete.

INSERT I min 'new line'

Example: I 21 'N0018 M03'

This command will cause the string defined in new line to be inserted immediately following line 21 of the input tape. If resequencing is active (see below) the block number may be modified.

STOP S min

Example: S 30

This command will cause the editing process to be suspended after line 30 of the input tape has been processed. The program will then transfer to the AUTO BLOCKS? prompt of the PREP command to allow entry of one or more lines by the operator. The editing process may be re-started by entering the ESC key followed by X at the beginning of any line.

RESEQUENCE R min,max first,increment,block codes

Example: R 10,20 0250,10,N,H

The resequence command will allow the operator to adjust the block numbers on an entire tape or a group of lines within the tape. In the example given, the operator has called for resequencing the block numbers on lines 10 through 20 inclusive starting with the value 0250 and incrementing by 10. The only lines that will be affected within this group will be those that begin with an N or

an H. Note that this character may be preceded by a space or a slash (/) character. If the line begins with any other character, it will not be modified. At least one block code must be entered with the RESEQUENCE command but up to four may be entered separated by commas.

When resequencing is active, it will affect the lines that are inserted by the INSERT command. If the block number of one of these lines has a block code that is recognized by the resequence command, the number will be replaced by the value of the resequenced block number. Therefore, the operator need only type the desired block code without a number on the lines to be inserted.

If the STOP command is encountered, the RPT-48 will ask for a response to the AUTO BLOCKS? prompt. The entry made by the operator at this time will be retained when the editing procedure is re-entered by the ESC X sequence. Care should be taken to ensure that the block base and increment numbers are set correctly before returning to editing. This can be accomplished by using the ESC Q sequence immediately prior to the ESC X sequence.

PRINT

P min

Example: P 1

This command controls the terminal printer during editing. Normally, the printer is "blind" to the data during the editing procedure and no printing takes place. If printing is desired, the PRINT command may be used to indicate the line where printing is to start. Printing will then continue until the end of tape or until the BLIND command below is encountered.

BLIND

B min

Example: B 10

This command will disable printing ("blind" the printer) starting at the line number given as min. The PRINT and BLIND commands allow the operator to enable printing only during the portion of the tape that is being actually edited. The remainder of the tape will be processed more rapidly if printing is disabled.

OFFSET 0 min,max address,value,format

Example: 0 2,7 Y,1.5,D6

This command allows the operator to add or subtract values from the dimension fields of a tape. Tapes that contain repetitive patterns of operations may be created by producing a tape for a single pattern and then modifying it to produce the complete tape.

The example above assumes that the controller uses the decimal format with a field size of 6 digits (not including the decimal point). Each Y field on lines 2 through 7 will be modified by adding 1.5 inches to the value presently contained in the tape.

To subtract a value from a field on the tape, the value should be entered with a minus sign when the command is entered. The minus sign may either precede or follow the field. The results, if negative, will be output with a minus sign following the address letter and preceding the numeric value. If the result is positive, a plus sign will be output if the original tape contained a plus sign.

If the controller requires either leading zero, trailing zero, or fixed format, the above example would be entered as shown below. In all cases a 6 digit field with xx.xxxx format is assumed.

Leading 0 2,7 Y,015,L6

Trailing 0 2,7 Y,15000,T6

Fixed 0 2,7 Y,015000,F6

EDIT TABLE SUB-COMMANDS

The following sub-commands may be used to build the edit command table, list the contents of this table, and clear the table. One of the commands, GO, is also used to start the actual process of editing after the table has been built.

The edit command table of the RPT-48 will store about 1,300 characters. The commands are of varying length and a precise limit is difficult to calculate, but probably 80 to 100 typical commands could be stores.

When entering command into the table, care should be taken to follow the proper format for the command or an error condition will be noted. Each command is divided into three basic portions, name, line number, and data.

- Name: The name of each command will be a single letter (C, D, I, S, R, B, or P) followed by a space.
- Line number: The line number portion of a command will contain one or two numbers. If two numbers are entered, they shall be separated by a comma. The first line number, min, entered must be greater than or equal to the min number of the previous edit command or it will cause an error. The line number portion will be terminated by a space if further data is required or by the RETURN key.
- Data: The data area of an edit command may contain one or two strings of characters as in the C and I commands; or numbers and code characters as in the R command. When a string is to be entered, it must be started and ended with some character that is not contained within the string itself. For example, 'X1.25' and *AB CD* are valid strings while (X1.25) and 'AB CD are not. The data field or the R command is described under the RE-SEQUENCE command in the section on EDIT COMMANDS.

The EDIT TABLE SUB-COMMANDS are described below. These commands will be recognized by the RPT-48 only after the editing module has been entered. This is accomplished by typing the word EDIT at the COMMAND? prompt. The RPT-48 will respond with the sub-command prompt (?) which indicates the system is ready to accept sub-commands.

KILL

K

This sub-command will clear the entire edit command table. Commands entered into the table are normally retained until either the power is turned off or the KILL sub-command is executed.

ENTER

E min

Example: E 3

This sub-command allows entry into the table. Each command entered is assigned a number and a number may be entered with the E command to cause insertion of the next command following the one specified by the number. In the example above, the next command would be entered as command number 4. The previous command numbered 4 would be re-numbered to be command 5, 5 would become 6, and so on to the end of the table.

The entry of the E with no command number will cause entry to begin at the top of the table or command number 1. To enter a command at the end of the table, the operator may either enter the number of the last command known to be in the table or a number greater than any in the table such as 999.

As each command is entered, the RPT-48 will insert it in the table, re-number any commands following the one just entered, and print the number of the next command to be entered. If the table is complete, the operator should depress the ESC key twice to return to the (?) prompt position for entry of a new sub-command.

LIST

min,max

Example: L 5,6

This sub-command will print the contents of the edit command table. If the L is entered with no command number, the entire table will be listed. If a single command number is entered only that command will be printed. If two numbers are entered, all commands from the first number to the second number inclusive will be printed. If the table is empty or a command number greater than the last command in the table is entered, the RPT-48 will return to the (?) prompt.

EXPUNGE X min,max

Example: X 10,13

This sub-command will remove the specified commands from the table and re-number all commands following the ones removed. The example given would remove commands number 10,11,12, and 13. Entry of the X without a command number will be ignored. If a single number is entered, only the specified command will be expunged. If the second number is greater than the highest command in the table, all commands from the first number to the end of the table will be expunged.

GO G

Example: G

This sub-command will initiate the actual editing of the tape and should only be entered when the tape has been mounted in the reader. The RPT-48 will respond to the entry of a G by prompting for the man-readables exactly as described in the COPY system command. Refer to this command for instructions in the mounting of the tape and proper responses.

If it is necessary to stop the editing procedure the operator may depress the Reader ON/OFF control to stop the reader and re-start the procedure by depressing the ON/OFF control again. If the operator depresses the ESC key twice the procedure will halt and control will return to the COMMAND? prompt.

SYSTEM CONFIGURATION COMMANDS

The RPT-48 offers great flexibility in the adjustment of certain system parameters. Included in this group are the code to be used by the input output devices; the method in which TAB codes are to be processed; the baud rate or speed of the peripheral devices; the feed code that will be used on the tapes; the type of End-of-Block code that will be read and punched; the position of tab stops and line width on the terminal; and the selection of four special codes that may be translated in a manner different than the standard EIA to ASCII table.

CONF To check or change the system configuration the operator should enter the word CONF at the COMMAND? prompt. The

RPT-48 will respond with the prompt DEV? asking for the entry of the specific device that is to be checked or modified. If a RETURN is entered at this point, the following printout will appear:

```
COMMAND? CONF
DEV?
DEV=TER CDE=AEVN TBC=TAB SPD=300 FDC=NULL EOB=0/D 0/A
DEV=PTR CDE=AEVN TBC=TAB SPD=N/A FDC=NULL EOB=0/D 0/A
DEV=PTP CDE=AEVN TBC=TAB SPD=N/A FDC=NULL EOB=0/D 0/A
DEV=MDM CDE=AEVN TBC=TAB SPD=300 FDC=NULL EOB=0/D 0/A
DEV=LOC CDE=AEVN TBC=TAB SPD=300 FDC=NULL EOB=0/D 0/A
```

DEV?

This displays the names of the devices used with the basic system: TER, PTR, and PTP for Terminal Paper Tape Reader, and Paper Tape Punch respectively. It also shows the five parameters that may be adjusted for each device. MDM and LOC will be covered in Section 8.

CDE

The first parameter CDE, or code, controls both the code and the parity for the specified device. The options that may be selected are:

AEVN ASCII code with even parity
AODD ASCII code with odd parity
EIA EIA code with odd parity
NONE Transparent data transfer, no parity

To change the code the operator should respond to the DEV? prompt with the device name followed by a space; the name of the parameter followed by the equals sign (=); and the name of the option to be used followed by the RETURN key. The RPT-48 will then respond with the DEV? prompt. If only a device name is entered followed by the RETURN key the status of that device will be printed for visual checking. If all adjustments are complete the operator should enter two ESC codes to return to the COMMAND? prompt.

For example, to set the code of the paper tape punch to EIA the operator would enter the following: PTP CDE=EIA following the DEV? prompt. Refer to Section 4, Code Conversion, for further information.

TBC The second parameter permits the selection of four options for handling the TAB code. The options are TAB, CNT, SPEC, and OMIT. If the options is set to TAB any TAB code in the input data will be passed to the output device unchanged. This will allow the use of the Tab function of the LA-34 and similar devices. The option CNT is designed to be used with devices that do not support the tab function. If this option is active a TAB code in the input data will be translated into the appropriate number of spaces to place the next character at the next tab stop. This option may be made active for the punch while the terminal is set for TAB. The SPC option will convert all tabs to a single space code which will serve as a data separator but not use excess space on either the terminal or the paper tape. The final option, OMIT, will drop the TAB code completely.

SPD This parameter is used for the modem port and port A. The printer port uses auto-bauding and the reader, punch, and parallel port (port B) operate on a demand basis and baud rates are not applicable (N/A).

FDC This parameter allows the operator to choose one of three codes for leader and trailer on the tapes. The options are NULL, SPC, and DEL. This variable should be set to SPC normally if the CDE variable is set to EIA since a NULL will not have odd parity.

It is important that the operator set the FDC parameter of the input device (PTR) to the proper code before processing tapes since the RPT-48 uses this value when attempting to locate the first real data character.

EOB The EOB parameter allows the selection of up to four characters to represent the end of block on the data tapes. The characters should be entered using the procedures described in Section 4, Code Conversion. The operator should be careful to set the parameter properly for both the input device and the output device.

This feature will allow the RPT-48 to be readily adapted to most of the special types of EOB sequences. For example if the EOB parameter of the punch were set to EOB=1/6 1/3 O/D it would correspond to the sequence required by Westinghouse of ASCII SYN, DC3, CR. During input of data the EOB

code will be recognized by the RPT-48 and replaced with the ASCII CR code (O/D). When this code is encountered during output it will be replaced with the EOB string designated for the output device. Any ASCII code except for the NULL, O/O, may be selected as part of the EOB string.

This parameter may also be used to adjust the vertical spacing of the terminal. If the EOB parameter of the terminal were set to O/D O/A O/A it would cause any listings to be double-spaced regardless of the EOB of the input tape.

Two additional variables may be adjusted under the CONF command; Tab Stops, and the special Translate table. To adjust these values the operator should enter the appropriate name at the DEV? prompt.

TAB When this parameter name is entered the RPT-48 will respond by printing the following:

 RM 132

This indicates that the right margin is set at position 132 at present. If a change is required the operator should enter the desired value and depress the RETURN key. The RPT-48 will then print:

 TB 1

showing the value of the first tab stop. If a change is desired enter the number. Otherwise enter only the RETURN key. If all changes are complete two depressions of the ESC key will return the program to the DEV? prompt.

There is provision for 16 tab stops in the RPT-48.

NOTE: If the terminal device is an LA-34 Decwriter and a change is made in the tabstop table there will be a pause before the DEV? prompt is printed. This is caused by the need to transmit the new values to the terminal printer.

TRN This parameter allows the operator to select up to four codes that will be translated in a special fashion when

translation between ASCII and EIA is being performed. A table for storing four pairs of codes is provided. When TRN is typed at the DEV? prompt the RPT-48 will respond by printing the value of the first pair of codes. If NC prints it indicates that the pair is empty.

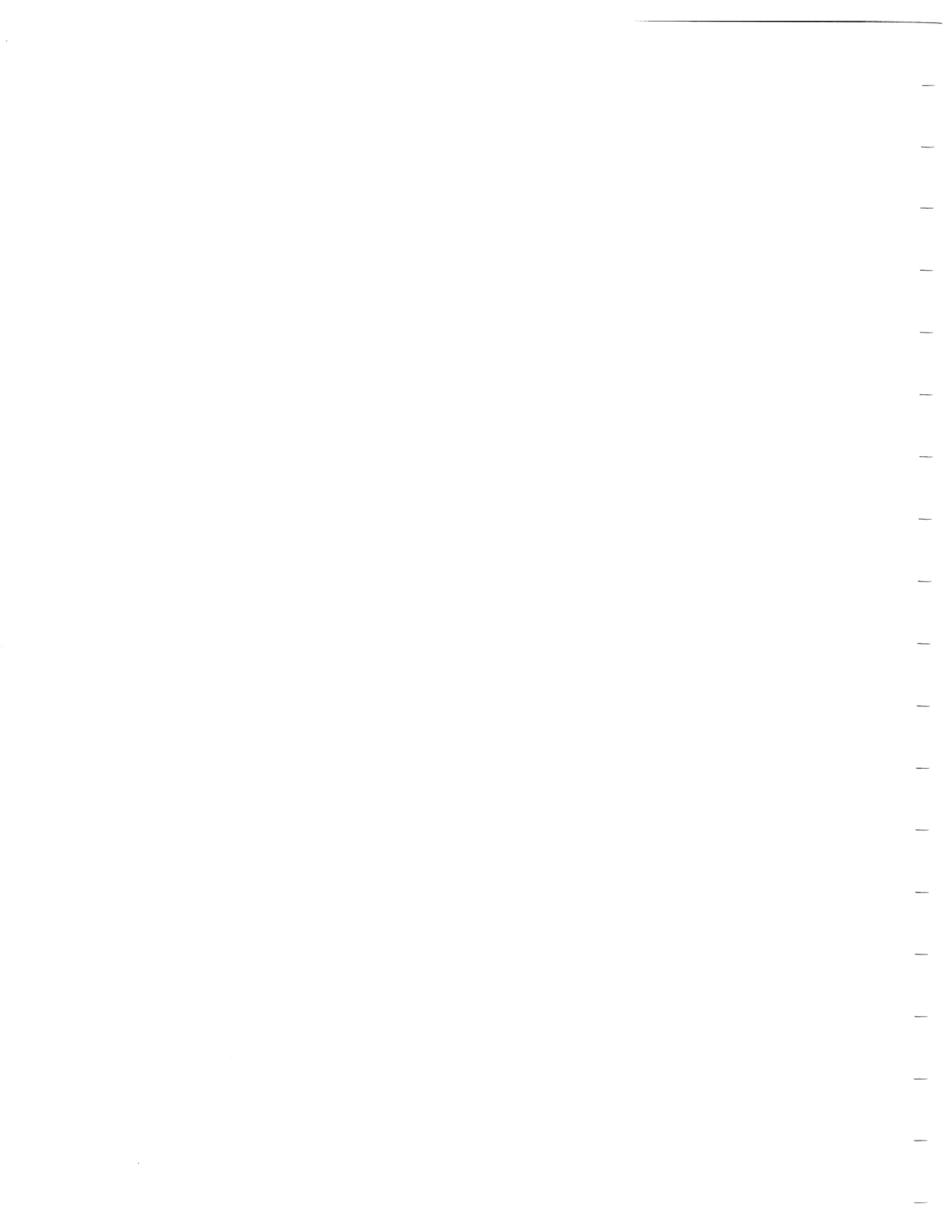
The operator may set a pair by entering the EIA code followed by the equals sign and then the ASCII code. The entry of the two codes is described in Section 4, Code Conversion. For example, if it was desired to translate the EIA EOR code to the ASCII per cent sign the operator would enter O/B=2/5 and follow it with the RETURN key. The value of the next pair would then be printed until the end of the table has been reached. To cancel a translation pair the operator should set the value to F/F.

NOTE: The EIA value is always entered before the equals sign and the ASCII value following the sign.

Since the setting of parameters may be burdensome to accomplish, a provision has been made for automatically producing a tape of the parameters that may be loaded to re-configure the machine automatically. This procedure is accomplished by the two commands DUMP and LOAD.

DUMP When this command is entered at the COMMAND? prompt the RPT-48 will respond with the TAPE ID? query. The operator may then enter some message to identify the configuration contained in the tape. After this message is punched in man-readable code the RPT-48 will punch the contents of the parameter tables in its memory and terminate the tape with a checksum. This tape contains all values that are adjusted by the CONF command but does not contain any of the data stored in the EDIT COMMAND table.

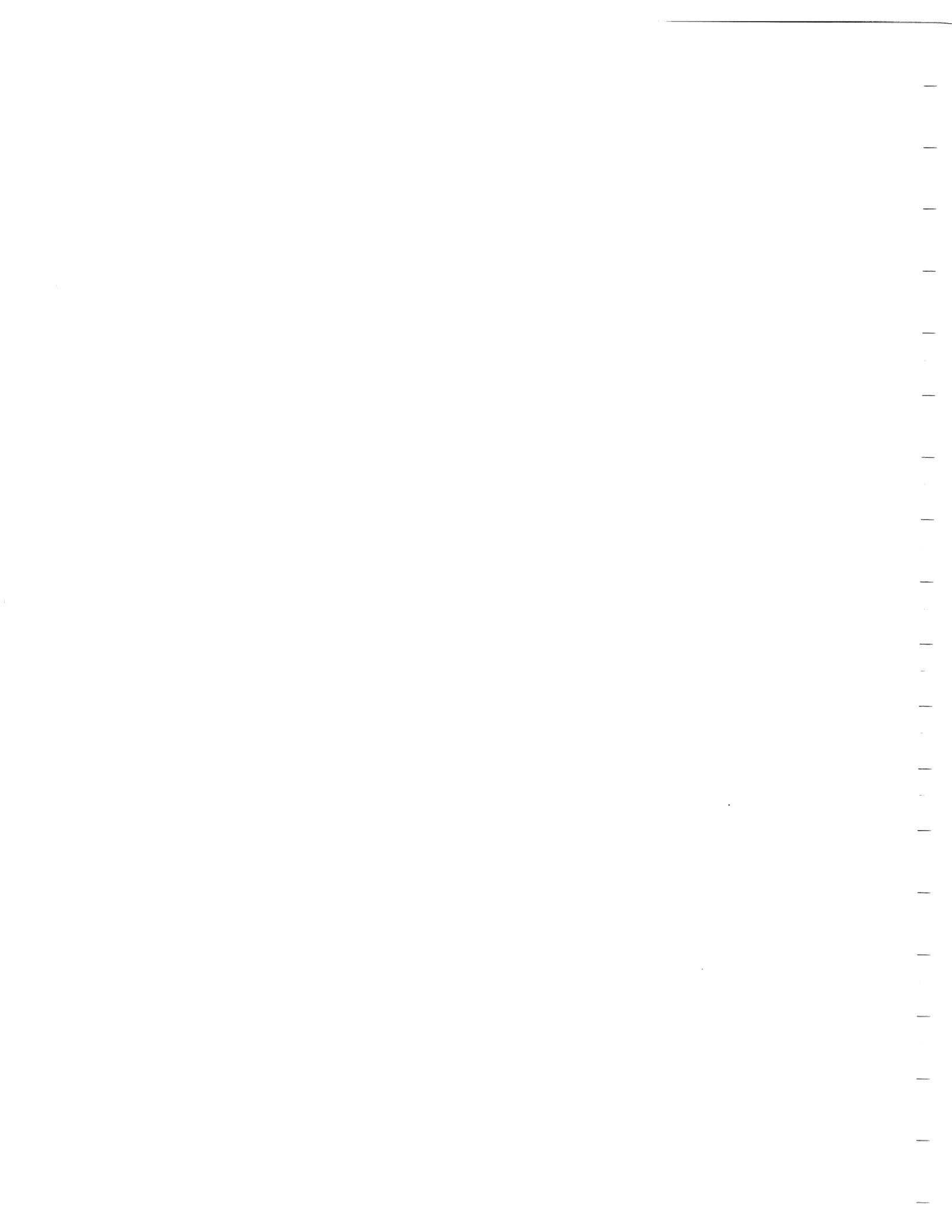
LOAD To reconfigure the RPT-48 to a previous set-up place the configuration tape produced by the DUMP command in the reader and enter LOAD at the COMMAND? prompt.



SECTION 6

READY REFERENCE

The following information will briefly describe the command structures and alternative choices for using the RPT-48. A simple block diagram shows the location and designation of the interface ports, and the ASCII/EIA code tables are presented here for quick references. Please refer to other sections for explanations and use of the various commands.



SYSTEM COMMANDS

CONF	(Configuration)	Configure system parameters
PREP	(Preparation)	Generate manual part programs
EDIT	(Edit)	Modify existing programs
COPY	(Copy)	Duplicate program tape
LIST	(List)	Print with line numbers
X LSTA	(List Port A)	Print with line numbers on Port A
PRNT	(Print)	Print without line numbers
VRFY	(Verify)	Validate existing program tape
DUMP	(Dump)	Save present configuration data
LOAD	(Load)	Restore system configuration from system reader

PREP COMMANDS

ESC/V	(Escape, V)	Reprint same line
ESC/D	(Escape, D)	Delete line
BKSP	(Backspace)	Delete one character for each depression
ESC/E	(Escape, E)	End program tape
ESC/ESC	(Escape, Escape)	Restart

EDIT SUB-COMMANDS

L	(N)	(List)	Print line number or table
E	(N)	(Enter)	Writes new line
X	(N)	(Delete)	Erases line or table
G		(Run)	Execute program
BKSP		(Backspace)	Deletes one character
K		(Kill)	Deletes entire table



EDITOR COMMANDS

P	(N)	(Print)	Turn Printer On
B	(N)	(Print)	Turn Printer Off
C	(Min),	(Max)	"Old", "New" Change and Global Replacement
I	(N)	Data	Insert
D	(Min),	(Max)	Delete
R	(Min),	(Max)	Start, Increment, Block Letter Resequence Block Numbers
S	(Min)		Stop
O	(Min),	(Max)	Address, Value, Format

CONFIGURATION COMMAND

Responses to DEV? prompt

TER	Local terminal printer/keyboard
PTR	Paper Tape Reader
PTP	Paper Tape Punch
MDM	Modem Port
LOC	Local Communication Port
PIN	Parallel Interface

Note: Last three symbols refer only to communication option. See Section 8

Options for CDE parameter

AEVN	ASCII code with even parity
AODD	ASCII code with odd parity
EIA	EIA code with odd parity
NONE	Transparent mode

Options for TBC parameter

TAB	Received TAB codes are output as TAB codes.
CNT	Received TAB codes will be converted into a string of SPACE codes to cause the next printed character to be printed at the next Tab Stop contained in the internal Tab Stop Table.
SPC	Received TAB codes are converted to a single SPACE code.
OMIT	Received TAB codes are omitted from the output data.

CONFIGURATION COMMAND (Continued)

Options for the SPD parameter

Note: This parameter will only be used with the communication option discussed in Section 8. The available communication speed options are:

110, 300, 600, 1200, 2400, and N/A
where N/A indicates Not Applicable.

Options for the FDC parameter

- NULL Leader and trailer will consist of sprocket hole only.
- SPC Leader and trailer will be a SPACE in whatever code has been selected under the CDE option.
- DEL Leader and trailer will be either 7 or 8 hole characters depending on the code selected under the CDE option.

Options for the EOB parameter

Any four or less characters may be chosen to define the EOB for an input or output device. See Section 5 and Section 4 for further information.

RPT-48 REAR PANEL

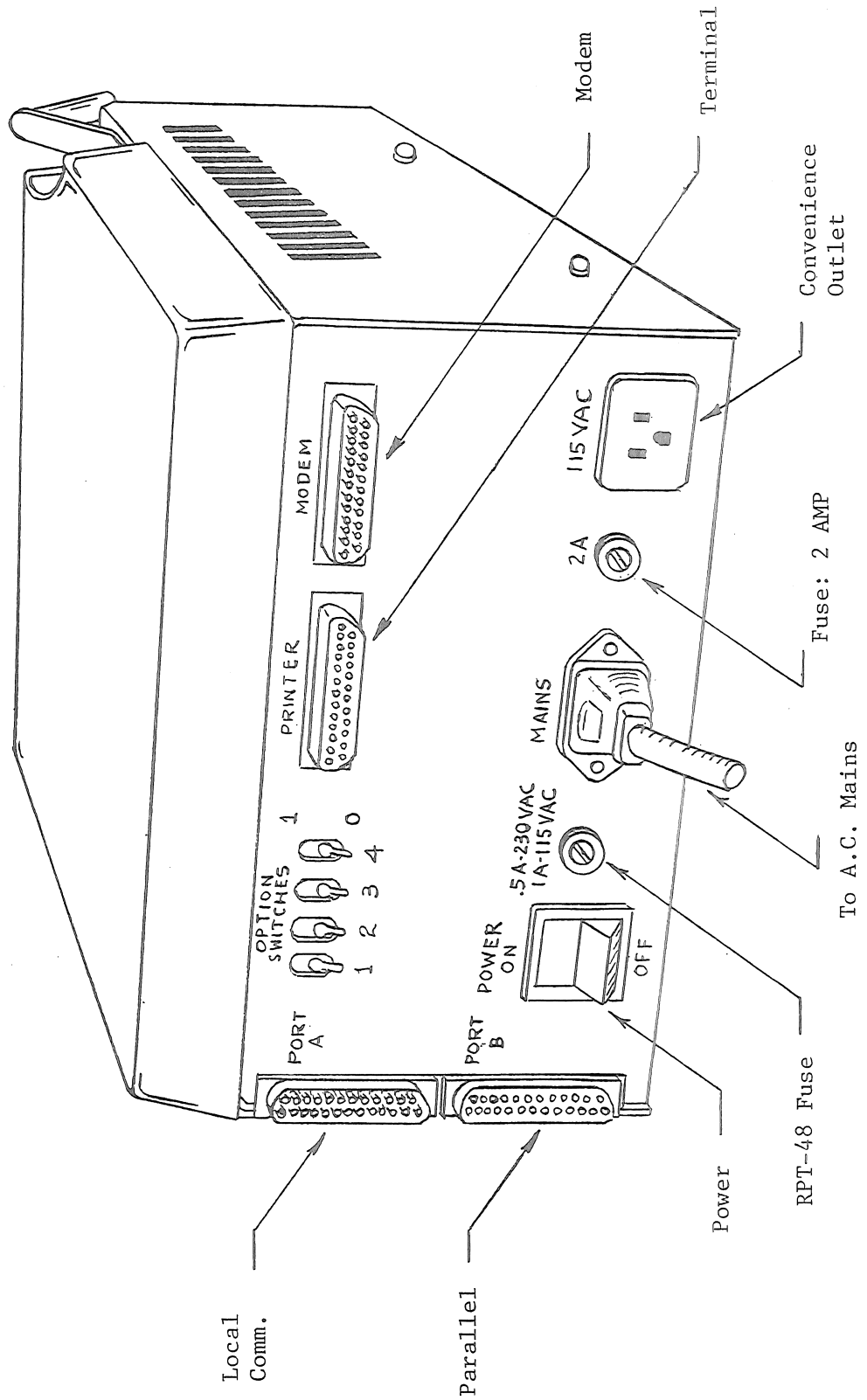


Figure 6-1

USA STANDARD CODE

FOR INFORMATION INTERCHANGE

ASCII

BITS					PARITY BIT (EVEN)								
					0	0	0	0	1	1	1	1	
b8													
b7					0	0	1	1	0	0	1	1	
b6					0	1	0	1	0	1	0	1	
b5					0	1	2	3	4	5	6	7	
b4	b3	b2	b1	row	col	0	1	2	3	4	5	6	7
0	0	0	0	0		NUL	DLE	SP	0	@	P		p
0	0	0	1	1		SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2		STX	DC2	"	2	B	R	b	r
0	0	1	1	3		ETX	DC3	#	3	C	S	c	s
0	1	0	0	4		EOT	DC4	\$	4	D	T	d	t
0	1	0	1	5		ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6		ACK	SYN	&	6	F	V	f	v
0	1	1	1	7		BEL	ETB	'	7	G	W	g	w
1	0	0	0	8		BS	CAN	(	8	H	X	h	x
1	0	0	1	9		HT	EM	)	9	I	Y	i	y
1	0	1	0	A		LF	SUB	*	:	J	Z	j	z
1	0	1	1	B		VT	ESC	+	;	K	[	k	
1	1	0	0	C		FF	FS	,	<	L	\	l	
1	1	0	1	D		CR	GS	-	=	M	]	m	
1	1	1	0	E		SO	RS	.	>	N	^	n	
1	1	1	1	F		SI	US	/	?	O	_	o	DEL

"1" signifies a hole; "0" signifies no hole

Table 6-1

EIA RS244B

CODE FOR NC PERFORATED TAPE

b8 →					0	0	0	0	1	1	1	1	
b7 →					0	0	1	1	0	0	1	1	
b6 →					0	1	0	1	0	1	0	1	
b5 →					PARITY BIT (ODD)								
BITS	b4	b3	b2	b1	col row	0	2	4	6	8	A	C	E
	0	0	0	0	0	SPACE	0	-	+	EOB			
	0	0	0	1	1	1	/	j	a				
	0	0	1	0	2	2	s	k	b				
	0	0	1	1	3	3	t	l	c				
	0	1	0	0	4	4	u	m	d				
	0	1	0	1	5	5	v	n	e				
	0	1	1	0	6	6	w	o	f				
	0	1	1	1	7	7	x	p	g				
	1	0	0	0	8	8	y	g	h				
	1	0	0	1	9	9	z	r	i				
	1	0	1	0	A		BS		LC				
	1	0	1	1	B	EOR	,	%	.				
	1	1	0	0	C				UC				
	1	1	0	1	D								
	1	1	1	0	E	&	TAB						
1	1	1	1	F				DEL					

"1" signifies a hole; "0" signifies no hole

Table 6-2

DEFINITIONS

AEVN	=	ASCII code, Even Parity (American Standard Code for Information Interface)
CDE	=	Code
CNT	=	Count
DEL	=	Delete
DEV	=	Device
EIA	=	N/C Code (Electronic Industries Association)
EOB	=	End of Block
FDC	=	Feed Control
ID	=	Identification
LOC	=	Local Port
MDM	=	Modem Port
PIN	=	Parallel Input Port
PTP	=	Paper Tape Punch
PTR	=	Paper Tape Reader
SPC	=	Space
SDP	=	Speed
TBC	=	Tab Control
TER	=	Terminal
X/X Z/Z	=	Designation for Hex Characters, Refer to Code Tables

SECTION 7

DEMONSTRATION

The following examples are intended to familiarize the first time user of the Model RPT-48 with the operation of the equipment and the command structure used by Trend.

Not all of the commands are shown in the examples, nevertheless, this is a good representation of the utility of RPT-48. The sample printouts may be used as a guide when first sitting down to operate the equipment.

Refer to Section 5, Modes of Operation, and Section 6, Ready Reference Guide, for more complete descriptions of the commands and entry procedures.

Once the equipment has been powered on and is ready for operation, type CONF and RETURN to display the default status condition of the RPT-48. Press RETURN after "DEV" has been printed. You should see a printout similar to that in the sample printout below, labeled Example 1.

```
COMMAND?  CONF
DEV?
DEV=TER   CDE=AEVN TBC=TAB   SPD=300   FDC=NULL EOB=0/D 0/A
DEV=PTR   CDE=AEVN TBC=TAB   SPD=N/A    FDC=NULL EOB=0/D 0/A
DEV=PTP   CDE=AEVN TBC=TAB   SPD=N/A    FDC=NULL EOB=0/D 0/A
DEV=MDM   CDE=AEVN TBC=TAB   SPD=300   FDC=NULL EOB=0/D 0/A
DEV=LOC   CDE=AEVN TBC=TAB   SPD=300   FDC=NULL EOB=0/D 0/A
```

Example #1

Note that the code for the paper tape punch is set to ASCII, even parity. This code can be changed by typing PTP, CDE=EIA and RETURN. This input will update the status of the punch. Key PTP and RETURN to display punch parameters once again for verification. Now change the punch back to AEVN. Key ESC/ESC to return to the command prompt.

```
COMMAND?  CONF
DEV?      PTP CDE=EIA
DEV?      PTP
DEV=PTP   CDE=EIA TBC=TAB   SPD=N/A    FDC=NULL EOB=0/D 0/A
DEV?      PTP CDE=AEVN
DEV?      PTP
DEV=PTP   CDE=AEVN TBC=TAB   SPD=N/A    FDC=NULL EOB=0/D 0/A
DEV?
COMMAND?
```

Example #2

A small DEMO tape has been included with this manual and identified as DEMO TAPE FOR RPT-48 MANUAL. It is located on inside and back cover of the manual. Load this tape in the reader and key LIST followed by RETURN. The system will prompt back asking if the tape in the reader has man-readable (visible) characters for a heading. In this case, if it does so, "Y" should be entered, followed by RETURN. This will list the contents of the tape on the printer. Refer to Example #3.

```

COMMAND? LIST
VISIBLES? NO/YES Y
RPT-48 DEMO TAPE
0001 N00091 G00 Z220000 F2000
0002 N00096 X141800 Y130000
0003 N00101 Z98295
0004 N00106 G01 Y063000 F350
0005 N00111 G00 Z200000 F2000
0006 N00131 G00 X140000 F2000
0007 N00136 G00 Y132000
0008 N00141 X165000
0009 N00146 X165000 Y131000
0010 N00151 G01 X149510 Y121140 F350
0011 N00156 G03 I153300 J109230
0012 N00161 X140809 Y10930
0013 N00166 G01 X140800 Y77400
0014 N00171 G03 I153300 J77400
0015 N00176 X153300 Y64900
0016 N00181 GO X163300 Y61170
0017 N00186 G00 Z110000 F2000

```

35612

COMMAND?

Example #3

Note the checksum message printed at the end of the listing. This should agree with the checksum punched in the tape.

If the printout does not appear as shown in Example #3, but has continuous strings of characters with no white space between, it is probably because your terminal device does not recognize the TAB codes that are contained in the DEMO TAPE. To correct this condition use the CONF command and enter TER TBC=CNT at the DEV? prompt. This will change the processing of TAB codes within the RPT-48 to emit a string of spaces to properly position the print head. Replace the tape in the reader at the beginning and perform the LIST command again.

Remount the DEMO tape in the reader and check to be sure the "command" prompt has been printed below the checksum message. Now type the command COPY and RETURN. The system will prompt asking for Identification Information. A choice is offered for handling the identifier (NONE/COPY/MODIFY/ENTER). Respond by typing M and RETURN. The RPT-48 will read past the visibles and stop. The system is now asking for the new identifier. Type RPT-48 DEMO by (insert your name) and RETURN. This will create a new tape and the original can be returned to the manual. Refer to Example #4.

```
COMMAND?   COPY
VISIBLES?  NONE/COPY/MODIFY/ENTER    M

TAPE ID?   RPT-48 DEMO BY JOHN SMITH
LEADER?    2

COMMAND?
```

Example #4

Mount the newly created tape in the reader. Modifications to the tape can be made using the Model-48 editor. Instructions are entered into the command table and executed with a single pass of the original tape.

Enter EDIT and RETURN. The system will prompt with "(?)" asking for one of the edit table commands. Key L (space) 0 and RETURN. This will list the contents of the command table. Since the equipment has just been powered on, the response will be another "(?)" indicating the Command Table is empty.

ENTER E RETURN. The line counter is set to one because the Model-48 automatically increments the line count with each depression of the return key. The first instruction may be entered now.

A typical response is P0001 and RETURN. This turns on the printer at the beginning of the program tape. Note the system will respond with E0002, indicating it is ready for the next instruction. Key C 1 "Z220000", "Z110000". This completes the command table for this modification. The program will perform a correction, changing the value of the Z field. Depress the ESC key to return to the Edit Command Level. Depress G and RETURN to start the program.

Copy the man-readable identifier and refer to Example #5 to compare the results.

```

COMMAND?   EDIT
<?>      L
<?>      E
E 0001     P 1
E 0002     C 1 'Z220000', 'Z110000'
E 0003
<?>      G
VISIBLES? NONE/COPY/MODIFY/ENTER   C
RPT-48 DEMO TAPE
LEADER?    2
0001 N00091      G00                Z110000 F2000
0002 N00096                X141800 Y130000
0003 N00101                Z98295
0004 N00106      G01                Y063000      F350
0005 N00111      G00                Z200000 F2000
0006 N00131      G00      X140000                F2000
0007 N00136      G00                Y132000
0008 N00141                X165000
0009 N00146                X165000 Y131000
0010 N00151      G01      X149510 Y121140                F350
0011 N00156      G03      I153300 J109230
0012 N00161                X140809 Y10930
0013 N00166      G01      X140800 Y77400
0014 N00171      G03                I153300 J77400
0015 N00176                X153300 Y64900
0016 N00181      G0      X163300 Y61170
0017 N00186      G00                Z110000 F2000

```

COMMAND?

Example #5

This operation modified only the first line of our sample tape.

To perform a global replacement, first mount the sample tape in the reader, and return to the edit mode by keying EDIT and RETURN.

Key L (Space) 0 and RETURN after the first "(?)" prompt. This will list your previous program that still resides in the command table. Now key K and RETURN to clear the entire table. This allows us to start a fresh program. Key E (Space) 0 and RETURN to start at line one of the command table. Enter the following program:

```

E0001     P0001
E0002     C 1,17 'F2000','F4000'

```

Following line two depress ESC twice. Key G and RETURN to run the program. Refer to Example #6. Notice that lines 0001, 0005, 0006 and 0017 have been modified.

```

COMMAND?  EDIT
  <?>    E
E 0001    P 1
E 0002    C 1,17 'F2000','F4000'
E 0003
  <?>    G
VISIBLES? NONE/COPY/MODIFY/ENTER  C
RPT-48 DEMO BY JOHN SMITH
LEADER?   2

```

```

0001 N00091      G00                ZZ20000 F4000
0002 N00096                X141800 Y130000
0003 N00101                Z98295
0004 N00106      G01                Y063000      F350
0005 N00111      G00                ZZ20000 F4000
0006 N00131      G00      X140000                F4000
0007 N00136      G00                Y132000
0008 N00141                X165000
0009 N00146                X165000 Y131000
0010 N00151      G01      X149510 Y121140                F350
0011 N00156      G03      I153300 J109230
0012 N00161                X140809 Y10930
0013 N00166      G01      X140800 Y77400
0014 N00171      G03                I153300 J77400
0015 N00176                X153300 Y64900
0016 N00181      GO      X163300 Y61170
0017 N00186      G00                Z110000 F4000

```

COMMAND?

Example #6

This next and final example shows the ease of re-numbering the program block numbers using the R command. Remount the sample tape and return to EDIT MODE by keying EDIT and RETURN, as before. Enter the following program after clearing the command table:

```

E0001      P0001
E0002      R 1,17 100,5,N

```

This instruction happens to end with the letter "N" to correspond to the N Block Numbers. If the program tape contains "H" or other blocks, all blocks could be resequenced by adding the letters, separated by a comma. This allows the user to re-number only certain blocks should the requirement exist.

Run the program and compare the results with Example #7.

```
COMMAND?   EDIT
  <?>     E
E 0001     P 1
E 0002     R 1,17 100,5,N
E 0003
  <?>     G
VISIBLES? NONE/COPY/MODIFY/ENTER   C
RPT-48 DEMO BY JOHN SMITH
LEADER?    2

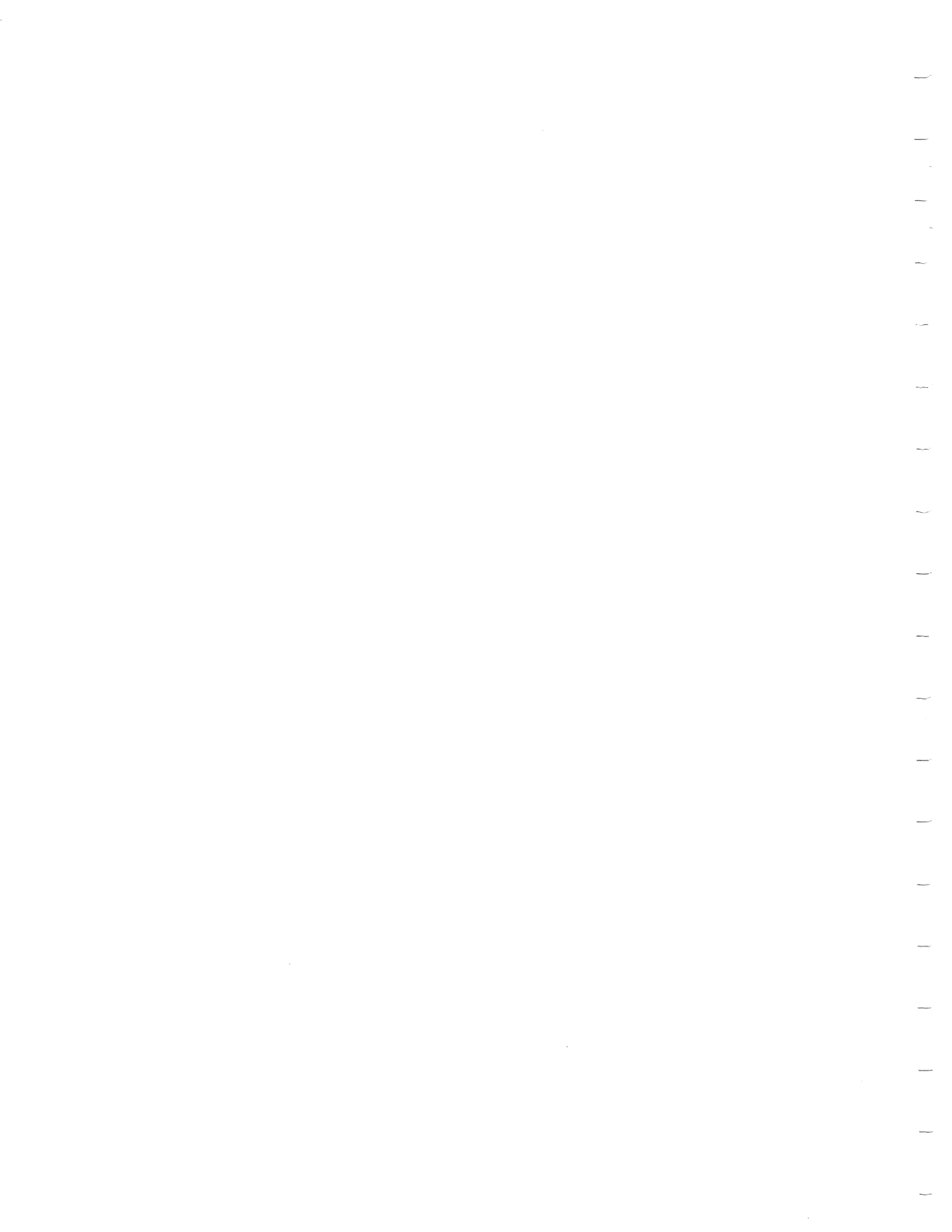
0001 N100      G00                Z220000 F4000
0002 N105                X141800 Y130000
0003 N110                Z98295
0004 N115      G01                Y063000   F350
0005 N120      G00                Z200000 F4000
0006 N125      G00      X140000                F4000
0007 N130      G00                Y132000
0008 N135                X165000
0009 N140                X165000 Y131000
0010 N145      G01      X149510 Y121140                F350
0011 N150      G03      I153300 J109230
0012 N155                X140809 Y10930
0013 N160      G01      X140800 Y77400
0014 N165      G03                I153300 J77400
0015 N170                X153300 Y64900
0016 N175      G0       X163300 Y61170
0017 N180      G00                Z110000 F4000

COMMAND?
```

Example #7

Try taking one of your regular program tapes and using it with the Editor System. First copy the tape and insert new visibles at the beginning. Try running the commands you used on the sample tape and then experiment with the other commands such as Insert, Delete, etc.

We at Trend are always interested in receiving feed-back from our users. Your opinion will help us create a better product to satisfy the requirements of the industry. Criticism and suggestions should be directed to Mr. Richard Lamanna, Vice-President of Engineering.



SECTION 8

COMMUNICATION OPTION

This section covers the use of the RPT-48 as a communication terminal in the on-line mode.

GENERAL

The communication section of the RPT-48 provides for sending and receiving data via a Modem; the local communication interface, Port A; or receiving data from the parallel interface, Port B. The selection of which port is to be active is controlled by entering one of the following commands at the COMMAND? prompt.

COMM Activate the Modem Port

COMA Activate the Local Port

COMB Activate the Parallel Port

NOTE: The Parallel Port may also be activated by placing option switch #1, located on the rear panel, in the on or up position prior to turning on the main power switch. See Section 2.

BAUD RATES

The Baud Rates for the Modem and Local Ports may be set with the CONF command described in Section 5. The rate may be 110, 300, 600, 1200, 2400, 4800, or 9600. The parallel port operates on demand and the Baud Rate is not applicable.

EOB CODES

The EOB Codes for the ports may be set with the CONF command. These codes apply only to the data stream transmitted from the RPT-48 to the host. When receiving data from the host it is passed directly to the punch, or printer, without checking for EOB.

This feature allows the user to configure his system to recognize the end of block sequence of the tape on the reader, remove it from the data stream, and replace it with the configured code for the active port. Tapes produced in EIA code can readily be translated and sent to a host with any four character sequence as the EOB.

TRANSMISSION CODES

The code for the modem and local ports may be set by the CONF command. Normally the code for the modem port should be set to AEVN since this is the standard for asynchronous transmission. Characters received from the host will be tested for even parity and replaced with the backslash (5/C) if they are incorrect. Characters transmitted to the host will be adjusted for even parity. The code for the parallel port is fixed at 8 bit transparent.

LINE CONTROL

The RPT-48 follows the rules for XON/XOFF line control. When the internal buffer of the RPT-48 has limited room for more characters, less than 20 characters, a XOFF code (1/3) will be transmitted to the host. When the number of characters in the buffer has been reduced to 10 or less, the RPT-48 will transmit an XON (1/1) to the host to request that transmission resume.

OPERATION

Entering either COMM or COMA at the COMMAND? prompt will cause the RPT-48 to print the following message:

FDX, DELAY=N, STOP ON EOB Y/N?

This message shows the settings of the two rear option switches and request the operator to indicate whether it is necessary to stop after each block is transmitted. If option switch 4 is turned on, up position, FDX will be replaced with HDX indicating that all characters entered via the keyboard or reader will be printed on the terminal as they are transmitted. Normally, FDX, the terminal prints only characters received from the host. If option switch 2 is in the up position, the DELAY=N will be printed as DELAY=Y indicating that a 300 millisecond delay will occur before transmission resumes upon receipt of an XON (1/1) from the host.

The operator should respond to the prompt with a Y if stopping on EOB is desired and an N or CR if it is not desired. If the Y is entered the RPT-48 will pause after transmitting the complete EOB sequence to the host and wait for a XON (1/1) before resuming.

After the prompt has been answered, the RPT-48 will print the special command prompt <> to indicate that the system is in "handshake mode" and ready to accept a communication subcommand. The selected port will be initialized for the configured Baud Rate and the interface signals will indicate to the host that the RPT-48 is ready to communicate. At this time the operator should establish the connection between the RPT-48 and the host.

HANDSHAKE MODE

When in the handshake mode the RPT-48 will pass data from the terminal keyboard to the selected port and print characters on the terminal as controlled by option switch 2. This mode will allow the operator to receive and respond to the "log-on" messages sent by the host. Parity and control codes are ignored in this mode.

Any character may be transmitted from the keyboard to the host with the exception of the ESC (1/B). This code is used as part of the communication subcommand sequences shown below. It will be noted that a single ESC may be transmitted to the host by depressing the ESC and A keys in sequence.

SUBCOMMANDS

The subcommands for the communication system are composed of two character sequences where the first character is the ESC key. When the RPT-48 detects an ESC entry from the keyboard, the next character will be assumed to be a communication subcommand. If it is not a legal subcommand code it will be ignored. When not in the "handshake mode" any key sequence that does not begin with the ESC code will be ignored.

NOTE: In the following descriptions the subcommands will be shown as ESC/ followed by the appropriate code. Do not enter the / character. It is used for clarity only.

TRANSMIT ESC/T

When the ESC/T command is entered the RPT-48 will activate the Reader logic but not start the mechanism. The mechanism may now be started by depression of the Reader On/Off switch or by the receipt of an X-On (1/1) code from the host. The operator should not enter this command until all but the last character of the command for the host has been transmitted. For example, if the user is connected to a Westinghouse system the command to transmit a tape is LOADTAPE followed by the file name to be loaded. The entry sequence to be used is shown below:

```
R;  
  
.LOADTAPE FILENAME (return)
```

The user should enter the ESC/T command immediately following the FILENAME and prior to the depression of the RETURN key. While the tape is being transmitted operation of keys on the keyboard should be avoided since they will cause spurious characters to be transmitted to the host. The depression of the ESC key, however, will not be sent to the host and the following character will be treated as an RPT-48 subcommand.

When the EOT block of 30 nulls is read the reader will stop and the RPT-48 will print the CHECKSUM and return to the handshake mode. If the tape contained a command terminator code for the host, such as FINI or @, the operation is complete. If no such code was present in the tape the operator must enter the proper codes on the keyboard to properly terminate the command at the host.

During transmission the tape is read until the EOB configured for the PTR is located. This sequence is then replaced with the sequence configured for the selected port. The reader will then continue or stop depending on the operator's response to the STOP ON EOB? prompt.

RECEIVE ESC/R

The operator should check for an ample supply of tape for the punch prior to starting tape reception.

The ESC/R command will activate the punch logic and turn on the tape punch. It will also place the RPT-48 in a transparent mode to allow for the reception of "man-readable" characters that may be transmitted as part of the leader. This is a special mode and will override any code or parity selection made for the tape punch (PTP) under the CONF command. Characters received will be sent only to the punch while in this mode. The operator may reactivate the configured data mode for the punch by entering the ESC/Space command. For example, if the host system is a Westinghouse system the command to produce a punched tape at the user's terminal is shown below:

R;

.PCTAP FILENAME (return)

where FILENAME specifies the data file to be sent. The operator should enter the ESC/R command immediately after the FILENAME and prior to the depression of the RETURN key. The host will then begin to transmit the tape including the "man-readable" identification. The operator should depress the ESC key only on the keyboard and watch the tape until the "man-readable" section follows it. The operator should then depress the Space bar once to activate the parity and checksum logic of the RPT-48. The RPT-48 will now examine the input data for the configured parity and replace any wrong characters with the backslash (5/C) code. When the first character that is either a RETURN (O/D), LINEFEED (O/A), or a printable character is found, the RPT-48 will begin to form a checksum of the data output to the tape punch. The RPT-48 will also examine the data stream for a string of 30 NULL (O/O) characters and these will be treated as an EOT block. The RPT-48 will return to the handshake mode and any further transmission from the host will be directed to the terminal rather than the tape punch. The operator may then enter the ESC/E command to punch the checksum into the output tape for checking purposes.

If the operator does not enter the ESC/Space command reception of data will be in a completely transparent mode with no checking for parity or the EOT block. The operator may then use the LIST command to check the tape for parity. No test of the input data is made for the EOB sequence during tape reception. Therefore, all codes sent by the host will be punched into the tape.

STOP ESC/S

This command will cause the RPT-48 to stop and return to the "handshake mode". The line will remain active. The operator may then resume operation by use of the GO command.

END ESC/E

This command will operate in a fashion similar to the END command of the PREP function. Three inches of nulls will be punched followed by the visible representation of the checksum for the tape just produced.

GO ESC/G

This command will be used to resume operation after a STOP command. It should only be used after the mode of operation TRANSMIT, or RECEIVE has been established by the use of either the ESC/T or ESC/R commands.

QUIT ESC/ESC

This command will stop the reader and punch, disconnect from the line, and return to the COMMAND? prompt.

ABORT ESC/A

This command will transmit a single ESC (1/B) to the host. In most systems this will cause the termination of the command in process at the host. The RPT-48 will not return to the "handshake" unless the operator enters the STOP command.

The BREAK key of the keyboard is also active and may be used to abort operation at the host if the system allows it.

ENABLE ESC/SPACE

This command enables parity checking and checksum accumulation during reception of data. See RECEIVE for details.

PRINTER CONTROL

The number 4 option switch will establish either full or half duplex operation while in the "handshake mode" and should be set according to the requirements of the user's host computer. The user may wish to eliminate printing during reading of tape, however, and this may be accomplished by using the following two commands.

ESC/B will disable local printing of data produced by the keyboard or reader.

ESC/P will enable printing of the data.

The data received from the host will always be printed.

APPENDIX A

PRINTER TERMINAL CONFIGURATIONS

The standard hardware configuration for a RPT-48 tape preparation and editing system consists of the following:

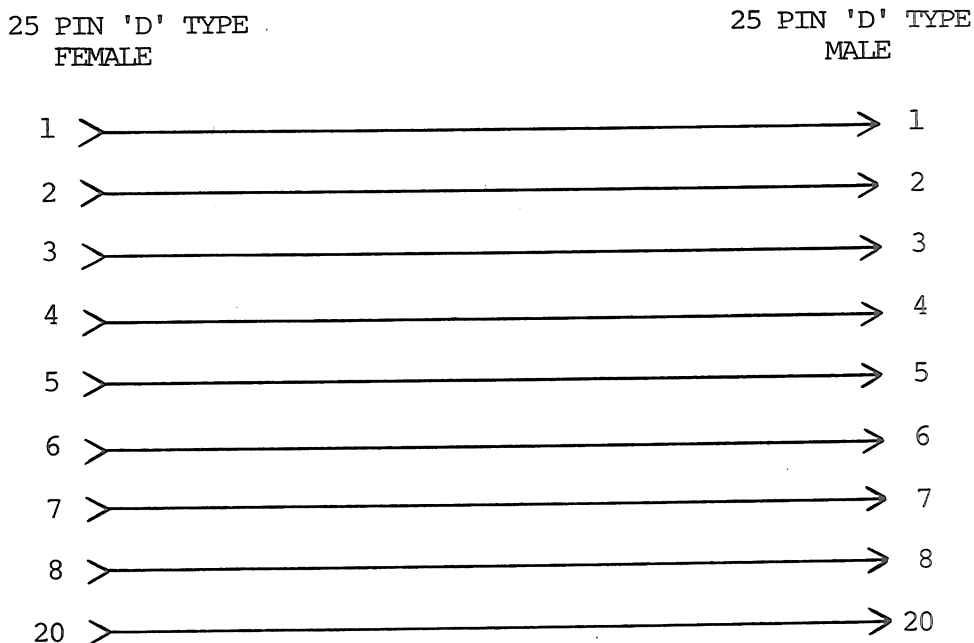
1. The RPT-48
2. The LA34 DECWRITER
3. The Terminal RS-232 Interconnect Cable Trend No. 1233

POWER CONNECTION

The power cord for the LA-34 is connected to the convenience outlet on the rear panel of the RPT-48 (115 volt units only). The power switch on the LA-34 is placed in the ON position and the power for the system is controlled by the switch on the rear panel of the RPT-48 (see Figure 2-3). In European 230 volt units, the LA-34 and the RPT-48 are connected directly to the power mains and both power switches must be used. THE PRINTER POWER MUST BE TURNED ON FIRST.

RS-232 CONNECTION

The RS-232 Cable TREND NO. 1233 is used to connect the LA-34 to the RPT-48 port marked PRINTER. The 1233 cable may also be used to connect the RPT-48 MODEM port to Bell 103 type modems or equivalent and to most acoustic couplers.



TREND NO. 1233

LA-34 FUNCTION KEY SETTINGS

Set the following LA-34 special function keys:

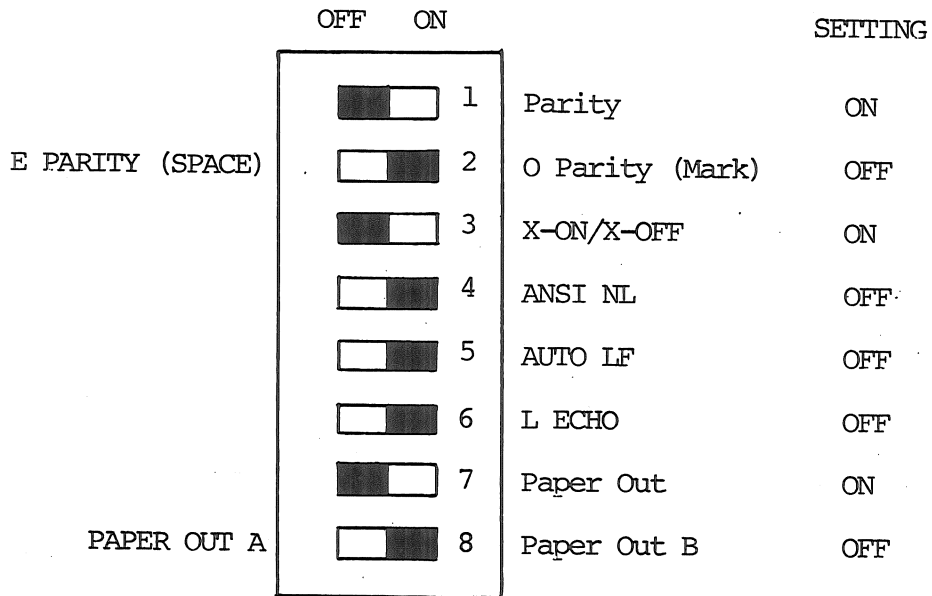
1. LINE/LOC Line (up position)
2. 300/SPEED/110 300 (up position)
3. CAPS/LOCK LOCK (down position)

See Page 8 of the LA-34 User's Guide.

LA-34 INTERNAL SWITCH SETTINGS

Set the internal communication switches as follows:

1. Open the access cover and move the print head to the right side plate.
2. Using a ball point pen, reach in between the timing belt and front carriage shaft and set the switches according to the following figure. Press down on the side of the switch indicated by the shaded area.



3. Close the access cover and reset the fault by pressing the VIEW key.

4. Print out the status message to ensure that the proper setting was made by pressing and holding the CTRL key while pressing the SET-UP key. Now release CTRL and SET-UP and press */8. The following message should print.

```

H(cpi): A=10,B=12,C=13.2,D=16.5 H=A
V(lpi): A=6,B=8,C=12,D=2,E=3,F=4 V=A
X-ON/X-OFF
Paper Out A
E Parity
L      T      T      T      T      T      T      T      T      T
V1.1

```

Press SET-UP to resume operation.

RPT-48 OPTION SWITCHES

The RPT-48 option switches are located on the rear panel (see Figure 2-1). Switch #3 must be down or in the '0' position for operation with the LA-34 terminal.

ALTERNATE PRINTER TERMINAL

The Teletype Model 43 KSR terminal (No. 4320AAK Pin Feed or No. 4320AAL Friction Feed) can be used in place of the LA-34. This system will operate slower when the tab sequential print format is being used.

POWER CONNECTION

Same as LA-34.

RS-232 CONNECTION

Same as LA-34.

TTY-43 FUNCTION KEY SETTINGS

Set the following special function keys.

- | | |
|---------------------------|-------------|
| 1. ON-UP/PARITY/OFF-DN | ON-UP |
| 2. HALF-UP/DUPLEX/FULL-DN | FULL - DOWN |
| 3. 30-UP/CPS/10-DN | 30 - UP |
| 4. CAPS/LOCK | LOCK - DOWN |

TTY-43 INTERNAL SWITCH SETTINGS

The TTY-43 has internal option switches located under the keyboard assembly. The standard factory setting is required for use with the RPT-48. Therefore, no changes in these settings are required.

RPT-48 OPTION SWITCHES

The RPT-48 option switches are located on the rear panel (see Figure 2-1). Switch #3 must be UP or in the '1' position for operation with the TTY-43 terminal.

APPENDIX B

VIDEO DISPLAY TERMINAL CONFIGURATION

Improved operating speed and convenience can be achieved by configuring the RPT-48 with a CRT terminal and a low cost line printer as follows:

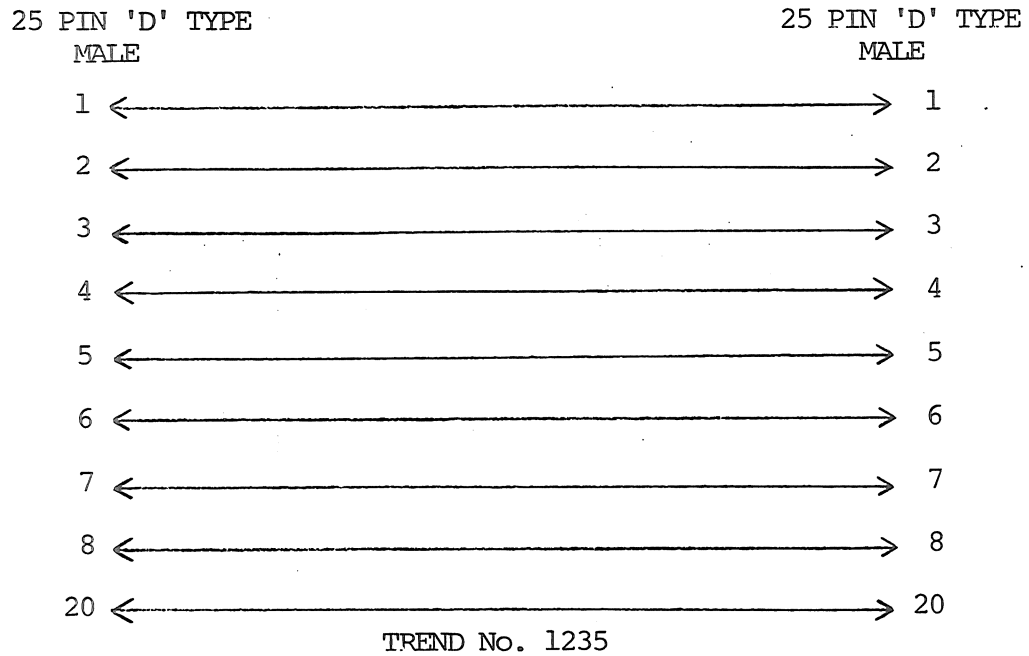
1. The RPT-48
2. The ADDS VIEWPOINT TERMINAL
3. The EPSON MX 80 PRINTER with RS-232 INTERFACE #8141
4. The Terminal RS-232 interconnect cable TREND No. 1235
5. The PORT A RS-232 interconnect cable TREND No. 1234

POWER CONNECTION

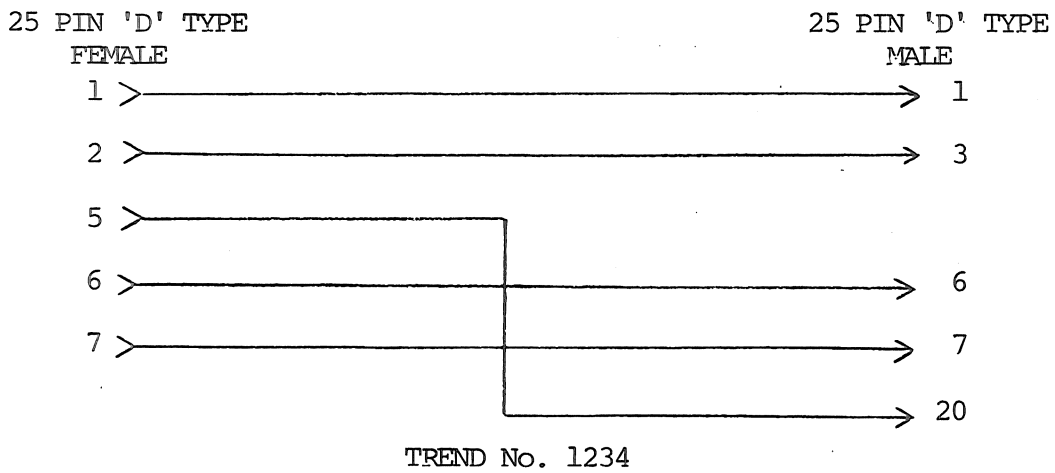
The power cord for the video terminal is connected to the convenience outlet on the rear panel of the RPT-48 (115 volt units only). The power switch on the video terminal is left in the 'ON' position and power for video terminal and the RPT-48 is controlled by the switch on the rear panel of the RPT-48 (see Figure 2-3). The MX 80 printer is connected directly to the power mains and must be turned on separately. In European (230 volt) units, all three devices must be connected directly to the power mains and turned on individually. THE VIDEO DISPLAY MUST BE TURNED ON FIRST.

RS-232 CONNECTION

The RS-232 cable TREND No. 1235 is used to connect the Viewpoint EIA Port to the RPT-48 port marked PRINTER. The Viewpoint Auxillary port is not used.



The RS-232 Cable TREND No. 1234 is used to connect the MX-80 printer to the RPT-48 port marked 'A'.



VIEWPOINT REAR PANEL SWITCH SETTINGS

The rear panel switches are only read by the terminal's firmware upon power-up. When the settings are changed the power must be cycled to implement the change. Set the rear panel switches as follows:

<u>Switch No.</u>	<u>Setting</u>	<u>Function</u>
1	DOWN	} 2400 Baud
2	UP	
3	UP	
4	DOWN	Auto Scroll
5	UP	No Auto Line Feed
6	DOWN	Line
7	UP	} Even Parity
8	DOWN	

VIEWPOINT INTERNAL SWITCH SETTING

The VIEWPOINT terminal has internal option switches located on the main logic board. The standard factory setting is required for use with the RPT-48 therefore, no changes in the settings are required.

MX 80 INTERNAL SWITCH SETTING

The option switches for the MX 80 are located on two internal printed circuit boards. To set these switches:

1. Disconnect power and the RS-232 cable.
2. Remove paper feed knob by pulling it off.
3. Remove translucent cover and remove control panel connector.
4. Remove cover (four screws on bottom of machine).
5. Remove the RS-232 option board, the one with the RS-232 connector, (four screws).

Now set the switches located under the RS-232 option board as follows:

<u>Switch</u>	<u>Setting</u>
SW 1-1	ON
SW 1-2	ON
SW 1-3	ON
SW 1-4	OFF
SW 1-5	ON
SW 1-6	ON
SW 1-7	OFF
SW 1-8	ON
SW 2-1	ON
SW 2-2	ON
SW 2-3	OFF
SW 2-4	OFF

Now set the switches located on the RS-232 option board as follows:

<u>Switch</u>	<u>Setting</u>
SW 1-1	OFF
SW 1-2	ON
SW 1-3	ON
SW 1-4	OFF
SW 1-5	OFF *
SW 1-6	ON
SW 1-7	OFF
SW 1-8	OFF

* With SW 1-5, the respective functions set by its ON and OFF positions may become opposite to the above table due to the arrangement of IC's. This condition will cause the printer not to work at all. In such a case, reverse the ON and OFF positions of SW 1-5.

Reassemble the printer by following the disassembly procedure in reverse.

RPT-48 OPTION SWITCHES

The RPT-48 option switches are located on the rear panel (see Figure 2-1). Switch #3 must be UP or in the '1' position for operation with the Viewpoint terminal.